

## **Australia—Selected Issues**

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AUSTRALIA

**Selected Issues**

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Approved by the Asia and Pacific Department

September 21, 2011

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## I. WHY HAS HOUSEHOLD SAVING INCREASED SO SHARPLY IN AUSTRALIA?<sup>1</sup>

### A. Introduction

1. **Australia's net household saving rate began rising in the mid-2000s and jumped to over 10 percent of gross disposable income after the global financial crisis of 2008–09 (Figure I.1).** This was the highest level in nearly 25 years, but was still about 3 percent below the average for the 1970s and early 1980s. The recent spike in saving was higher than in some other advanced economies. Even though the economy is recovering from the crisis, house prices have declined in real terms and the stock market has not fully recovered to its previous highs. In this environment, consumers have remained cautious and households have continued to save and rebuild their balance sheets.

2. **Past staff analysis identified wealth effects, public saving, demography, and the terms of trade as the main factors associated with changes in Australian private sector saving.**<sup>2</sup> Cross-country regressions on annual data for 19 advanced economies suggest that private saving is negatively correlated with public saving (interpreted as a Ricardian offset) and old age dependency, and is positively correlated with the terms of trade. Single equation estimates for Australia confirm the negative correlation between private and public saving, and show a quantitatively large co-movement between private saving and the terms of trade. They also show a strong negative correlation between changes in household net worth and private saving.

3. **This paper relates Australian household saving more closely to movements in asset markets using two approaches:**

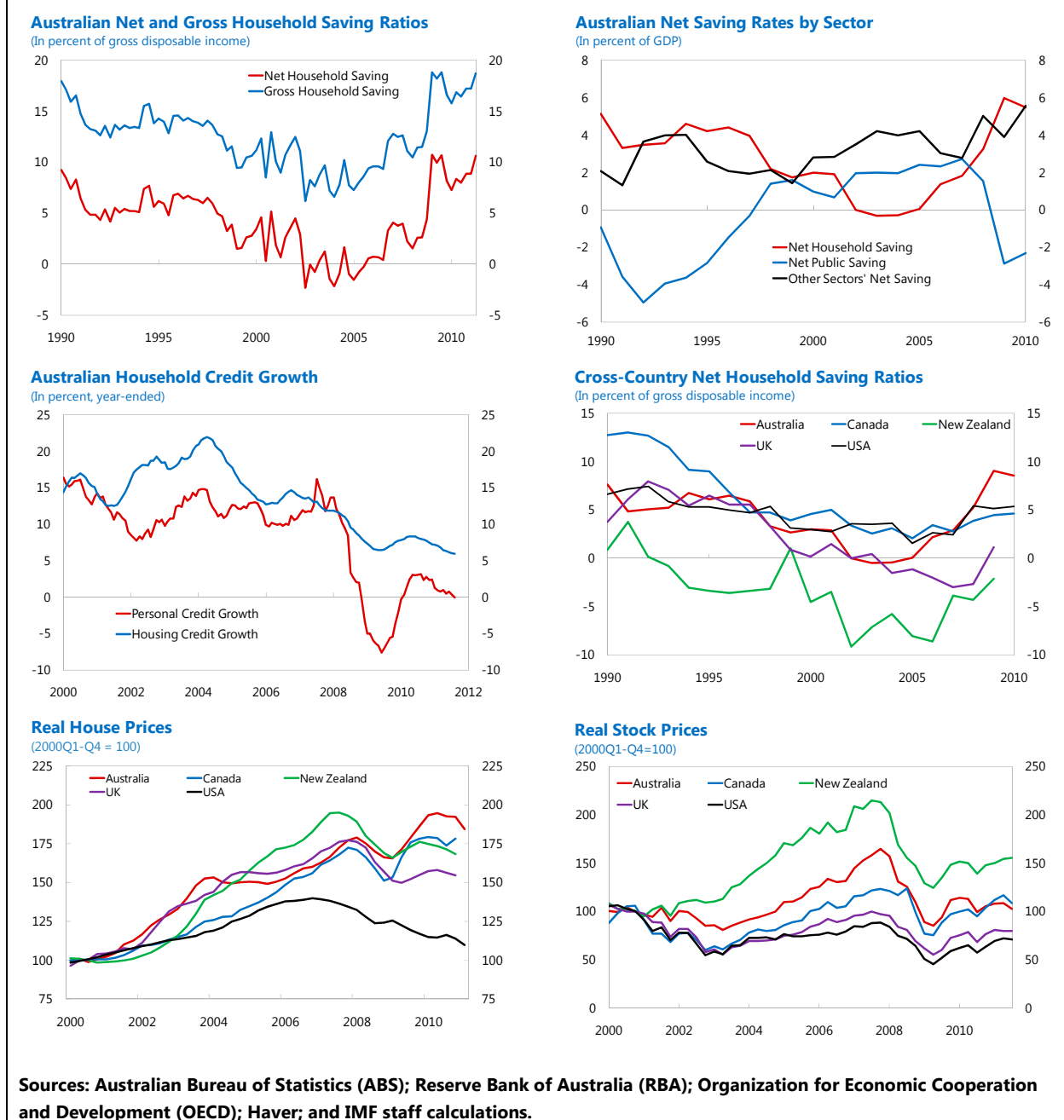
- Event study analysis examining deleveraging episodes in a broad sample of advanced economies following different asset market shocks;
- Econometric analysis using quarterly disaggregated household asset data and staff-constructed asset returns for Australia, Canada, and the United States.

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<sup>1</sup> Prepared by Suman Basu with assistance from Kessia De Leo and Solomon Stavis. The paper benefited from discussions with Ray Brooks and seminar participants at the Australian Treasury Department and the Reserve Bank of Australia.

<sup>2</sup> Brooks (2011), "How Well Do Standard Models Explain Australian and New Zealand Saving Behavior?" New Zealand Selected Issues Paper, IMF Country Report No. 11/103.

**Figure I.1. Consumer Caution in Australia**



4. **The event study analysis suggests that the jump in Australian saving has been large in comparison to past deleveraging episodes in advanced economies.** The annual data for 20 advanced economies over 1990–2010 suggests that the pace of deleveraging, and the extent of the jump in the saving rate, is more strongly affected by movements in house prices than in stock prices.

5. **Econometric analysis identifies some of the specific channels whereby asset market shocks appear to be related to Australian household saving, and confirms the importance of public saving and the terms of trade.** Stock market shocks (which are highly visible) affect saving most strongly in the short term, but housing and especially pension wealth are more important over the medium term. Our error correction specification indicates that a 10 percent decline in Australian house prices from the 2010Q4 level would be associated with a rise in the household saving rate by 1.2 percentage points, while a 10 percent shock to pension wealth would be associated with a similar rise even though pensions are a much smaller portion of wealth. Beyond standard wealth effects, staff-constructed measures of expected medium-term returns to housing are significant, with each percentage point decline in expected returns associated with an increase in the saving rate of  $\frac{1}{3}$  percentage points. Finally, decomposition of changes in household saving consistently identifies changes in the terms of trade as a quantitatively important contributor.

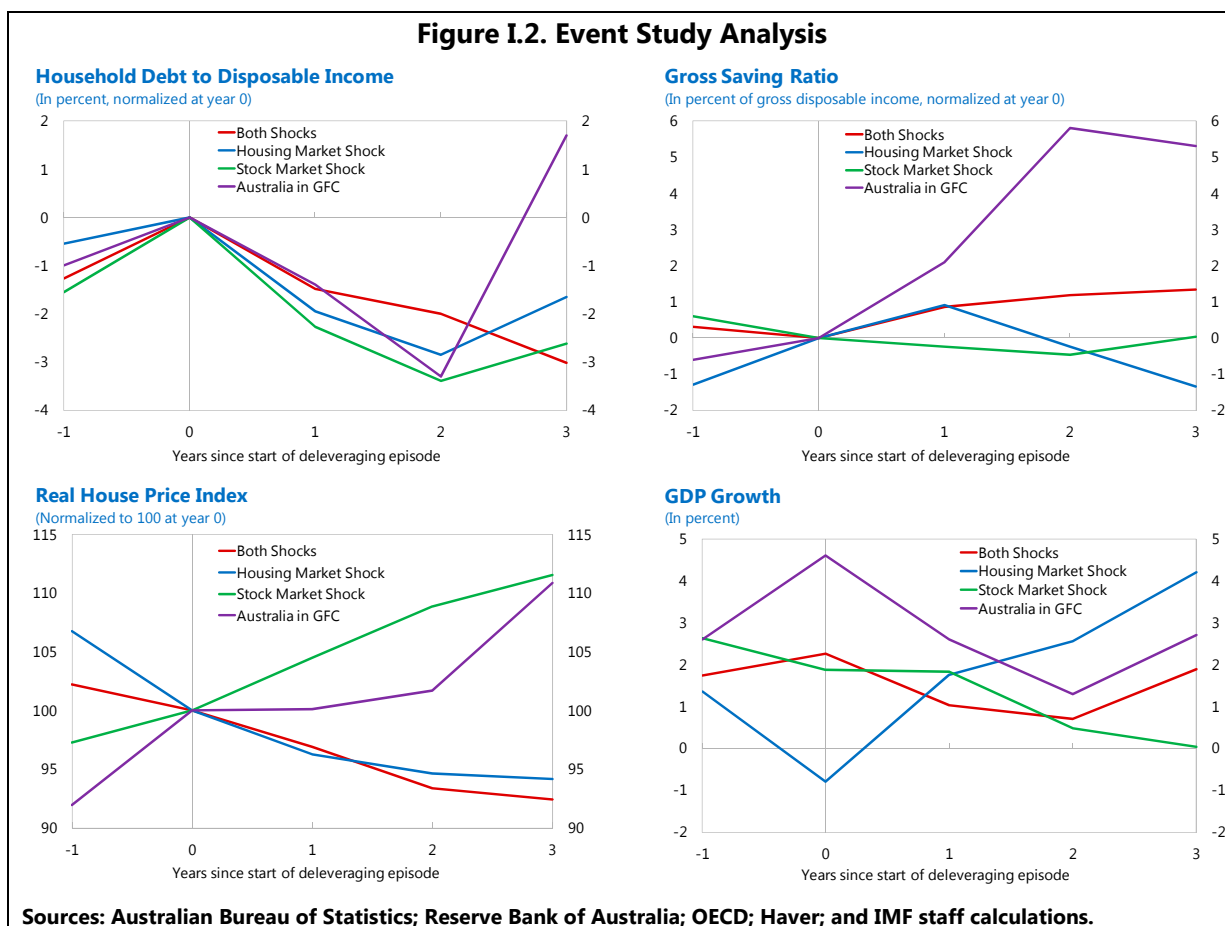
### B. Event Study: Deleveraging Episodes in Advanced Economies

6. **For a sample of 20 advanced economies over the period 1990–2010, we identify 12 deleveraging episodes** (Table I.1). We use the terminology of deleveraging loosely since actual leverage data is not available for all the countries, and we define such episodes to begin when the household debt to disposable income ratio declines by more than 0.5 percentage points in one year. We restrict attention to episodes for which we have three years of data after deleveraging begins.

**Table I.1. Deleveraging Episodes and Asset Market Shocks**

Total number of deleveraging episodes	12
Of which associated with:	
Both housing market and stock market shocks	5
Stock market shock only	4
Housing market shock only	2
Other	1

7. **The increase in household saving in Australia has been larger than the historical average for deleveraging episodes** (Figure I.2). For advanced economies in the past, the gross saving ratio has increased after a negative house price shock, but not after a negative stock market shock alone. The magnitude of the jump in saving in Australia seems unprecedentedly large given that the housing market merely slowed down since the crisis, but did not crash.



8. **Housing market shocks are more likely than stock market shocks to be associated with a deleveraging episode, suggesting that the future behavior of Australian households is sensitive to the evolution of house prices.** In the sample, there are eight housing market declines (defined by a 5 percent fall in real house prices), and seven of these were associated with deleveraging episodes. By contrast, only 15 out of the 35 stock market crashes in the data (a crash defined by a 10 percent decline in real stock prices) were associated with deleveraging. Moreover, of these 15 stock market crashes, house prices were concurrently declining by some degree in six of them.

### C. Quarterly Saving and Asset Data for Australia, Canada, and the United States

9. **To analyze household saving behavior more closely, we collect disaggregated wealth data at a quarterly frequency for a sample of financially deregulated economies.** Our analysis covers the period 1990Q1–2010Q4 and we use quarterly data in order to be able to estimate the impact on net household saving of the high frequency movements in different asset prices over this turbulent period. Wealth data for Australia, Canada, and the United States are broken down into housing assets and financial assets (the latter in turn split up into several components including pension wealth and direct stockholdings).

10. **Net household saving turned negative in the mid-2000s in Australia, and the rise in the saving ratio both over 2005–08 and since the crisis has been more marked than in the other economies** (Figure I.3). Unlike in Australia, net saving rates in Canada and the United States remained positive throughout, reached their nadir (above 1 percent) at a later date and did not show a clear rising trend until the crisis year of 2008.

11. **The negative effect of the crisis on household net worth has been only partially reversed, while high saving rates have stabilized both household debt and housing leverage.** Household net worth was less affected in Australia than in other countries by the stock market collapse of the early 2000s. The recent crisis sharply reduced net worth, but the housing market rebound in late 2009 helped reverse some of the losses. Pensions and stock market holdings, which are smaller components of household wealth, have not fully recovered. The ratio of housing debt to housing assets spiked with the fall in asset prices but has fallen since then. In the United States, the housing debt to assets ratio remains elevated.

12. **Estimates of medium-term housing returns show different patterns for the three economies.** Conceptually, households' saving should be affected by returns not only on deposits but also on the assets they own, such as houses. We assume that households are backward-looking, so that at each point in time, the expected housing return is simply calculated as the trend house price growth over the previous five years. On this measure, Australian expected housing returns reached very high levels by the mid-2000s and have been falling since 2004, well before the global crisis. Both Canadian and the United States expected housing returns were lower during the mid-2000s, and began declining only after the crisis.

13. **All three countries suffered a deterioration in the fiscal position of similar magnitude as a result of the global crisis.** The stronger fiscal position in Australia and Canada at the onset of the crisis meant that net public saving did not become as negative as in the United States.

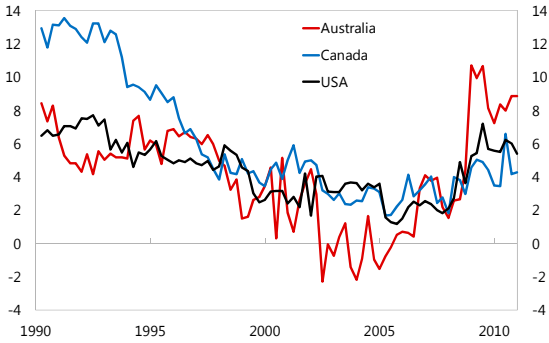
14. **Australia is unique in the magnitude of the run-up in its terms of trade since the mid-2000s.** In part, this is because Australia's main commodity exports (iron ore and coal) are inputs for the global steel industry, where very strong demand has pushed up prices of raw materials 3–5 times. Canada has also benefited from the global rise in commodity prices, but not to the same extent because oil prices did not rise as much as iron ore and coal prices. The United States, as an importer rather than an exporter of commodities, was hurt by the increase in commodity prices.



**Figure I.3. Quarterly Data for Australia, Canada, and the United States**

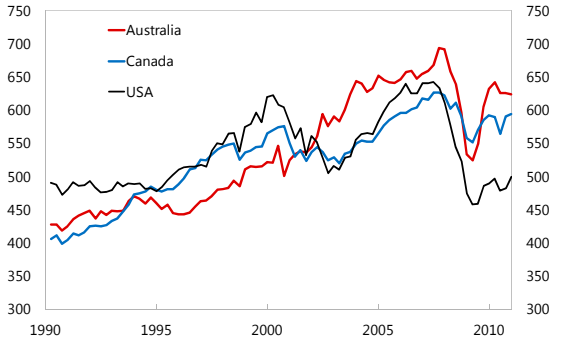
**Household Saving Ratios**

(In percent of gross disposable income)



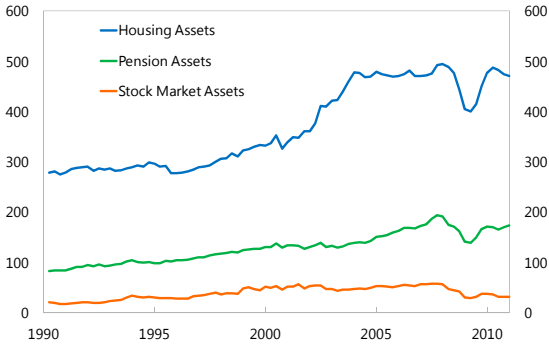
**Household Net Worth**

(In percent of gross disposable income)



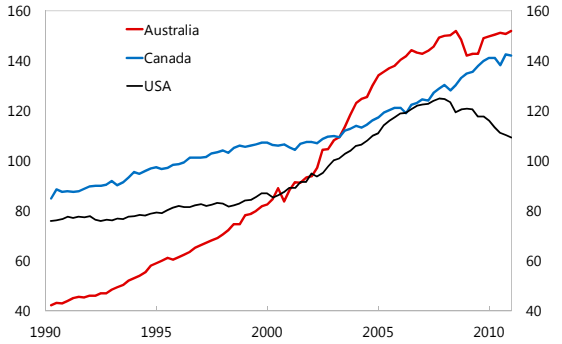
**Selected Components of Household Wealth in Australia**

(In percent of gross disposable income)



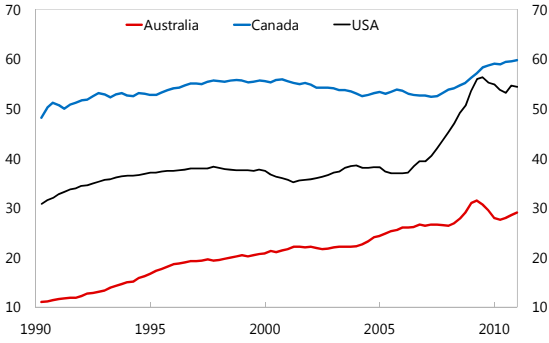
**Household Debt**

(In percent of gross disposable income)



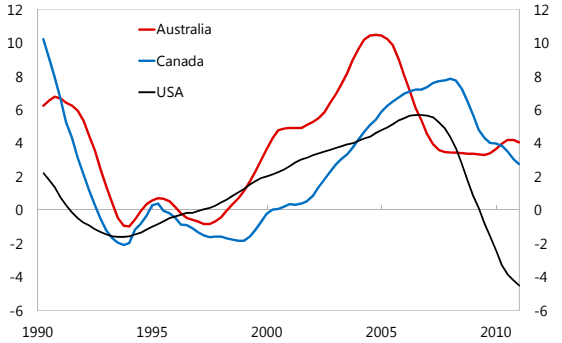
**Housing Debt to Assets Ratio**

(In percent)



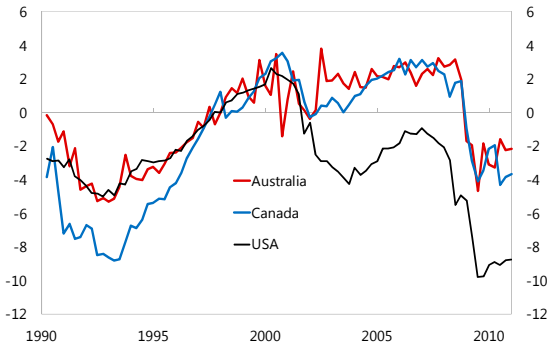
**Constructed Returns to Housing**

(In percent growth per year)



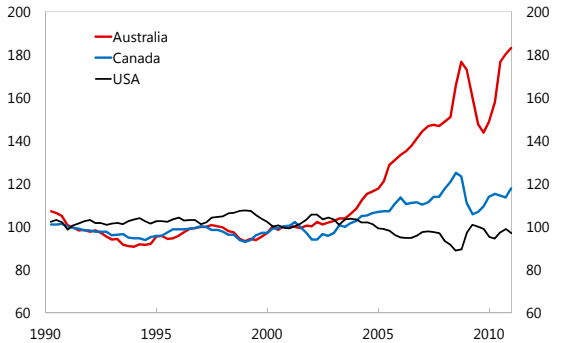
**Net Public Saving**

(In percent of GDP)



**Terms of Trade**

(2000Q1-Q4 = 100)



Sources: Australian Bureau of Statistics; RBA; Federal Reserve Board; OECD; Haver; and IMF staff calculations.

## D. Econometric Analysis: Panel Regressions

**Table I.2. Panel Regressions: Household Saving Rate**

Fixed Effects Regression	OLS (Lags)	IV
Housing assets/disposable income	-0.035**	-0.014
Stocks/disposable Income	0.017	0.002
Pensions/disposable income	-0.099**	-0.048*
Liabilities/disposable income	0.11*	-0.061
Expected housing returns	-0.25**	-0.27***
Government transfers/disposable income	-0.150	0.680
Net public saving/GDP	-0.48***	-0.76***
Net corporate saving/GDP	-0.190	-0.42**
Output gap	0.210	0.036
Log terms of trade	15.1**	16.5***
Unemployment rate	-0.550	-1.65***
Consumer confidence	0.0056	-0.063
Young age dependency ratio	0.77*	-0.290
Old age dependency ratio	-0.88	-1.38***
Standard errors	Clustered by country	
Observations	251	251
Number of countries	3	3
Sample period	1990Q1-2010Q4	1990Q1-2010Q4
Significance: * 10% level, ** 5% level, ***1% level.		

15. **The main results of ordinary least squares (OLS) and instrumental variable (IV) regressions, for a panel of quarterly data for Australia, Canada, and the United States for the past 21 years (Table I.2), suggest that:**<sup>3</sup>

- A 10 percent decline in Australian housing wealth from the 2010Q4 level is associated with an increase in the household saving rate of 1.6 percentage points,<sup>4</sup> while a 10 percent decline in pension wealth is associated with a 1.7 percentage point increase (although pensions are a much smaller portion of wealth), according to the lagged OLS specification. This higher sensitivity to pension wealth holds in the IV

<sup>3</sup> For the OLS specification, one quarter lags are used to reduce endogeneity and standard errors are clustered by country. The IV specification uses lagged values of variables as instruments. The variables in the regressions are non-stationary but the residuals are stationary, implying co-integration in the levels specification.

<sup>4</sup> This is calculated by multiplying the 2010Q4 figure for the Australian housing assets/disposable income ratio (which equals 470.2) by 10 percent and then by the regression coefficient in the table of -0.035.

specification too, and makes sense if households are primarily saving for retirement purposes. Higher sensitivity to financial wealth is consistent with past studies.<sup>5</sup>

- A fall in expected housing returns by 1 percentage point is associated with a  $\frac{1}{4}$  percentage point increase in the saving rate. Households may recognize that a lower return to housing (typically their largest single investment) means that they need to save more in order to achieve a given target level of wealth by the retirement date. The slowdown in Australian trend house price growth between 2005 and 2008 may explain part of the increase in saving during this period.
- Household saving moves in a way that appears to offset about half of any changes in net public saving, according to the lagged OLS specification. This could indicate a Ricardian offset, whereby public borrowing today raises expectations that taxes will increase in the future, inducing households to save. Alternatively, large negative shocks (including, but not necessarily restricted to, the recent crisis) may generate both higher public borrowing and a greater perceived risk of future macroeconomic volatility, and the latter effect may be the driver of increased consumer caution and precautionary saving by households.<sup>6</sup>
- A 10 percent increase in the terms of trade is associated with an increase in the household saving rate by 1.5–1.7 percentage points. This robust and quantitatively large impact is surprising and may imply that households view the increase in the terms of trade as temporary, or that the increase in the terms of trade is a harbinger of structural change and makes consumers worried that their jobs (typically outside the mining sector) may be at risk from such change.
- Demographic variables are not robustly statistically significant in the quarterly specification, perhaps because of higher noise than in the annual data, or because there is less demographic variation in this sample than in past staff work.

16. **Structural differences between Australia and the other countries, which may account for saving behavior, are captured to varying degrees by the econometric analysis.** It is possible that the saving rate is returning to earlier levels after adjusting to financial deregulation and structurally lower interest rates. To the extent that the effects of deregulation are reflected in movements of assets and liabilities, they should be reflected in the regressions. For the period since the crisis, Australian household incomes have grown

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<sup>5</sup> See Dvornak, N., and M. Kohler, 2003, “Housing Wealth, Stock Market Wealth and Consumption: A Panel Analysis for Australia,” RBA Research Discussion Paper 2003–07.

<sup>6</sup> The coefficient on public saving does not change substantially if the sample is restricted to 1990–2007, so the regression does not capture an effect driven solely by the recent crisis.

faster than those in the United States and Canada, which has increased the scope for deleveraging after a debt-fuelled consumption boom, and may account for the larger jump in the saving rate. The terms of trade variable may be capturing this effect since growth in commodity incomes has been driving the Australian recovery.

### E. Econometric Analysis: Single Equation Estimates for Australia

17. **The lagged OLS specification for Australia alone yields similar results to the panel regression** (Table I.3). The wealth effect from pensions is larger than that from housing: a 10 percent decline in housing wealth from the 2010Q4 level is associated with an increase in the household saving rate of 2.3 percentage points, while a 10 percent decline in pension wealth is associated with a 1.3 percentage point increase. A fall in expected housing returns by 1 percentage point is associated with a  $\frac{1}{4}$  percentage point increase in the saving rate. The terms of trade remains quantitatively important. The graph of residuals for the lagged OLS regression indicates that the model does reasonably well in accounting for the rise in household saving since 2005.

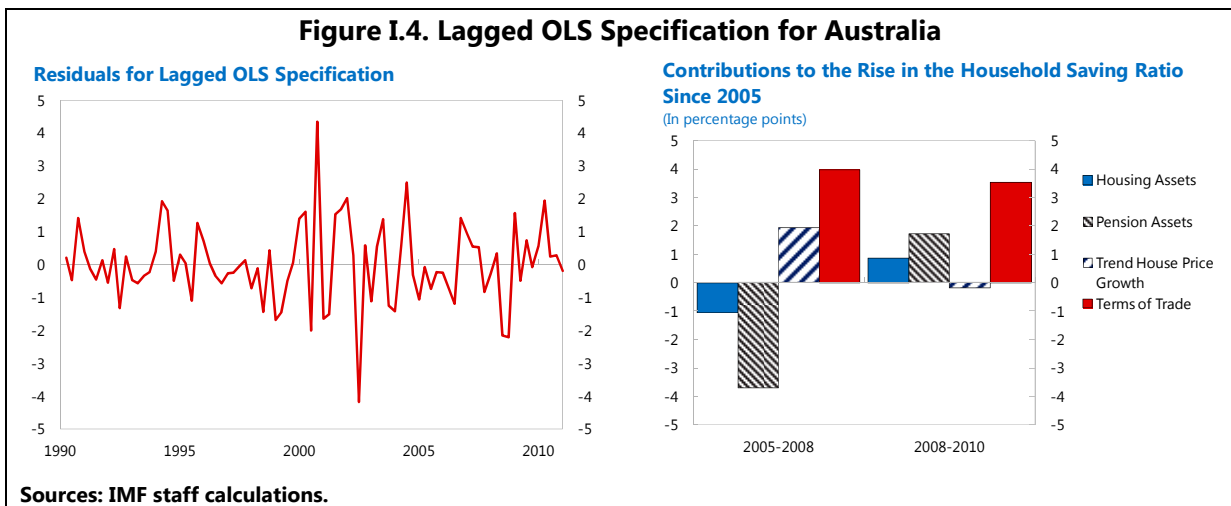
**Table I.3. Australia Regressions: Household Saving Ratio**

Fixed Effects Regression	OLS (lags)	IV	IV
Housing assets/disposable income	-0.048**	-0.0074	0.048
Stocks/disposable income	0.0011	0.24	0.16
Pensions/disposable income	-0.073*	-0.18*	-0.17***
Liabilities/disposable income	0.025	0.10	-0.42*
Expected housing returns	-0.28**	-0.27	-0.47***
Government transfers/disposable inco	-0.14	-0.81	0.38
Net public saving/GDP	-0.12	-1.84*	-0.59*
Net corporate saving/GDP	0.19	-0.93	-1.30**
Output gap	-0.097	1.10	-
Log terms of trade	17.1***	12.8	29.6***
Unemployment rate	-0.21	-0.58	-
Consumer confidence	0.17	-0.31	-
Young age dependency ratio	-1.34	1.07	-7.19**
Old age dependency ratio	-1.34	2.03	0.43
Standard errors	Newey-West		
Observations	84	84	84
Number of countries	1	1	1
Sample period	1990Q1-2010Q4	1990Q1-2010Q4	1990Q1-2010Q4

Significance: \* 10% level, \*\* 5% level, \*\*\*1% level.

18. **The lower degree of freedom in the single country regression reduces the power of the IV specification.** Removing some of the insignificant variables results in an IV regression which qualitatively matches the lagged OLS results, but with larger coefficients.

19. **The main factors associated with the increase in the household saving rate since 2005 appear to be the decline in expected housing returns and household asset values, and the rise in the terms of trade.** The lagged OLS specification is used for the decomposition and indicates that the fall in expected housing returns was important during 2005–08, while declines in the values of housing and pension assets were associated with a jump in the saving rate from 2008 onward (Figure I.4). The rising terms of trade accounts for quantitatively large increases in the saving rate during the entire period since 2005.



20. **An error correction model (ECM) specification for Australian household saving further separates out the impact of different asset prices on saving:**

- In the long term, net household saving is in a cointegrating relationship with housing assets, pension assets, expected housing returns, and the terms of trade (Table I.4).
- In the short term, stock market shocks (which are highly visible) affect saving, with a 10 percent fall in stock prices being associated with a 0.5 percentage point increase in saving (Table I.5). In addition to the wealth effects from total stockholdings, the specific index of resource sector stocks is important. This short-term relationship quickly gives way to the long-run relationship.

**Table I.4. Long-Run Cointegrating Relationship for the Household Saving Ratio**

Fixed Effects Regression	OLS (lags)
Housing assets/disposable income	-0.025***
Pensions/disposable income	-0.070***
Expected housing returns	-0.34***
Log terms of trade	20.6***
Standard errors	Newey-West
Observations	84
Number of countries	1
Sample period	1990Q1-2010Q4

Significance: \* 10% level, \*\* 5% level, \*\*\*1% level.

**Table I.5. Short-Run ECM Relationship for the Household Saving Ratio**

Fixed Effects Regression	OLS (lags)
Lagged error correction term	-0.80***
Stocks/disposable income	-0.16***
Industrial stock market index/GDP	0.0082
Financial stock market index/GDP	0.054
Resources stock market index/GDP	-0.020**
Output gap	0.31
Log terms of trade	16.2**
Standard errors	Newey-West
Observations	83
Number of countries	3
Sample period	1990Q1-2010Q4

Significance: \* 10% level, \*\* 5% level, \*\*\*1% level.

## F. Sensitivity Tests and Policy Conclusions

21. **Household saving is sensitive to the values of housing and pension assets, and monetary policy can influence consumer behavior by affecting these.** Adding real interest rates such as real mortgage rates to the above regressions does not yield statistically significant coefficients, but monetary policy rates are known to affect asset prices and household saving decisions are sensitive to these prices. Moreover, an increase in interest rates would lower net-of-interest disposable income and hence reduce the level of

consumption, even if the saving rate remains unchanged. In addition to the wealth effects from housing and pension wealth, expected housing returns are robustly statistically significant. Even if house prices plateau for a prolonged period without falling, expected housing returns would eventually fall and household saving would rise.

22. **Some of the Commonwealth government’s fiscal consolidation may be offset by households.** Therefore, further policy steps to support household saving may be needed if the government wishes to maintain the current high level of household saving. Adding our crude annual data on superannuation contributions yields mixed results on their effectiveness: member contributions tend to be significant (which means they are not fully offset by households) but employer contributions tend not to be. However, other more detailed studies have identified positive effects from employer superannuation contributions.<sup>7</sup>

23. **According to the decomposition analysis, the terms of trade robustly accounts for a large portion of the changes in household saving, and more research is needed to understand this link.** Perhaps households view most of the increase in the terms of trade as temporary (quite different from the government’s view), or the higher income flows may be accruing to individuals in the upper portion of the income distribution who have a high propensity to save. Regarding the post-crisis period specifically, higher income growth in Australia relative to other advanced economies (driven by commodity income) may make it easier for households to begin the deleveraging process, contributing to higher saving. On the other hand, households may view the increase in the terms of trade as a sign that their own jobs may be under threat as the mining sector crowds out their industry of employment, or they may be induced by terms of trade volatility to upgrade their general assessment of economic uncertainty, and therefore to save more. As far as we can tell, the terms of trade is not simply a proxy for the real exchange rate or real oil prices: both are statistically insignificant if added. To the extent that a negative shock to the terms of trade would tend to reduce household saving, consumption would be cushioned from the associated fall in household income. The significant effect of the terms of trade persists even if the sample is restricted to 1990–2004.

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<sup>7</sup> See Connolly and Kohler (2004), “The Impact of Superannuation on Household Saving,” RBA Research Discussion Paper 2004–01.

**Data Appendix**

<b>Net and gross household saving</b>	Haver Analytics.
<b>Net public saving</b>	Haver Analytics.
<b>Net corporate saving</b>	Haver Analytics.
<b>Gross disposable income</b>	Defined net of interest payments and including gross income of unincorporated enterprises, from Haver.
<b>Real and nominal GDP</b>	Haver Analytics.
<b>Household assets and debt</b>	Reserve Bank of Australia; Statistics Canada; Federal Reserve Board; and Haver.
<b>Household credit</b>	Reserve Bank of Australia.
<b>House price index</b>	Australian Bureau of Statistics; for panel regressions, OECD data are used because they have a longer time series for all countries.
<b>Stock market index</b>	S&P/ASX200 Share Price Index (Australia); S&P/TSX: Composite (Canada); S&P 500 Composite Index (USA); NZSX All Indexes (New Zealand); FTSE All Share Price Index (UK). All these series, and decomposition into sectoral indices, are from Haver.
<b>Consumer price index</b>	Haver Analytics.
<b>Terms of trade</b>	Haver Analytics.
<b>Old and young age dependency ratios</b>	Australian Bureau of Statistics; and Haver Analytics.
<b>Government transfers</b>	Reserve Bank of Australia; and Haver Analytics.
<b>Unemployment rate</b>	Haver Analytics.
<b>Output gap</b>	Haver Analytics; and IMF staff calculations.
<b>Consumer confidence</b>	OECD Main Economic Indicators.
<b>Policy and lending interest rates</b>	IMF <i>International Financial Statistics</i> .
<b>Mortgage interest rate</b>	Haver Analytics.
<b>Inflation expectations</b>	Consensus Forecasts.
<b>Superannuation contributions</b>	Australian Treasury Department.
<b>Real effective exchange rate</b>	IMF Information Notice System working database.
<b>Oil price</b>	Haver Analytics.



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## II. POLICY CHALLENGES FOR AUSTRALIA FROM REBALANCING IN CHINA AND DOWNSIDE RISKS IN THE GLOBAL ECONOMY<sup>1</sup>

1. **This paper analyses the policy challenges for Australia from three scenarios:** rebalancing in China, a temporary growth slowdown in China, and a recession in advanced countries. To analyze these potential policy challenges, we use the Globally Integrated Monetary and Fiscal Model (GIMF) calibrated for six regions of the world: Australia, China, Japan, Emerging Asia, United States, and the Remaining Countries.<sup>2</sup> This allows us to study not only the direct linkages between the Australian and Asian economies, but also the indirect linkages in a multi-country framework.
2. **The results suggest that Australia is likely to cope with shocks better than other countries or regions.** Rebalancing in China would have only a small impact, provided Australia is flexible enough to adjust quickly to a change in the structure of external demand. However, a separate shock to Chinese and global growth will have a sizable impact on demand for commodities and in turn lead to a slowdown in Australia. The impact on real GDP growth in Australia is milder than elsewhere, in part because monetary and fiscal policy has scope to buffer the shock. The simulation also shows the important role that the flexible exchange rate policy plays in helping adjust to the shock.
3. **For fiscal policy, a policy implication is that fiscal space should be built during good times when commodity prices are high.** The authorities plan to continue to build fiscal buffers, which should allow a discretionary fiscal response over and above the full operation of automatic stabilizers during a downturn. The simulation of a global recession, triggered by a crisis in advanced countries, results in a sizable increase in net public debt in Australia (about 10 percent of GDP) assuming a gradual return to budget surplus. The increase in net public debt would have been even larger if a discretionary increase in spending were assumed, as undertaken following the Global Financial Crisis. In addition, broad-based economic reforms, including those aiming to increase labor participation and flexibility, would facilitate structural adjustment and lower the real cost of shocks (see Chapter III, The Impact of the Mining Boom on the Australian Labor Market).

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<sup>1</sup> Prepared by Juan Jauregui and Werner Schule. The paper greatly benefited from assistance by D. Muir and discussions with seminar participants at the Australian Treasury Department and the Reserve Bank of Australia.

<sup>2</sup> See *Globally Integrated Monetary and Fiscal Model (GIMF) – Theoretical Structure*, 2010, IMF Working Paper No.10/34.

### A. Comprehensive Rebalancing in China

4. **As in the China Spillover Report,<sup>3</sup> we assume that a successful rebalancing of China's growth toward private consumption comes about by a comprehensive set of policy measures** that includes exchange rate appreciation, financial sector reform, structural reforms, and a stronger social safety net.<sup>4</sup> All these measures support private consumption and shift resources from the tradables to the nontradables sector while slowing the build-up of export capacity through private investment.

- Exchange rate appreciation: The nominal exchange rate appreciates against the U.S. dollar by 20 percent over five years. Because prices in China are sticky, the nominal appreciation translates into a persistent real effective appreciation of about 16 percent over five years.
- Financial sector reform: Interest rate liberalization will result in a higher cost of capital. At the same time households and SMEs are assumed to get increased access to financial services.
- Fiscal reform: Government spending is re-oriented toward the social safety net, affordable housing and the provision of health and education services in a way that is neutral for the budget balance. As a result of fiscal and financial sector reform, households save less.
- Structural reforms: Reforms facilitate a reallocation of capital and labor from the tradables to the nontradables sector.

5. **As a result, the model suggests that China's annual GDP growth rate would fall by 1½ percent** and the level of GDP would be about 7 percent below baseline after five years (Figure II.1). However, Chinese consumers enjoy improved terms of trade, which raises their welfare. Domestic demand increases by about 8 percent of GDP while net exports fall. The current account surplus narrows by 4 percent of GDP over five years.

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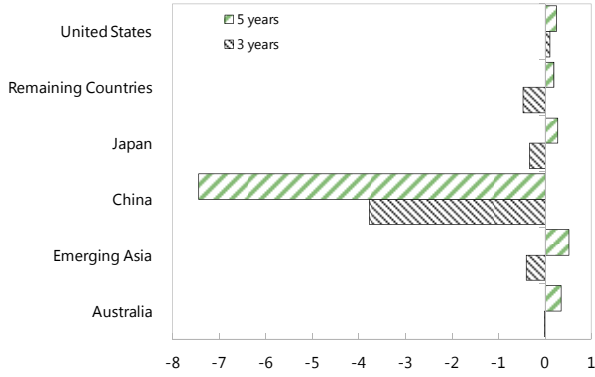
<sup>3</sup> See *People's Republic of China: Spillover Report for the 2011 Article IV Consultation and Selected Issues*, IMF Country Report No. 11/193.

<sup>4</sup> In GIMF, these policies were implemented through shocks to the exchange rate target, households' rate of time preference, investment, sovereign and bond premiums, and productivity shocks in the tradable and non-tradable sectors. *People's Republic of China: Spillover Report for the 2011 Article IV Consultation and Selected Issues*, IMF Country Report No. 11/193.

**Figure II.1. Comprehensive Rebalancing Strategy in China–Impact on Australia**

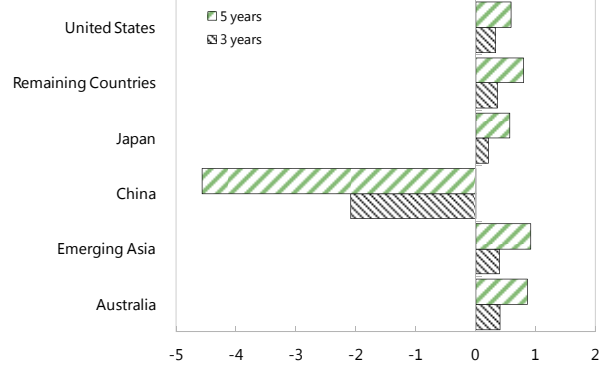
**Real GDP**

(Percent deviation from control)



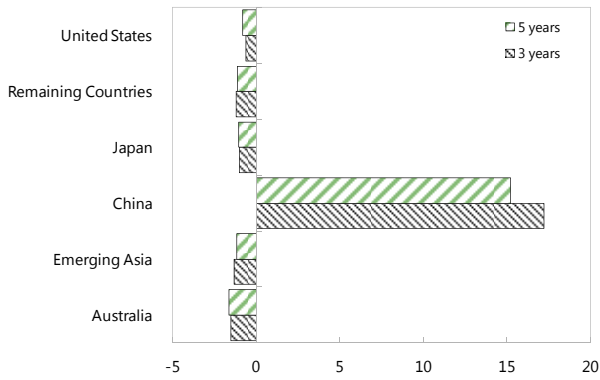
**Current Account/GDP**

(Percent deviation from control)



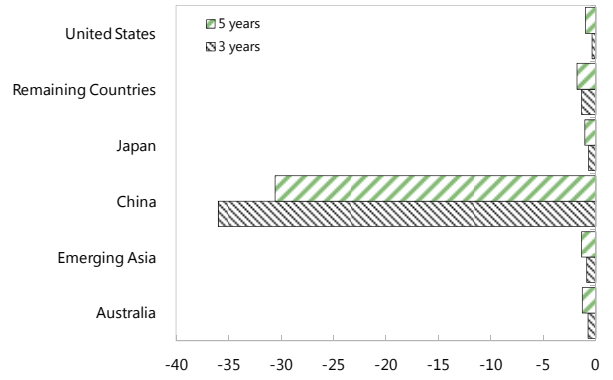
**Consumption**

(Percent deviation from control)



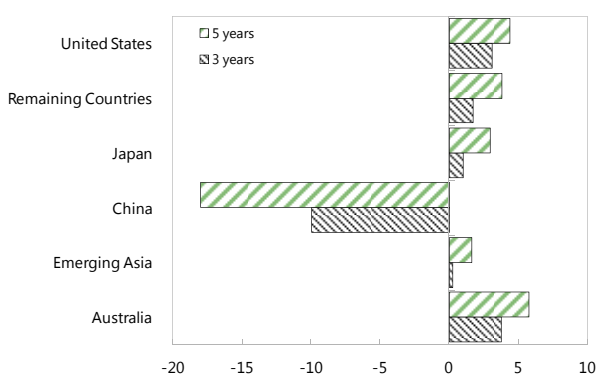
**Investment**

(Percent deviation from control)



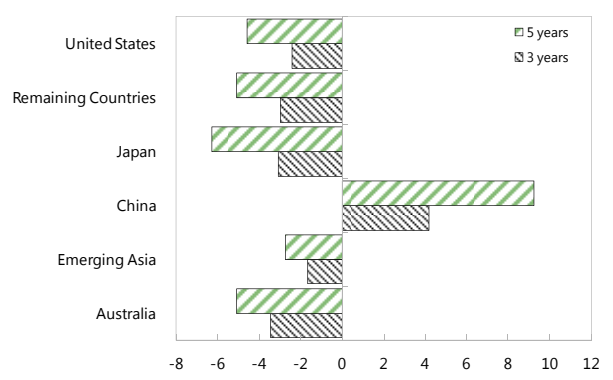
**Real Non-Commodity Exports**

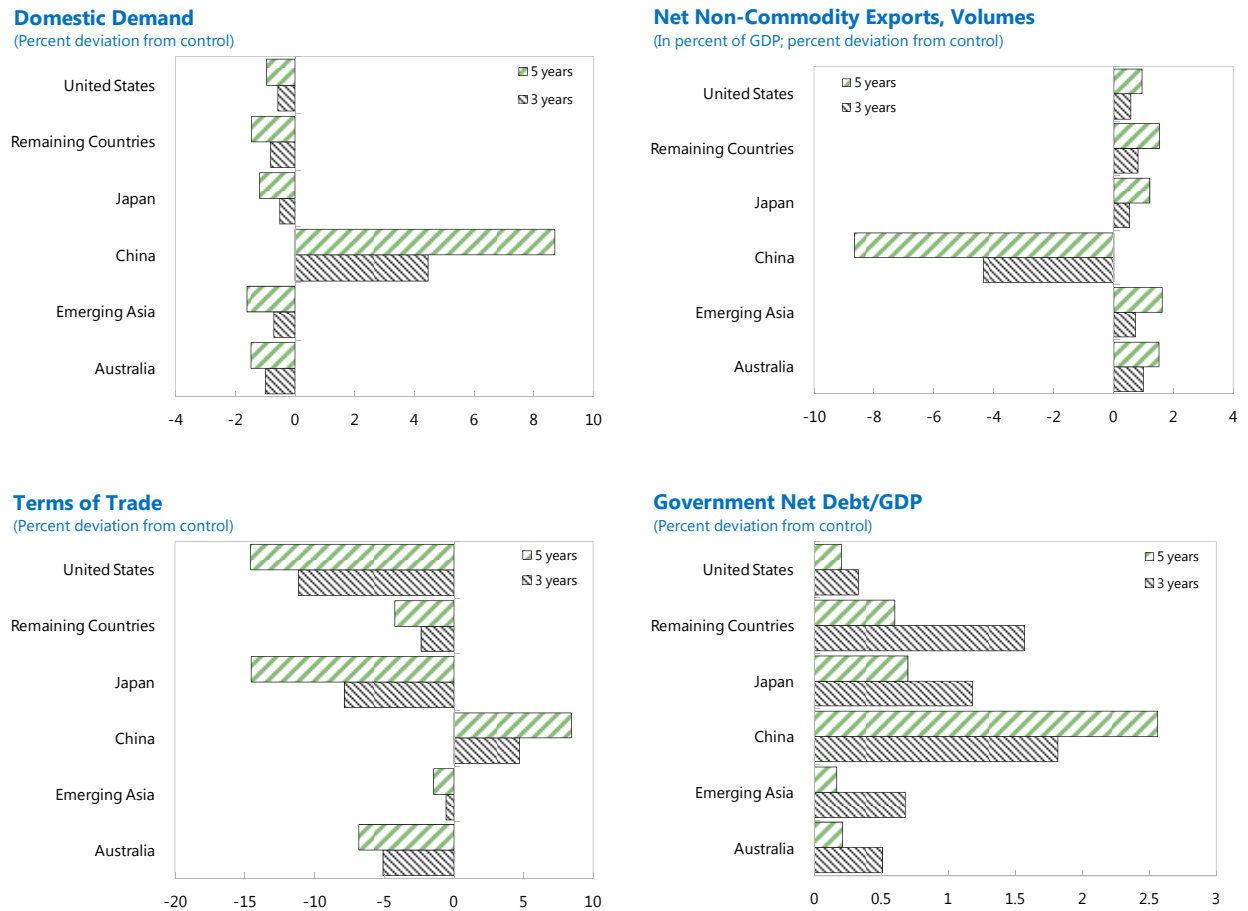
(Percent deviation from control)



**Real Non-Commodity Imports**

(Percent deviation from control)



**Figure II.1 cont'd.: Comprehensive Rebalancing Strategy in China—Impact on Australia**

Source: GIMF simulations.

### *Impact on Australia*

6. **Rebalancing toward domestic demand in China is mirrored by rebalancing toward external demand in the rest of the world.** Nevertheless, global GDP remains about  $\frac{3}{4}$  percent below baseline after five years, as structural adjustment in the global economy takes more than five years to complete. Commodity revenues in Australia remain little changed as the lower demand from China is largely compensated for by higher demand elsewhere.<sup>5</sup> The gain in competitiveness leads to an increase in noncommodity exports of goods and services and the current account improves by about  $\frac{3}{4}$  percent of GDP after five

<sup>5</sup> The commodity basket in GIMF includes energy, minerals, and agriculture commodities, while Australian commodity exports to China are mainly iron ore and coal, which represent a larger input share in Chinese output than elsewhere. The simulations are therefore likely to underestimate the negative impact of rebalancing in China on the demand for Australia's key commodities.

years. Real GDP is modestly higher, however, nominal GDP falls  $\frac{3}{4}$  percent below baseline because of lower terms of trade. Government revenues from commodities are lower while government expenditures change little. As a result, the public debt to GDP ratio increases, though not by much.

## B. One Year of Slower Growth in China—the Role of Policy Flexibility in Major Economies

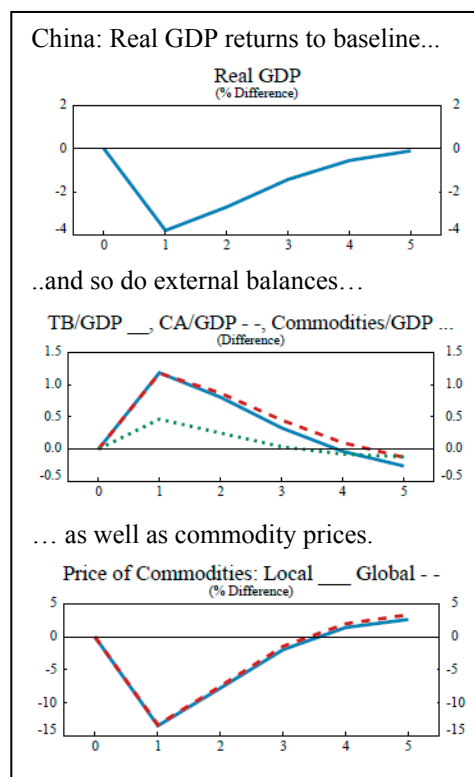
7. **In this tail risk scenario, we assume a decline in investment drives a slowdown in China,** possibly because of problems in the real estate market or some financial market disturbances.<sup>6</sup> GDP growth falls to around 6 percent for one year and the level of real GDP returns to baseline after five years, with 1 percent higher-than-baseline growth in each of the four years following the growth shock.

8. **We assume no large discretionary fiscal policy response from the Chinese authorities.** If the Chinese authorities were to respond as they did following the Global Financial Crisis, by increasing public spending on infrastructure, it would likely cushion the impact of the slowdown on demand for commodities.

9. **Lower growth in China leads to a persistent fall in global commodity prices** by about 13 percent (Figure II.2). While this hurts commodity exporters, it benefits commodity importers and reduces the impact of slower Chinese growth on the global economy.

### *Policy flexibility*

10. **The impact on the global economy is mitigated by automatic fiscal stabilizers in Australia and other countries.** However, with limited fiscal space, many advanced countries may not have the policy flexibility to let automatic stabilizers work fully. To illustrate the role of fiscal stabilizers, two scenarios were run: one in which automatic

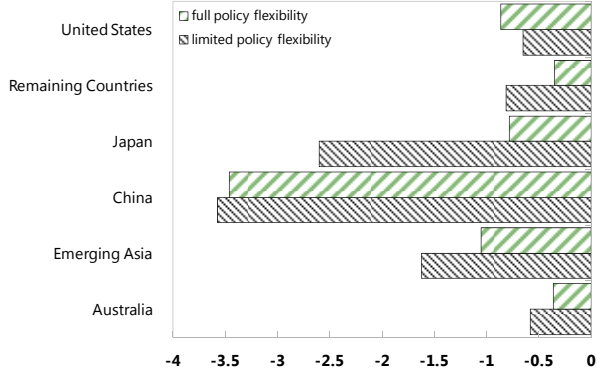


<sup>6</sup> Implemented as a temporary shock to investment.

**Figure II.2. One Year of Lower Chinese Growth—The Role of Policy Flexibility**  
(First year impact)

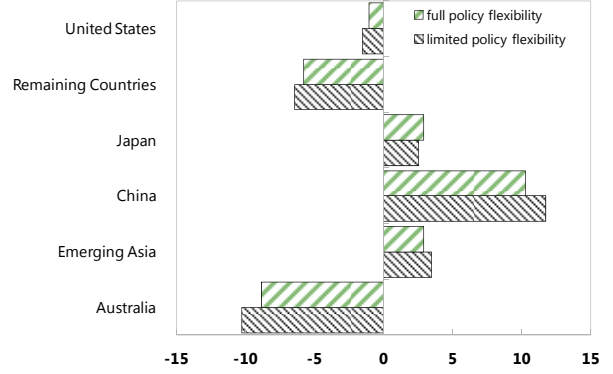
**Real GDP**

(Percent deviation from control)



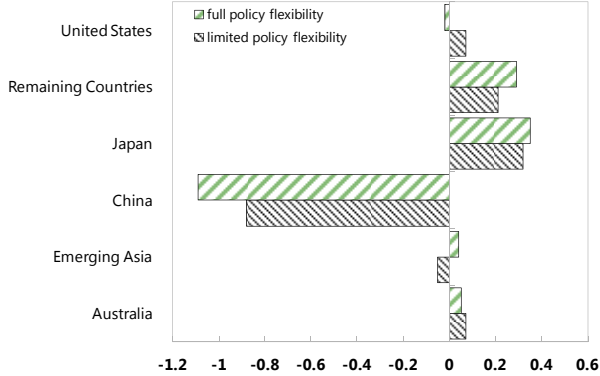
**Terms of Trade**

(Percent deviation from control)



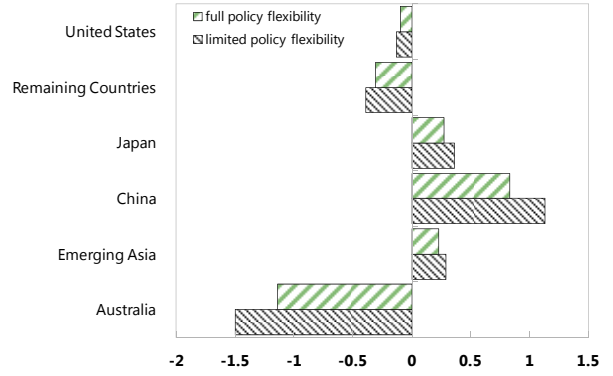
**Domestic Demand**

(Percent deviation from control)



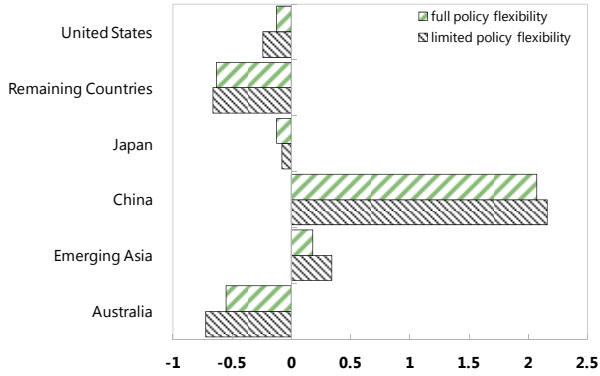
**Commodity Balance, Nominal**

(In percent of GDP; percent deviation from control)



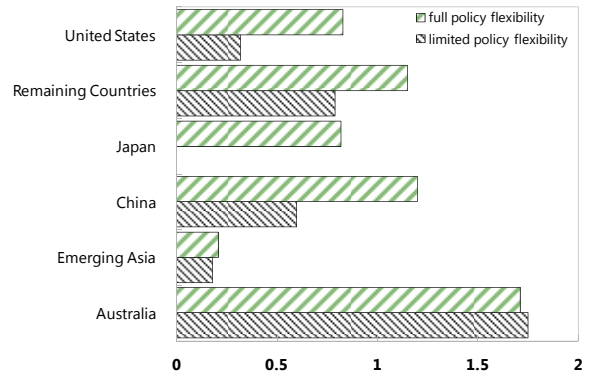
**Current Account/GDP**

(Percent deviation from control)



**Fiscal Deficit/GDP**

(Percentage point deviation from control)

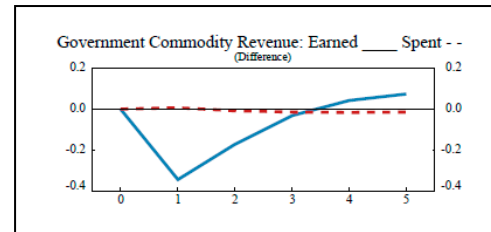


Source: GIMF simulations.

stabilizers are allowed to work fully (full policy flexibility) and another where automatic stabilizers are reduced in Europe, Japan, and the United States (limited policy flexibility).<sup>7</sup> In Japan and the United States, policy interest rates are at the lower bound and cannot be reduced. China's renminbi is assumed to be pegged to the U.S. dollar.

11. **Australia suffers a terms of trade shock.** The size of the impact, however, depends significantly on the degree of policy flexibility elsewhere.

- With limited policy flexibility elsewhere, Australia's terms of trade falls by about 10 percent in the first year, relative to baseline. The impact of the fall in global commodity prices on the terms of trade is partly offset by a fall in the price of commodity imports, including oil. With full policy flexibility in advanced countries, the fall in Australia's terms of trade would be cut by two-thirds.
- Real GDP falls by about  $\frac{3}{4}$  percent relative to baseline, because of lower demand from China and the negative impact of the Chinese shock on global demand. However, with policy flexibility in advanced countries the fall would be less than  $\frac{1}{4}$  percent. The reduction in commodity prices amplifies the negative impact on nominal incomes, with nominal GDP falling by  $2\frac{1}{2}$  percent in the case of limited policy flexibility ( $1\frac{1}{2}$  percent with full policy flexibility).
- Government revenue in Australia falls directly, through a decline in resource taxes and company income taxes, and indirectly through lower economic activity. We assume public expenditure is reduced gradually to balance the budget. As a result, transitory deficits add to public net debt which rises by about 3 percentage points of GDP over two years.



12. **A depreciation of the Australian dollar helps buffer the shock, as do cuts in the policy interest rate.** The exchange rate depreciation redirects exports to non-commodities and reduces imports. The contribution of net exports to GDP growth in real terms improves. However, the depreciation is not strong enough to fully offset the impact of lower commodity prices on the nominal trade balance, which worsens by about  $1\frac{1}{2}$  percent of GDP. Because about half of private earnings from commodities accrue to foreign shareholders, the drop in the current account balance is smaller than the decline in the trade balance.

<sup>7</sup> Automatic fiscal stabilizers are calibrated in GIMF to reflect those estimated by the OECD.



### C. A Recession in Advanced Countries

13. **This scenario represents the tail risk of a confidence crisis triggered by high sovereign debt in advanced countries, particularly Europe.** It assumes higher risk premiums on government bond rates (75 basis point area wide) and a risk premium on the exchange rate, leading to a real effective exchange rate depreciation in the Remaining Countries block. A permanent deleveraging by private households and a two-year discretionary reduction in the fiscal deficit are also assumed ( $1\frac{3}{4}$  percent of GDP). In the United States, households deleverage as well, but no discretionary fiscal tightening was assumed. Government bond rates rise in all countries, except China.

14. **As a result, advanced economies enter into a recession led by a decline in investment.** Global GDP falls by about 3 percent (Figure II.3). China's output declines most, hit by the reduction in imports in advanced countries directly and a related fall in investment. International commodity prices fall by about 25 percent. The terms of trade in commodity export countries worsen, and improve in those countries which are net commodity importers. Lower commodity prices support consumption in the latter countries.

15. **Macroeconomic policy flexibility is assumed to be limited in most advanced countries.** Automatic fiscal stabilizers in Europe and the United States are reduced to  $\frac{1}{3}$  of their OECD estimates, and no fiscal space is assumed to be left in Japan. Again, in Japan and the United States, policy interest rates are at the lower bound and cannot be reduced and China's renminbi is assumed to be pegged to the U.S. dollar.

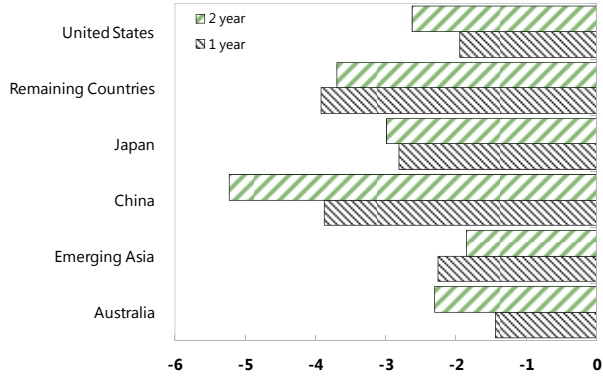
16. **GDP in Australia falls too, but by less than in the other regions, despite a large decline in commodity prices.** This is largely due to a strong policy reaction and a flexible exchange rate and sizeable foreign ownership in mining companies.

- Policy interest rates are reduced by more and earlier than elsewhere and the exchange rate depreciates against all other countries except the Remaining Countries block (Europe). Real net noncommodity exports improve and mitigate the impact of the worsening commodity balance on the wider economy.
- Automatic fiscal stabilizers in Australia are allowed to work fully by keeping expenditures on the planned path while temporarily absorbing shortfalls in government revenues, including from commodities, in a larger fiscal deficit. Net debt rises by about 10 percent of GDP after five years. This cushions the blow to domestic incomes and demand.
- Mining profits are squeezed, as commodity prices fall. However, a large share of foreign ownership limits the impact on the domestic economy and the current account. Nevertheless, lower profits depress investment in Australia.

**Figure II.3. Global Recession—Impact on Australia**

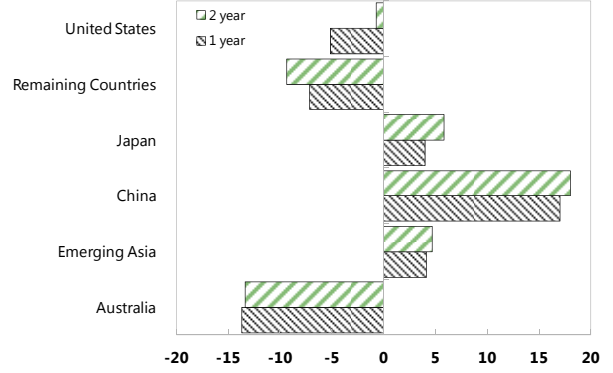
**Real GDP**

(Percent deviation from control)



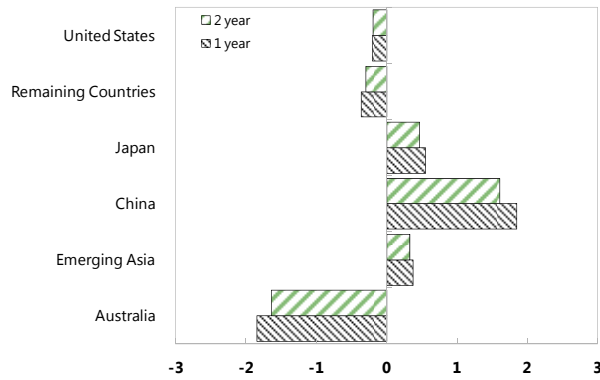
**Terms of Trade**

(Percent deviation from control)



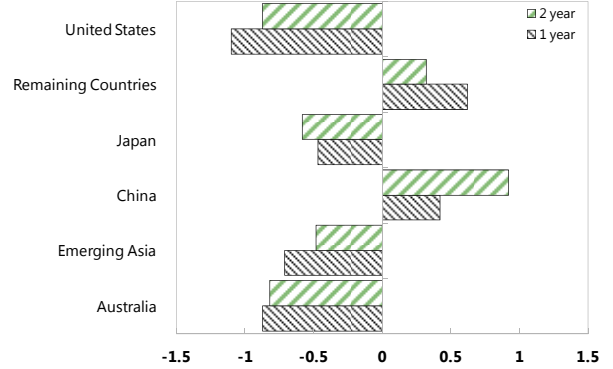
**Commodity Balance, Nominal**

(In percent of GDP; percent deviation from control)



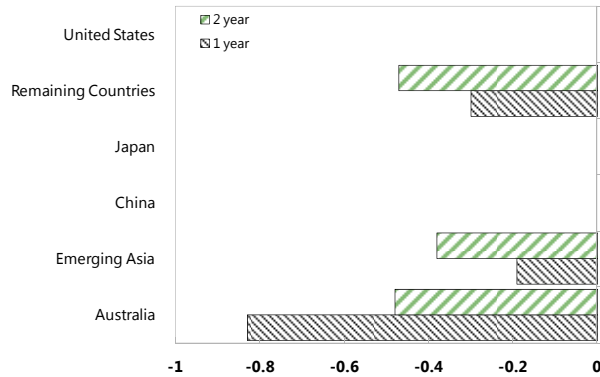
**Current Account/GDP**

(Percent deviation from control)



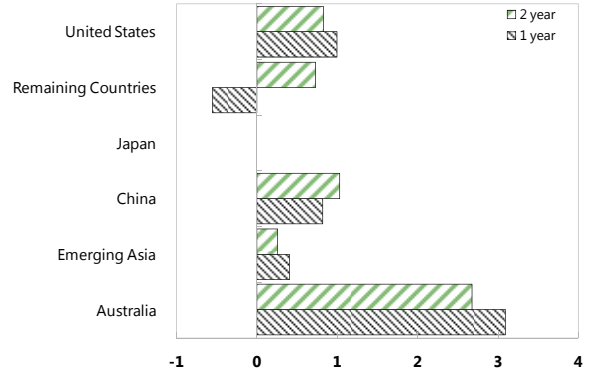
**Policy Interest Rate**

(percentage point deviation from control)



**Fiscal Deficit/GDP**

(Percentage point deviation from control)



Source: GIMF simulations.

## References

International Monetary Fund, 2011, *People's Republic of China: Spillover Report for the 2011 Article IV Consultation and Selected Issues*, IMF Country Report No.11/193.

Kumhof, Michael, Douglas Laxton, Dirk Muir, and Susanna Mursula, 2010, *The Global Integrated Monetary and Fiscal Model (GIMF) – Theoretical Structure*, IMF Working Paper No. 2010/34,  
<http://www.imf.org/external/pubs/ft/wp/2010/wp1034.pdf>

### III. THE IMPACT OF THE MINING BOOM ON THE AUSTRALIAN LABOR MARKET<sup>1</sup>

1. **Australia's mining boom is increasing demand for labor in the resources and related construction sectors.** In addition, robust income growth, supported by elevated terms of trade and mineral wealth, has driven consumption growth and demand for labor in service sectors such as health care.<sup>2</sup> This is happening at the same time as the population ages and the economy continues to become more service-oriented. Meeting the rising demand for labor will require not only raising labor supply but also moving labor across industries and regions. This note discusses the impact of the mining boom on the labor market so far for Australia and implications for New Zealand, and outlines the policy measures taken to increase labor participation and encourage the movement of labor. It also discusses further policy action that could be taken to increase labor supply.

#### A. What Has Been the Impact of the Mining Boom So Far?

2. **The mining boom began in 2003 and contributed to Australia's strong labor market performance** (Figure III.1). Australia has enjoyed faster employment growth than many other OECD countries, with a steady rise of labor participation. Compared to many other OECD peers, the rise of unemployment in Australia during the recent global crisis was smaller and turned around faster, with the unemployment rate already falling back to around the NAIRU (4½–5 percent). New Zealand's unemployment rate, however, has not fallen to pre-crisis level. Like their peers, the average hours worked in Australia and New Zealand displayed a downward trend during the last two decades.<sup>3</sup>

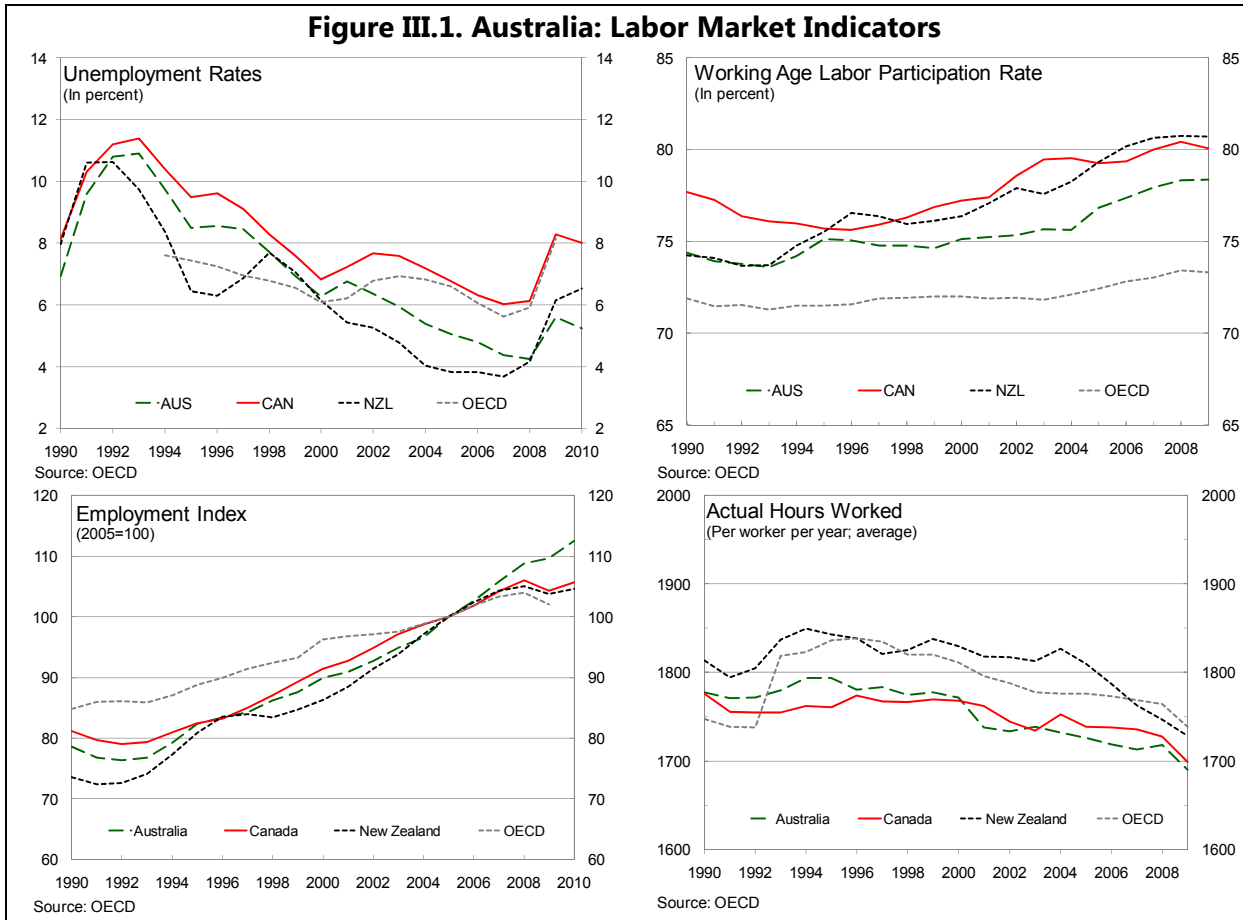
3. **The mining boom has played a role in shaping the industry composition of employment in Australia** (Figure III.2). Employment in mining and related construction grew strongly. Together, mining and construction made up around 10 percent of total employment. Importantly, these two sectors directly accounted for over 20 percent of new jobs created since 2003. Service sectors such as health care also enjoyed strong employment growth, supported by income growth associated with high commodity prices and population aging. Moreover, some of the service industries benefited directly from the mining sector's demand for technical support, with employment in the professional, scientific, and technical services sector expanding by more than 200,000 since 2003. The stagnation in manufacturing employment is consistent with Australia's long-term trend toward a more service-based economy, also evident in other advanced economies. Nonetheless, manufacturing employment growth fared relatively better in Australia than in many other advanced

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<sup>1</sup> Prepared by Yan Sun with research assistance from Fernan Ramirez. The paper greatly benefited from comments by colleagues in Australian Treasury and Reserve Bank of Australia.

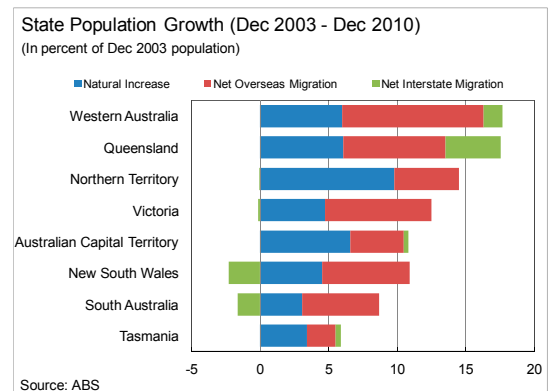
<sup>2</sup> Garton (2008) suggested large spill-over effects of strong mining-related activity on labor demand in non-mining sectors and states, more than offsetting other factors such as higher interest rates and exchange rates.

<sup>3</sup> Cross-country data comparison of hours worked is not meaningful due to differences in their data sources.



economies. There is also large differentiation within the manufacturing sector, with employment in some sub-sectors benefiting from the recent boom while other sub-sectors contracted (bottom right chart of Figure III.2).

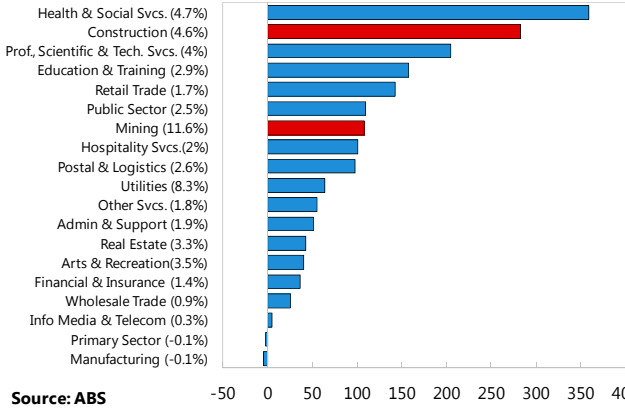
4. **The mining boom has also contributed to labor movement across regions.** The population of Queensland and Western Australia, where a large chunk of mining investment has taken place, rose at a much faster pace than the national average, although Queensland as the sunshine state also attracts retirees. In particular, interstate migration data suggest that major mining states may have attracted population from other more populous regions such as New South Wales. Nevertheless, given the relative strength of the labor market in major mining states, the extent of interstate migration was limited. Overseas migration is the most important source of population increase for most states, and it plays a particularly large role in Western Australia.



**Figure III.2. Employment Growth Across Sectors**

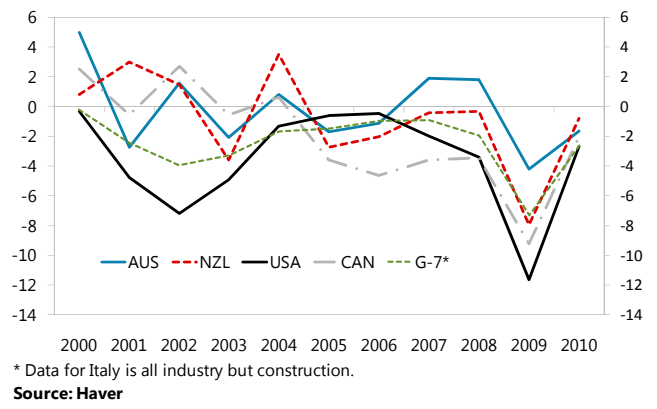
**Employment Change by Industry 2003-2010**

(In thousands of employed; average annual growth rates in bracket)



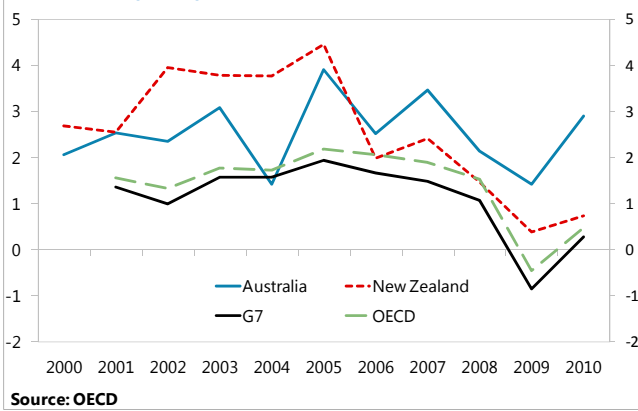
**Manufacturing Employment Growth**

(Annual percentage change)



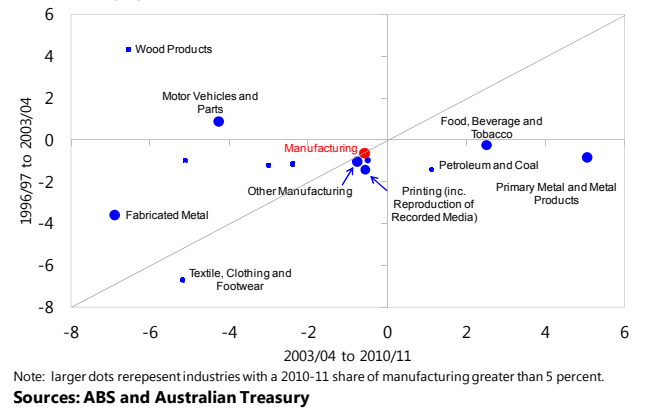
**Service Employment Growth**

(Annual percentage change)



**Manufacturing Employment**

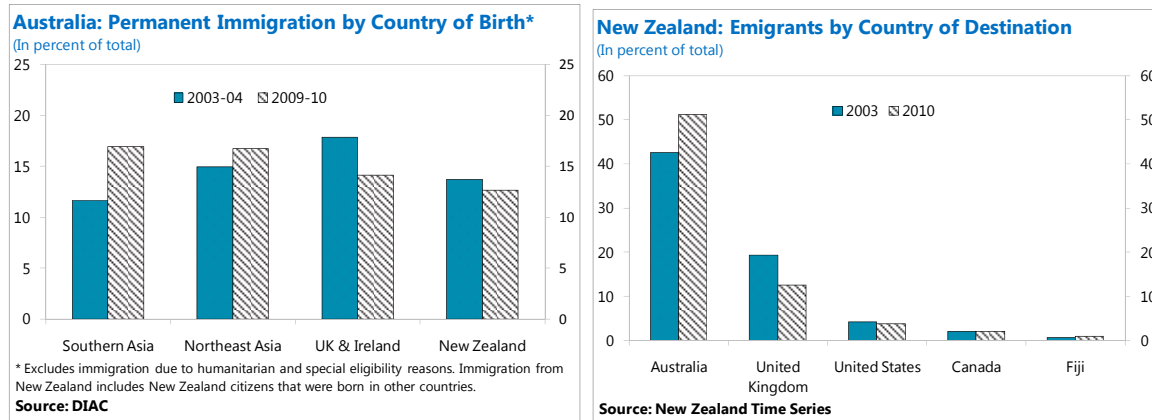
(Annual average growth, in percent)



5. **Reflecting a unified labor market between Australia and New Zealand, New Zealand has been an important source of overseas migration to Australia.**<sup>4</sup> Although permanent immigration from Asia grew faster during 2003–10, immigration from New Zealand alone still accounted for 10–15 percent of the total. Furthermore, the number of settler arrivals from New Zealand increased by about 40 percent during 2010–11 from the previous year, making up 16 percent of the total. Australia has also remained the single most important destination of emigration for New Zealand. This suggests that the ongoing mining

<sup>4</sup> Australia New Zealand Closer Economic Relations Trade Agreement stipulates a free labor market. A set of arrangements, collectively known as the Trans-Tasman Travel Arrangement, allow Australians and New Zealanders to visit, reside, and work in each other’s country without restriction. These arrangements have been supplemented by the Social Security Agreement, the Reciprocal Health Agreement, and the Child Support Agreement.

boom and robust economic growth in Australia will have implications for the labor market in New Zealand.



6. **Labor pressure in Australia's major mining states may emerge** (Figure III.3). Thanks to the overall economic expansion supported by the mining boom, all states and territories saw unemployment rates dropping and labor participation rising from 2003. Two major mining states Queensland and Western Australia accounted for about 55 percent of total value added in mining and construction in 2010 and experienced the largest employment increase in the two sectors since 2003. As slightly less than a third of Australia's population resides in the two states, their labor markets have tightened somewhat more than elsewhere. Western Australia, for example, has the lowest unemployment rate, the lowest under-employment rate, and the highest labor participation rate among all six states and its labor cost has risen, on average, at a much faster pace than in other regions since 2007.<sup>5</sup> The labor pressure could be exacerbated by future large mining investment. Together, Queensland and Western Australia are expected to account for almost 90 percent of total resource investment in the pipeline, currently estimated at about US\$300 billion (about 20 percent of 2011 GDP) over the next few years.

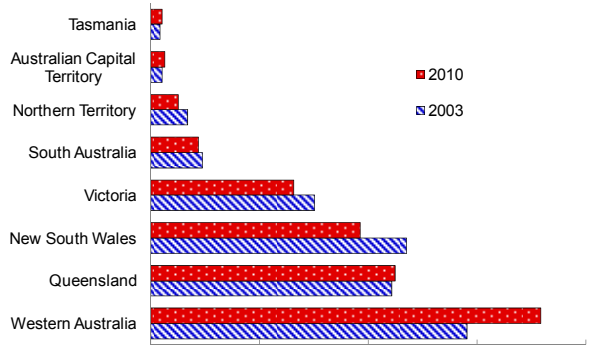
### B. How Has Labor Participation Responded?

7. **Australia's working age labor participation has risen steadily since the 1990s, with much of the rise having taken place since the mining boom got underway in 2003** (Figure III.4). The increase in recent years was largely driven by the rise of female participation and may have reflected that more workers were encouraged to participate in the labor force as a result of the fall in unemployment. Table III.1 decomposes the change in labor participation rates into the change in employment-working age population ratio and the change in the unemployment-working age population ratio. It suggests that the increase in

<sup>5</sup> Borland (2011) found that the relation between wage growth and employment growth is similar in mining and nonmining states.

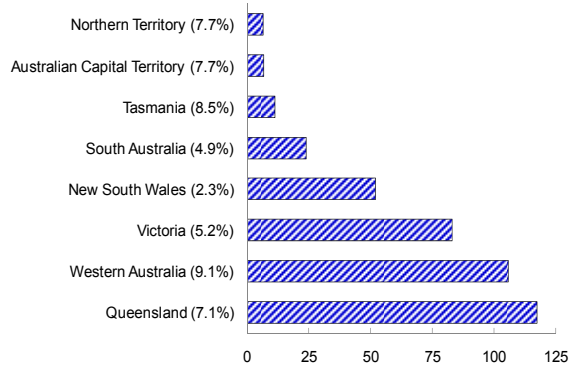
**Figure III.3. Australia: Mining Boom and Regional Labor Market Indicators**

**Share of Australian Value Added in Mining & Construction**  
(In percent)



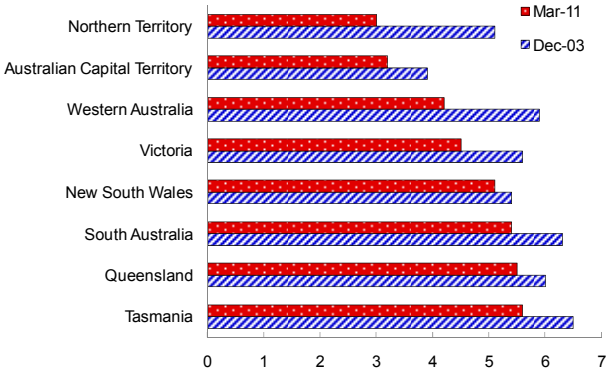
Source: ABS

**Mining & Construction Employment Change (Q4 2003-Q2 2011)**  
(In thousand of persons; average annual growth in bracket)



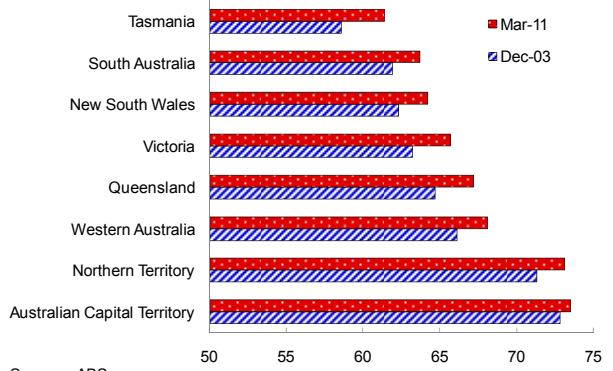
Source: ABS

**Unemployment Rate by State**  
(In percent)

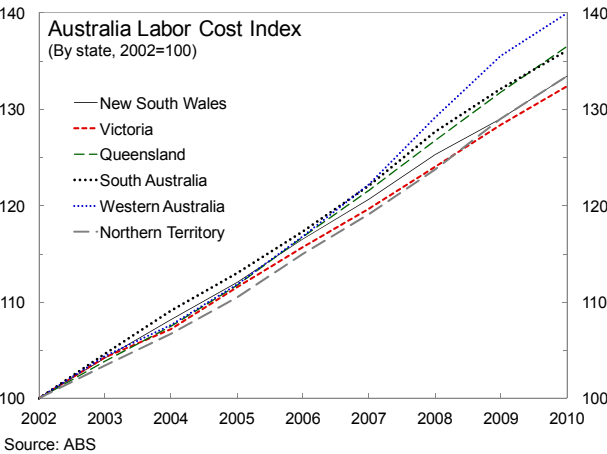


Sources: ABS

**Labor Participation Rate by State**  
(In percent)

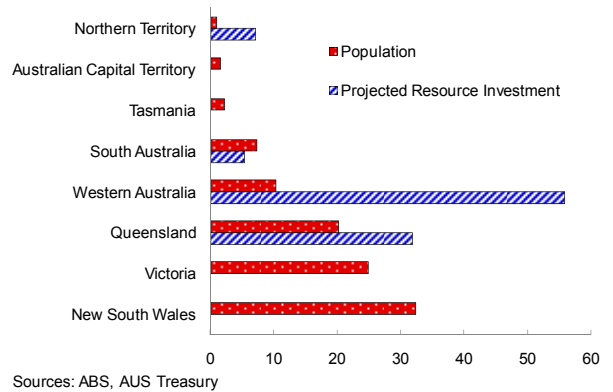


Sources: ABS



Source: ABS

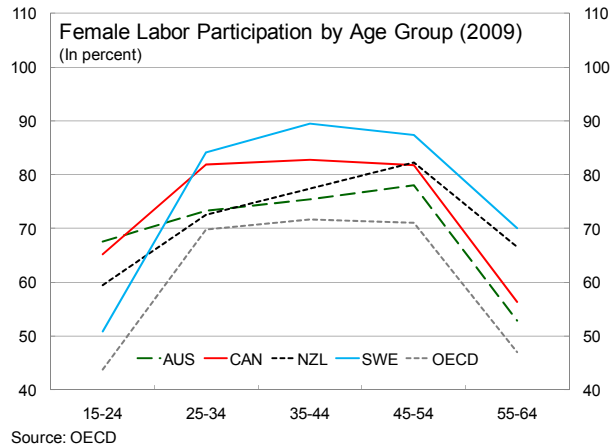
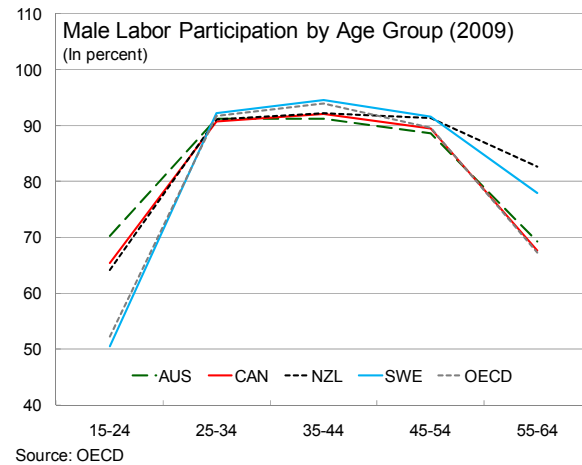
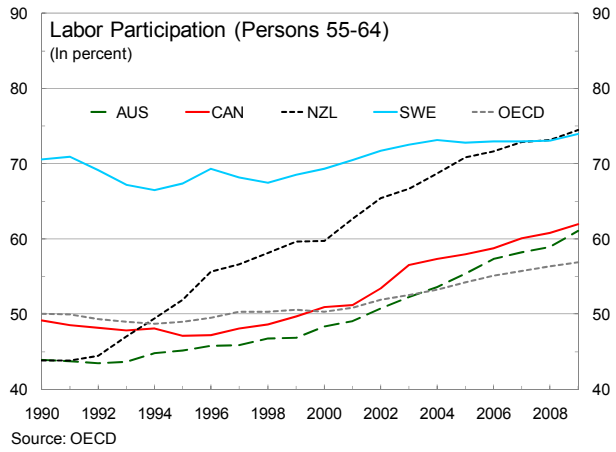
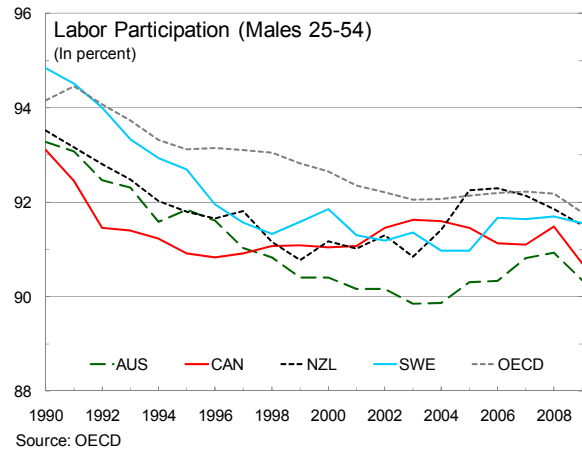
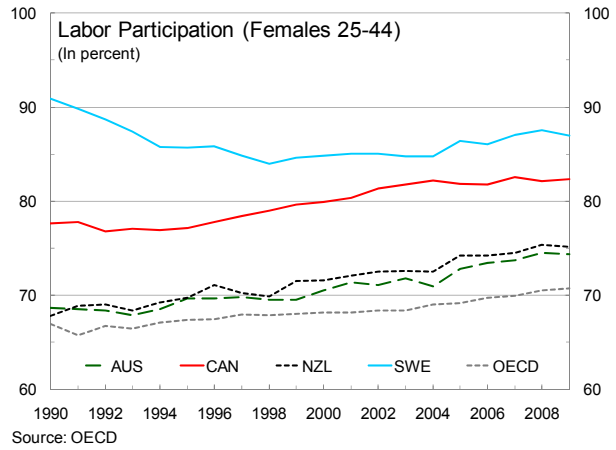
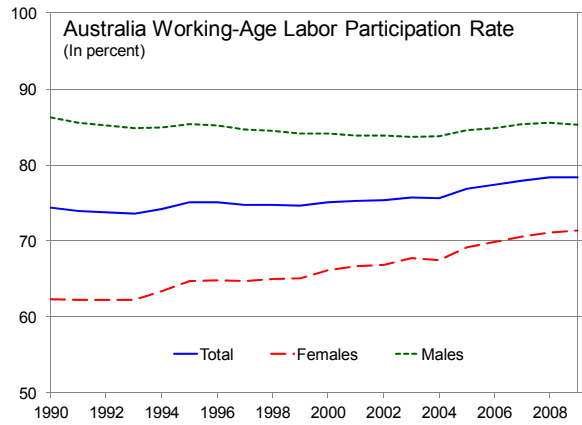
**Share of Population and Projected Investment by State**  
(In percent)



Sources: ABS, AUS Treasury



**Figure III.4. Australia: Labor Participation Rates**

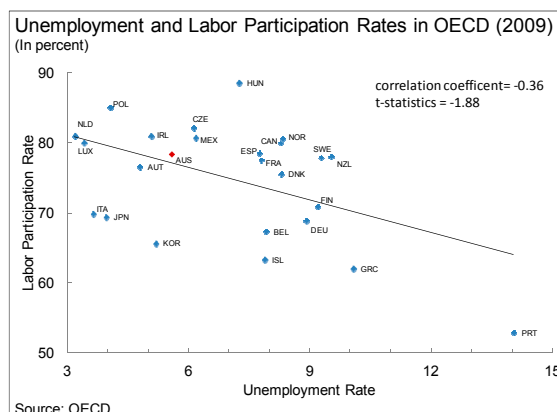
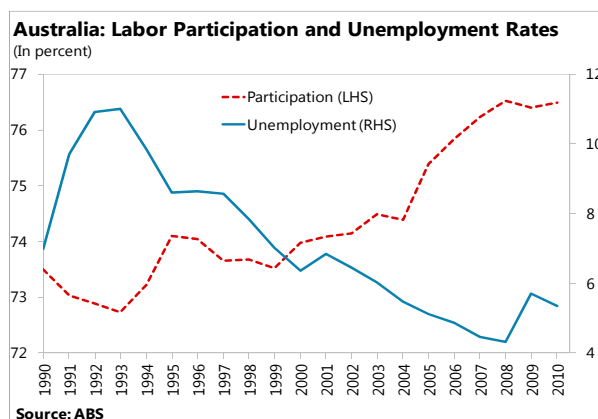


labor participation in Australia during 2003–09 was entirely due to more employment opportunities (i.e., the increase in employment ratio). The text figures below also show an apparent negative correlation between unemployment and participation, reflecting the discouraged-worker effect.<sup>6</sup>

Table III.1. Decomposition of Changes in Labor Participation Rates, 2003-09  
(In percent)

	Labor Participation Rate	Employment Ratio	Unemployment Ratio
Australia	2.7	2.8	-0.1
Canada	0.6	0.0	0.6
New Zealand	3.1	1.8	1.3
Sweden	0.5	-1.5	2.0
United States	-0.5	-3.0	2.5
OECD average	1.8	0.9	0.8

Source: OECD.



8. **While labor supply has increased, Australia trails many other OECD countries in the labor participation of several key age groups.** These include prime-aged males (25–54 years old), females of child-bearing age (25–44 years old), and people near retirement (55–64 years old).<sup>7</sup> Among the 33 OECD countries with 2009 labor participation data, Australia ranks 27th in the category of prime-aged males and 25th in females of child-

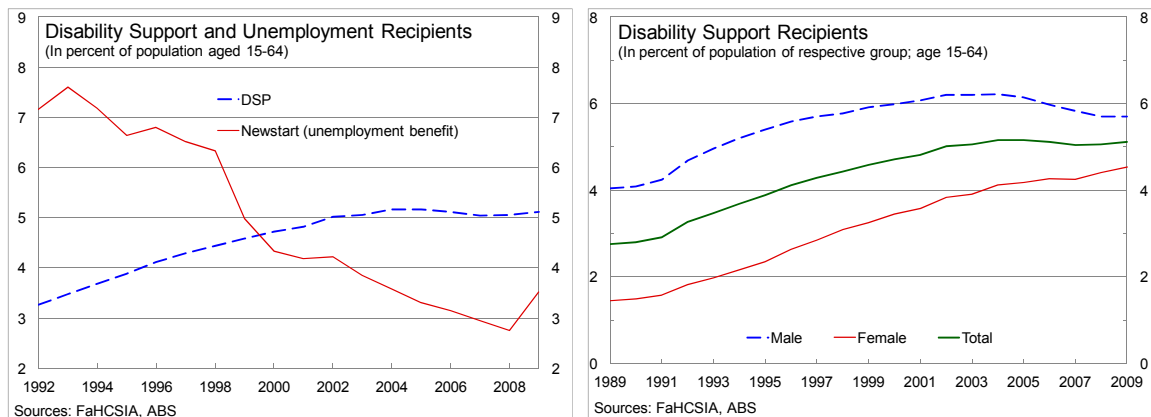
<sup>6</sup> Borjas (2008) noted overwhelming evidence that the correlation between the labor participation rates of many groups and the aggregate unemployment rate is negative.

<sup>7</sup> Abhayaratna and Lattimore (2006) came to a similar conclusion after adjusting for variations in statistical practices among OECD countries. This note uses OECD cross-country labor data and no adjustment has been made to the data. The latest data available are 2009 and do not capture the impact of policy changes in recent years.

bearing age. While the participation rate of Australian older people (55–64) ranks 11th, it is significantly lower than the level in New Zealand and Sweden. In aggregate, the three groups accounted for about 70 percent of Australia’s work force in 2010. The cross-country comparison suggests scope to raise labor force participation further and potential benefits of examining whether policy settings may explain some of the differences.

### C. Why is Australia’s Labor Participation Low in Key Groups?

9. **The Disability Support Pension (DSP) is likely to have discouraged labor participation of prime-aged males in Australia** (Lattimore 2007). The DSP has become a fiscally costly destination for prime-aged males with disability who are outside the workforce. While unemployment payments have fallen in recent years, expenditure on the DSP has risen strongly, with about half of all inactive men on DSP. This increase cannot be attributed to population aging or higher disability rates. Instead, one possible reason, suggested by Lattimore, is Australia’s decreased receptiveness to employ people with disabilities, accentuated by the incentives embedded in the DSP, which encourage entry and discourage exit. DSP benefit rates exceed unemployment benefits and have no job search requirements. Removing these deficiencies and encouraging beneficiaries on DSP to seek employment will help improve labor participation.



10. **Inflexible institutional arrangements discourage labor participation of women at child-bearing age.** In particular, the choice between working and withdrawing from the labor market is influenced by access to quality child care, parental leave, and flexible work arrangement, including the availability of part-time work opportunities. The fall in labor participation due to child bearing is more pronounced in Australia than many other OCED countries. Research has suggested the need to examine child care subsidies and the quality of child care in Australia (Jaumotte 2003, Rush and Downie 2006, and Kalb 2009).

11. **Labor participation rates of women at child-bearing age and older people are also affected by financial disincentives embedded in the tax and transfer systems.** Indeed, higher effective marginal tax rates (EMTRs) tend to reduce work incentives of

married women and older people more than other age groups.<sup>8</sup> Dandie and Mercante (2007) found that lower-income earners, including single parents and married women, are typically more responsive to financial disincentives to work. Harding and others (2007) found that 7 percent of working-age Australians face EMTRs of 50 percent or more in 2006–07, higher than the 5 percent a decade ago. They also found that mothers are more likely to face high EMTRs.

#### **D. Policy Measures**

**12. The Australian authorities have adopted policies to improve labor supply and mobility in recent years.** Measures to improve child care included uncapping childcare places and increasing payments to assist working or studying parents with their out-of-pocket childcare costs.<sup>9</sup> In April 2010, the authorities launched a five-year plan to improve the quality of family day care with a new national quality framework. A paid parental leave scheme, which has income and work requirements, went into effect on January 1, 2011. In addition, the authorities are trialing a relocation assistance package of up to \$6,000 to encourage unemployed people to relocate to take up a job. Finally, the authorities are currently in transition toward increasing the superannuation eligibility age.

**13. A number of further measures were rolled out in the 2011–12 Budget to encourage labor participation.** These include:

- **Tax changes to improve work incentives.** (i) Increasing the amount of the Low Income Tax Offset delivered through workers' regular pay during the year from 50 percent to 70 percent of the total entitlement.<sup>10</sup> This change will improve immediate rewards for work among lower-income earners. (ii) Phasing out the Dependent Spouse Tax Offset (DSTO) for people under age 40 to reduce disincentives for labor participation, particularly among young married women.<sup>11</sup>

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<sup>8</sup> EMTRs measure the proportion of an additional dollar of earnings that is lost to both income tax and implicit tax, the reduction of means-tested government benefits.

<sup>9</sup> The Australian Government used to determine how many Outside School Hours Care (OSHC) and Family Day Care (FDC) places could be allocated in a particular year and in which area. By uncapping, the new system since late 2006 means that existing and new OSHC and FDC services can be fully responsive to unmet demand where it exists.

<sup>10</sup> The Low Income Tax Offset (LITO) is a tax rebate for individuals on lower incomes. From July 1, 2010, it provides individuals earning less than \$30,000 with a tax rebate of \$1,500. Out of the maximum \$1,500 benefit, \$750 or 50 percent is given through the year, with the remainder delivered after a tax return is filed. The full offset is reduced by 4c for every dollar of taxable income above \$30,000, meaning that income greater than \$67,500 does not receive any benefit.

<sup>11</sup> The dependent spouse tax offset is designed to assist taxpayers who maintain their spouse by offering a tax rebate which can be offset against any tax payable.

Essentially, the DSTO was made unavailable for people with a dependent spouse who is 40 or under on July 1, 2011, unless their spouse is disabled, a caregiver, or they are eligible for the zone, overseas forces, or overseas civilian tax offsets. People with dependent spouses and children were not affected by this change because they are not eligible for this benefit, receiving instead family tax benefit.

- **Work requirements for those on disability pension.** This involves fast-tracking strengthened DSP assessment processes; introducing appropriate participation requirements for DSP recipients under age 35 with some work capacity; and allowing DSP recipients to work more hours and remain on DSP.
- **Age pension.** Improving the Work Bonus which rewards older people who continue to participate in the workforce.<sup>12</sup>
- **Single parents benefit.** Reducing marginal tax rates; introducing a more generous income test for single parents on Newstart Allowance—the main unemployment benefit—with school-age children to better support part-time work; providing additional training, career advice, and parenting support.

14. **The carbon tax package, announced in July 2011, proposed income tax cuts that should help raise labor participation to offset the impact of a carbon tax.** In particular, the increase in the tax-free income threshold improves work incentives for working mothers.

15. **There is scope to continue down this path of reforming tax and transfer systems.** Many of the policy measures adopted in Australia are in line with recommendations of the Future Tax System Review (FTSR) undertaken in 2009/10. Experience in Canada, New Zealand, and Sweden also suggests potentially large gains from tax and transfer reforms in enhancing work incentives and labor participation (Box III.1). There is scope to improve work incentives by further reducing effective marginal tax rates. An option to replace the lost revenue includes more reliance on a consumption-based tax. Australia's existing goods and services tax rate of 10 percent is relatively low by advanced country standards.

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<sup>12</sup> The Work Bonus is an incentive for age pensioners to remain in the workforce. Under the Work Bonus, half of the first \$500 of biweekly employment income is disregarded from the income test for age pensioners. This means the maximum that can be disregarded is \$250. Once the employment income has received the 50 percent discount, it is added to the rest of the income and the normal allowable income threshold applies.

**Box III.1. Policies of Raising Labor Participation in Canada, New Zealand, and Sweden**

**Canada enjoyed a rapid rise of female labor participation from the mid-1990s to mid-2000s.** The tax and benefit reform in the mid-1990s played an important role in raising work incentives for women (Tsounta, 2006). On tax, the enhancement of the Child Tax Benefit and the introduction of the working income supplement for working poor in 1997 contributed to falling tax wedges on secondary earners. Federal maternity and parental leave benefits have been expanded and provision of publicly provided childcare has improved. Quebec introduced a comprehensive family support policy in 1997 while in other provinces fee subsidization is available for low-income and other needy groups. The Child Care Expense Deduction also carries an implicit subsidy to encourage female labor participation.

**New Zealand's labor participation rate of older people rose rapidly during the last two decades and is on par with the rate in the Nordic countries.** Brooks (1999) found that the far-reaching social welfare reforms in the 1990s contributed to the rise. Benefit rates were cut, including unemployment benefits, while eligibility criteria were tightened. Moreover, the National Superannuation scheme was reformed, with the pension eligibility age increased sharply and the elimination of mandatory retirement age.

**Despite its high tax burden, Sweden has one of the highest labor participation among OECD countries, particularly for females and older people.** According to Tsounta and Bonato (2005), this can be attributed to a combination of favorable tax treatment and household subsidies targeting the most elastic labor force—women and older people. An important policy is to put most of the tax burden on primary household earners and keep the tax wedge for secondary earners low. Another important point relates to the government's generous provision of high-quality childcare and elderly care, with employment as a pre-condition for receiving benefits. Parental leave benefits depend on previous earnings, providing a strong incentive for women to work prior to giving birth. The Swedish authorities recently adopted measures to further improve labor market flexibility, including reducing marginal labor income taxes and tightening administration and eligibility for sickness benefits.

16. **The FTSR suggested reforms to state revenues such as using a business cash flow tax over time to finance the abolition of inefficient taxes.** This could lead to gains in labor supply. For example, the review recommended the removal of stamp duties, to be achieved through a switch to more efficient taxes such as land taxes. This may improve labor mobility, as the FTSR observed that the conveyance stamp duties discourage people from changing their place of residence. The duty discourages transactions of commercial and residential property, because the effective tax rate falls the longer the property is occupied. In other words, people who move more frequently bear more tax.

17. **Some insights can also be drawn from recent policy changes in New Zealand.**

The New Zealand authorities reduced income tax rates and raised consumption tax rates in 2010. According to Schule (2010), a revenue-neutral shift in taxes from labor and capital to consumption produces significant long-run growth gains in the New Zealand context, through increasing labor supply and investment as a result of lower tax rates. New Zealand has also undertaken a review of welfare dependency, which recommended encouraging those on benefits to seek employment.

18. **Building on the policy measures already taken, further reforms of the tax and transfer systems will put Australia in a stronger position to meet labor challenges arising from the mining boom and aging population.**

The upcoming Tax Forum in October 2011 will provide an opportunity for discussing and building a consensus on future tax reforms. In addition, the Productivity Commission recently released a report on disability care and support, which proposed a new national disability scheme. This work could provide a basis to pursue broader reform of income support for people with disabilities and raise their employment ratio to the average OECD benchmark.

19. **Meeting the rising labor demand in mining, related construction, and service sectors also requires the right skill sets in the labor force.** Building on the 2009–10 higher education reforms and the 2010–11 Budget strategy of “skills for sustainable growth,” the authorities plan to invest \$A 3 billion in new skills initiatives over six years to better meet the economy’s skills need.

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