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New Zealand: Selected Issues

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NEW ZEALAND

Selected Issues

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Approved by the Asia and Pacific Department

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NEW ZEALAND BANKS–HOW VULNERABLE ARE THEY TO THE GLOBAL CRISIS AND DOMESTIC RECESSION?[1]

1. **New Zealand's banks have weathered the global financial storm relatively well thus far.** Banks remain profitable, with low levels of impaired assets, and aggregate capital well above the regulatory minimum. However, they are vulnerable on two fronts. They are heavily exposed to households, whose debt has risen significantly and whose assets have been hit by a slump in house and equity prices. In addition, banks are reliant on short-term wholesale funding from offshore markets that have been disrupted since the collapse of Lehman Brothers in September 2008.

2. **The paper finds that a sharp worsening of asset quality would be needed to reduce bank capital below the regulatory minimum.** An increase in the default rate from less than 1 percent at present to 5–6 percent for all loans would be required to reduce bank capital below 8 percent of risk weighted assets. While such a large increase in defaults is unlikely, the risks of such an outcome have jumped in the past year as the outlook for global and local economies has worsened. Therefore, banks should be required to undertake extreme stress tests and increase their capital if needed.

3. **Banks would have access to domestic liquidity from the Reserve Bank of New Zealand (RBNZ) in the event of a disruption to capital inflows, but the balance of payments and exchange rate may come under pressure.** The paper notes that use of some official reserves, borrowing from Australian parent banks, and tapping some of the Reserve Bank of New Zealand's (RBNZ) swap line with the U.S. Federal Reserve could fill the financing gap if up to two-fifths of external debt in 2009 were not rolled over. The government's wholesale funding guarantee scheme, introduced in November 2008, should help banks roll over their funding and lessen the possibility of a more severe disruption.

A. The Global Turmoil: How Has it Affected New Zealand Banks?

4. **The direct impact of the global financial crisis on New Zealand banks has been limited thus far.**[2] Banks had minimal exposure to U.S. subprime-related or other distressed assets, and the securitization of mortgages in New Zealand was very limited. The four largest banks are wholly owned by Australian parents that have remained profitable and have

[1] Prepared by Ray Brooks and Rodrigo Cubero.

[2] Banks account for almost 80 percent of total assets of the New Zealand financial system, while nonbank lending institutions account for 7 percent and funds under management for the remainder.

retained their high credit rating.[3] The main direct impact of the global financial crisis on New Zealand banks has been an increase in the cost of borrowing relative to the New Zealand dollar swap rate, as discussed below.

5. **The banking system remained strong through late 2008.** The turmoil did not affect banks' capitalization significantly, although profits weakened somewhat (Tables I.1 and I.2). Capital remained well above the regulatory minimum of 8 percent of risk-weighted assets. The net interest margin fell only slightly, despite the increase in funding costs. The banking system has become more concentrated in the four large banks, whose share of total bank assets rose to almost 90 percent in 2008.

Table I.1. New Zealand: New Zealand's Four Large Banks: Selected Financial Soundness Indicators
(In percent)

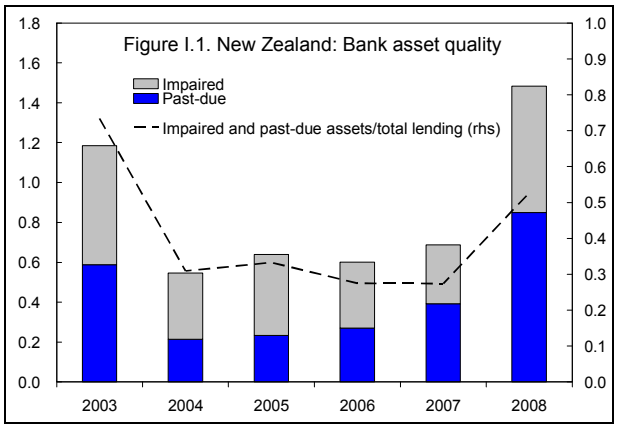
	ANZ		ASB		BNZ		Westpac	
	Dec-08 quarter	Sep-08 year	Dec 08 half-year	Jun-08 half-year	Dec-08 quarter	Sep-08 year	Dec-08 quarter	Sep-08 year
Profitability								
Return on assets	0.9	1.0	0.8	0.9	1.3	…	0.8	1.1
Return on equity	8.5	12.6	17.7	16.1	24.8	20.0	9.1	11.3
Net interest margin	1.8	1.9	1.6	1.8	2.0	1.9	2.2	2.4
Capital adequacy								
Tier one capital ratio (Basel II)	8.2	8.1	8.4	9.4	7.9	8.1	9.3	…
Total capital ratio (Basel II)	11.7	11.7	10.5	11.8	10.7	10.7	12.5	…
Assets-to-capital multiple 1/	17.4	18.0	19.2	18.3	13.8	…	17.0	…
Assets quality and provisioning								
Past due 90 days plus/total loans	0.4	0.3	0.4	0.3	0.3	0.2	1.1	0.8
Mortgages past due 90 days plus/mortgages	0.6	0.5	0.6	0.5	…	…	0.5	0.2
Gross impaired to total assets	0.3	0.3	0.2	0.1	0.4	0.3	0.7	0.5
Specific provision to gross impaired assets	44.1	39.6	34.0	73.3	25.8	34.9	25.3	23.0
Total provision to gross impaired assets	189.3	200.0	106.8	363.3	103.2	150.3	100.8	113.8
Mortgages/total loans	54.0	54.3	65.5	66.4	45.6	46.4	66.5	66.6
Mortgages with loan-to-value ratio greater than 80 percent/total mortgages 2/	26.0	…	16.9	…	10.9	…	28.3	…
Total assets (in billions of N.Z. dollars)	132.1	122.9	65.3	59.4	76.1	64.2	56.0	52.3
Liquidity								
Cash to total assets	2.3	3.9	2.0	1.9	2.9	2.0	1.7	0.2
Cash and due from banks to total assets	7.7	8.0	3.4	3.1	4.8	3.7	1.7	0.2
Cash, due from banks, and trading securities to total assets	9.6	10.2	10.3	11.3	13.7	8.1	8.4	4.0

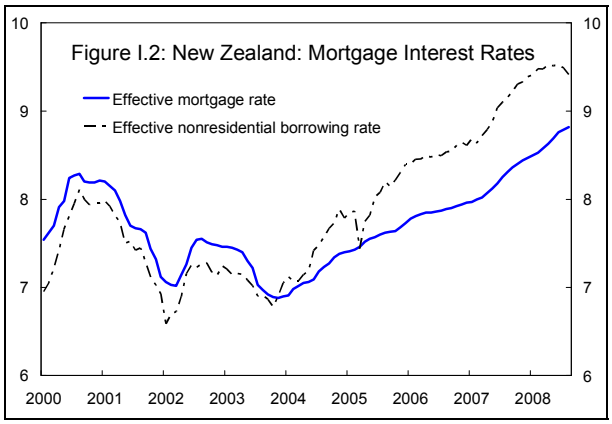
Source: Banks' disclosure statements.

1/ Total on-and-off balance sheet assets divided by total capital.
2/ Valued at time of mortgage origination.

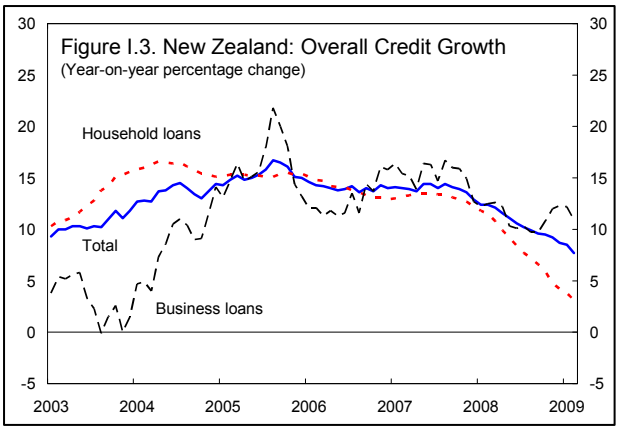
[3] The four largest banks in New Zealand (with their Australian parents in brackets) are: the Australia and New Zealand Bank (a subsidiary of the Australian-based bank of the same name), Auckland Savings Bank (wholly owned by Commonwealth Bank of Australia), Bank of New Zealand (owned by National Australia Bank), and Westpac (a subsidiary of the Westpac Banking Group). Of the 100 largest banking groups in the world, only 11 have credit ratings of AA and higher; the four Australian parent banks are among those 11.

6. **Some signs of a deterioration in asset quality emerged in recent quarters, but impaired assets remain small.** Loans overdue for 90 days or more jumped in the past year, but averaged just ½ percent of total loans for the four main banks (Figure I.1). Gross impaired assets (i.e., where collateral is insufficient to fully cover the loan) have also increased, but are covered by total provisions. The increase in past due and impaired assets came from corporate and mortgage lending, due to pressure on borrowers' cash flows from a slowing economy and, up to mid-2008, higher interest rates (Figure I.2).





7. **Overall credit growth slowed to 7–8 percent year-on-year in early 2009** (Figure I.3). Credit to households has slowed more markedly, however, reflecting a shift in demand and a more risk-averse approach of banks to household lending.

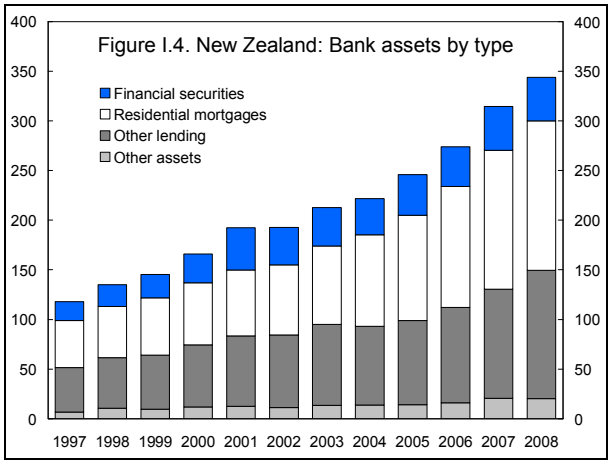


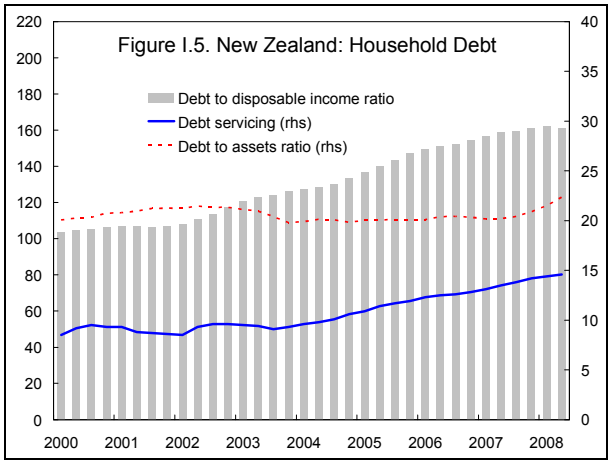
8. **The financial ratios of New Zealand banks compare favorably with those of other advanced country banks.** Their capital position is one of the strongest, with leverage (assets-to-capital multiple of 22) well below that for Finland, Ireland, and the United Kingdom (Appendix Table I.A1). Asset quality and provisioning are also high by international standards. But New Zealand banks—like their Australian counterparts—are more exposed to mortgages and rollover risk (i.e., the low ratio of liquid assets to short-term funding) than banks in other advanced countries. Financial soundness ratios, however, are lagging indicators and can deteriorate rapidly under stress. This is illustrated by the Icelandic experience, where banks had strong indicators for capital and asset quality in 2007, but became insolvent in 2008.

B. Can Banks Handle an Increase in Mortgage Defaults?

9. **New Zealand banks remain heavily exposed to the housing market.** Residential mortgages comprised 44 percent of total bank assets and 54 percent of total loans in 2008 (Figure I.4). The increase in lending in recent years coincided with strong growth in house prices, but the housing cycle turned in late 2007 and house prices in January 2009 were about 10 percent below the peak.

10. **Households' high levels of indebtedness, in turn, increases their vulnerability to shocks.** Total households' debt has risen fast in recent years, reaching about 160 percent of disposable income by end-2007, where it has since stabilized, while debt service reached 14½ percent of disposable income by June 2008 (Figure I.5). Therefore, their capacity to repay is vulnerable to a continued decline in house prices, increases in interest rates, or a fall in disposable income from the economic downturn.





11. **This section looks at whether banks' high exposure to housing is a cause for concern, by analyzing their resilience to an increase in defaults.** Two scenarios for mortgage defaults are used to gauge the impact on bank capital. Then evidence from other countries is used to assess the likelihood of those scenarios materializing.

12. **The analysis suggests that bank capital would be resilient to a sharp increase in defaults.** The tests that were conducted involved scenarios of default on 5 or 10 percent of all housing loans (Table I.3). The average loss given default was assumed to be 40 percent.[4]

[4] This is on the upper end of values generated by empirical and simulation studies for New Zealand, the United States., the United Kingdom, and other countries (Harrison and Mathew, 2008), as well as above the average (22–24 percent) used by New Zealand banks and required by the RBNZ under the Basel II Accord. The IMF's *Global Financial Stability Report* (October 2008) uses a loss-given-default rate of 39 percent in a stress scenario.

While bank profits would be severely hit, with over 100 percent average annual net profits wiped out in a 5 percent default scenario, the tests indicate that bank capital would fare reasonably well even in a 10 percent default scenario. The aggregate capital ratio drops to 8½ percent, and the capital ratio for the most affected large bank falls to just below 7 percent.

Table I.3. New Zealand: Housing Market Risk: Stress Tests Results, December 2008

	Four Large Banks (average weighted by assets)
Total capital ratio, average (actual)	11.3
Housing loans to total loans, average (actual)	56.5
Stress test scenarios:	
Default on 5 percent of all housing loans	
New total capital ratio	10.2
Minimum capital ratio among four large banks	8.7
Default on 10 percent of all housing loans	
New total capital ratio	8.7
Minimum capital ratio among four large banks	6.8

Source: IMF staff calculations.

13. **Existing evidence suggests that the overall default ratios assumed in the stress tests above are implausibly high for New Zealand.** Data from the Household Economic Survey (HES) for 2007 suggest that less than 4 percent of mortgages on owner-occupier properties[5] were in the higher risk group with debt service of over 30 percent of disposable income and a loan-to-value ratios of over 80 percent (Table I.4).[6] Using data on the distribution of debt-service and loan-to-value ratio buckets and applying probabilities of default from downturns in the United Kingdom in the early 1990s, Harrison and Mathew (2008) estimated the average probability of default for New Zealand households to be around

[5] Estimates from HES and other sources suggest that owner-occupied properties account for about one half of total residential mortgages; second and holiday homes account for about 11 percent, and investment properties make up the rest.

[6] Data in the RBNZ's *November 2008 Financial Stability Report* indicate that about 23 percent of mortgages had loan-to-value ratios above 80 percent, consistent with data from bank disclosure statements (Table I.1). This compares with only 8 percent in the HES data. The difference is mainly due to asset valuation: while the FSR is based on values at loan origination, the HES reports property values based on the latest tax valuation, further updated to the time in which the survey was completed using regional quarterly housing indexes. Given the increases in house prices up to early 2008, the loan-to-value ratios based on current market prices are lower. And, despite their fall in the last year, house prices remain around 80 percent above their 2002 level. An additional source of differences is that the HES data excludes mortgages on investment property. Loan-to-value ratios for investment property are typically higher than those for owner-occupied property.

1 percent, and this coincides with what the four largest New Zealand banks currently report.[7] To put this in context, analysis of the U.S. mortgage market suggests that the default rate on all mortgages will peak at about 6 percent, assuming a loss-given-default ratio of 40 percent (IMF *GFSR*, October 2008).

14. **Moreover, the analysis above assumes that the increase in defaults occurs instantly.** In practice, however, an increase in default rates driven by an economic downturn takes places gradually over the length of the downturn. As long as banks remain profitable, their profits could be set aside to cover some of the emerging losses.[8]

Table I.4. New Zealand: Owner-Occupied Mortgages by Risk Bucket 1/
(In percent of all mortgages)

	Loan-to-Value Ratio			
	< 60	60–80	> 80	Total
Debt service ratio 2/				
0–20	34.0	4.7	3.1	41.8
20–30	19.6	9.0	1.7	30.3
30–40	7.5	5.5	1.9	14.8
40–50	6.4	1.6	0.9	8.9
50+	2.5	1.0	0.7	4.2
Total	70.0	21.8	8.3	100.00

Sources: Statistics New Zealand (Household Economic Survey) and Reserve Bank of New Zealand.
1/ Excludes mortgages on second or holiday homes and investment properties.
2/ Annual mortgage payments (interest and principal) to annual household disposable income.

15. **Another way of assessing the likelihood of the stress test scenarios materializing is to see what the scenarios imply for default probabilities for various debt-service and risk buckets.** Table I.5 provides a numerical example of default rates that would lead to an overall probability of default of 10 percent. The example shows that one would need to assume rather high default probabilities (in the range of 60–95 percent) for the higher risk households. However, experience with housing downturns in Australia and New Zealand in the 1980s and 1990s, and with Hong Kong in the late 1990s, suggests that default rates range around 4–5 percent for mortgages with loan-to-value ratios of more than 80 percent

[7] The weighted average of the ex-ante probability of default across risk groups (i.e., excluding those mortgages already in default) estimated by banks is 1.6 percent (see Table I.7).

[8] The absence of sizable mortgage securities on the banks balance sheet means banks do not need to mark-to-market mortgage losses that would require a call on capital.

(Harrison and Mathew, 2008). Also, the default rate for securitized U.S. mortgages, which involve a high share of sub-prime loans, was about 11 percent by end 2007.[9]

Table 1.5. New Zealand: Numerical Example of Mortgage Default Probabilities 1/
(In percent)

	Loan-to-Value Ratio		
	<60	60–80	> 80
Debt service ratio			
0–20	0.5	5.0	10.0
20–30	1.0	10.0	30.0
30–40	5.0	30.0	60.0
40–50	10.0	50.0	75.0
50+	40.0	80.0	95.0
Overall probability		10.0	

Source: IMF staff calculations.

1/ Probabilities of default (in percent) on mortgages required for the overall probability of default to be equal to 10 percent.

16. **There are a number of factors that would mitigate against a large increase in bank losses from mortgage lending.** First, interest rates on new mortgages have fallen by over 400 basis points from their peak in July 2008, which will make it easier for households to service the loans.[10] Second, a portion of the higher loan-to-value ratio mortgages is insured by third parties.[11] Third, in contrast to the practice in many U.S. states, the legal framework in New Zealand makes the homeowner liable for remaining debt even after repossession by the bank. This discourages homeowners from defaulting on mortgages when a drop in house prices wipes out equity. And finally, almost three-quarters of the mortgage debt in New Zealand in 2007 was held by households with incomes in the two highest quintiles, and the median debt service ratio for those households is below 20 percent. Households in the two lowest income quintiles held only 7 percent of mortgage debt.

[9] The default rate is here defined as the sum of loans to borrowers subsequently declared bankrupt, loans in foreclosure, and loans already foreclosed but with the property still in the bank's possession, as a percentage of total loans outstanding. The data were obtained from *Loan Performance*.

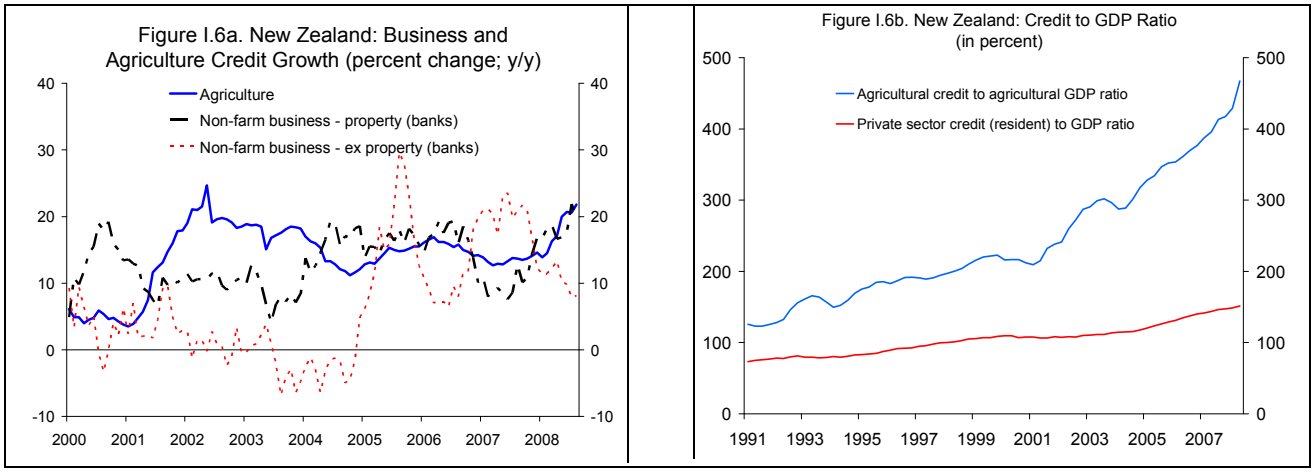
[10] If rates for new mortgages hold at present levels, average household debt service could fall by 3–4 percent of disposable income by end 2009.

[11] For example, the ASB Bank insured ¼ of loans with 80 percent or higher loan-to-value ratios. Also, some first home borrowers with high loan-to-value ratios have mortgages guaranteed by their parents; and loans on many rental properties are secured against the landlord's own home. This underlying collateral is not reflected in the loan-to-value ratio of the mortgage.

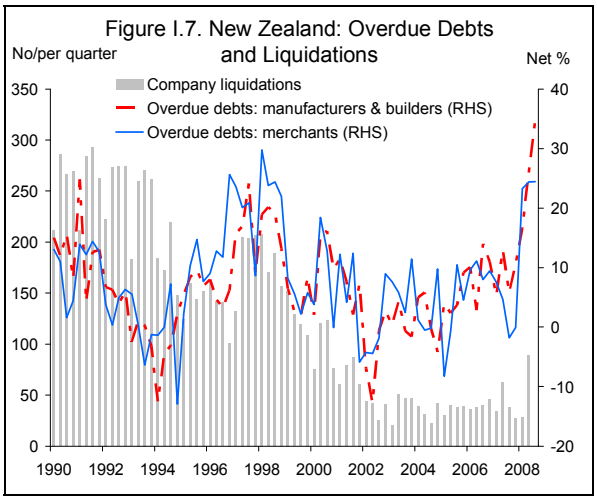
17. **Stress tests in the Financial System Stability Assessment (FSSA) also suggest some resilience of bank capital to a combination of adverse shocks.** The shocks included a 20 percent fall in house prices, a 4 percentage point increase in the unemployment rate and a 4 percent decline in household income (IMF, 2004). They resulted in a loss of ¼ of annual bank profits on average. In addition, the FSSA stress tests show that banks would suffer significant losses from a sharp rise in funding costs, but the results suggest that no individual bank's capital position would be endangered by the scenario.[12] Preliminary updates of these stress tests by the RBNZ suggest the results remained valid through 2007 (Rozhkov, 2007). The RBNZ's November 2008 *Financial Stability Report* also suggests some resilience of bank profits to a combination of house price, unemployment, and interest rate shocks. Of course, increases in unemployment or other shocks to household income beyond those contemplated in these stress tests could lead to more severe losses.

C. How Vulnerable are Banks to Higher Defaults on Corporate Lending?

18. **Banks' exposure to businesses and agriculture is smaller than to households, but has grown quickly in the past year.** The pace of growth in lending for commercial property and agriculture, particularly dairy farming, picked up in 2008 in response to earlier strength in real estate and dairy prices (Figure I.6a). However, commercial property and dairy prices have fallen in recent quarters, which amplifies the risks of such lending. Signs of stress in the business sector have already emerged with a sharp pick up in past due loans, which has been a precursor for liquidations in the past (Figure I.7). Moreover, the high level of debt to agricultural output points to significant risks in the event of a sharper-than-expected downturn in dairy prices (Figure I.6b).



[12] The funding-costs-stress scenario in the FSSA assumes an increase in short-term interest rates to 18-20 percent, a depreciation of the New Zealand dollar by 40 percent, and a permanent increase in the risk-premium for New Zealand dollar denominated debt.



19. **The financial position of New Zealand's corporate sector is generally sound, but a cross-country comparison points to some vulnerabilities.** While their share of short-term debt is low by advanced country standards, New Zealand companies have relatively high debt-to-asset ratios (Table 1.6, Appendix Table A2 and Figure A1).[13] Somewhat higher leverage and higher interest rates in New Zealand lead to a lower interest coverage ratio—only Ireland and Portugal are below—, but still well above one. The agricultural sector is particularly exposed, with profitability and interest coverage well below those of manufacturing or the corporate sector as a whole.

Table I.6. New Zealand: Corporate Sector Indicators
(Aggregate ratios for non-financial private enterprises, in percent)

	All industries			Agriculture	Manufacturing
	2005	2006	2007	2007	2007
Leverage (total liabilities to total assets)	52.7	53.4	51.9	47.8	55.2
Current assets to current liabilities	131.7	125.3	128.4	160.0	170.4
Interest coverage ratio 1/	3.7	3.8	3.7	1.6	7.7
Return on equity	13.3	14.7	13.7	2.1	19.5
Return on assets	6.3	6.9	6.6	1.1	8.8

Source: Statistics New Zealand (Annual Enterprise Survey), and Fund staff calculations.

1/ Earnings before interest and taxes divided by interest payments.

[13] Based nonfinancial enterprise data from Statistic New Zealand's Annual Enterprise Survey and cross-country data for listed nonfinancial companies. The data sets are not fully comparable. Listed companies tend to be larger and financially healthier than nonlisted companies that are also covered by the HES. Moreover, the listed companies covered may be particularly unrepresentative in New Zealand, as their market capitalization is less than 40 percent of GDP, compared with 100 percent or more in Australia, Canada, and the United States.

20. **Despite these weaknesses, the data for listed companies suggest a very low probability of systemic financial distress one year ahead.** Indeed, New Zealand has the highest distance-to-default ratio among comparator countries (Appendix Table I.A2 and Figure I.A1). This means that it would take a large shock to asset values or returns to lead to solvency or liquidity problems among the listed companies.

21. **To assess the risks to banks of corporate and other lending, this paper analyzes data recently published by banks on their risk exposure.** Following the adoption of the Basel II internal modeling approach, banks published a breakdown of corporate, mortgage and other retail lending exposure disaggregated into six risk categories (Table I.7). They also published estimates of the probability of default and loss given default for the six categories. The data show that corporate lending has been classified as more risky than mortgage and other retail lending, with about half of corporate lending exposures classified in the risk category 5 or higher.

22. **A significant increase in the probability of default or the loss given default would be needed to reduce bank capital significantly.** Table I.7 illustrates this using an arbitrary exercise, where the probability of default is increased to the level of the next highest risk category and the loss given default for mortgages is raised to 1½ times that reported by the banks. In this case, the average overall default rate for the four large banks would rise to about 5–6 percent of total loans, losses would amount to about 2 percent of loans for mortgages and corporate loans, and the average capital adequacy ratio would fall just below the regulatory minimum of 8 percent.[14] The bank most affected in this scenario would see its capital ratio fall to 7 percent.[15] Of course, the increase in default rates does not have to follow this particular pattern. Detailed analysis by banks would be needed to assess the vulnerabilities of borrowers to stress.

23. **While this exercise suggests some resilience of bank capital to an increase in defaults, banks should be required to undertake extreme stress tests.** The tests outlined above are not as extreme as the earlier scenario discussed of a 10 percent default rate for mortgages, but it covers a broader range of assets. While this scenario is still unlikely, risks have risen in the past year with the deterioration in the global outlook and the knock-on effect to New Zealand through a fall in economic activity, lower agricultural commodity prices and a higher cost of external borrowing. Therefore, banks should be required to undertake more detailed and extreme stress tests and increase their capital if needed.

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[14] The October 2008 *Global Financial Stability Report* (Box 1.6) projects the charge-off or loss rate for corporate loans in the U.S. also peaking at about 2 percent under a stress scenario.

[15] This example uses the loss given default determined by the banks for corporate and other retail lending, but increases the loss given default to about 40 percent on average for residential mortgages to match the loss given default used in the earlier numerical example.

Table I.7 New Zealand: New Zealand Banks' Credit Risk Exposure by Asset Class, December 2008 1/

Risk group	Exposure (billions of NZ$)	Reported Average Probability of Default	Adjusted Average Prob. of Default 2/	Adjusted Loss Given Default 3/	Estimated Loss 4/	Loss/Exposure (Percent)
Corporate						
0-2	16,162	0.1	0.3	56.8	27	0.2
3-4	36,790	0.3	1.2	34.3	156	0.4
5	35,542	1.2	3.1	34.3	390	1.1
6	21,746	3.1	12.5	34.5	970	4.5
7-8	5,335	12.5	18.8	37.3	381	7.1
Default	1,117	100.0	100.0	38.0	442	39.6
Total/average	**116,692**	**2.6**	**5.5**	**37.6**	**2,366**	**2.0**
Retail mortgages						
0-2	30,708	0.3	0.5	34.9	49	0.2
3-4	57,195	0.5	1.2	36.5	244	0.4
5	42,227	1.2	3.7	38.2	592	1.4
6	16,270	3.7	15.7	39.8	1,016	6.2
7-8	6,110	15.7	23.5	41.5	596	9.8
Default	1,646	100.0	100.0	48.1	792	48.1
Total/average	**154,156**	**2.6**	**5.2**	**37.3**	**3,290**	**2.1**
Other retail						
0-2	2,598	0.1	0.4	74.0	8	0.3
3-4	6,886	0.4	1.4	65.0	58	0.8
5	4,179	1.4	3.1	65.5	77	1.8
6	2,746	3.1	15.6	64.5	249	9.1
7-8	1,089	15.6	23.3	67.0	151	13.9
Default	209	100.0	100.0	70.5	134	64.2
Total/average	**17,707**	**3.1**	**6.4**	**66.5**	**677**	**3.8**
Total estimated loss					6,333	
Loss as percent of risk-weighted assets					3.3	
Implied new total capital ratio (average of four banks)					7.7	
Minimum new total capital ratio among the four banks					7.1	

Sources: Bank disclosure statements and staff estimates.

1/ As reported by Auckland Savings Bank, Australia and New Zealand Bank, Bank of New Zealand and Westpac.
2/ The staff's adjusted probability of default assumes that the assets shift to the next highest risk category, and that the probability of default for the category 7–8 is one and a half times that assumed by the banks.
3/ The staff's adjusted loss given default is about 1 1/2 times higher than reported by the banks for mortgage debt, but unchanged to that reported by the banks for corporate and other retail debt.
4/ The staff's loss estimate is calculated as the exposure multiplied by the probability of default and the loss given default.

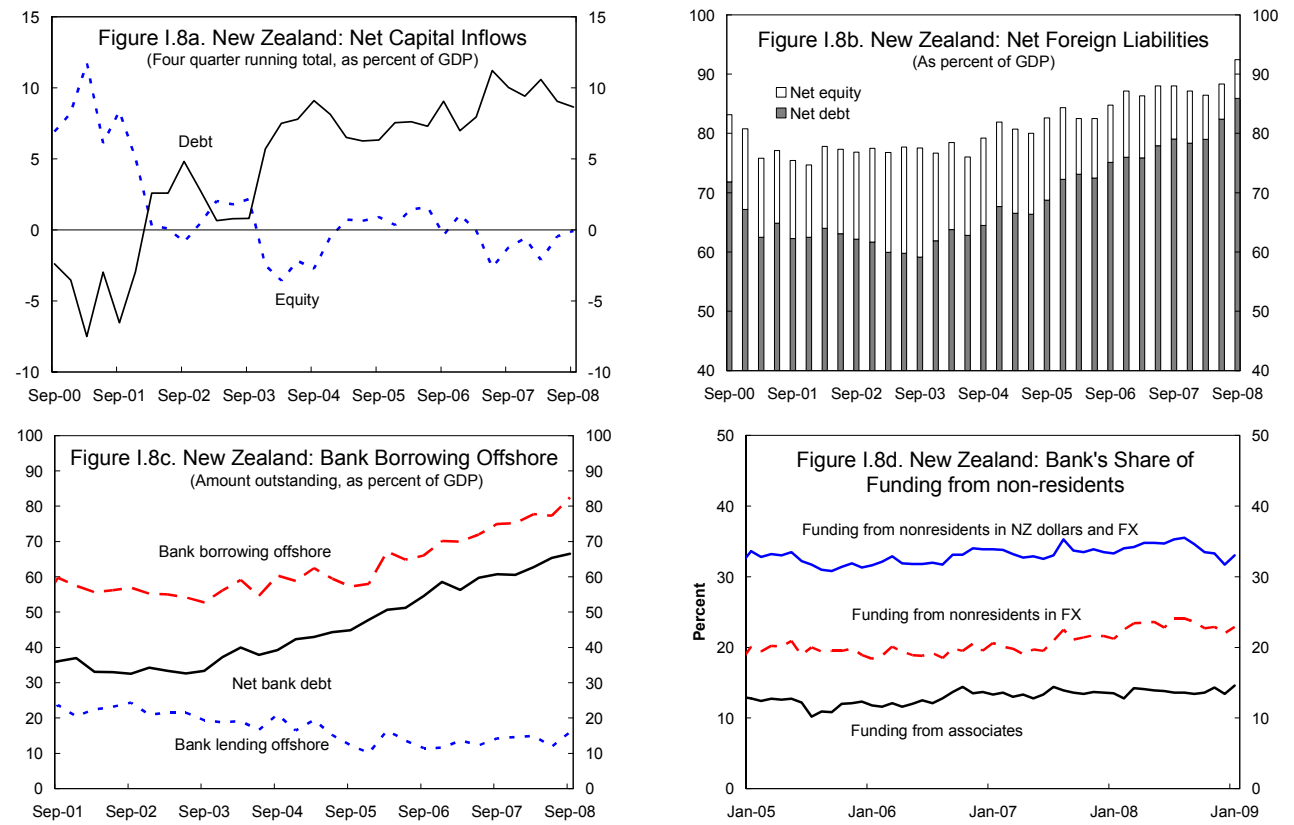
D. What are the Risks Related to Banks' Wholesale Funding?

24. **The magnitude and maturity structure of foreign borrowing by New Zealand banks leaves them vulnerable to disruptions to capital inflows.**[16] Over the past 5–6 years, New Zealand banks have borrowed sizable amounts from offshore markets to fund their lending, with nonresidents comprising one-third of banks' total funding (Figure I.8). Two-thirds of this funding matures in less than a year, with almost ½ maturing within 90 days, equivalent to 30 percent of GDP (Figure I.9).[17] Going forward, the ability of banks to roll over their external funding depends not just on their financial health (including the quality of their

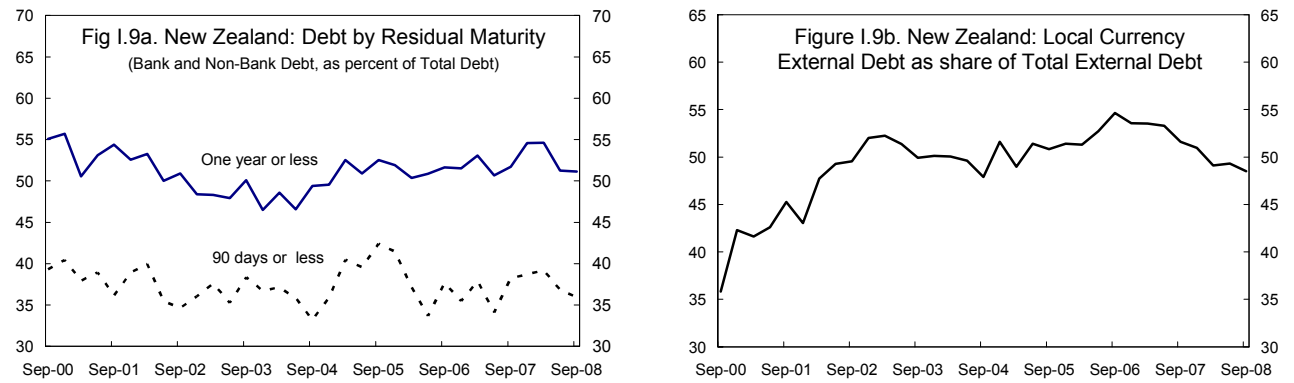
[16] A Selected Issues paper for the New Zealand 2008 Article IV discussed the policy implications of a disruption to capital inflows (see Brooks, 2008).

[17] Based on data provided by the RBNZ for mid-2007 for banks.

loan bank and their credit rating) and that of their Australia-based parents, but also on global financial conditions.



Sources: New Zealand Time Series; and Fund staff calculations.

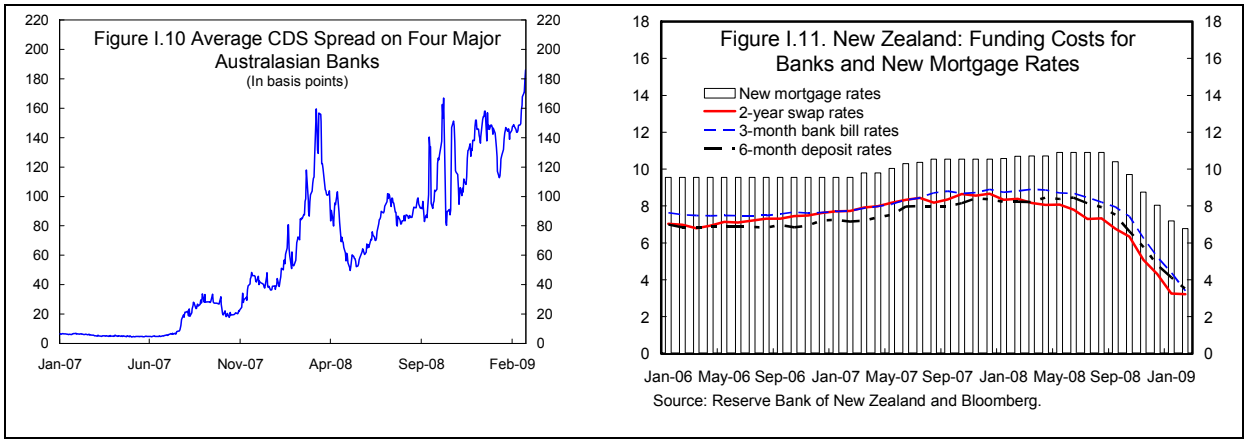


Sources: Statistics New Zealand; and Fund staff calculations.

Sources: Statistics New Zealand; and Fund staff calculations.

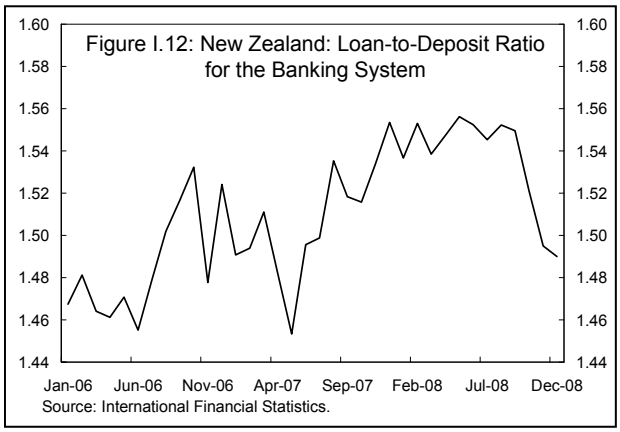
25. **The global financial turmoil has increased the spreads on foreign funding, particularly over the medium-term.** Since the Lehman Brothers collapse in September 2008, bank access to financing in global markets has become more difficult. Credit default

swap spreads for the four large Australasian banks have increased markedly, especially for five-year funding (Figure I.10).



26. **This, however, has been more than offset by the reduction in foreign and domestic interest rates, leading to a fall in the total cost of funding.** The significant easing of monetary policy by the RBNZ and foreign central banks has led to a sharp drop in the funding costs for New Zealand banks. For instance, the two-year NZ dollar swap rate, used to price a popular class of mortgage products, has fallen to less than half their level one year earlier (Figure I.11). Short-term wholesale and retail funding costs, as reflected by the 90-day bank bill rate and the 6-month deposit rate, have fallen by similar amounts. This has enabled banks to reduce interest rates for new mortgages (Figure I.11).

27. **The introduction of retail deposit and wholesale funding guarantees in late 2008 also helped ease the funding pressure on banks.** As a result, retail deposit growth picked up, though the loan-to-deposit ratio still remains high at over 150 percent (Figure I.12). In addition, the wholesale guarantee enables banks to use the New Zealand sovereign credit rating (S&P AA+, Moody's Aaa) to tap the international markets, for a fee.



28. **Still, New Zealand's high current account deficit and short-term foreign debt levels make it vulnerable to a reduction in capital inflows.** The global financial deleveraging, or a sudden shift in investor sentiment, could lead to a capital account shock.

- **Analysis of balance of payments financing suggests that if two-fifths or more of the maturing debt failed to be rolled over in 2009, a financing gap could arise.** The total external debt falling due this year is about NZ$120 billion. About 40 percent of it could be financed by using one-third of the official reserves of

NZ$24 billion and two-thirds of the US$15 billion U.S. Federal Reserve credit line, and by banks raising NZ$30 billion from their Australian parents (Table I.9).[18] But if only half of the maturing debt or less were rolled over, a financing gap could arise. However, such a dramatic fall in rollover rates is unlikely: during the Asian crisis, about ¾ of bank debt and 2/3 of nonbank debt of Korea, the Philippines and Thailand was rolled over.[19] Moreover, external short-term debt figures include funding provided by parent banks to their bank subsidiaries, which does not face the same roll-over risk as arms' length funding.[20]

- **Any remaining financing gap, once any additional offshore borrowing by the public or private sectors is considered, would force an external adjustment and a depreciation of the currency.**[21] The fall in the exchange rate would stimulate a shift in the current account and would make domestic assets (including equity and housing) more attractive.

29. **A negative shock to capital inflows would entail a balance of payments financing problem, but banks would still have access to domestic funding.** Since banks' foreign exchange risk is fully hedged, a shortfall in their offshore funding could simply be replaced by domestic currency funds, particularly from the RBNZ. Since the onset of the turmoil in 2007, the RBNZ has expanded banks' access to its liquidity, including by accepting securitized mortgages as collateral. Over the last year, banks have prepared to take advantage of this by securitizing a small fraction of their mortgage portfolio.

30. **A cross-country analysis points to several factors that reduce New Zealand's risk of a sudden capital account reversal or mitigate its consequences** (Appendix Figure I.A2):

- **Gross external debt is not as large as in some advanced countries.** While New Zealand's net foreign liabilities are among the highest of advanced countries, its gross foreign liabilities (at 160 percent of GDP) are small compared with Finland, the United Kingdom, and Iceland.

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[18] Australian bank regulations limit direct lending to subsidiaries to a maximum of 50 percent of Tier 1 capital. This implies a maximum lending to all Australian bank subsidiaries in the order of NZ$40 billion. However, lending can also take place through local branches and other associated vehicles.

[19] IMF (2009), note prepared for the Group of Twenty Meeting, March.

[20] Non-equity parent funding to bank subsidiaries is classified by Statistics New Zealand as portfolio or other investment rather than foreign direct investment.

[21] Staff analysis suggests a semi-elasticity of the current account/GDP ratio of -.24 with respect to the exchange rate. This implies that a 20 percent depreciation of the currency would narrow the current account deficit by almost 5 percent of GDP over the medium term.

- **The banking system is not large by international standards:** gross bank assets are about twice GDP compared to factors of 7 for the United Kingdom, 9 for Ireland, and 11 for Iceland.[22] Thus, the contingent liabilities on the public finances from potential bank failures are smaller as a share of GDP in New Zealand than elsewhere. By contrast, in Iceland and Ireland, concerns about the fiscal cost of a bank bailout of the oversized banking sectors was reflected in the sharp jump in their sovereign CDS spreads in late 2008.

- **Banks' asset quality remains sound.** New Zealand has experienced a credit-fueled house price boom only surpassed by Iceland's, and household debt is high,[23] but the analysis above suggests that banks can withstand significant shocks. Also, corporate debt is not as high as in other advanced economies that have recently experienced financial distress.[24] More importantly, New Zealand banks (like their Australian parents) have little exposure to sub-prime assets. In contrast, over half of Iceland's bank assets were held abroad, with a significant share in asset-backed securities. The rapid collapse in the market value of these securities triggered a sudden loss of market confidence in Icelandic banks.

- **New Zealand's public finances remain strong:** at about 20 percent of GDP, its gross public debt was one of the lowest among advanced countries. As a result, the New Zealand government's access to, and cost of, foreign or domestic financing is likely to remain favorable.

- **Exchange rate risk is hedged.** Banks hedge more than 90 percent of their foreign currency debt using financial derivatives, and more than half of their foreign borrowing is in New Zealand dollars.[25] Banks have limited lending in foreign currency, and corporates also hedge most of their foreign exchange risk anyway. Thus, the sharp depreciation of the New Zealand dollar (about 30 percent against the U.S. dollar between May 2008 and end-March 2009) did not have a material impact on bank or private sector balance sheets. In contrast, in Iceland, about 70 percent of bank loans to corporations were foreign-exchange linked, leading to a severe corporate and

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[22] This is based on gross, unconsolidated assets, which do not net out assets held in other domestic banks.

[23] New Zealand's household debt-to-disposable income ratio was 150 percent in 2006 and 160 percent in 2007. Iceland's, however, was higher, at 225 percent in 2006.

[24] New Zealand's total corporate liabilities (an upper bound on corporate debt) stood at 178 percent of GDP in 2007, compared with corporate debt-to-GDP ratios of 278 percent for the United Kingdom and 308 for Iceland. Also, the corporate sector has not been mired by risky derivative bets on the exchange rate, which brought down large companies and put downward pressure on the currency in countries like Korea, Mexico, and Brazil.

[25] Statistics New Zealand, 2009, *Balance of Payments and International Investment Position: Year ended 31 March 2008*.

banking sector slump when the currency collapsed in October 2008. Foreign exchange exposure has also been a key driver of recent financial distress in Eastern Europe.

31. **Thus far into the global crisis, New Zealand banks have been relatively successful in rolling over offshore debt, but there are some signs of strain.** New Zealand dollar-denominated bank funding from nonresidents has remained stable. However, funding from nonresidents, expressed in U.S. dollars, has been on a downward trend since mid-2008, falling by one-fifth between December 2007 and February 2009 (Table I.8). Since the sharp exchange rate depreciation has more than offset this decline, overall funding from nonresidents expressed in New Zealand dollars has increased by one quarter from December 2007 through February 2009.

Table I.8. New Zealand Banks: Funding Structure
(in NZ$ billions, unless otherwise stated)

	Dec-07	Dec-08	Feb-09
Funding from residents	177	202	202
In NZ$	167	193	193
In foreign currency	10	9	9
Funding from nonresidents	112	127	142
In NZ$	40	39	42
In foreign currency	72	88	100
Other liabilities	22	50	59
Capital and reserves	21	23	20
Total	**332**	**402**	**424**
Memorandum item			
Total funding from nonresidents (expressed in US$ billions)	*87*	*74*	*72*

Source: Reserve Bank of New Zealand, and Fund staff calculations.

32. **In order to reduce banks' vulnerability on the funding side, the RBNZ has drafted new liquidity guidelines.** The RBNZ guidelines were circulated for comment in late 2008, with the intention of being phased in from 2010. They would require banks to have a minimum core funding of 80 percent of total assets, where core funding is defined as wholesale and retail funding with residual maturity of more than one year plus 80 percent of short-term retail funding. The liquidity guidelines will encourage banks to shift to medium-term debt and may even help reduce New Zealand's overall debt. Since the cost of medium-term debt relative to short-term debt has risen, banks will have an incentive to rely more on retail funding.

Table I.9. New Zealand: Balance of Payments Financing
(In billions of New Zealand dollars)

	2007	2008 Est.	2009 Illustrative Scenario 1/	2009 Illustrative Scenario 2/
Current account balance	-14.4	-16.0	-13.4	-13.4
(In percent of GDP)	-8.2	-8.9	-7.8	-7.8
Capital and financial account balance	14.7	16.0	-43.7	-75.3
Capital account	-0.8	-0.9	-0.4	-0.4
Foreign direct investment	-1.0	4.8	4.7	4.7
Portfolio and other investment	16.4	12.1	-48.0	-79.6
Net equity	-0.7	-3.9	-2.0	-2.0
Net debt	17.2	16.0	-46.0	-77.6
Net errors and ommissions	-0.3	0.0	0.0	0.0
Overall balance	0.0	0.0	-57.1	-88.7
(In percent of GDP)	…	…	-33.2	-51.5
Other sources of financing	…	…	57.1	57.1
Australian parent banks 3/	…	…	30.0	30.0
Official reserves 4/	…	…	8.1	8.1
U.S. Federal Reserve swap facility 5/	…	…	19.0	19.0
Remaining gap	…	…	0.0	-31.6
Remaining gap (billions of US$)	…	…	0.0	-16.6
Remaing gap as percent of GDP			0.0	-18.3
Memorandum items:				
Short-term debt (eop)	117.7	120.3	71.7	40.0
Percent rolled over	…	…	59.6	33.3
Total external debt (eop)	215.6	235.1	186.5	154.9
Short-term assets (eop, excl reserves)	22.5	25.9	23.3	23.3
Percent liquidated	…	…	10.0	10.0
Total foreign assets (eop, excl. reserves)	56.2	62.2	59.6	59.6
Official reserves	22.3	19.3	…	…
NEER annual average	133.0	124.1	…	…
REER annual average	137.7	129.3	…	…

Sources: Statistics New Zealand and Fund staff estimates.

1/ Scenario 1 illustrates the percent of short-term debt that needs to be rolled-over to close the financing gap, given assumptions on funding from other sources plus the liquidation of 10 percent of foreign assets.
2/ Scenario 2 illustrates the remaining financing gap if only one-third of short-term debt is rolled over, given assumptions on funding from other sources plus the liquidation of 10 percent of foreign assets.
3/ Assumes Australian parent banks increase lending to their New Zealand bank subsidiaries by NZ$30 billion.
4/ Assumes the use of one-third of official reserves as of end-February 2009.
5/ Assumes two-thirds of the US$15 billion swap facility with the US Federal Reserve are used.

APPENDIX

NEW ZEALAND'S VULNERABILITIES IN A COMPARATIVE PERSPECTIVE

Table I.A1. Banking Sector Financial Soundness Indicators for New Zealand and a Sample of Comparator Countries, 2007

	Australia	Austria	Canada	Finland	Greece	Iceland	Ireland	Portugal	Spain	United Kingdom	**Sample avrge 1/**	**New Zealand**
						(In percent, except where otherwise indicated)						
Capital												
Assets to Tier 1 capital multiple 2/	33.2	28.8	26.4	185.1	25.6	16.2	43.7	32.1	25.4	51.2	**46.8**	**24.8**
Assets to total capital multiple 2/	23.2	19.9	21.7	156.9	30.8	13.0	33.3	21.2	16.3	33.8	**37.0**	**21.9**
Asset quality												
Impaired loans to total loans	0.3	3.4	0.5	0.5	6.2	0.9	0.7	1.3	1.0	1.6	**1.6**	**0.2**
Specific provisions to impaired loans	216.6	82.0	156.7	62.5	43.3	84.2	52.3	154.8	188.4	59.0	**110.0**	**239.6**
Profitability												
Return on average assets	1.6	0.8	0.9	2.1	1.2	1.6	0.5	0.9	1.0	0.6	**1.1**	**1.0**
Return on average equity	29.5	11.5	18.1	21.8	17.1	18.5	14.5	14.4	14.4	13.7	**17.3**	**16.9**
Net interest margin	1.8	1.9	1.8	1.4	3.0	1.4	1.0	1.9	1.8	1.1	**1.7**	**2.0**
Dividend payout	74.2	19.7	43.4	60.9	35.9	21.3	56.0	35.4	22.1	49.5	**41.8**	**61.0**
Composition of assets and liabilities												
Mortgages to total loans	53.1	5.4	10.2	7.6	27.8	3.5	1.7	21.4	5.0	15.8	**15.1**	**56.0**
Loans to total assets	61.8	53.3	47.7	45.4	61.8	59.8	52.8	68.3	67.6	43.4	**56.2**	**69.4**
Retail deposits to total liabilities	41.3	41.5	31.7	31.0	60.8	29.7	25.7	46.5	42.1	38.1	**38.8**	**56.6**
Liquid assets to deposits and ST funding	4.1	15.1	2.1	25.6	20.8	16.5	9.0	9.0	9.5	7.7	**11.9**	**5.3**

Source: Bankscope, and Fund staff estimates.

1/ Simple (unweighted) average of comparator countries, excluding New Zealand.

2/ Assets include off-balance sheet items; figures expressed as a multiple, not in percent.

Table I.A2. Financial Soundness Indicators for the Nonfinancial Corporate Sector in New Zealand and a Set of Comparator Countries, 2007

(Companies listed in a stock exchange; aggregations based on market capitalization weighted averages)

	Leverage			Liquidity		Profitability		Default probability
	Liabilities to assets	Debt to assets	ST debt to total debt	Current ratio 1/	Interest coverage ratio 2/	Return on average assets	Return on average equity	Distance to default, pooled 3/
	(In percent, except where otherwise stated)							
Australia	51.3	25.8	21.5	181.6	14.5	12.4	22.8	19.6
Austria	57.3	25.5	41.2	126.7	12.7	8.6	19.1	14.9
Belgium	53.0	23.9	23.0	127.2	29.0	9.9	19.0	15.3
Canada	47.0	21.0	16.4	189.5	13.6	6.9	12.7	18.5
China	45.6	24.9	72.1	160.5	35.9	9.0	15.7	13.8
Denmark	52.1	24.5	28.4	168.8	12.5	12.3	28.6	17.1
Developed Asia	49.0	21.3	40.1	177.2	61.4	7.6	14.1	--
Developed Europe	58.6	24.6	33.1	134.3	22.7	10.1	23.0	--
Emerging Asia	45.8	21.2	49.3	185.8	51.0	11.4	20.5	--
Emerging Europe	37.2	19.2	50.7	200.9	27.1	14.8	23.8	--
Finland	53.1	16.5	49.8	147.1	81.2	14.4	30.0	18.7
Greece	59.0	34.1	34.5	146.7	28.8	13.0	29.4	16.6
Ireland	61.8	35.8	12.2	197.5	7.1	8.5	24.2	12.7
Japan	50.7	21.4	45.5	173.7	77.4	5.4	11.1	13.5
Korea (South)	48.5	21.5	51.4	152.5	27.7	7.0	13.6	11.3
Portugal	70.5	41.4	21.6	91.8	7.2	7.4	24.0	16.2
Spain	65.0	37.6	24.8	109.2	15.1	9.4	28.6	15.9
Sweeden	52.0	22.1	29.7	178.3	17.1	12.0	24.0	14.6
United Kingdom	59.9	25.6	28.5	121.2	15.5	10.9	27.8	20.0
United States	54.6	23.2	20.4	172.7	29.8	8.4	18.9	20.1
Sample average 4/	**53.6**	**25.5**	**34.7**	**157.2**	**29.4**	**10.0**	**21.5**	**16.2**
New Zealand	**47.1**	**29.1**	**25.8**	**147.5**	**11.5**	**15.3**	**18.3**	**27.1**

Sources: Worldscope, and Fund staff calculations.

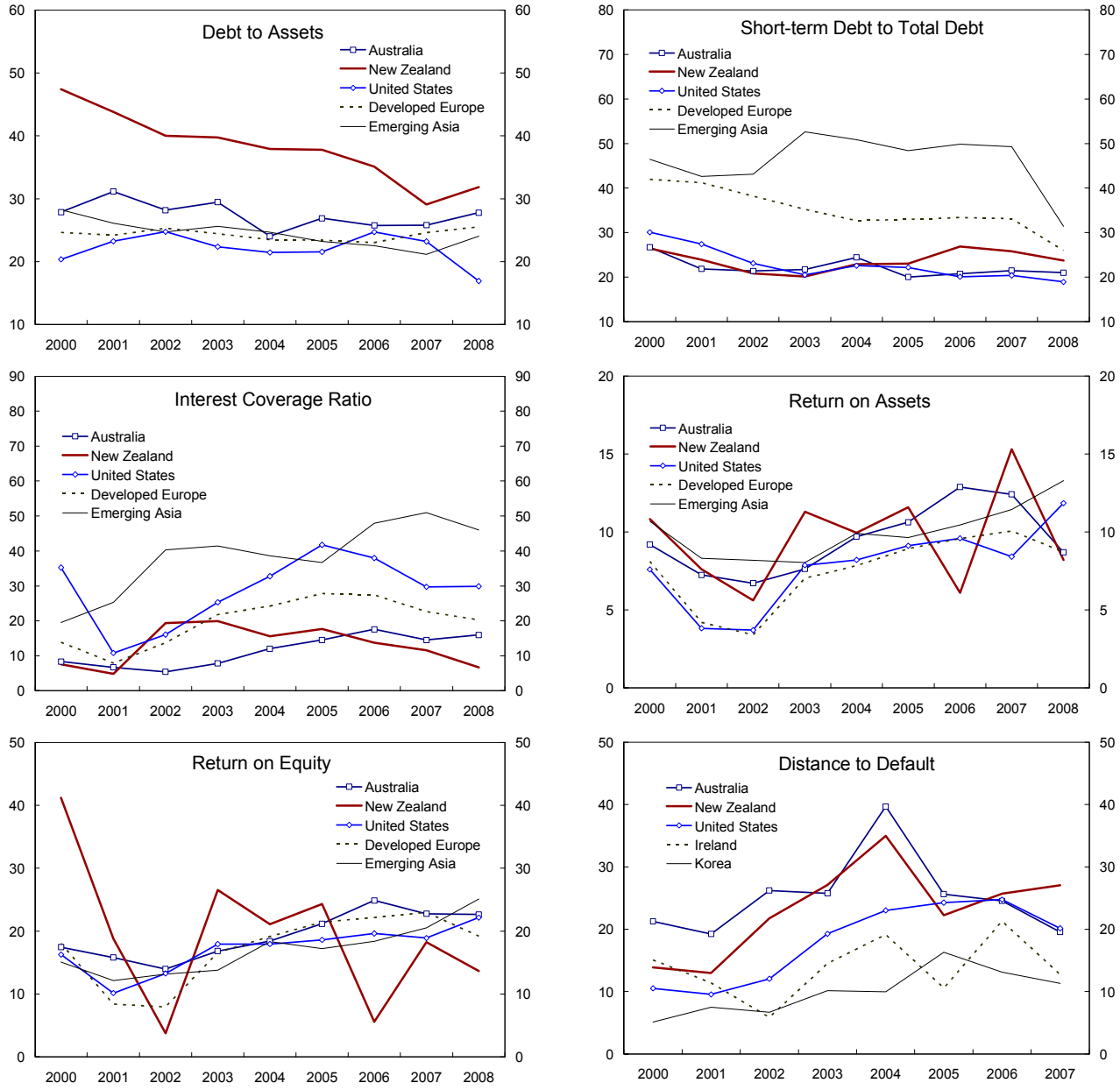
1/ Current assets to current liabilities.

2/ Earnings before interest and taxes to interest payments, expressed in absolute, not percent, terms.

3/ Distance to default within one year (DtD), measured as $DtD = 3+ \{\log (A) - \log (B) + [\mu - (\sigma^2_A)/2]\}/\sigma_a$, where A is total assets, B is the default barrier measured as short-term debt plus one half of long-term debt plus interest payments, μ is the expected return on assets (based on last year's annual capital gain including dividends), and σA is the standard deviation of the asset return. DtD is calculated from pooled data, adding all inputs into a synthetic company at the country level. Asset values and the standard deviation of asset returns are derived using the Black-Scholes-Merton option pricing formula, with stock prices and their volatility as inputs.

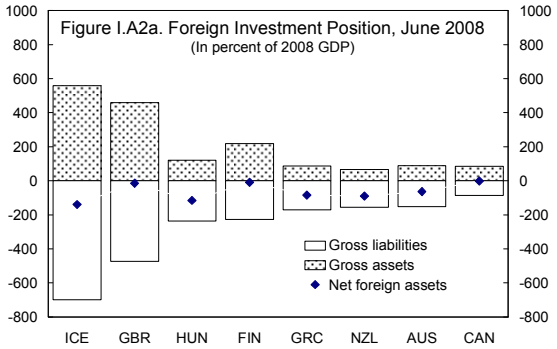
4/ Simple (unweighted) average of comparator countries, excluding New Zealand.

Figure I.A1. Corporate Vulnerability Indicators for New Zealand and Comparators

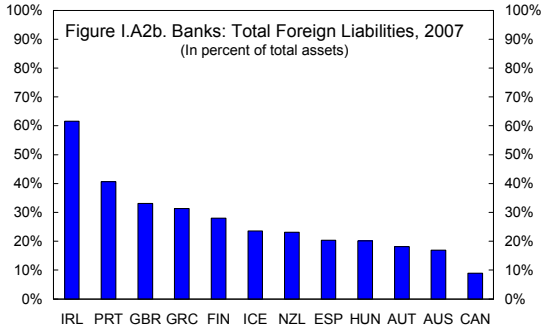


Sources: Worldscope; and Fund staff calculations.

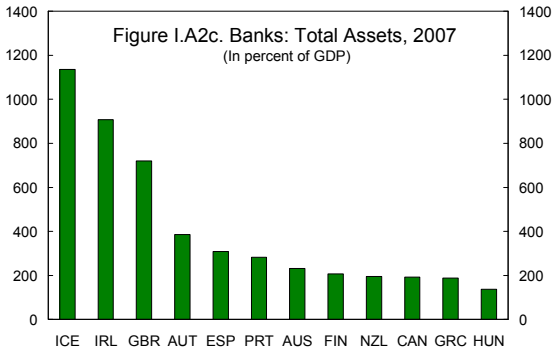
Figure I.A2. Selected Economic Indicators for New Zealand and Comparators



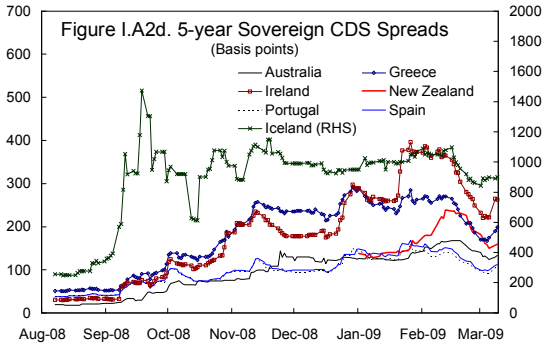
Source: International Financial Statistics; and Fund staff calculations.



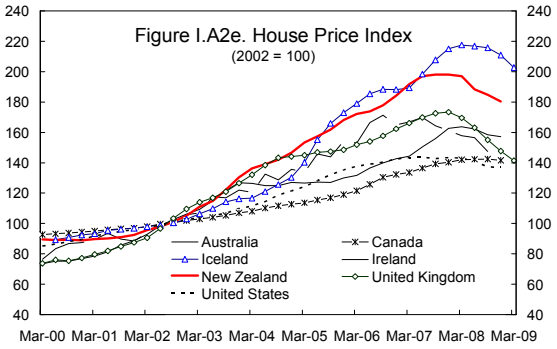
Sources: Reserve Bank of New Zealand; International Financial Statistics; Bankscope; and Fund staff estimates.



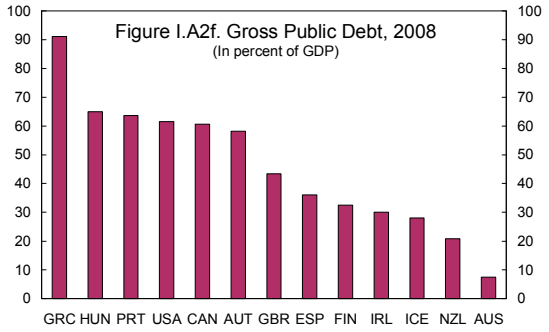
Sources: World Economic Outlook; Bankscope; and Fund staff estimates.



Source: Bloomberg.



Source: Haver Analytics; and Fund staff calculations.



Sources: International Financial Statistics and World Economic Outlook; and Fund staff calculations.

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II. Short-term Benefits and Medium-term Costs of Fiscal Stimulus[1]

1. **New Zealand met the global crisis in a strong fiscal position, with significant surpluses and low public debt.** This strength was due to a combination of sound fiscal policies and high commodity export prices. Staff estimates presented in this chapter suggest that the high the terms of trade added about 1¾ percent of GDP to government revenue. The projected decline in the terms of trade will therefore have a strong negative impact on revenue.

2. **A sizable fiscal stimulus is in place that will help mitigate the impact of the global crisis.** The analysis in this chapter shows that, among the measures taken, increases in public investment are most effective in stimulating demand, and, if temporary, will have a smaller impact on debt in the medium term. Targeted transfers to low income (liquidity constrained) consumers, followed by tax cuts, are the next most effective fiscal stimulus measures.

3. **The stimulus measures together with the fall in the terms of trade could result in a significant deterioration of the fiscal position over the medium term.** On current policies, gross public debt could increase sharply over the next five years, and without policy adjustment, investors might demand an increase in the risk premium. The analysis, using the Global Integrated Monetary and Fiscal model (GIMF) calibrated for New Zealand and the rest of the world, suggests that a higher risk premium would reduce the effectiveness of the fiscal stimulus in the short run and could trigger a long-lasting decline in output. Policy adjustment through cuts in expenditure made effective when growth returns but announced in advance would preserve the stimulus in the near term and ensure fiscal sustainability.

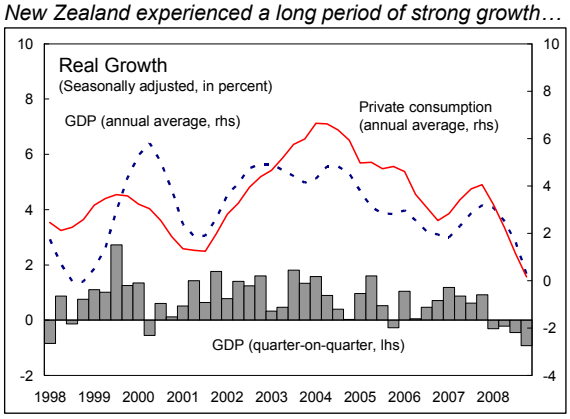
A. Fiscal Position Before the Crisis

4. **New Zealand has experienced a long period of strong growth.** During the 10-year period 1998–2007, the average growth rate of real GDP exceeded 3 percent per annum (Figure II.1). In recent years (2003–07) growth was driven in part by increasing house and commodity prices. Real house prices increased by about 60 percent during that period, while the terms of trade increased by about 25 percent. The increase in the terms of trade was driven primarily by export prices, and in particular dairy prices, which roughly doubled in nominal terms during the period.

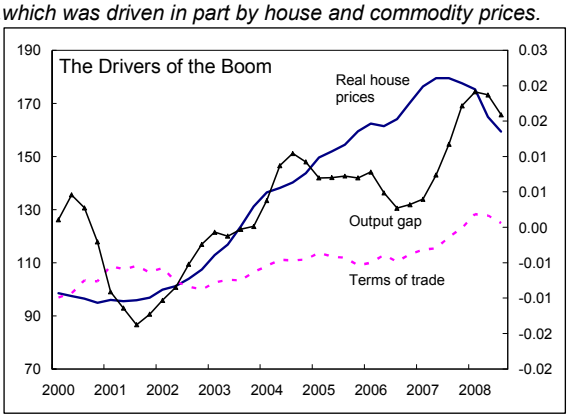
[1] Prepared by Dmitriy Rozhkov and Werner Schule.

Figure II.1. The Recent Boom

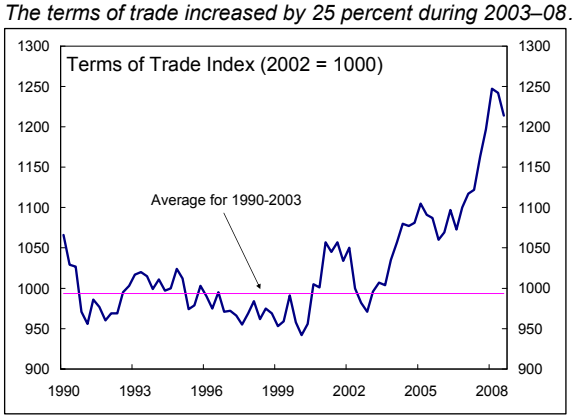
New Zealand experienced a long period of strong growth…



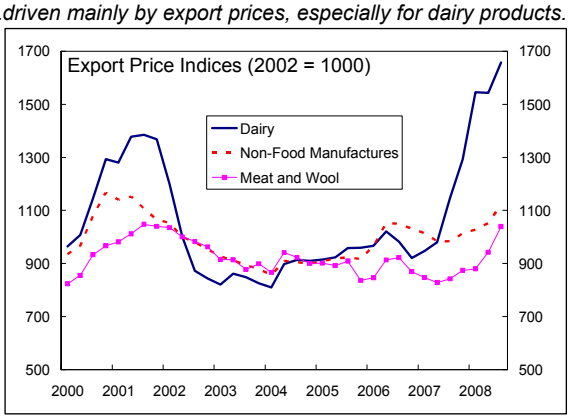
…which was driven in part by house and commodity prices.



The terms of trade increased by 25 percent during 2003–08…

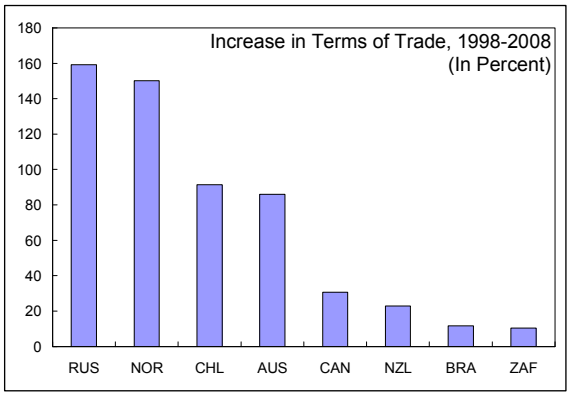


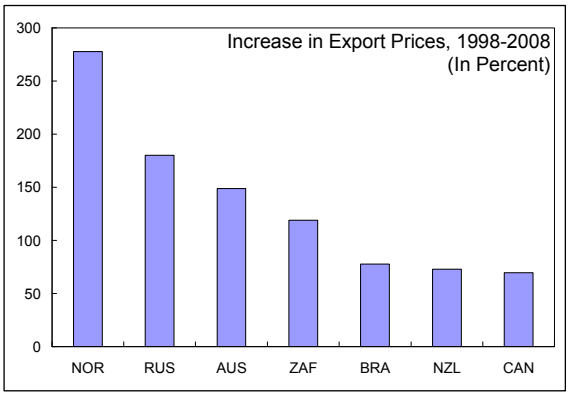
…driven mainly by export prices, especially for dairy products.



Sources: CEIC, Statistics New Zealand; and Fund staff calculations.

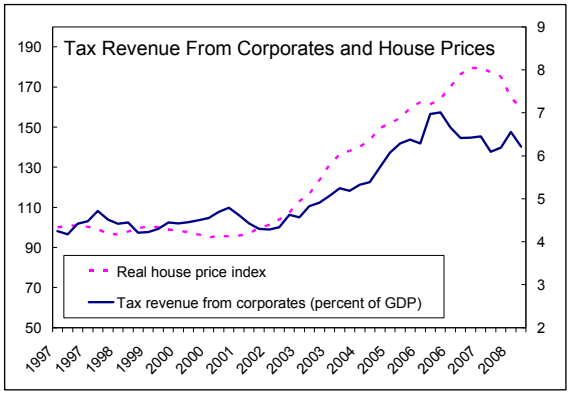
5. **The terms of trade boom was not unique from a historical perspective, or in comparison to other commodity exporting countries.** The 25 percent increase in the terms of trade in 2003–07 was large compared to recent history, but fluctuations of much larger magnitude were common in the 1960s and 1970s. This increase was also relatively modest, compared to other commodity exporting countries, in particular oil and metal exporters (text figures).

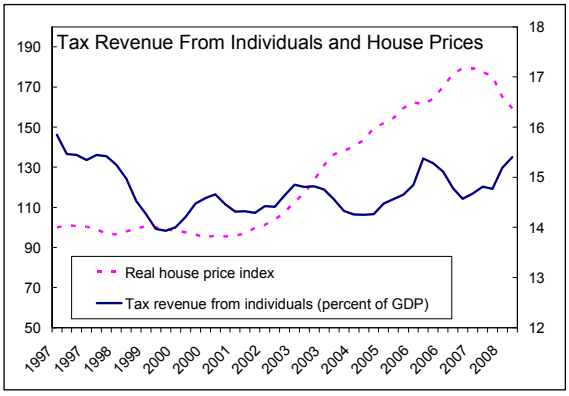




Source: WEO database.

6. **The increase in the terms of trade has affected government revenue.** Growing export prices have boosted corporate and individual incomes, and in turn increased the revenue collected from corporations and individuals.[2] Text figures below show that tax revenue increased in line with the terms of trade, although the correlation appears somewhat less pronounced in the case of taxes from individuals.



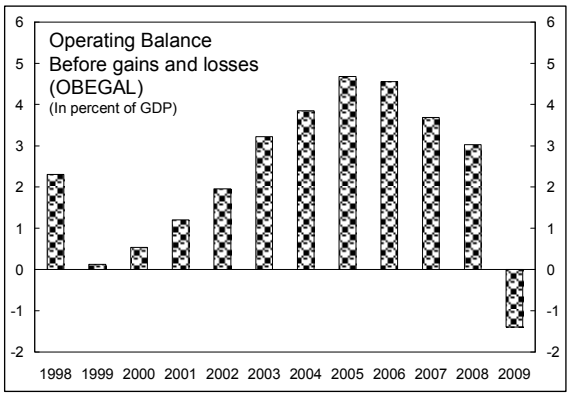


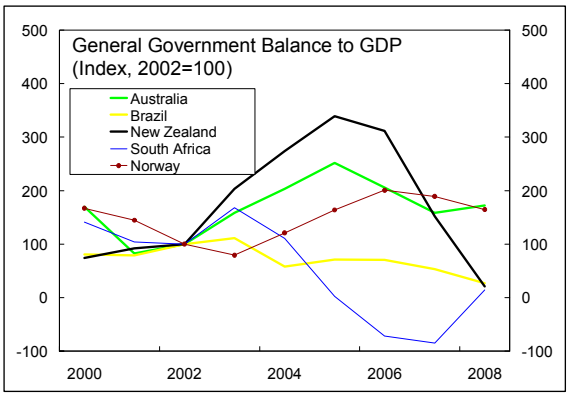
Sources: CEIC, and Statistics New Zealand.

7. **Owing to a combination of a long period of growth and sound policies, New Zealand met the global crisis with a strong fiscal position.** With a sound fiscal

[2] Small farms in New Zealand are often not incorporated, and their profits are taxed as individual income of the owner.

framework in place, New Zealand has continuously generated budget surpluses for 15 years.[3] In recent years of strong economic growth, and booming house and commodity prices, revenues were consistently stronger than forecast and objectives for the budget balance were exceeded. As a result, gross public debt dropped to 17½ percent of GDP in June 2008 and the government's net asset position became positive. Text charts below show that New Zealand's fiscal response to the period of boom was more conservative than in many other commodity exporting countries. The balance was allowed to grow substantially until 2008/09, when a combination of tax cuts and new spending measures contributed to a fiscal stimulus.





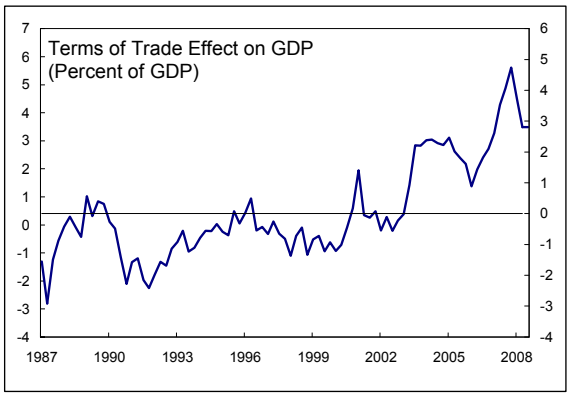
Sources: New Zealand Treasury; WEO database; and Fund staff calculations.

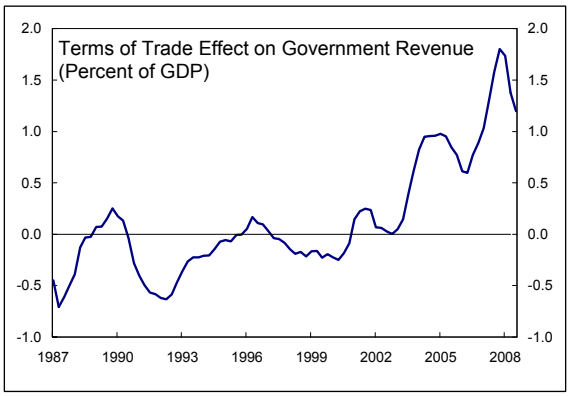
8. **It is important to have a reliable quantitative estimate of the impact of the terms of trade on government revenue.** A significant part of the increase in the terms of trade was in all likelihood not permanent. In fact, prices of New Zealand exports began to fall in the second half of 2008, in line with other commodity prices. In light of this, the part of government revenue that is due to higher than normal the terms of trade should be treated as temporary, and this has obvious implications for the assessment of the medium-term fiscal outlook.

9. **We use a simple method to estimate the terms of trade impact on government revenue.** First, we obtain the estimate of nominal GDP net of the impact of the terms of trade, by multiplying real GDP by the implicit price deflator for gross national expenditure. The difference between the resulting number and actual nominal GDP is the impact of the terms of trade on nominal GDP. Then, we multiply the impact on nominal GDP by the effective tax rate, to obtain the impact of the terms of trade on government revenue.

[3] The fiscal framework is based on the Public Finance Act introduced in 1989 and amended in 2004 (see http://www.treasury.govt.nz/publications/guidance/publicfinance/pfaguide/). The Act requires the government to set long-term objectives for budget balances and public debt. Debt targets were gradually revised downward over time, and the 2006 Fiscal Strategy Report specified the objective to "maintain Gross Sovereign Issued Debt broadly stable at around 20 percent of GDP."

10. **The results suggest that at the peak of the terms of trade boom, government revenue was boosted by about 1¾ percent of GDP.** At the peak of the boom (in the first half of 2008), the high level of the terms of trade added roughly 5½ percent to nominal GDP. Given the effective tax rates in New Zealand, this resulted in an increase in government revenue of about 1¾ percent of GDP. As shown by the text figures below, the impact of the terms of trade on GDP and government revenue has fallen significantly in the second half of 2008, as commodity prices began to fall.



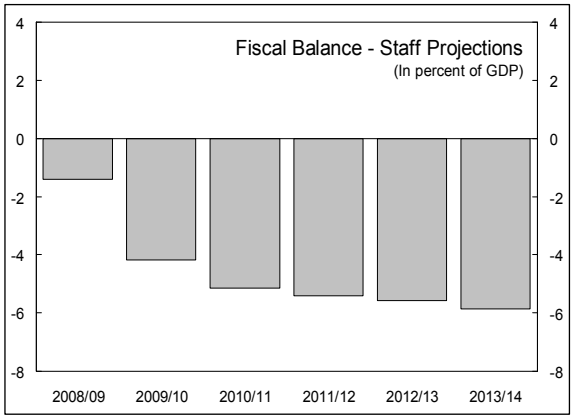


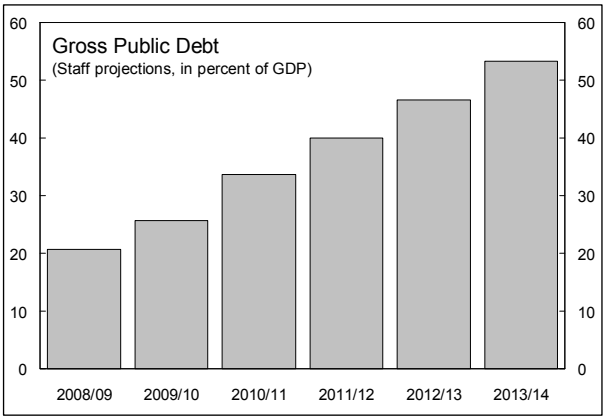
Sources: Fund staff calculations and estimates.

11. **Tax revenue may also be affected by house prices.** However, in New Zealand, where there is no capital gains tax, and property taxes are collected by local authorities, the impact on government revenue is mostly indirect, through taxes such as the goods and services tax (GST). Estimating this effect is quite complicated, and the ratio of GST to GDP has been relatively stable during the recent period. Therefore, we do not attempt to produce an estimate of the impact of house prices on government revenue in this chapter.

B. Fiscal Outlook

12. A sizable fiscal stimulus is being projected, but the medium-term fiscal outlook has deteriorated. The policy decisions taken in the past year will deliver a sizable fiscal





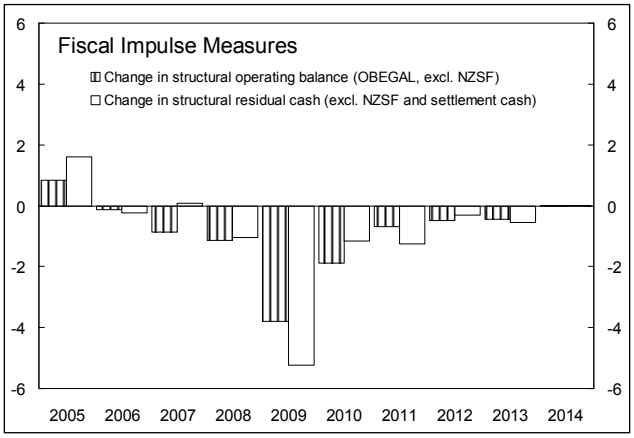
stimulus that will help cushion the impact of the global downturn, but the permanent nature of many of the tax cuts and expenditures means that deficits will continue to increase over the medium term. Staff's projections[4] assume that the revenue-to-GDP ratio remains the same as in the authorities' December 2008 downside scenario but that nominal GDP is lower, in line with the staff's April 2009 WEO forecast.[5] Spending is largely given by the authorities' forecast. However, to allow for the likely impact of weaker economic growth on wages and on the prices of goods and services purchased by the public sector, nominal operating expenditures are assumed to remain about ½ percent of GDP lower.[6] As a result, the staff expects that on current policies the budget deficit would widen to about 6 percent of GDP by 2014 and the residual cash deficit would be even larger (Table II.1).[7]

Table II.1: Fiscal Outlook (WEO baseline April 2009)

Year ending June, as percent of GDP	2009	2010	2011	2012	2013	2014
Revenues	33.3	32.4	31.5	31.4	31.8	31.8
Operating expenditures	35.4	37.5	37.5	37.5	37.9	38.0
Operating balance 1/	-1.4	-4.2	-5.1	-5.4	-5.6	-5.9
Residual cash balance	-4.7	-6.8	-8.4	-8.5	-8.8	-9.1
Gross debt	20.7	25.7	33.6	40.0	46.6	53.3
Nominal GDP (% change)	-1.3	-2.6	3.3	5.3	5.5	5.4
Real GDP (% change)	-1.6	-0.9	1.7	3.1	3.2	3.1

Source: Staff forecast.
1/ Operating balance before gains and losses (OBEGAL).

13. **A range of measures indicates a large fiscal impulse in New Zealand.** The change in the structural operating balance and the change in the structural residual cash balance is around 4–5 percent of GDP in 2008/09 (text figure). While fiscal impulse measures are useful, there are a number of caveats. First, the calculation of structural balances is sensitive to estimates of potential



[4] April 2009 WEO forecast.

[5] Fiscal stimulus in the rest of the world is included in the baseline, the staff's WEO forecast

[6] Capital spending, net surpluses of public sector entities, contributions to the NZSF, and the difference between the authorities' residual cash balance and the change in their gross debt (the 'other' item) are taken from the authorities' forecast.

[7] Annex I shows the reconciliation between the operating balance before gains and losses (OBEGAL) and the residual cash balance.

growth. Second, all endogenous changes in revenues and expenditures are not accounted for by cyclical adjustment. In New Zealand, commodity price shocks are likely to affect revenues in ways that go beyond their impact on economic fluctuations (see the analysis in part A above). Third, the impact of fiscal stimulus on the economy depends critically on the type of policy action, on second round effects, and on the reaction of economic agents.[8]

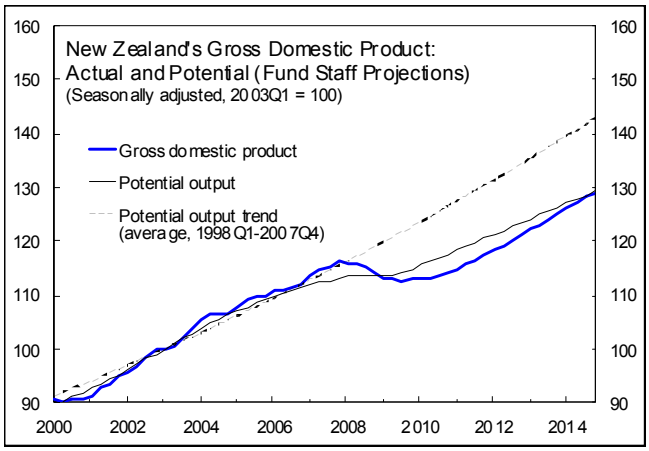
14. **Alternatively, looking at discretionary policy measures—the permanent tax cuts and increased public spending—the fiscal stimulus would be around 3 percent of GDP by 2009/10.** The stimulus would be in the upper range of G-20 countries (Table II.2).[9]

Table II.2: Net Debt Movements 1/
(in percent of GDP)

	2009 forecast	2010 forecast	2011 forecast	2012 forecast
Net debt forecast December 2007	1.0	1.0	1.0	1.1
Net debt forecast December 2008	3.2	7.6	12.9	17.6
Change in net debt forecast	2.2	6.7	11.9	16.5
of which:				
Economic-driven and other changes	0.6	3.9	8.3	12.3
Policy changes	1.6	2.8	3.6	4.3

Sources: Ministry of Finance; Fund staff calculations.
1/ From December 2007 to December 2008 fiscal and economic update.

15. **The balance of risks to the forecast is to the downside.** If the recession turns out to be deeper and more prolonged than in staff's baseline forecast, the fiscal situation would deteriorate further in the absence of policy changes. In the medium term, the impact of the global recession on the level and growth rate of potential output is key. Staff estimates New Zealand's cumulative 2008–14 output loss compared to past trend growth at around 8 percent (text chart). The bulk of the permanent loss is due to a drop in the level of potential GDP; a smaller part results from a reduced rate in its growth rate. If the short-term risks were to materialize, gross debt could rise above 60 percent of GDP at the end of the forecast period (Table II.3).



[8] These issues will be addressed in the model-based analysis below.

[9] G-20 Surveillance Note at http://www.g20.org/pub_further_pubs.aspx.

Table II.3: Fiscal Outlook (Downside scenario)

Year ending June, as percent of GDP	2009	2010	2011	2012	2013	2014
Revenues	33.3	32.4	31.5	31.4	31.8	31.8
Operating expenditures	36.1	38.6	38.7	38.6	39.1	39.8
Operating balance 1/	-2.1	-5.3	-6.3	-6.6	-6.8	-7.4
Residual cash balance	-5.5	-8.0	-9.6	-9.7	-10.0	-10.7
Gross debt	21.8	28.1	37.2	44.6	52.2	60.2
Nominal GDP (% change)	-3.3	-3.6	3.3	5.3	5.5	5.4
Real GDP (% change)	-3.6	-1.9	1.7	3.1	3.2	3.1

Source: Staff forecast.
1/ Operating balance before gains and losses (OBEGAL).

C. Model-Based Analysis

16. **A two-country version of the IMF's Global Integrated Monetary and Financial model (GIMF) was calibrated for New Zealand and the world.** GIMF is well equipped to analyze fiscal policies within a general equilibrium framework.[10] It is based on optimizing behavior of forward-looking agents. However, a number of non-Ricardian features allow for meaningful fiscal policy effects. There are two types of households: overlapping generations households à la Blanchard-Weil (OLG) with an average planning horizon calibrated to 20 years, and liquidity-constrained households (LIQ), who simply spend their current income. All households receive labor income and transfers, and OLG households also earn interest and dividends on assets (capital, and domestic and foreign bonds). Product and labor markets are monopolistically competitive. Annex II provides a selection of calibration values.

17. **GIMF has an elaborate government sector.** On the fiscal side, there are three distortionary taxes (on capital income, labor income, and consumption), lump-sum transfers to all households and targeted transfers to liquidity constrained households, and government investment and consumption spending. Government investment adds to the public capital stock and increases the productivity of private factors of production, while government consumption is assumed to be non-productive. A fiscal policy reaction function ensures sustainability of public finances and allows for different degrees of cyclical stabilization. A number of real and nominal rigidities enables the model to mimic realistic dynamics and allows for meaningful monetary policy effects. A variable foreign exchange risk premium augments the uncovered interest parity (UIP) condition, and a separate variable risk premium drives a wedge between policy and private sector interest rates.

[10] For a complete description of the model see Laxton and Kumhof (2009).

18. **Spending and tax multipliers were estimated using the calibrated version of GIMF.** Multipliers are measured by the deviation of GDP from baseline after a temporary increase in spending, transfers, or various tax cuts of 1 percent of GDP over 5 years. The size of fiscal multipliers in New Zealand is reduced by its high degree of openness (exports and imports in percent of GDP), relatively low share of liquidity constrained households (calibrated to 25 percent,[11]) and variable foreign exchange risk and private sector credit risk premia. On the positive side are relatively flexible product and labor markets which should reduce pressures on prices. The results are summarized in Table II.4.

Table II.4: Spending and tax multipliers in GIMF
(Percentage difference in GDP from base value)

	1st year	3rd year	5th year
Fiscal instrument			
Investment	0.84	0.98	1.21
Consumption	0.58	0.31	0.28
Transfers, targeted	0.42	0.28	0.14
Transfers, lump sum	0.19	0.05	-0.07
Consumtion tax	0.26	0.23	0.13
Income tax	0.26	0.36	0.33
Capital tax	0.08	-0.04	-0.13
Income tax permanent	0.49	0.86	1.15
Capital tax permanent	0.17	0.26	0.44

Source GIMF staff simulations. Simulations involve a 1% of GDP increase in government spending (consumption, investment), or reduction in tax rates (income, consumption, capital), or increase in transfers (lump sum, targeted to liquidity constrained households).

19. **The results suggest investment spending is most effective in providing stimulus to the economy, followed by public consumption, targeted transfers, labor income and consumption taxes.** Investment and consumption multipliers are on top chiefly because government spending enters directly into GDP. However, while public consumption crowds out private consumption and investment, public investment crowds in private investment and raises potential output permanently. Targeted transfers and consumption and labor tax cuts immediately raise consumption of LIQ households, while the bulk of temporary lump sum transfers and tax cuts are saved by OLG households. Temporary capital tax cuts have a near zero impact on GDP. They are distributed as dividends and mostly saved by OLG households which hold all assets and make investment decisions. However, permanent capital tax cuts have strong supply effects, raising investment and GDP, although the latter with a considerable lag as it takes time for capital to build. Similarly, permanent income tax cuts will have a strong and persistent effect on labor supply, and their impact on GDP is growing over time.

20. **Essential elements of New Zealand's fiscal stimulus are replicated in GIMF simulations.** A stylized representation of the tax cuts and spending measures as described in the authorities' Budget Policy Statements (BPS) is given in tableII.5. Tax cuts are staggered

[11] A 25 percent share of LIQs might underestimate the impact of the financial crisis on household's access to credit.

and reach a peak of 3 percent of GDP in the fourth year. The fiscal stimulus reaches 3.9 percent of GDP but declines slightly over time due to the impact of fiscal drag.

Table II.5. Fiscal Stimulus
(In percent of GDP)

Year	1	2	3	4	5	6
Tax cuts	-1.8	-2.5	-2.9	-3.0	-2.8	*-2.7*
Individual income tax	-0.6	-1.3	-1.7	-1.8	-1.6	*-1.5*
Capital income tax	-1.2	-1.2	-1.2	-1.2	-1.2	*-1.2*
Additional spending	0.2	0.5	0.7	0.9	0.8	0.5
Public investment	0.0	0.4	0.6	0.7	0.7	*0.3*
Public consumption	0.2	0.2	0.2	0.2	0.2	0.2
Total	2.0	3.0	3.6	3.9	3.6	3.2

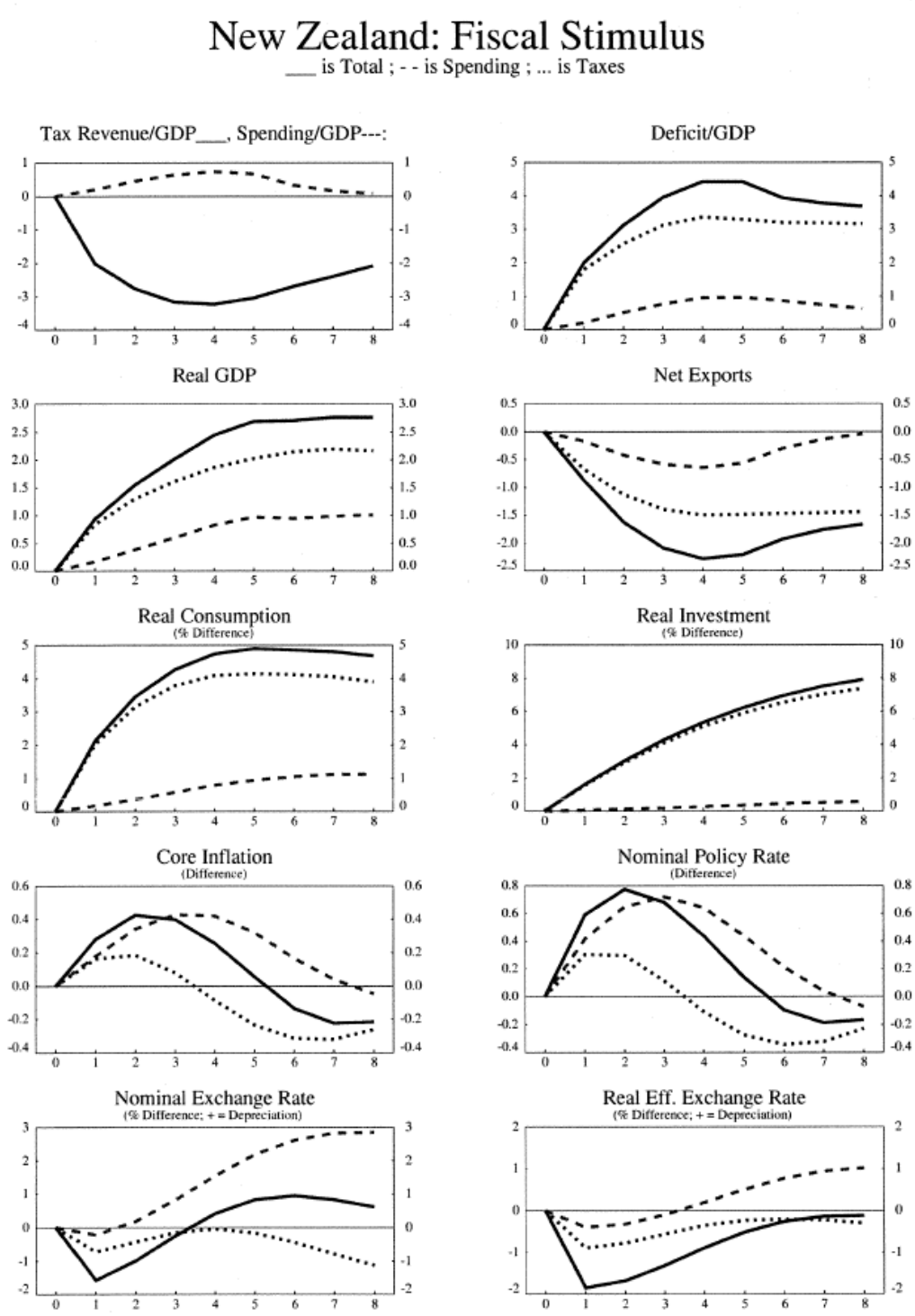
Source: Fund staff calculations.

21. **The impact of the stimulus is sizeable and persistent in the model** (Figure II.2). Both LIQ and OLG households increase consumption because tax cuts are permanent. Moreover, private investment and labor supply increase, raising future potential output and households' income expectations. The positive supply response reduces price and wage pressures, limiting the need for a monetary policy response. With public spending weighted in favor of investment, the positive effects on private spending dominate. Excess demand (relative to baseline) leads to an appreciation of the real effective exchange rate (again, relative to baseline) and net exports decline.

22. **Public debt rises significantly as a result of the permanent tax cuts and increased spending, which would likely lead to a higher risk premium on New Zealand's liabilities.** Without policy adjustment, debt would peak at 45 percentage points above baseline after 24 years—equivalent to a level of about 65 percent of GDP.

23. **Incorporating an increase in the risk premium on New Zealand debt would significantly undermine the effectiveness of the fiscal stimulus in the short run.** (Figure II.3)**.** Earlier simulations with a constant risk premium were unrealistic. This scenario assumes that investors react in a nonlinear way to an expected rise in public debt by raising the country risk premium by either 250 or 500 basis points. The model's monetary policy rule continues to target domestic inflation while letting the exchange rate float freely. The nominal exchange rate depreciates while private sector interest rates rise, reflecting changes in the risk premium and policy interest rates. Higher private sector real interest rates dampen consumption and depress investment. The impact on GDP is mitigated by an improvement in net exports. Nonetheless, real GDP remains significantly below its adjustment scenario level, and, depending on the size of the risk premium, might even fall below baseline in the short run.

Figure II.2

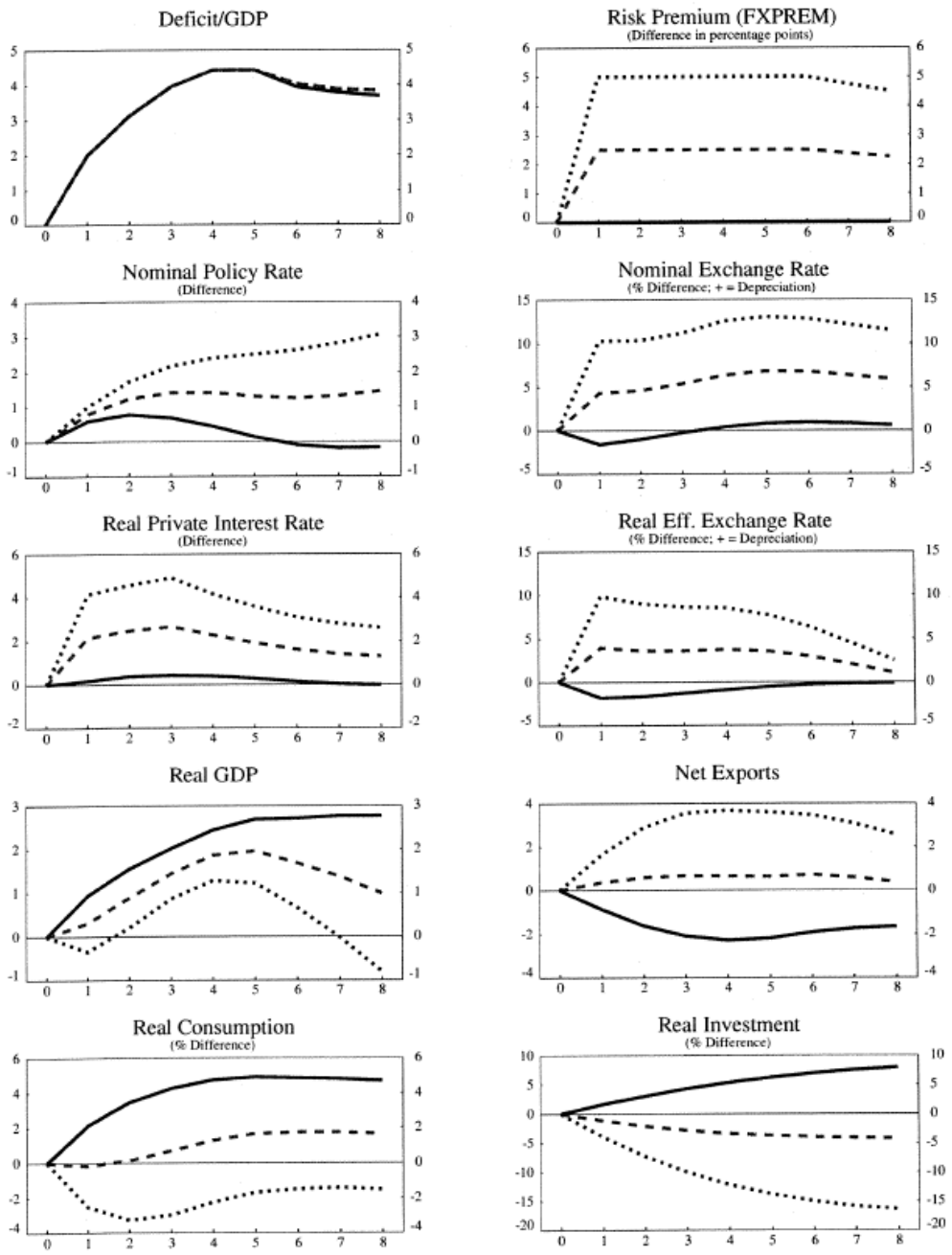


Source: GIMF simulations.

Figure II.3

New Zealand: With Risk Premium

____ No risk premium ; - - - Risk premium 250 ; ..... Risk premium 500



Source: GIMF simulations.

24. **The deficit would need to be reduced over the medium term by policy actions to avoid an increase in the risk premium.** For illustrative purposes, an adjustment scenario is shown that would cut spending by ½ percent of GDP in fiscal year 2011, when the economy is expected to recover, and about 2 percent of GDP per year in 2012–14 relative to baseline. There is scope to cut spending: this adjustment would return the expenditure-to-GDP ratio to the 2007/08 level. Moreover, the 2007/08 level of spending was about 2 percent of GDP higher than 4 years earlier before the housing and terms-of-trade boom boosted revenue. Expenditure cuts would stabilize gross public debt at about 40 percent of GDP.

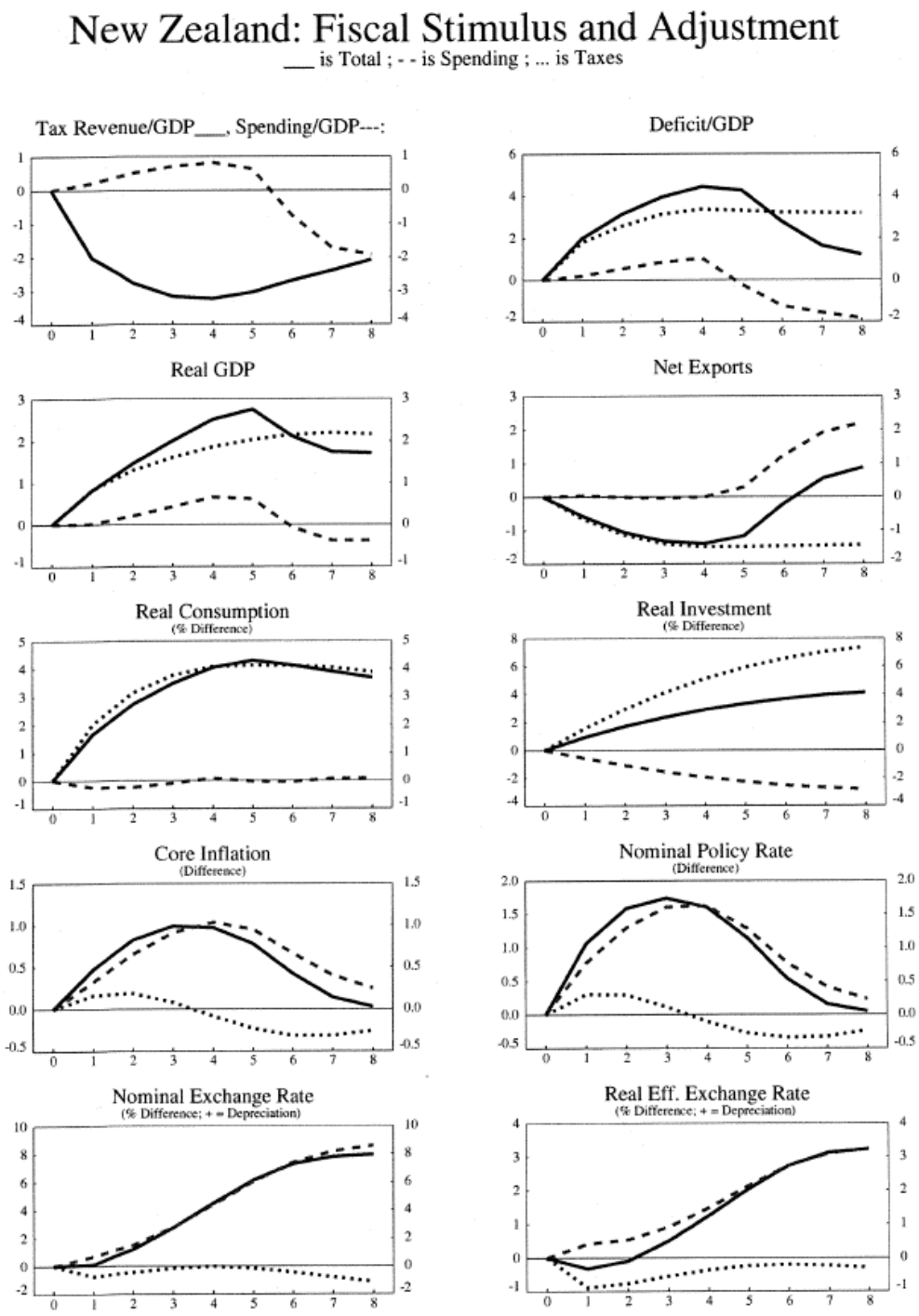
Table II.6: Fiscal Outlook (Adjustment scenario)

Year ending June, as percent of GDP	2009	2010	2011	2012	2013	2014
Revenues	33.3	32.4	31.5	31.4	31.8	31.8
Operating expenditures	35.4	37.5	37.0	35.2	33.4	31.6
Operating balance 1/	-1.4	-4.2	-4.6	-3.2	-1.1	0.7
Residual cash balance	-4.7	-6.8	-7.9	-6.2	-4.3	-2.5
Gross debt	20.7	25.6	33.0	37.2	39.4	39.9
Nominal GDP (% change)	-1.3	-2.6	3.3	5.3	5.5	5.4
Real GDP (% change)	-1.6	-0.9	1.7	3.1	3.2	3.1

Source: Staff forecast.
1/ Operating balance before gains and losses (OBEGAL).

25. **In the GIMF simulation the near-term stimulus combined with medium-term expenditure cuts results in better outcomes.** This simulation assumes no rise in the risk premium. The primary balance moves into surplus after 7 years and reaches 2 percent of GDP in the medium-term (Figure II.4). Debt converges toward baseline (20 percent of GDP) after 18 years. Net exports improve, dampening the impact of fiscal retrenchment on real GDP. GDP rises above baseline and the level under the risk premium scenarios. The near-term effectiveness of the stimulus is much greater if accompanied by a later adjustment that is pre-announced and expected, thereby limiting the likelihood of a rise in the risk premium.

Figure II.4



Source: GIMF simulations.

ANNEX I. RECONCILIATION OF THE OPERATING BALANCE BEFORE GAINS AND LOSSES AND THE RESIDUAL CASH

The following table summarizes the main steps from the OBEGAL, which is an accruals concept, to residual cash. This is done by removing non-cash items, including capital depreciation, and adding cash items, including Crown contributions to the NZSF,[12] net retained surpluses of state-owned enterprises (SOEs) and Crown entities (CEs), and purchases of physical assets, advances and the forecast of future capital spending.

New Zealand: Reconciliation of Core Crown Residual Cash 1/

	2007/08	2008/09 Proj.	2009/10 Proj.	2010/11 Proj.	2011/12 Proj.	2012/13 Proj.	2013/14 Proj.
	(In billions of New Zealand dollars)						
Operating balance before gains and losses	5.4	-2.5	-7.2	-9.1	-10.1	-11.0	-12.2
Non-cash items (including depreciation)	2.5	1.9	2.9	2.2	2.1	1.8	1.9
Net retained surpluses of SOEs and CEs	-0.8	-1.4	-1.5	-1.3	-1.1	-1.0	-1.1
Contribution to New Zealand Superannuation Fund	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-2.5
Purchase of physical assets	-1.4	-1.5	-1.7	-1.8	-1.9	-2.0	-2.1
Advances, capital injections, future capital spending	-1.6	-2.5	-1.9	-2.6	-2.7	-2.8	-2.9
Residual cash balance	2.1	-8.3	-11.7	-14.9	-15.9	-17.3	-18.9
	(In percent of GDP)						
Operating balance before gains and losses	3.0	-1.4	-4.2	-5.1	-5.4	-5.6	-5.9
Non-cash items (including depreciation)	1.4	1.1	1.7	1.2	1.1	0.9	0.9
Net retained surpluses of SOEs and CEs	-0.5	-0.8	-0.9	-0.7	-0.6	-0.5	-0.5
Contribution to New Zealand Superannuation Fund	-1.2	-1.3	-1.3	-1.3	-1.2	-1.2	-1.2
Purchase of physical assets	-0.8	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0
Advances, capital injections, future capital spending	-0.9	-1.4	-1.1	-1.4	-1.4	-1.4	-1.4
Residual cash balance	1.2	-4.7	-6.8	-8.4	-8.5	-8.8	-9.1

1/ Ministry of Finance, Economic and Fiscal Forecast December 2008; Fund staff WEO forecast April 2009.

2/ Includes: Non-cash items and working capital movements; purchase of physical assets; and advances, capital injections, and forecast for future capital spending.

[12] These contributions have been relatively constant over time and therefore do not materially influence the change in the balance.

ANNEX II. CALIBRATION TABLE (SELECTION)[13]

	New Zealand	World
GDP (percent share in world nominal GDP)	2.0[14]	98.0
National expenditure accounts		
Consumption	59.7	37.0
Liquidity-constrained	13.1	17.0
Overlapping generations	48.5	47.0
Investment	16.4	18.9
Government expenditure	21.6	19.5
On consumption	19.1	17.5
On investment	2.5	2.0
Exports	36.1	0.8
Of final goods	7.2	0.4
Of intermediate goods	2.6	0.4
Of commodities (net)	26.3	-0.6
Imports	37.2	0.2
Of final goods	19.1	0.2
Of intermediate goods	18.1	0.0
National income accounts (percent share of GDP)		
Wages and dividends	57.2	69.9
Capital income	16.4	18.9
Commodities sector returns	6.6	0.6
Taxes on wages	13.8	8.0
Taxes on capital	6.0	2.7
Government (percent share of GDP)		
Debt	21.8	60.0
Primary surplus	2.0	0.0
Structural parameters		
Intertemporal elasticity of substitution	0.25	0.25
Consumer Habit persistence	0.40	0.40
Probability of survival	0.95	0.95
Income decline rate	0.95	0.95
Share of liquidity-constrained agents	0.25	0.35
Elasticities of substitution		
Home/foreign final goods	0.75	0.75
Home/foreign intermediate goods	0.99	0.99
Tradable/nontradable	0.50	0.50
Commodities	0.50	0.50
Capital/Labor	0.99	0.99
Frisch elasticity	0.40	0.40
Monetary policy rule		
Inflation forecast	0.60	0.60
Output gap	0.25	0.25
Lagged interest rate	0.25	0.25

[13] Steady state.

[14] Size is somewhat larger than actual share in world GDP for convenience of calculation. This choice does not materially change the insignificance of changes in the New Zealand economy for the rest of the world.

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