NEW ZEALAND

SELECTED ISSUES

September 2019

This Selected Issues paper on New Zealand was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on September 5, 2019.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org Web: http://www.imf.org
Price: $18.00 per printed copy

International Monetary Fund
Washington, D.C.

NEW ZEALAND

SELECTED ISSUES

September 5, 2019

Approved By
Asia and Pacific Department

Prepared by Geoff Bannister, Dirk Muir, and Yu Ching Wong (all APD), with additional inputs from Ioana Hussiada and assistance from Nadine Dubost (both APD).

CONTENTS

TRADE, NET MIGRATION AND AGRICULTURE: INTERACTIONS BETWEEN EXTERNAL RISKS AND THE NEW ZEALAND ECONOMY[1]

A. The Interaction of External Risks and Linkages in New Zealand

1.   As a small open economy, New Zealand is vulnerable to external risks, a concern at a time when downside risks to the global economy have increased. The risks of greatest concern are those that would involve New Zealand's key external linkages – trade in tourism and education services, trade in agricultural goods, and external wholesale funding of its banks – or key trading partners and markets – Australia, China, and global markets for agricultural goods. In this paper, the external risks related to trade are examined, using the Australia-New Zealand Integrated Monetary and Fiscal Model (ANZIMF), a version of GIMF, the IMF's Global Integrated Monetary and Fiscal model (Box 1).

2.   This paper considers three channels for New Zealand's external linkages.
1)   New Zealand is a large-scale agricultural exporter of agricultural goods, especially dairy products (Figure 1). Agricultural exports account for over 13 percent of New Zealand's GDP.
2)   New Zealand is a large exporter of tourism and education services, referred to hereafter as services. While it has a diverse clientele for both, its largest relationships are with Australia and China (Figure 2). Export links with Australia tend be strongest for services, while those for China tend to involve more agricultural goods.

Figure 1. New Zealand's Agricultural Exports (Percent of New Zealand GDP)	Figure 2. New Zealand's Services Exports (Percent of GDP)
Sources: StatsNZ, UN COMTRADE, and IMF staff calculations.	Sources: OECD.stat EBOPS 2010 database, StatsNZ, and IMF staff calculations.
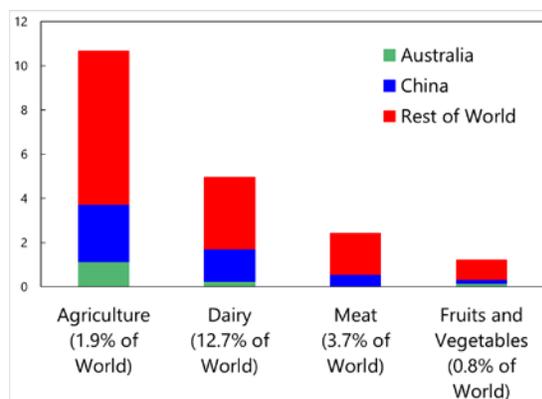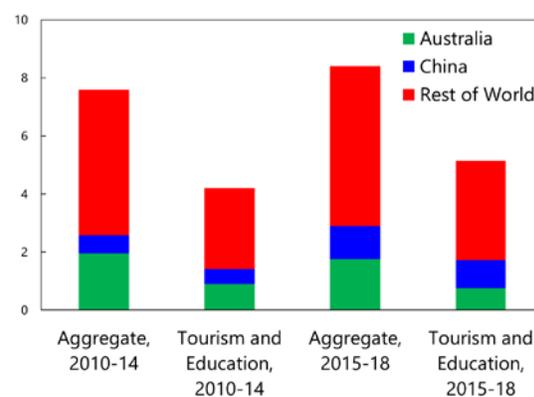
---

[1] Prepared by Dirk Muir (APD). The chapter benefited from valuable comments by the Treasury of New Zealand and participants at a joint Treasury and Reserve Bank of New Zealand seminar.

3) **Net immigration is a third source of external linkages, which has become increasingly important in the past five years.** A novel feature of this paper is to consider the additional impacts from potential changes in net migration arising from the risks under consideration. Net migration into New Zealand, while slowing, is still near record-high levels. It is in part driven by external factors. Students coming to school in New Zealand (many from Australia and China) are staying as permanent residents afterwards. Australia also accounts for other migration flows – not just of Australian citizens but also returning New Zealand citizens who left when the domestic economy was relatively weaker.

Box 1. ANZIMF – The Australia-New Zealand Integrated Monetary and Fiscal Model

ANZIMF is an annual, multi-region, micro-founded general equilibrium model of the global economy. It is based on the IMF's Global Integrated Monetary and Fiscal model (GIMF), with supporting documentation that is broadly applicable to ANZIMF (Kumhof and others, 2010, and Anderson and others, 2013). Structurally, each country/regional block is close to identical, but with potentially different key steady-state ratios and behavioral parameters (Table 1). This exercise focuses on New Zealand.

ANZIMF Expenditure Accounts Calibration

	New Zealand	Australia	China	Rest of Asia	United States
Share of Global GDP (Percent)	0.23	1.7	15.1	14.6	24.4
Domestic Demand (Percent of GDP)					
Household Consumption	60.4	55.1	54.5	58.7	62.0
Private Investment	16.3	21.3	25.0	21.0	18.2
Government Absorption	23.3	23.6	20.5	23.0	19.8
Consumption	19.5	19.8	13.5	20.0	16.3
Investment	3.8	3.8	7.0	3.0	3.5
Trade (Percent of GDP)					
Non-Commodity Exports	14.1	19.1	17.4	26.3	13.7
Goods	11.7	17.6	17.0	24.2	12.8
Services	2.4	1.5	0.4	2.1	0.9
Non-Commodity Imports	-21.0	-25.1	-17.3	-25.5	-13.7
Goods	-19.4	-23.1	-16.5	-23.6	-13.2
Services	-1.6	-2.0	-0.8	-1.9	-0.5
Net Agriculture	11.0	1.9	0.1	-1.2	0.3
Key Parameters					
Percent share of LIQ households	25	25	25	40	25

Note 1: "Services" includes tourism and education services.
Note 2: "Goods" includes consumption, investment, and intermediate goods and other services.

Sources: IMF staff calculations; IMF's *World Economic Outlook* and *Direction of Trade Statistics* databases; U.N. Comtrade; OECD.Stat National Accounts Database.

Consumption dynamics are driven by higher-income, saving households and non-saving, lower-income households. Saving households face a consumption-leisure choice, based on the overlapping generations (OLG) model of Blanchard (1985), Weil (1989) and Yaari (1962). Households treat government bonds as wealth since there is a chance that the associated tax liabilities will fall due beyond their expected lifetimes making the model non-Ricardian. The long-term real global interest rate, therefore, is endogenous and equilibrates global savings and investment. The real exchange rate serves to adjust each country's saving position (its current account and associated stock of net foreign assets) relative to the global pool. Non-saving, lower income households must consume all their income each year, amplifying the model's non-Ricardian properties in the short term.

Private investment relies on the Bernanke-Gertler-Gilchrist (1999) financial accelerator. Investment cumulates to the private capital stock for tradable and nontradable firms, which is chosen by firms to maximize their profits. The capital-to-GDP ratio is inversely related to the cost of capital, which is a function

---

Box 1. ANZIMF – The Australia-New Zealand Integrated Monetary and Fiscal Model (concluded)

of depreciation, the real corporate interest rate, the corporate income tax rate, and relative prices, and an endogenously determined corporate risk premia.

Government absorption consists of exogenously determined spending on consumption goods and infrastructure investment. Both affect the level of aggregate demand. Spending on infrastructure cumulates into an infrastructure capital stock (subject to a constant but low rate of depreciation). A permanent increase in the infrastructure capital stock permanently raises economy-wide productivity.

Trade is tracked bilaterally between all regions. There are flows for goods, services, and agricultural goods, and they react to demand, supply and pricing (i.e., the terms of trade and bilateral real exchange rates) conditions. Agricultural goods trade, and its related demand and supply equations, are based on a broad array of products, as New Zealand has strong exports for dairy products, meat, and fruit.

The nominal side of the economy depends on implicit Phillips' curves and monetary policy. The core price is the consumer price index (CPI), while relative prices mimic the structure of the national expenditure accounts. There is also wage inflation, which is implicitly a key driver for CPI inflation. In the short term, the nominal side of the economy is linked to the real side through monetary policy, which is conducted under a CPI inflation targeting regime, where with an interest rate function returns expected inflation to target over several years.

Fiscal policy is driven by a sufficiently detailed government sector that can reproduce simplified fiscal accounts for each country. Fiscal policy aims to maintain a debt target (expressed in flow space as a deficit target), using at least one of seven policy instruments available in the model. On the spending side, they are government consumption, infrastructure spending, general lumpsum transfers to all households (such as pensions, aged care provisions, unemployment insurance) and lumpsum transfers targeted to LIQ households (such as welfare, certain pensions). On the revenue side, the instruments are taxes on consumption (the goods and services tax, GST), personal income (PIT) and corporate income (CIT).

Relative to standard versions of GIMF, this model contains sectors for agriculture and for services. The data definition for the agriculture sector in this application covers all agricultural goods, but the focus for New Zealand is on dairy with significant contributions from meat (lamb and beef) and fruit (kiwi fruit). Similarly, the definition of services is restricted to tourism (mostly travel, accommodation, and food services) and education (mostly travel and correspondence courses).

The agriculture sector. The U.S. dollar global agriculture price is determined when producing countries sell in a global market, from which all countries then compete for their demands based on price. Countries produce agricultural goods from their endowment. Supply moves in tandem in the short term with the gap between the current and medium-term average global price and reacts (optionally) to demand-driven long-term changes in the global price. Both the short- and long-term price elasticities of supply are 0.40. Net export flows are explicitly tracked, although it is possible from the structure of the model to deduce the bilateral flows. Agricultural goods are part of consumption and inputs to both tradable and non-tradable intermediate goods production (much more for tradables).

The services sector. Services are produced from tradable and nontradable goods. They are priced as an input for consumption in New Zealand or exported to be consumed by foreigners. Services are exclusively part of consumption, and their demand vis-à-vis consumption goods is relatively inelastic. Consumption of services is a combination of services provided domestically or abroad. This allows for a final price of services that will enter the CPI, much as consumption services combines with the consumption of goods to define final household consumption.

3.   **This paper considers how external risks affect New Zealand through the three spillover channels.**[2] The components and magnitudes of the risk scenarios are illustrative only. Their results are presented relative to a baseline forecast consistent with the IMF's *World Economic Outlook*. The risk scenarios address three configurations of spillovers to New Zealand:

- *Section B:* Spillovers through all three channels, by considering a growth slowdown in China. It includes exacerbating impacts from net migration and also considers potential roles and interactions for New Zealand's monetary and fiscal policies.
- *Section C:* Spillovers through the net migration channel, by considering an illustrative growth slowdown in Australia.
- *Section D:* Spillovers from lower global agricultural prices caused by demand or supply factors, contrasted with impacts from domestic supply factor.

Section E concludes.

B.   Spillovers from a Growth Slowdown in China

4.   **Global trade tensions could result in a broad-based growth slowdown in China.** This risk scenario considers the possibility that global trade tensions could disrupt the ongoing structural reform process. In that case, China's real GDP would be significantly lower than expected under current baseline forecasts, along with most components of GDP. However, exchange rate and terms of trade adjustments would mitigate the impact on New Zealand's GDP, although domestic demand would contract.

A Growth Slowdown in China[3]

5.   **China would experience substantially weaker real GDP growth under this scenario** (Figure 3).[4] Real GDP growth would be about 1 percentage point lower than in the baseline in the short term, and about 0.6 percent lower for nine years. In the long term, the level of real GDP would be 11.9 percent lower relative to the baseline. Two-thirds of the decline would be from lower productivity, which leads to higher production costs and lower production capacity compared to the baseline. China's goods would be more expensive and would experience reduced foreign demand. Inflation in tradable goods prices would be even weaker than before, being 1.0 percent lower by the third year, and would only return to baseline after ten years. Lower inflation in China would result in

---

[2] The external risk scenarios are quantified in detail in Annex I.

[3] This scenario is derived from previous scenarios focused on China (Dizioli and others 2016) and Australia (Karam and Muir 2017)

[4] The growth slowdown in China is based on four shocks. The trade tensions are assumed to result in lower productivity growth of about 0.5 percent per year for 10 years, reducing economy-wide productivity levels by 5 percent in the long term. At the same time, firms would face higher risk premiums, an increase of 0.5 percentage points relative to baseline. House prices in the major urban centers would fall by 10 percent over two years. Demand for imported agricultural goods would decline by about 0.5 percent per year, summing up to levels that are 9 percent lower in the long term, as household preferences would be shifting to local products.

a negative inflation impulse to countries that import substantial quantities of Chinese goods, such as New Zealand.

Figure 3. Growth Slowdown in China – Outcomes in China
(Deviations from WEO-consistent forecasts)

Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.
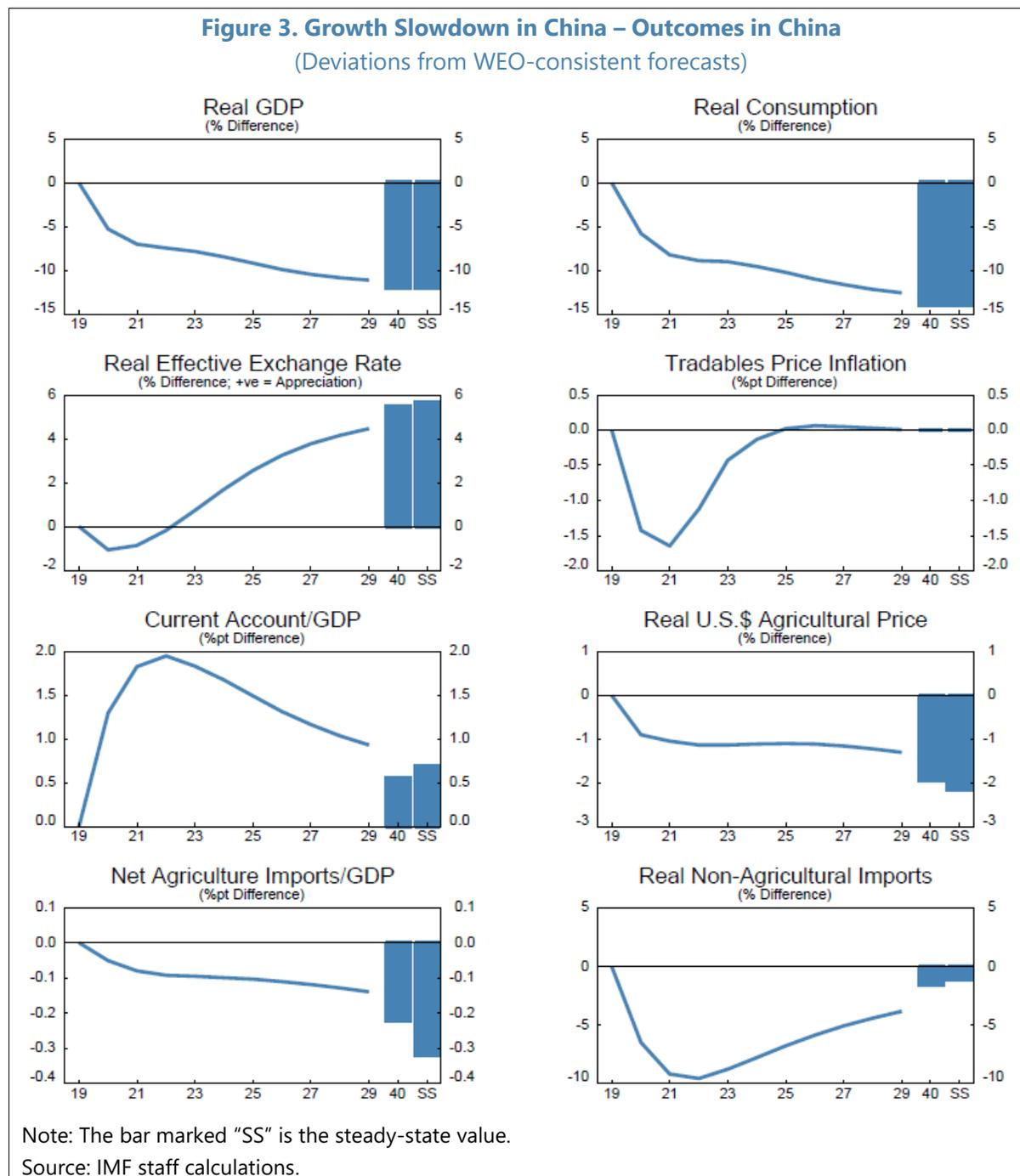
6.   Household consumption would be considerably lower in this scenario. The decline in house prices would decrease household wealth, while the lower productivity would reduce firms' labor demand and, consequently, labor income, wealth, and consumption. Consumption growth would be around 0.2 to 0.5 percentage points weaker than that of real GDP growth. Imports would

also be lower, including imports of agricultural goods. The latter would result in lower global prices for agricultural goods of almost 1 percent on impact and of 2.1 percent in the long term.

Figure 4. Growth Slowdown in China – Spillovers to New Zealand
(Deviations from WEO-consistent forecasts)

Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.
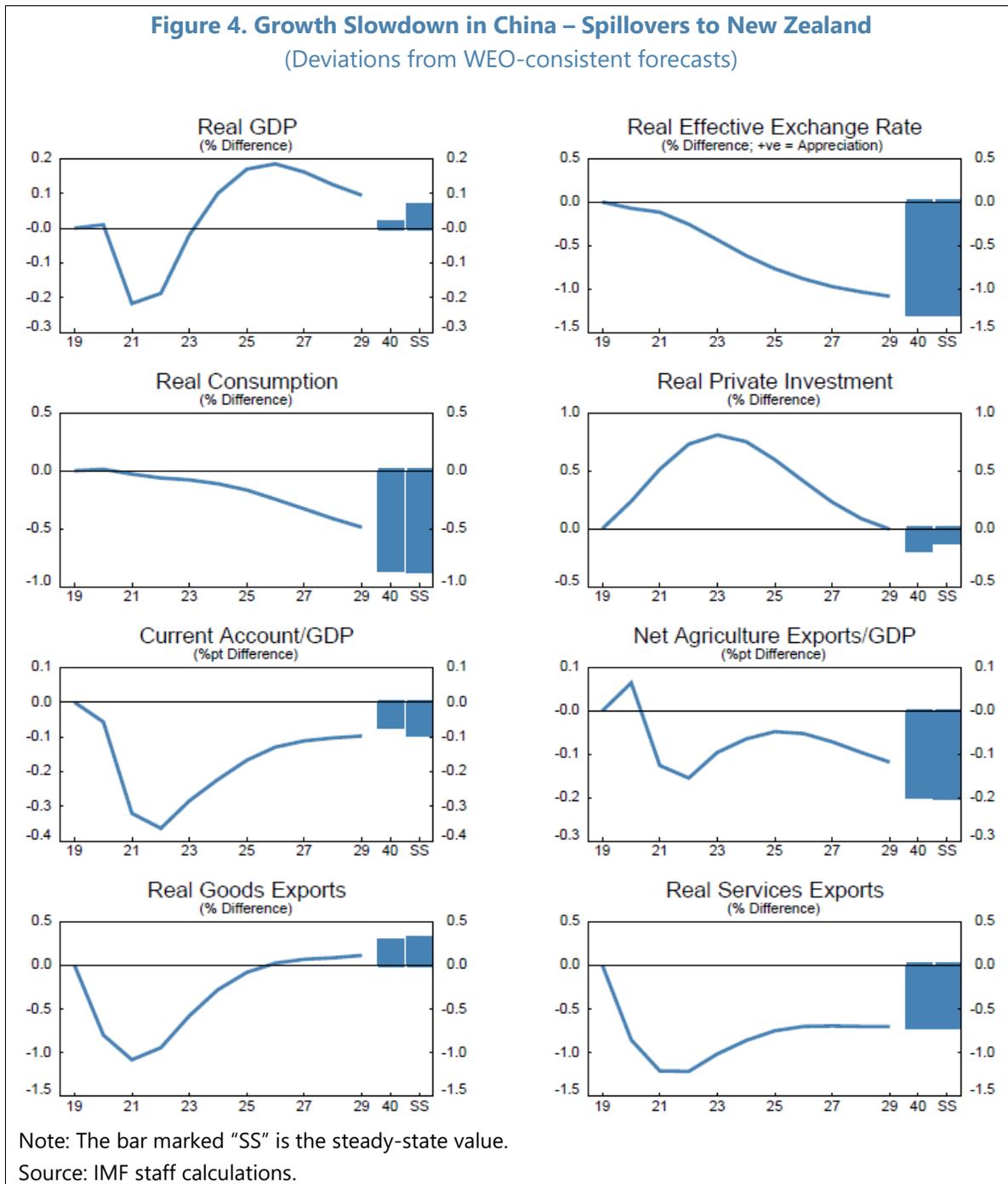
Spillovers to New Zealand

7. **New Zealand would experience strong spillovers through trade channels** (Figure 4). The China-led fall in global agricultural prices would reduce the value of New Zealand's production,

although lower prices would also shore up foreign demand outside China and New Zealand. A real depreciation of the New Zealand dollar would mitigate the impact on exports over time. New Zealand's tourism and education exports would be 1.6 percent lower in the short term, for example, but would decline by only 1.0 percent in the long term. The impact on agriculture and services would be a wealth shock, and lead to a depreciated REER. Therefore, while goods exports would be 1.1 percent longer in the short term, goods exports would be 0.5 percent higher in the long term.

8.   Economic activity would contract in the short term but would return to baseline in the long term because of expenditure switching. The lower agricultural goods prices lower New Zealand's wealth and consumption, with the latter being 0.9 percent lower relative to baseline in the long term. But given the behavior of exports, real GDP would contract by only 0.2 percent on impact and be broadly unchanged relative to baseline in the long term.

How Lower Net Migration Could Exacerbate the Negative Impact on New Zealand

9.   A growth slowdown in China could have the additional impact of reducing Chinese student migration into New Zealand (Figure 5). A part of New Zealand's services exports is consumed in the country by temporary residents, namely exports of education services. In recent years, this type of export has also contributed to increases in net migration into New Zealand because students obtain work permits after graduation. Here, the net migration of Chinese students is assumed to decline in line with the economic slowdown. The combination of lower consumption in China and a shift in preferences toward domestically produced goods and services might well result in fewer Chinese students attending school in New Zealand. This would not only reduce services exports but could also mean fewer students remaining in New Zealand after graduation. Currently, 17 percent of net migration comes from China in New Zealand. In the scenario below, it is assumed New Zealand's population is 0.1 percentage points lower per year for 10 years – approximately 40 percent of the share of New Zealand's net migration inflow coming from China.

10.   The shock to net migration would operate through its impact on labor supply. It would decrease the productive capacity of New Zealand and increase wage pressures. Given the lower long-term labor supply, demand for capital would be less, so investment would be 0.2 (short term) to 0.7 percent (long term) weaker relative to the scenario without the net migration effects. Wealth would be lower, leading to household consumption being 1.8 percent lower instead of 0.9 percent. Pressures from consumption and investment would reduce imports, decreasing the short-term current account deficit before the long-term re-equilibration from the change in the REER.

11.   The fall in net migration would exacerbate the negative spillovers to New Zealand from China. Real GDP would now be 0.7 percent lower than baseline in the long term. Short-term losses in the economy would be confined largely to the domestic sector. In the long term, the external sector would not be as strong, as the REER would depreciate less (only 0.9 percent) because of stronger real wages relative to the case without changes net migration. Services exports would be 1.6 percent lower relative to baseline, compared to 0.7 percent under the case without changes in net migration.

Figure 5. Growth Slowdown in China – Net Migration Effects in New Zealand
(Deviations from WEO-consistent forecasts)
_____ No Change in Net Migration
_ _ Annual 0.1 Percentage Point Decrease in Population Growth
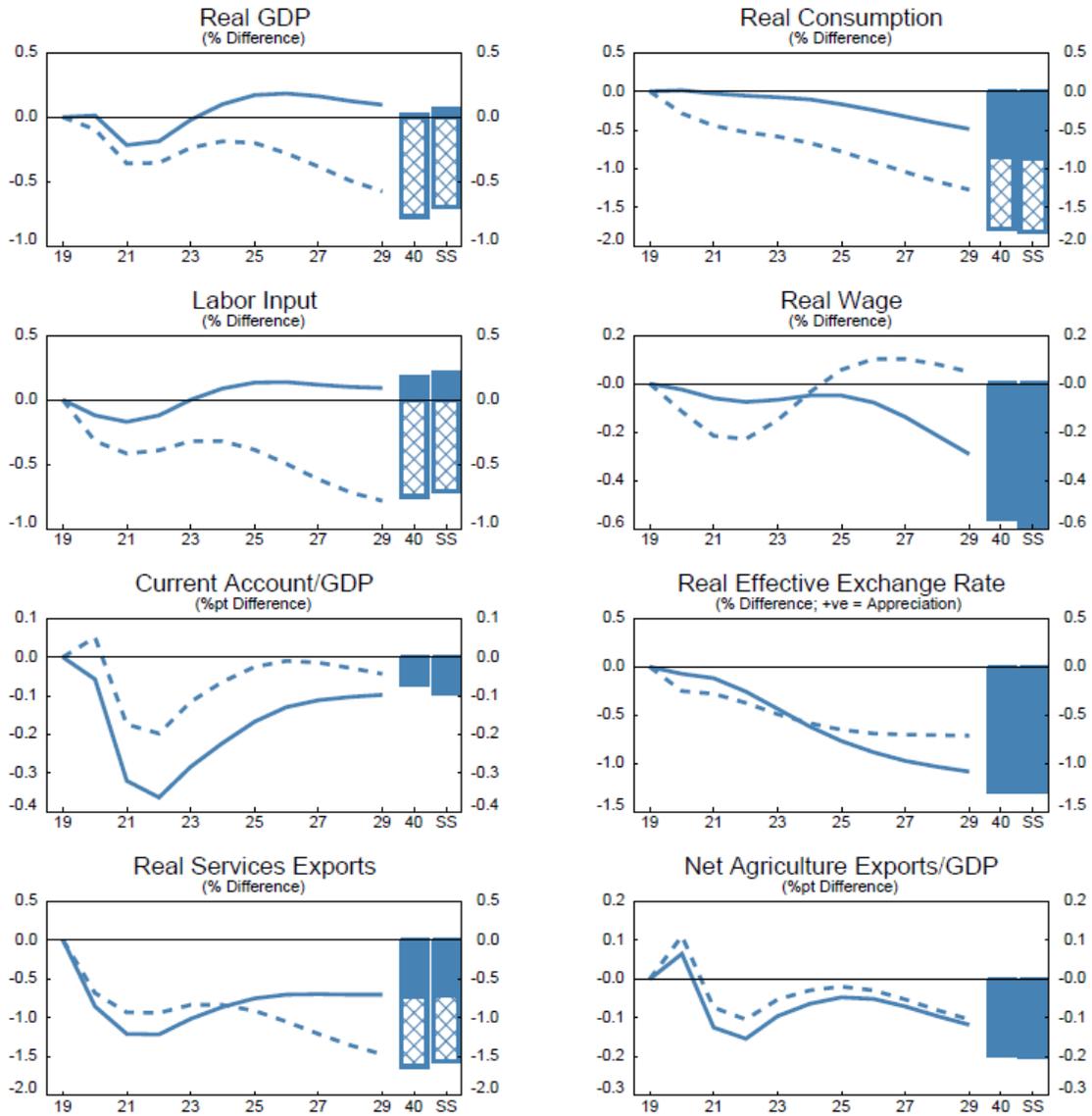
Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.

The Interaction of Monetary and Fiscal Policy

12.   A need for a fiscal policy response to an economic downturn in New Zealand is becoming more likely than it has been in the past. The global risk profile is increasingly tilted to the downside, at a time when the Reserve Bank of New Zealand's (RBNZ) policy rate is already at a low of 1 percent. If a major risk realized, the effective lower bound (ELB) on nominal interest rates

might be more likely to become a constraint on monetary policy. This section considers the effects of a fiscal policy response to a slowdown in China with the policy rate at the ELB. The effects on New Zealand would be relatively small if the RBNZ could cut the policy rate but much larger if it could not (Figure V.1, blue versus red lines).

13.   **The effectiveness of a fiscal policy response would depend on the instruments used.** Depending on the instruments, the multipliers of the discretionary fiscal policy response would be different. Two options at the opposite end of the spectrum of the multipliers are considered below:[5]

- *Lower Multipliers, Quicker to Deploy:* Increased government consumption spending and a GST rate cut.
- *Higher Multipliers, Slower to Deploy:* Increased government infrastructure investment and GST rebates targeted to lower-income households.

Each pair of fiscal instruments would be changed by 0.5 percent of GDP relative to their original paths for five years (Figure 6, green solid and dashed lines). As aggregate demand increased and led to inflationary pressures, it is assumed that the monetary authority would not increase the overnight cash rate even if inflation were to enter its target range in later years.

14.   **Both forms of fiscal stimulus would have the same qualitative effects.** The additional stimulus would push up inflation between 0.5 to 0.8 percentage points by the fifth year, thereby reducing the real interest rate and stimulating the economy. It would also increase the government-debt-to-GDP ratio, but by a manageable amount – only between 2.0 to 2.5 percent of GDP after 5 years. This is lower than what the cumulation of the deficits over the same period would seem to imply at first consideration, because the stronger nominal growth provided by the stimulus would increase the denominator of debt-to-GDP ratio relative to baseline.

15.   **In the case of the lower-multiplier fiscal stimulus, there would be a multiplier for real GDP of 0.7 on impact.** Real GDP would peak at 1.0 percent higher in the fifth year, relative to the growth slowdown in China constrained by the ELB and no additional fiscal policy response. Government spending would automatically increase aggregate demand. The temporary cut in the GST rate would only increase consumption for lower-income, non-saving households. Higher-income saving households consume smoothly from their stock of wealth, so the GST rate cut would add little to household wealth and have no discernible effect on households' level of consumption.

16.   **In the case of the higher-multiplier fiscal stimulus, there would be a multiplier for real GDP of 1.1 on impact.** Real GDP would peak at 1.6 percent higher in the fifth year, relative to the growth slowdown in China constrained by the ELB and no additional fiscal policy response. Public infrastructure investment, besides increasing aggregate demand, would increase productivity over the medium-to-long term. This would encourage more short-term private investment and increase the economy's productive capacity for an extended period. A larger share of a targeted GST rebate

---

[5] Annex II discusses the multipliers from the seven fiscal instruments available in ANZIMF and orders them from highest to lowest.

would likely be spent compared to a general GST rate cut, as it would affect only households that would benefit strongly from such a rebate. There would be the risk that infrastructure investment could not be increased as rapidly as depicted here.

Figure 6. Growth Slowdown in China with Various New Zealand Policy Options
(Deviations from WEO-consistent forecasts)
___ With Monetary Policy Reacting (as in Figure 4)
___ At the Effective Lower Bound
___ At the Effective Lower Bound with Higher-Multiplier Fiscal Stimulus
- - At the Effective Lower Bound with Lower-Multiplier Fiscal Stimulus

Source: IMF staff calculations.
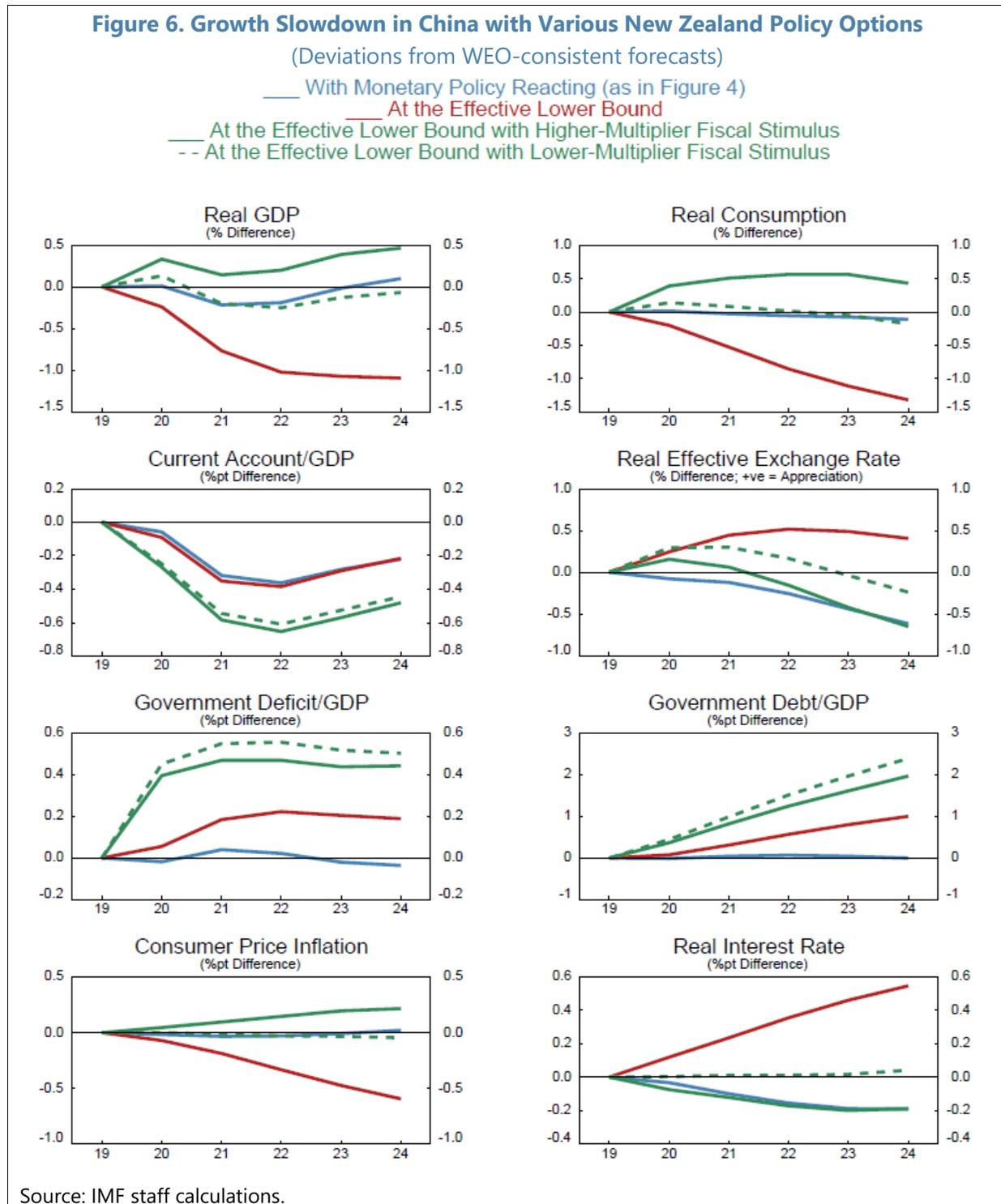
17.   New Zealand's openness would mean that either fiscal stimulus package would effectively induce a "fiscal devaluation." The REER would depreciate between 0.4 and 0.6 percent more than the case without fiscal stimulus. A fiscal devaluation would stimulate the economy through the export channel.

18.   In both cases, there would be a fair degree of leakage to abroad from the fiscal stimulus. In New Zealand's open economy, a significant portion of the fiscal stimulus would be spent on imports. There would be a higher current account deficit (higher imports for consumption and investment, or conversely, higher investment and government dissaving) of between 0.2 and 0.3 percentage points of GDP. Other more-closed economies might have higher multipliers from the same package, and smaller increases in their current account deficits.

19.   The effects of New Zealand's fiscal stimulus would be reinforced if there was to be simultaneous fiscal stimulus elsewhere in Asia and Australia (Figure 7). The fiscal stimulus in other economies would have some positive spillovers through trade channels, and further stimulate aggregate demand. This is in turn, in the presence of monetary accommodation, would allow for a lower real interest rate and greater REER depreciation, which would further stimulate aggregate demand.

Figure 7. Growth Slowdown in China with Fiscal Stimulus in Different Economies
(Deviations from WEO-consistent forecasts)
___ Higher-Multiplier Fiscal Stimulus in New Zealand Only
___ Higher-Multiplier Fiscal Stimulus in New Zealand, Australia and Asia

Source: IMF staff calculations.
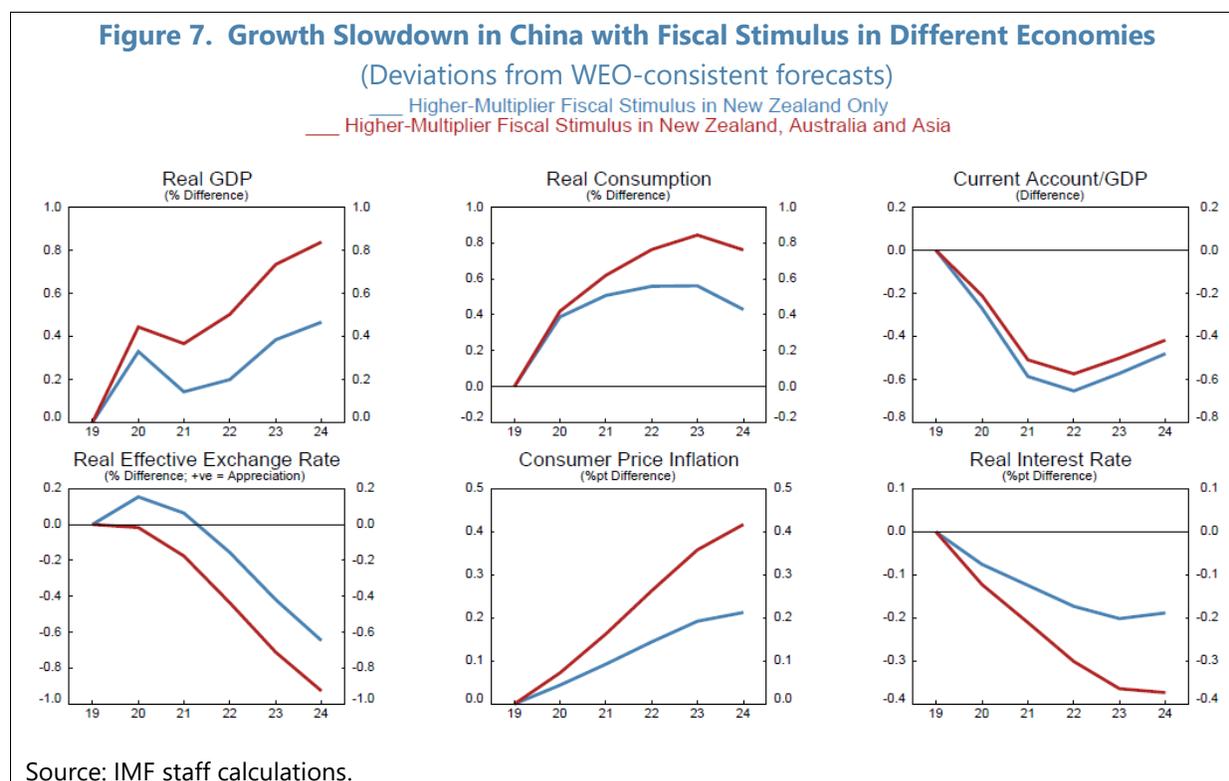
C. Spillovers from the Interplay of Net Migration and the Australian Economy

20.   Because of New Zealand's deep economic links with Australia, a growth slowdown in Australia might have large impacts on New Zealand. This includes the Trans-Tasman Travel Arrangement, which allows free movement of labor between the two countries. In any slowdown originating in Australia, net migration could potentially play a large role – a factor not often considered for many countries, given the unique relationship and patterns of population movements between Australia and New Zealand over time.

Figure 8. Growth Slowdown in Australia – Outcomes in Australia
(Deviations from WEO-consistent forecasts)

Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.
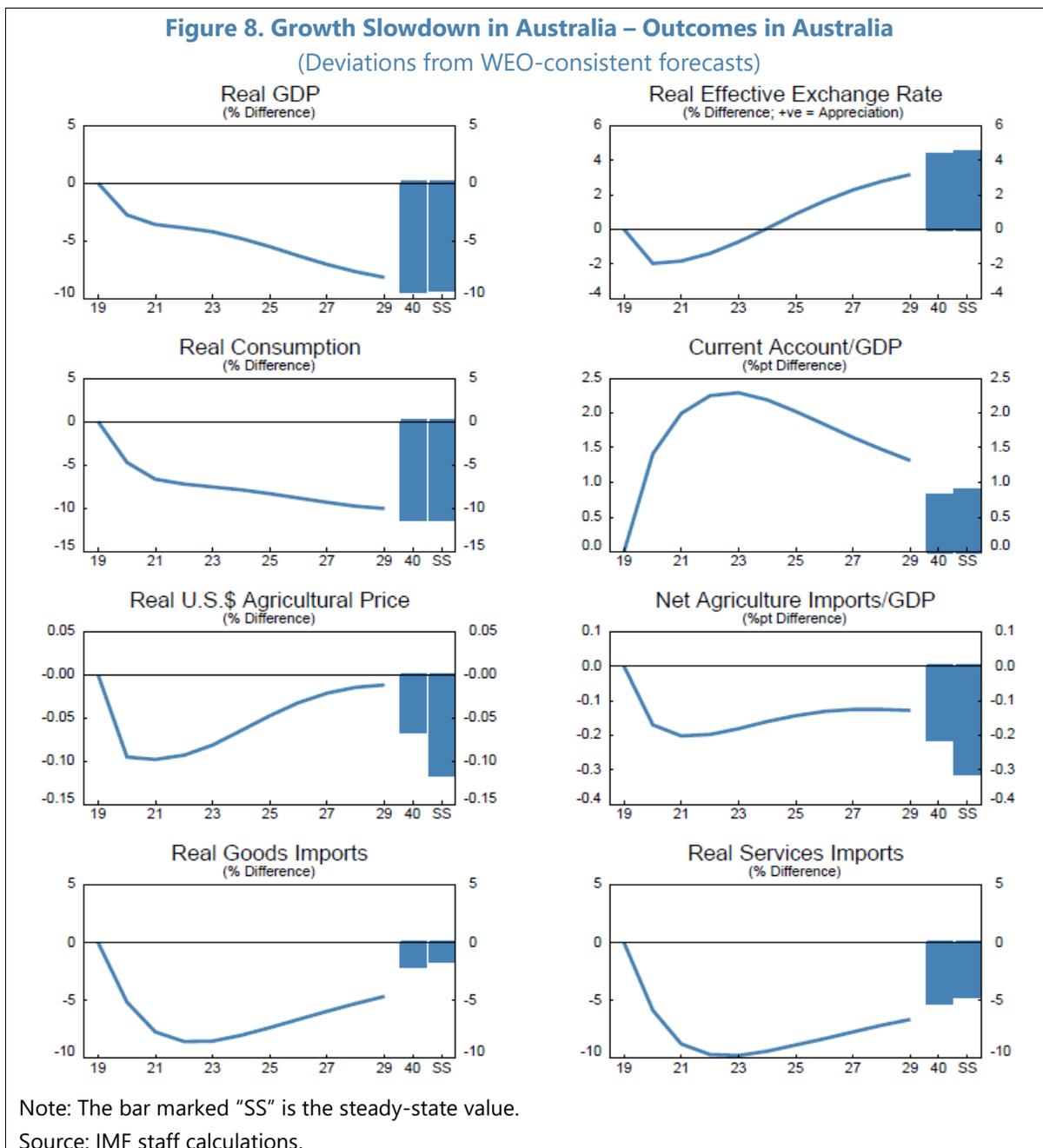
A Growth Slowdown in Australia

21.   In this illustrative scenario, Australia's real GDP growth would be substantially weaker (Figure 8).[6] Real GDP growth would be lower by about 3 percentage points on impact, and continue to be negative, subtracting around 0.5 percentage points off growth for another 9 years, such that real GDP would be 9.3 percent lower in the long term. Over 20 percent would be attributable to lower population growth from lower net migration. Lower population and productivity would reduce the productive capacity of the economy, and lead to higher marginal costs and inflation. Exports would become more expensive to produce. This would induce the Reserve Bank of Australia (RBA) to cut interest rates, and there would be a short-term 2 percent REER depreciation before being reversed by the continuing negative productivity shock. Therefore, foreign demand would eventually fall after its initial positive reaction to the short-term depreciation and help drive the REER to appreciate by 4.3 percent in the long term.

22.   Imports would weaken with the economy. Lower housing prices would subtract from financial wealth, restricting consumption, reinforced by lower productivity and population. Demand for tourism and education services would be reduced by 5.9 percent on impact, falling to 9.8 percent lower, before settling at only 4.7 percent lower. Agricultural imports are much less important for Australia than China, particularly from New Zealand, so the impact would only be around 0.2 percent of GDP in the short term, approaching 0.3 percent in the long term.

Spillovers to New Zealand

23.   To understand the spillovers to New Zealand, it is useful to compare its relationship with Australia versus China. The relative impacts should reflect the magnitudes of the growth slowdowns under consideration – that of Australia (9.3 percent of GDP in the long term) would be less than that of China (11.9 percent of GDP in the long term). Spillovers would also reflect that trade linkages are stronger with

Table 1. New Zealand: Trade Patterns in ANZIMF (Percent of New Zealand nominal GDP)			
Category for New Zealand	**Australia**	**China**	**Global**
Aggregate Exports	4.5	5.0	27.5
Agriculture	1.2	2.6	13.4
Tourism and Education Services	0.3	0.4	2.4
Goods and Other Services	3.0	1.9	11.7
Aggregate Imports	3.4	5.4	27.5
Agriculture	0.5	0.1	2.4
Tourism and Education Services	0.2	0.4	2.0
Goods and Other Services	2.7	4.9	23.1
Sources: StatsNZ, UN COMTRADE, and IMF staff calculations.			

---

[6] This growth slowdown in Australia is based on four shocks. There would be a slowdown in net migration, reducing labor supply about 0.25 percent per year for 10 years. At the same time, there would be a negative shift in expectations around the effects of new technology on the economy, resulting in permanently lower path for productivity, also about 0.25 percent per for year for 10 years. Both factors would contribute to a 20 percent decline in housing prices during the first two years, reducing household wealth and consequently consumption. All three factors would contribute to higher perceived country risk for Australia, which would permanently increase the country risk premium by 0.5 percentage points within a couple of years, further depressing investment.

China than Australia. In the context of ANZIMF, the relationship is close to that in the data in 2016 (Table 2). Moreover, shocks emanating from China are more likely to move global prices than those from Australia as China is more than nine times the size of Australia in terms of nominal U.S. dollar GDP.

Figure 9. Growth Slowdown in Australia – Spillovers to New Zealand
(Deviations from WEO-consistent forecasts)

Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.
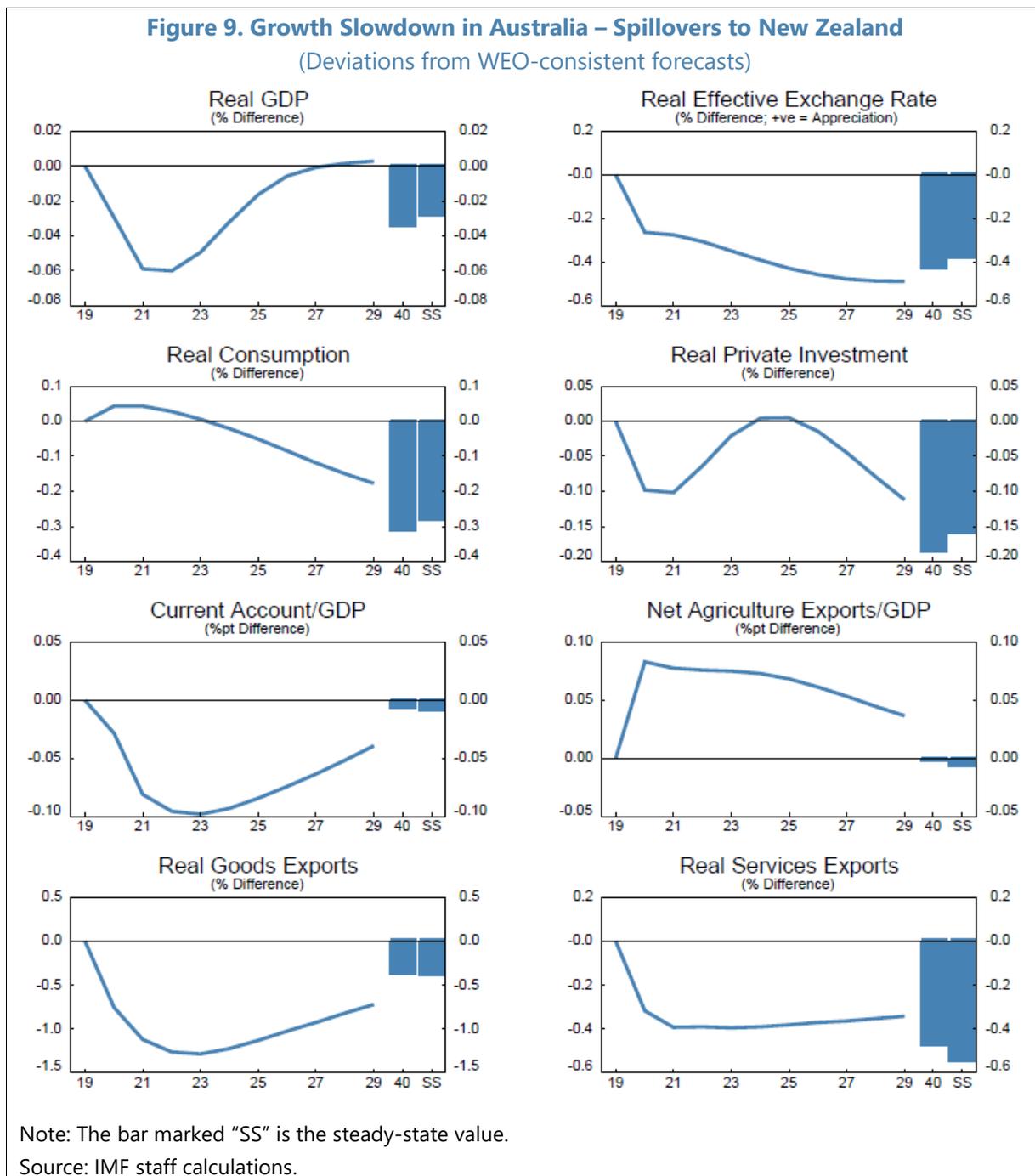
24.   New Zealand's exports would be lower (Figure 9). New Zealand's services exports would be about 0.4 percent lower (0.6 percent in the long term), much less than in the China growth

slowdown considered above, and in line with the composition of New Zealand exports. Similarly, goods exports would be roughly 1.3 percent lower (0.4 percent in the long term). Net agricultural exports would be broadly unchanged, because Australia has weaker demand for New Zealand agricultural goods than China, and no significant impact on global agricultural prices, unlike China.

Figure 10. Growth Slowdown in Australia – Net Migration Effects in New Zealand

(Deviations from WEO-consistent forecasts)
___ No Change in Net Migration
_ _ 20 Percent of Australian Decrease

Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.
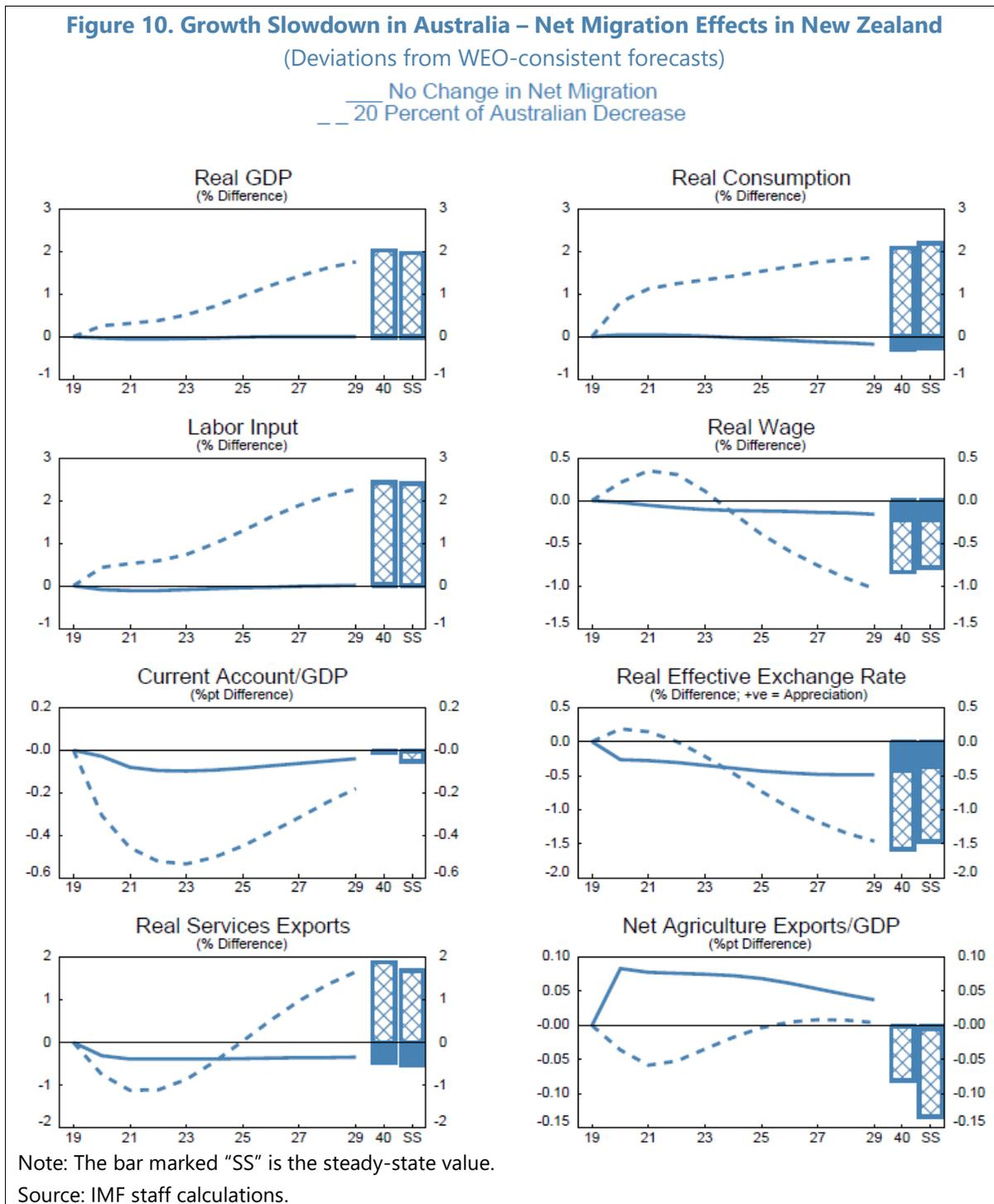
25.   These factors would weaken the domestic economy and real GDP would be 0.1 percent lower in the short and long terms. The fall in exports would reduce productive capacity and labor demand. The depreciation would discourage imports of consumption and investment goods. Overall, consumption would fall by 0.6 percent. Because of weaker inflation from aggregate demand, monetary policy would provide some short-term stimulus with lower real interest rates. There would be a short-term 0.1 percent of GDP deterioration in current account. In the long term there would be little impact on the current account as there would be a rebalancing between the domestic and external sectors, facilitated by a REER that would be 0.2 percent lower on impact, and 0.4 percent lower in the long term.

How Net Migration Could Improve Outcomes for New Zealand

26.   The results presented above do not account for the unique net migration patterns between Australia and New Zealand, which could potentially offset the negative impacts on New Zealand (Figure 10)**.** This can be illustrated by attributing 20 percent of Australia's lower population growth to higher net migration to New Zealand, Real GDP would expand steadily at about 0.2 percent per year, reaching 2.0 percent higher than baseline in the long term. The short-term benefits would be confined largely to the domestic sector. However, the external sector would also benefit in the long term as productive capacity would expand beyond domestic demand needs. Consequently, the REER would depreciate by 1.5 percent relative to baseline (instead of 0.4 percent). However, there would be little effect on the agriculture sector, as it would still be operating at capacity.

27.   The impacts would come from the net migration shock increasing labor supply. It would directly increase the productive capacity of New Zealand and reduce wage pressures. Moreover, investment would peak at 2.0 percent higher in the short term to build up the capital stock needed to complement labor and would stabilize at 1.6 percent higher in the long term. There would be increased household wealth and 2.2 percent higher consumption. Higher consumption and investment would stimulate imports, increasing the current account deficit by 0.5 percent of GDP (instead of only 0.1 percent of GDP).

D.   Spillovers to New Zealand's Agriculture Sector

28.   New Zealand's agriculture sector faces external risks that differ from those that could originate within the country. At the global level, a decrease in agricultural prices is considered, driven by either a permanent global (excluding New Zealand) supply increase or demand decrease of 10 percent for agricultural goods. These are contrasted against a supply decrease within New Zealand alone because of a sustained drought that lowers agricultural output by about 6 percent for 2 years before starting to recover.

Global Risks from Both Supply and Demand

29.   In the long term, the global price would be 2.7 percent lower from either a global supply increase or demand decrease (Figure 11, red and green lines). Overall, the long-term

effects would be similar between demand and supply shocks. In the short term, demand would move sluggishly in response to higher supply, because it would need the lower price to clear the market. Volume supplied would be assumed to be fixed in the long term. There would be short-term supply changes in response to price changes. Since the global price must fall to re-equilibrate global demand and supply, it would return demand to its baseline levels in the demand shock, whereas in the positive supply shock it would lift demand to absorb the additional supply.

Figure 11. Agriculture Sector Risk Scenarios
(Deviations from WEO-consistent forecasts)
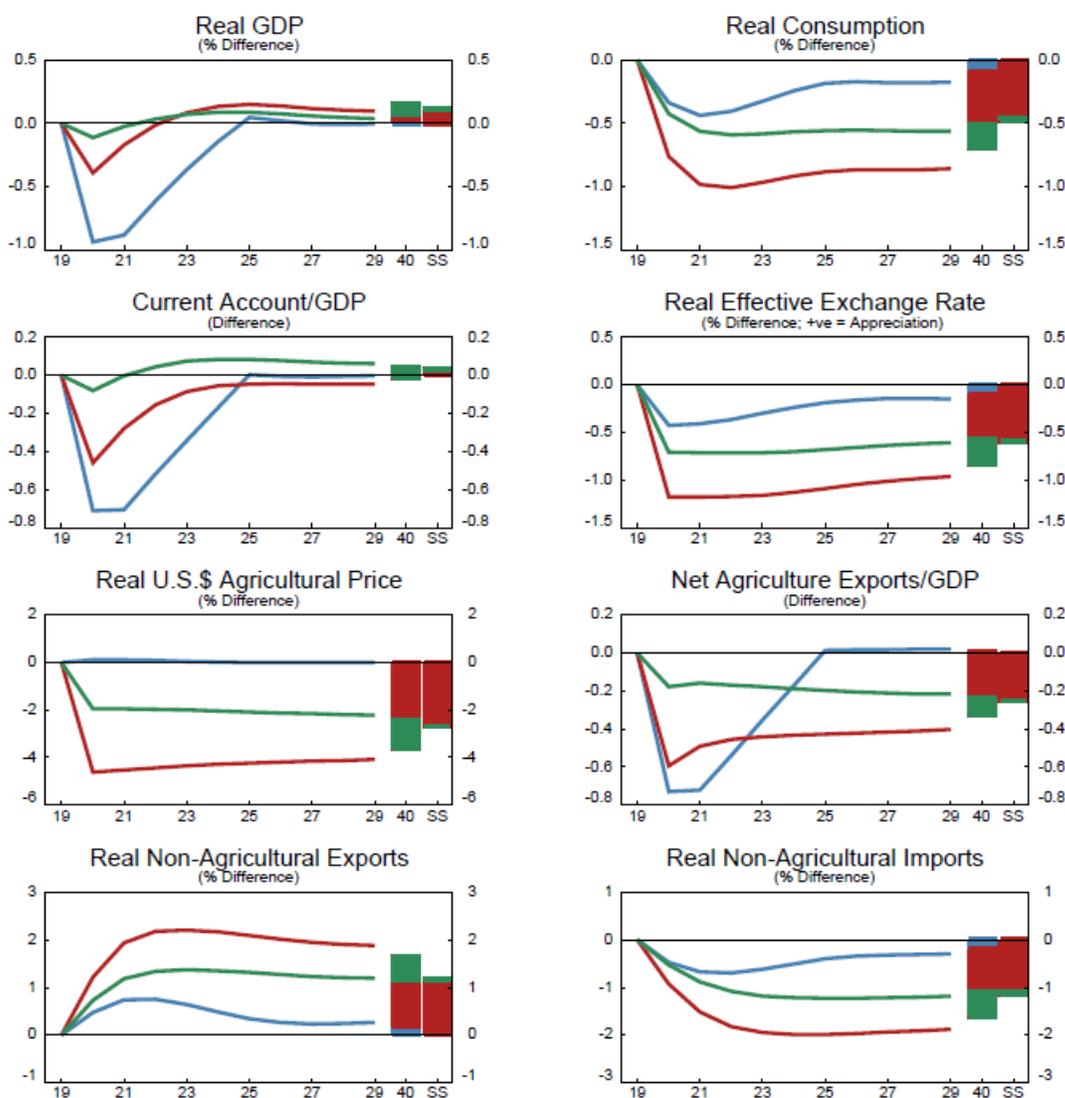
Note: The bar marked "SS" is the steady-state value.
Source: IMF staff calculations.

30.   From the perspective of New Zealand, it only would experience a negative wealth shock from lower prices. In the short term, there may be some fall in production which could slow the fall in prices, but in the end, production would remain unchanged. Consumption would be weaker from the wealth effect – 0.5 percent in long term, but substantially more at 1.0 percent in the short term for the global supply shock. As households would need time to adjust their demand to lower wealth, they would also dissave in the short term. This would lead to a higher current account deficit by 0.5 percent of GDP and a REER depreciation of 1.2 percent under the global supply shock, but a nearly unchanged current account deficit and a REER depreciation of only 0.7 percent under the global demand shock.

31.   There would be a long-term rebalancing of the domestic and external sectors. Long-term real GDP would be roughly unchanged, even after the initial short-term negative impact from the rapid current account deterioration in the global supply risk scenario. In the medium term, the REER depreciation would lead to higher non-agricultural exports of about 1.3 percent.

How Domestically-Driven Risks Have Different Outcomes

32.   For a domestically-driven risk such as a sustained drought in New Zealand, the outcomes would be markedly different (Figure 11, blue lines). One hand, the real GDP loss would be less, at only 0.4 percent on impact. However, the external sector would be much weaker from lower exports, with a higher current account deficit of 0.8 percent of GDP. There would be little impact on the global agricultural price. First, the drought is assumed to be only temporary, but more importantly, New Zealand is only a small global player, despite the large importance of agriculture in the domestic economy. Consequently, there would be little short-term mitigation from the 0.4 percent REER, depreciation, and there would be no significant external-domestic sector rebalancing.

E.   Conclusions

33.   The current set of external risks have the potential to be extremely damaging to New Zealand, but two factors would likely mitigate the economic impact. First, the flexible exchange rate regime is a reliable shock absorber and automatic stabilizer from the perspective of real GDP, although it leads to a rebalancing between the domestic and external sectors in the economy. Second, net migration flows can reduce the negative impact of lower external demand under some circumstances, such as a growth slowdown in Australia. However, this is not a reliable stabilizer – the magnitude of net migration is subject to many factors, plus it can also reinforce negative impacts, such as the example of a growth slowdown in China.

34.   Fiscal policy could also offset some of the short-term costs of adjustment. Fiscal policy can provide stimulus at relatively small and manageable cost to the already-low government debt to GDP ratio. Moreover, at the current juncture, fiscal policy might need to provide the bulk of policy support against negative shocks, as monetary policy might be ineffective if has become constrained by an effective lower bound on the monetary policy interest rate.

References

Anderson, D., B. Hunt, M. Kortelainen, M. Kumhof, D. Laxton, D. Muir, S. Mursula, and S. Snudden, 2013, "Getting to Know GIMF: The Simulation Properties of the Global Integrated Monetary and Fiscal Model," International Monetary Fund, IMF Working Paper 13/55.

Bernanke, B., M. Gertler, and S. Gilchrist, 1999, "The Financial Accelerator in a Quantitative Business Cycle Framework," in J. Taylor and M. Woodford, eds., *Handbook of Macroeconomics, Volume 1c*, Amsterdam: Elsevier.

Blanchard, O., 1985, "Debts, Deficits and Finite Horizons," *Journal of Political Economy*, 93: 223-47.

Bom, P. and J. Ligthart, 2014, "What Have We Learned from Three Decades of Research on the Productivity of Public Capital?" *Journal of Economic Surveys*, 28(5): 889-916.

Coenen, G., C. Erceg, C. Freedman, D. Furceri, M. Kumhof, R. Lalonde, D. Laxton, J. Lindé, A. Mourougane, D. Muir, S. Mursula, J. Roberts, W. Roeger, C. de Resende, S. Snudden, M. Trabandt, and J. in't Veld, 2012, "Effects of Fiscal Stimulus in Structural Models", *American Economic Journal: Macroeconomics*, 4(1): 22-68.

Dizioli, A., B. Hunt, and W. Maliszewski, 2016, "Spillovers from the Maturing of China's Economy", International Monetary Fund, IMF Working Paper 16/212.

Karam, K. and D. Muir, 2018, "Australia's Linkages with China: Prospects and Ramifications of China's Economic Transition", International Monetary Fund, IMF Working Paper 18/119.

Kumhof, M., D. Laxton, D. Muir, and S. Mursula, 2010, "The Global Integrated Monetary and Fiscal Model (GIMF) – Theoretical Structure" International Monetary Fund, IMF Working Paper 10/34.

Weil, P., 1987, "Permanent Budget Deficits and Inflation," *Journal of Monetary Economics*, 20: 393-410.

Yaari, M., 1965, "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer," *Review of Economic Studies* 32(2): 137-50.

Annex I. Key Assumptions Underlying the Simulations

Key Model Assumptions for ANZIMF

1. All agents in the model (including households, firms and the fiscal and monetary authorities) have perfect foresight.
2. The model has non-linearities in the financial accelerator, and potential for non-linearities in the conduct of monetary policy by either encountering the zero-interest-rate floor (the effective lower bound, ELB) or using monetary accommodation. Otherwise, the model is approximately linear for small enough shocks.
3. All countries in ANZIMF have the same economic structures, differing only through their parameterization and calibration.
4. The baseline calibration of ANZIMF is based on parameter values consistent with 2017 for the great ratios to GDP such the capital stock, government debt and deficit, net foreign assets and current account balance, and national accounts aggregates as well as trade flows, and 2016 and 2017 for services data.
5. The real exchange rate is a "jumper," adjusting immediately in the first year to shocks, since it follows the standard forward-looking, risk-adjusted uncovered interest rate parity condition which equates the forward sum of Australia-international interest rate differentials with the one-year in the exchange rate. However, there is no financial friction in the equation required to bring the net foreign asset position to its steady state, as the net foreign asset position and its dynamics solve endogenously as part of the OLG framework.
6. The agriculture sector is a global market with one global price.
7. China has a flexible exchange rate, with no capital controls. Capital controls are hard to model in this context, and in the current environment, it is not clear that China would always impose them if there were to be sudden movements in elements of the balance of payments.
8. There are no substantial financial market channels. ANZIMF only has a financial accelerator (albeit using the full general equilibrium form with non-linearities) and assumes complete domestic ownership of firms. All net foreign asset positions are denominated in U.S. dollars, in all countries. Some financial channels could be mimicked by correlated, exogenously-specified shocks.
9. The model is at an annual frequency, so degree of detail for some of the economy's dynamics are lost, particularly in the first year for investment.

Risk Scenario Assumptions

The risk scenarios result from shocks originating in China. Australia and the rest of the world interact with spillovers that are either direct, via third countries, or via the global agricultural goods market.

Growth Slowdown in China

The scenario is composed of four separate shocks in China:

1. **Lower productivity**. Permanent 5 percent reduction in tradables and nontradables productivity. Phased in as a -2 percentage points on productivity growth in year 1, and -1 percentage point on growth in years 2 through 4.
2. **Lower housing wealth.** 10 percent decline on impact in year 1 in nontradable sector net worth, to proxy for the permanent fall in the value of the housing stock.
3. **Increased corporate risk premia.** Permanent 0.5 percentage point increase in the corporate risk premia for both tradable- and nontradable-producing firms. Phased in by year 4, declining from an initial 2 percentage point increase on impact in year 1.
4. **Lower agricultural goods demand**. Permanent 5 percent reduction in demand for agricultural goods. Phased in over 5 years.

Additional Net Migration Effect in New Zealand. There are permanently fewer migrants to New Zealand from China. There is a 0.1 percent reduction in labor force growth for 10 years in New Zealand, so that the New Zealand population is permanently 1.0 percent lower.

The Interaction of Fiscal and Monetary Policies in New Zealand. The overnight cash rate (the RBNZ's monetary policy rate, and ANZIMF's short-term interest rate) is assumed to be unchanged for 5 years and is expected each year to be unchanged until the end of the following year. There are two different configurations of fiscal stimulus presented.

1. **Higher-multiplier fiscal stimulus.** 5-year, 0.25 percent of baseline GDP higher spending on government infrastructure investment. 5-year 0.25 percent of baseline GDP rebate of GST revenues to non-saving, lower-income households.
2. **Lower-multiplier fiscal stimulus**. 5-year, 0.25 percent of baseline GDP higher spending on government consumption (wages, salaries and other operating expenses). 5-year cut in the general GST rate such that government revenues are 0.25 percent of baseline GDP lower each year.

Growth Slowdown in Australia

The scenario is composed of four separate shocks in Australia:

1. **Lower net migration**. Permanent 2.5 percent reduction in labor force. Phased in over 10 years at 0.25 percentage points per year.
2. **Lower productivity**. Permanent 2.5 percent reduction in tradables and nontradables productivity. Phased in over 10 years as a -0.25 percentage points per year.
3. **Lower housing wealth.** 20 percent decline on impact in year 1 in nontradable sector net worth, to proxy for the permanent fall in the value of the housing stock.
4. **Increased corporate risk premia.** Immediate and permanent 0.5 percentage point increase in the corporate risk premia for both tradable- and nontradable-producing firms.

Additional Net Migration Effect in New Zealand. There are permanently more migrants to New Zealand from Australia. There is a 0.26 percent increase in labor force growth for 10 years in New Zealand, so that the New Zealand population is permanently 2.6 percent higher.

Agriculture Sector

There are three different scenarios under consideration, each consisting of one shock:

1. ***Higher global agriculture supply***. Immediate and permanent 10 percent increase in the global supply of agricultural goods, outside of New Zealand, by increasing the endowment (long-term supply curve).
2. ***Lower global agriculture demand***. Immediate and permanent 10 percent reduction in the global demand for agricultural goods, outside of New Zealand, by reducing the consumer's preference parameters for agricultural goods directly.
3. ***Drought in New Zealand***. The supply of agricultural goods in New Zealand is reduced by 6.25 percent in years 1 and 2. It takes until year 6 for long-term supply to return to its previous levels. The short-term elasticity of agricultural goods supply is set to 0 in years 1 and 2, so that agricultural goods supply cannot respond to short-term price movements. The elasticity is increased gradually, returning to its original value by year 6.

Annex II. New Zealand's Fiscal Multipliers in ANZIMF

ANZIMF has seven fiscal instruments. On the spending side, they are government consumption, government investment (infrastructure), lumpsum transfers to all households (such as pensions, aged care provisions, unemployment insurance) and lumpsum transfers targeted to LIQ households (such as welfare, certain pensions). On the revenue side, the instruments are taxes on consumption (the goods and services tax, GST), personal income (PIT) and corporate income (CIT).

Fiscal multipliers can be computed from the change in real GDP in model simulations. ANZIMF can be simulated with a change of one percentage point of baseline real GDP for two years for each fiscal instrument, separately, to provide fiscal stimulus to the economy. Two assumptions for monetary policy can be considered – either the RBNZ sets the overnight cash rate (OCR) to keep inflation within the target range, or it accommodates the fiscal stimulus by leaving the OCR unchanged for two years, so that monetary policy does not crowd out any of the fiscal expansion.

The fiscal instruments act on the economy through direct channels that then feed through the rest of the economy. The only reduced-form effect is the productivity increase induced by an increase in government infrastructure investment. This is calibrated using an estimate of the elasticity of output with respect to infrastructure capital of 0.170 from Bom and Ligthart (2014).

Table II.1. ANZIMF Fiscal Multipliers for New Zealand

	First Year	Second Year
Normal Conduct of Monetary Policy		
Government Consumption	0.71	0.61
Government Investment	0.88	0.85
Transfers to All Households	0.10	0.08
Transfers to LIQ Households Only	0.38	0.35
Goods and Services Tax	0.27	0.26
Personal Income Tax	0.24	0.23
Corporate Income Tax	0.18	0.21
Overnight Cash Rate Held Fixed for Two Years		
Government Consumption	0.83	0.67
Government Investment	1.03	0.93
Transfers to All Households	0.12	0.09
Transfers to LIQ Households Only	0.45	0.39
Goods and Services Tax	0.31	0.29
Personal Income Tax	0.29	0.26
Corporate Income Tax	0.39	0.37

Source: IMF staff calculations.

Spending generally, but not always, provides larger multipliers than tax cuts (Table 3, top half)**.** Government absorption multipliers are most effective, as they enter the measurement of real GDP directly, as well as stimulating the rest of the economy. Infrastructure investment is more effective than regular government spending, as it also raises productivity. Lumpsum transfers targeted to liquidity-constrained (LIQ) households are third-most effective, as they are consumed in full immediately by the targeted recipients. The GST is next, as it affects consumption behavior of all households contemporaneously. PIT applies to all households, but saving households smooth out the extra income as part of their large stock of wealth; only the liquidity-constrained households spend it immediately. CIT has even smaller effects, as its only impact is on firms, who take a longer-term planning view. But coupled with an unchanging OCR, the

CIT multiplier exceeds that of the GST and the PIT. Lumpsum transfers to all households have the smallest effect, as the lumpsum transfers to the saving households are smoothed out, in the same manner as a PIT cut. Moreover, lumpsum transfers are nondistortionary, unlike the distortionary PIT.

When the RBNZ accommodates the fiscal stimulus, the multipliers are larger (Table 3, bottom half)**.** Apart from the CIT, the ordering remains unchanged. The multipliers are roughly 15 to 20 percent larger (over 100 percent for the CIT) than with the normal conduct of monetary policy.

The extent and ordering of the multipliers are generally consistent with other countries such as the United States, including other macroeconomic models (Anderson and others, 2013; Coenen and others, 2011). However, magnitudes are smaller, as New Zealand is a small, more open economy that will use a larger share of fiscal stimulus to buy foreign relative to domestic goods and services.

QUANTIFYING CONSUMPTION-EQUIVALENT WELFARE IN NEW ZEALAND[1]

1.   New Zealand presented its first Wellbeing Budget on May 30th, 2019. This represents the culmination of substantial work over the past few years to integrate parts of the OECD Framework for Measuring Well-Being and Progress into the New Zealand public sector.[2] The Budget is part of a broader strategy embodied in the Treasury's Living Standards Framework (LSF): to consider a range of indicators and factors, beyond purely economic objectives, in policy decision making. The framework focuses on "four capitals" (natural, human, social and financial/physical) that promote wellbeing in 12 dimensions: civic engagement and governance; cultural identity; environment; health; housing; income and consumption; jobs and earnings; knowledge and skills; time use; safety and security; social connections; and subjective wellbeing.

2.   The Wellbeing Approach is part of a tradition that has sought to move "Beyond GDP" to broader measures of economic welfare. Although income per capita is a common measure of economic success, it has long been recognized to leave out important dimensions of both economic achievement and wellbeing. The Stiglitz commission report (Stiglitz and others, 2009), for example, proposed alternative indicators of economic performance and social progress. The IMF has recently focused on the implications of income distribution (Ostry and others, 2014 and Clements and others, 2015), and gender (Kochhar and others, 2017). The Sustainable Development Goals (SDGs) at the core of the post-2015 Development Agenda (United Nations, 2015), also recognize the many dimensions of welfare including equality, education, gender and environmental protection.

3.   A common challenge for these approaches is to accurately measure multidimensional welfare outcomes in a simple index. Summary measures that attempt to capture differences in dimensions of welfare across countries have been developed, including the Human Development Index (HDI) (UNDP, 2009), the Inclusive Development Index (IDI) (World Economic Forum, 2017), and the Multidimensional Poverty Index (Alkire and Foster, 2011). More recently, baseline indices have been developed to measure progress in the SDGs (Schmidt-Traub and others, 2017 and Sustainable Development Solutions Network and the Bertelsmann Stiftung, 2018). However, these indexes often aggregate the different indicators of wellbeing in an ad-hoc manner, making it difficult to know exactly what is being measured, and how these change across countries or over time (Ravallion, 2012).

4.   One recent approach is to measure consumption-equivalent welfare. This approach attempts to put an economic value (in terms of consumption) on different aspects of welfare, which allows for a theoretically consistent aggregation to come up with a single index that can measure differences in consumption-equivalent welfare across countries and over time. Jones and Klenow (2016) developed an index that includes consumption itself, and life expectancy, leisure and

---

[1] Prepared by Geoffrey Bannister (APD).

[2] The OECD Framework for Measuring Well-being and Progress can be found at:
https://www.oecd.org/statistics/measuring-well-being-and-progress.htm

inequality, and used it to measure consumption-equivalent welfare across countries from 1980 to 2007. Bannister and Mourmouras (2017) extend the index to include the costs of greenhouse gas emissions and sustainability (through adjusted net savings, World Bank, 2011) and extend the calculations to 2014. The virtue of the measure is that it presents a scalar index of consumption-equivalent welfare and its components that can be tracked and measured over time; the drawback is that it covers only a relatively narrow set of wellbeing indicators. However, these indicators can be mapped into some of the 12 dimensions of New Zealand's Living Standard Framework to cover at least part of its focus on wellbeing (Table 1).

Table 1. New Zealand: Mapping Consumption-Equivalent Welfare (CEW) Indicators Into Living Standards Framework (LSF)

Consumption Equivalent Welfare	Living Standards Framework
Consumption	Income and Consumption
Life Expectancy	Health Knowledge and Skills Safety and Security
Leisure	Jobs and earnings Time use
Inequality	Social connections Subjective Wellbeing
Greenhouse gas emissions	Environment

5.   How does New Zealand fare in the calculation of this welfare index? Figure 1 shows the welfare index on the vertical axis compared to national income on the horizontal axis for 165 countries in 2017, both in the natural logarithm of percent of the U.S. level. Countries along the 45-degree line have the same relative position in welfare and income compared to the United States. Poorer countries tend to be below the 45-degree line, with lower relative welfare than income. This is because they generally consume less out of their income, have lower life expectancy, less leisure or more inequality. New Zealand, on the other hand, is part of a group of upper income countries with higher relative welfare than income. New Zealand's consumption-equivalent welfare was 83 percent of the U.S. level in 2017 while its income was 68 percent of the U.S. level.

6.   Where does New Zealand's welfare advantage come from? Figure 2 presents the consumption-equivalent welfare index with its five components.[3] New Zealand scores better than the United States on life expectancy and inequality, but behind the United States on consumption and leisure, and very close to the U.S. level of greenhouse gas (GHG) emissions.[4] Table 2 presents

---

[3] In this formulation, the index is the multiple of its components.

[4] The relevant metric for the GHG index is the level of greenhouse gas emissions per unit of consumption. Data for greenhouse gas emissions is for 2012.

the relevant data and indexes for New Zealand, the United States and some other comparator countries. Relative to its peers in the table, New Zealand has a lower welfare index because it falls behind in the overall level of consumption and has higher hours worked, but it compares favorably on life expectancy, inequality and greenhouse gas emissions.

Figure 1. Consumption-Equivalent Welfare vs. Income, 2017
(Log of percent of US level)

Figure 2. New Zealand, Welfare Index in 2017
(US level = 1)
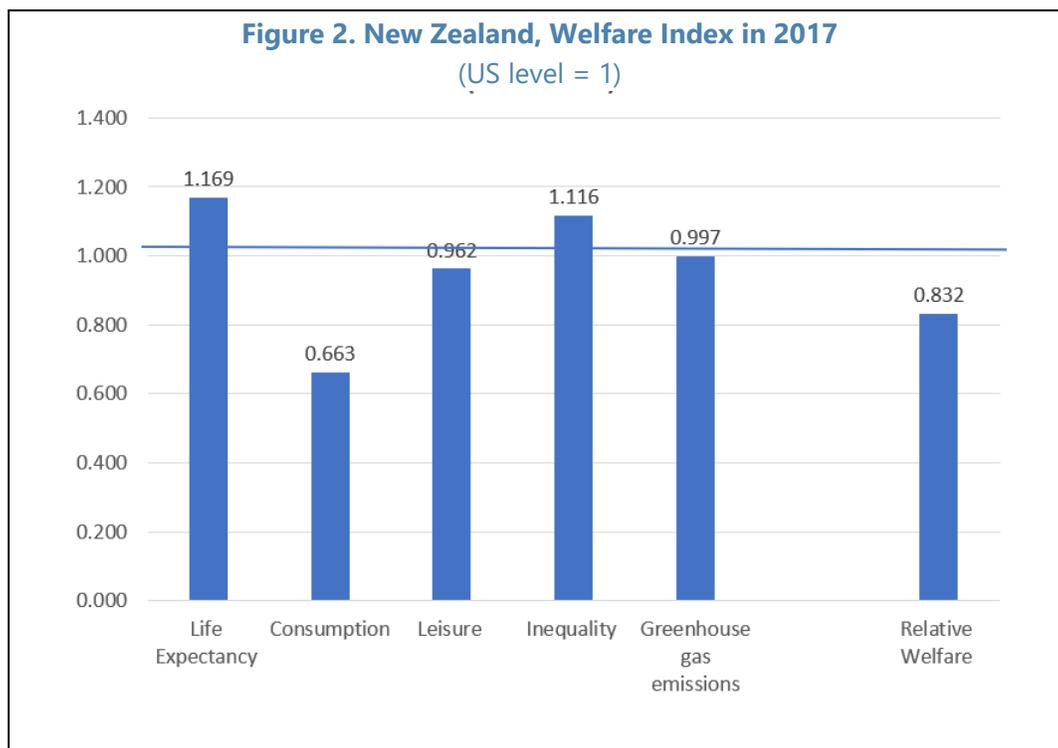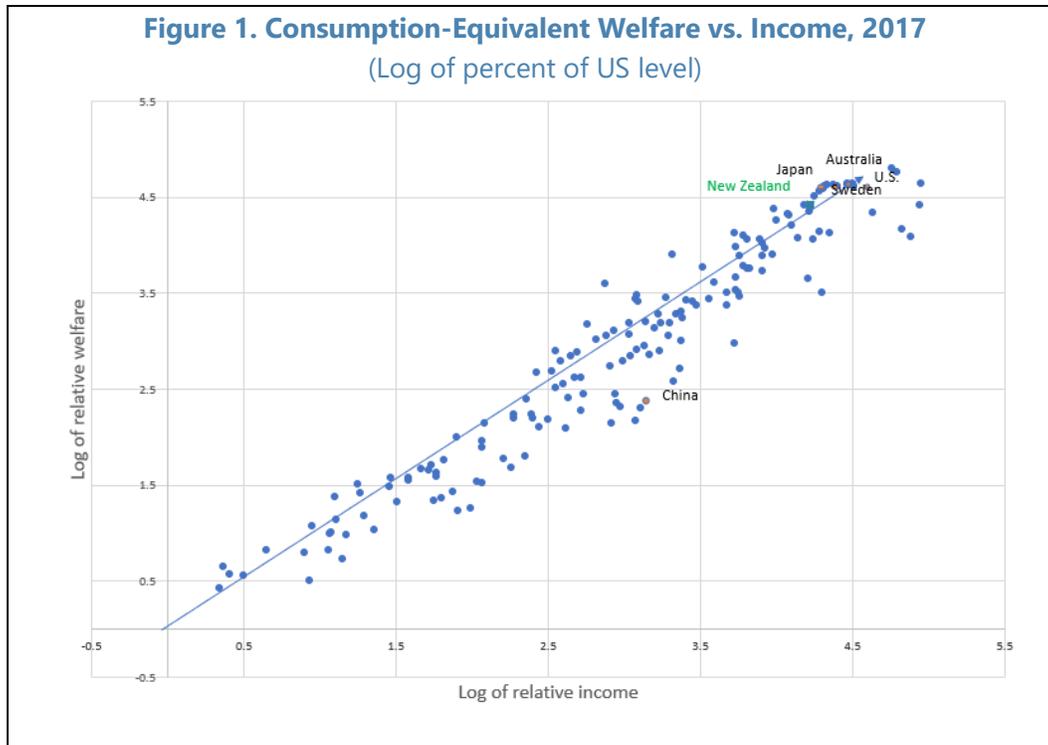
Table 2. New Zealand: Welfare Indicators, 2017						
Welfare per cap. (percent of US)	Income per cap. (percent of US)	Life Expectancy (years)	Consumption (% of US level)	Hours worked (per person/year)	Gini Coefficient	GHG emissions (tons per cap.)
New Zealand	83.2	68.5	81.7	66.3	941.7	33.8	17.6
United States	100.0	100.0	78.5	100.0	836.4	41.7	20.2
Other comparators:							
Australia	101.0	88.2	82.5	77.2	868.1	36.6	33.2
Canada	100.0	81.1	82.5	74.5	866.2	34.5	29.5
Denmark	101.8	86.9	81.0	72.0	709.0	27.8	9.6
Finland	101.6	74.9	81.4	71.4	759.0	27.7	12.7

7.   How has New Zealand's consumption-equivalent welfare index changed over time?
Figure 3 shows that both welfare and income grew significantly relative to the U.S. level from 2007 to 2017. From 2007-2014 the index moved parallel to the 45-degree line: welfare grew at the same pace as income. From 2014 to 2017 there was a significant improvement in both welfare and income, but welfare grew more quickly. Table 3 shows the annual rates of growth of welfare and income and the components of the welfare index from 2007 to 2017 and over the sub-periods. Welfare growth was much higher than income growth in 2014-17, because of improvements in life expectancy, higher consumption (which grew more quickly than income over this period) and declines in inequality.[5]

Figure 3. New Zealand: Progress in Welfare Over Time
(Log of percent of US level)

---
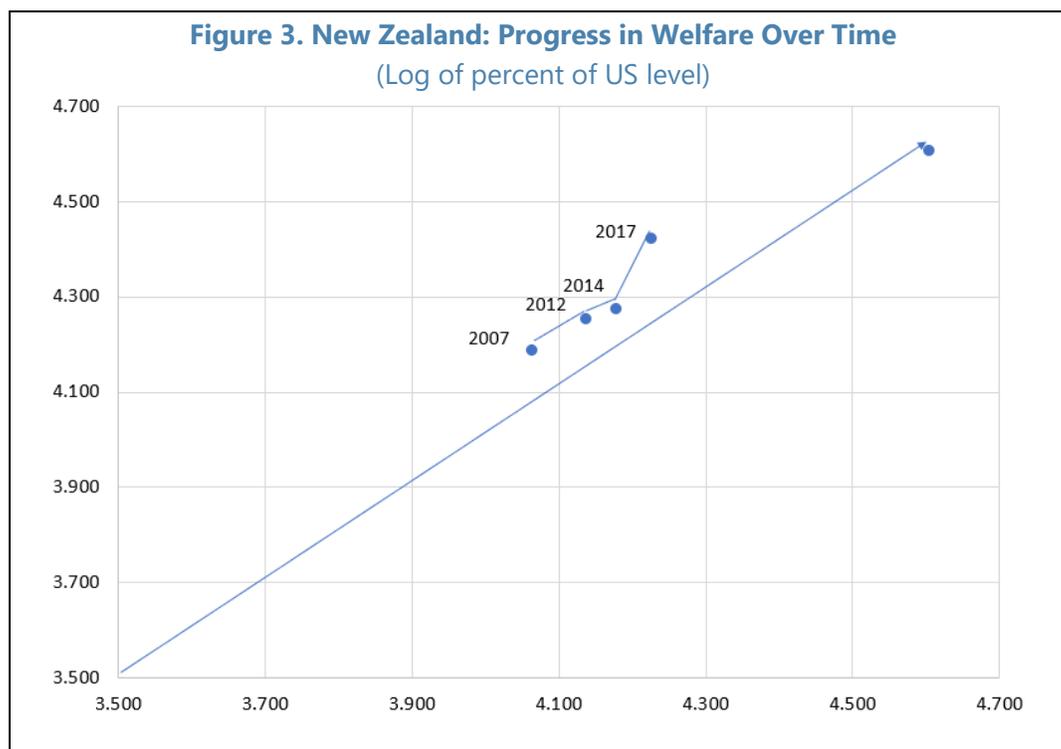
[5] It is worth noting that these movements are all relative to the U.S. level. For inequality, for example, New Zealand's Gini coefficient rose from 30.94 to 33.81, but U.S. inequality rose much more quickly with the Gini coefficient rising from 26.71 to 41.67.

Table 3. New Zealand: Growth of Welfare, Income, and Components, 2007-2017
(Annual percentage change)

			components of welfare index				
	Welfare	Income	Life exp.	Cons.	Leisure	Inequality	GHG
2007-17	2.3	1.6	0.5	1.6	-0.2	0.5	0.0
2007-12	1.3	1.4	0.3	1.4	-0.3	-0.1	-0.1
2012-14	1.1	2.1	0.1	1.4	-0.5	0.0	0.2
2014-17	4.9	1.6	1.1	1.9	0.0	1.9	0.0

8.   Several broad lessons flow from this analysis:

- Income growth, to the extent that it increases consumption opportunities, continues to be key to welfare improvements. This underscores the importance of implementing and maintaining policies that support equitable and inclusive growth. New Zealand does relatively well on inclusion, with a Gini coefficient on a par with its peers, if somewhat below the higher-achieving Nordic countries. But the overall level of income and consumption is lower than peers, and New Zealanders have a relatively higher labor input to produce that lower level of income.[6] This underscores the need to improve productivity. In sum, New Zealand's living standards framework does well in recognizing the importance of income and consumption in wellbeing but should explicitly recognize the importance of improvements in productivity as the third key component in this equation.

- A second lesson from the index is the importance of improvements in life expectancy. In New Zealand's case an improvement of 1.5 years in life expectancy at birth from 2007-2017 yielded growth of 0.5 percent per year in welfare. While New Zealand is at the upper edge of the distribution in life expectancy on average, there are sub-groups in the population for which important improvements in life expectancy could still be achieved that would have a significant impact on welfare. As highlighted in Table 1, in addition to improvements in health service delivery, there are other components that enter into improvements in life expectancy in an important way, including education and safety. Thus, the broad approach in the LSF is appropriate for contributing to consumption-equivalent welfare, and in turn, consumption-equivalent welfare could be a good summary indicator of success in achieving some of the wellbeing goals of the LSF.

- Third, further work would need to be done to fully incorporate New Zealand's wellbeing indicators into the consumption-equivalent welfare framework. Empirically mapping improvements in the specific indicators in the LSF for health, education and skills, and safety and

---

[6] The measure of hours worked per person per year has to be interpreted with care since it picks up the combined effects of hours per employed person, participation rates and employment rates. Nevertheless, it remains true that overall and labor productivity in New Zealand is well below OECD countries, a fact that has been attributed to distance from markets and low investment in innovation (de Serres and others., 2014).

security into improvements in life expectancy would allow for a quantification of the consumption-equivalent welfare benefits. For example, the relationship between health spending and life expectancy has been extensively studied (see Jaba and others, 2014), as has the relationship between education expenditure and life expectancy (Reynolds and Avendano, 2018). Similarly, the mapping of indicators on better jobs and earnings and time use into higher consumption and a better trade-off between consumption and leisure would allow for an assessment of how changes in these indicators affect consumption-equivalent welfare. Finally, assessing the value of environmental benefits, as has been done for example with contingent valuation studies (Carson and Hanneman, 2005), would allow for an assessment of environmental policies.

References

Alkire, S. and J. Foster, 2011, "Counting and Multidimensional Poverty Measurement." *Journal of Public Economics*, Vol. 95 issue 7-8, 476-487.

Bannister, G. and A. Mourmouras, 2017, "Welfare vs. Income Convergence and Environmental Externalities" IMF Working Paper 17/271.

Carson, R. and W. M. Hanemann, 2005, "Contingent Valuation." *Handbook of Environmental Economics*, Vol 2, chapter 17, 821-936.

de Serres, A., M. Yasuhiro and H. Boulhol, 2014, "An International Perspective on the New Zealand Productivity Paradox", New Zealand Productivity Commission, Working Paper 2014/01.

Jaba, E., C. Barigitte Balan, I-B. Robu, 2014, "The relationship between life expectancy and birth and health expenditures estimated by a cross-country and time-series analysis," *Procedia Economics and Finance* 15 (2014) 108–114.

Jones, C. and P. Klenow, 2016, "Beyond GDP? Welfare Across Countries and Time", *American Economic Review* 106(9).

Kochhar, K., S. Jain-Chandra and M. Newiak (eds.), 2017, *Women, Work and Economic Growth; Leveling the Playing Field.* International Monetary Fund, Washington DC

Ostry, J., A. Berg and C. Tsangarides, 2014, *Redistribution, Inequality and Growth.* IMF Staff Discussion Note, SDN/14/02. Washington DC.

Ravallion, M., 2012, "Mashup Indices of Development." *The World Bank Research Observer*, Vol. 27, No. 1. 1-32.

Reynolds, M. and M. Avedano, 2018, "Social Policy Expenditures and Life Expectancy in High-Income Countries," *American Journal of Preventative Medicine*, Jan. 54 (1) 72-79.

Schmidt-Traub, G., and others, 2017, "National Baselines for the Sustainable Development Goals assessed in the SDG Index and Dashboards." Nature Geoscience 10.8 (2017): 547. http://dx.doi.org/10.1038/ngeo2985.

Stiglitz, J., A. Sen and J-P. Fitoussi, 2009, *Report by the Commission on the Measurement of Economic Performance and Social Progress.*

Sustainable Development Solutions Network (SDSN) and the Bertelsmann Stiftung, 2018, "2018 SDG Index and Dashboards Report", available at: http://www.sdgindex.org/.

United Nations Development Program (UNDP), 2009, *Human Development Report 2009.* Palgrave Macmillan, New York.

United Nations, 2015, *Transforming our world: the 2030 Agenda for Sustainable Development.* United Nations, New York.

World Bank, 2011, *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium.* The World Bank, Washington DC.

World Economic Forum, 2017, *The Global Competitiveness Report, 2017-2018.* Geneva.

INTERACTION BETWEEN MONETARY POLICY AND FINANCIAL STABILITY IN NEW ZEALAND[1]

A.   Introduction

1.   The interaction between monetary policy and financial stability policy is an ongoing area of research and policy debate. This paper reviews the literature on the subject, takes stock of evolving consensus in the debate, and it examines the implications for New Zealand. It focuses on the role and interaction between monetary policy and other policies affecting financial stability, in particular, macroprudential policy. Another focus is structural vulnerabilities in the housing sector, the origin of much of current financial stability concerns.

2.   New Zealand's monetary policy has the dual objectives of achieving price stability and supporting maximum sustainable employment. The government is currently reviewing the Reserve Bank of New Zealand Act 1989 (RBNZ Act) to ensure that the RBNZ's responsibilities, governance arrangements and policy frameworks are up to date. Phase One of the review, which considered the monetary policy arrangement, was completed in April 2019. The RBNZ Act has been amended to (i) include a dual mandate, with an employment objective supporting maximum sustainable employment added to the price stability goal, and (ii) establish a committee structure for decision making, to enhance transparency in monetary policy decisions.

3.   Under the current monetary policy framework, financial stability must be considered in pursuing the price stability and maximum sustainable employment objectives.[2] Under the RBNZ Act (amended), a Remit issued by the Minister of Finance operationalizes the monetary policy objectives for the Monetary Policy Committee (MPC). In pursuing these objectives, the Remit requires the MPC to have regard for several secondary considerations, including "regard to the soundness and efficiency of the financial system".[3] Risks to financial stability in New Zealand include: high-level concentration of banks' exposure to the household sector (58 percent of bank lending) and agricultural sector (14 percent of bank lending, of which two-thirds is to dairy producers); and banks' exposure to foreign funding. High household debt and house price overvaluation also pose macrofinancial risks.

---

[1] Prepared by Yu Ching Wong (APD). The chapter benefited from valuable comments by the Treasury of New Zealand and participants at a joint Treasury and Reserve Bank of New Zealand seminar.

[2] Under the ongoing Phase Two Review of the RBNZ Act, the Minister of Finance has made an in-principle decision to replace the RBNZ's existing 'soundness and 'efficiency' objective that applies in relation to its prudential functions with an objective to "protect and enhance the stability of New Zealand's financial system." This objective is subject to public consultation and may subsequently change.

[3] New Zealand's monetary policy framework is set out in the RBNZ Act and includes three secondary instruments, the Remit, Charter, and Code of Conduct, that are established with the Act. Two other secondary considerations (set through the Remit) are to avoid unnecessary instability in output, interest rates, and the exchange rate; and to discount events that have only transitory effects on inflation, thereby setting policy with a medium-term orientation (RBNZ, 2019).

4.   **The current monetary policy framework in New Zealand appropriately focuses on price stability and employment objectives, but enhanced policy communication could reduce uncertainty.** Monetary policy can have significant effects on financial stability through its impact on credit growth and asset prices. For instance, at the current juncture, an accommodative monetary policy stance to meet price stability and employment objectives could have negative impact on financial stability through higher house prices and increasing household debt that warrants maintaining a more restrictive macrofinancial policy. Therefore, in the context of the RBNZ's transition to an MPC-based decision-making process and the reformulation of the MPC's remit, this paper considers *how to operationalize and set out the objectives for monetary policy with respect to financial stability*. In particular, whether we should formulate monetary policy objectives with respect to financial stability. Further, the interaction between monetary policy and financial stability policy imply that it can be useful and necessary in some circumstances, to coordinate these two policy decisions. In this context, this paper discusses *the importance of enhancing communication to improve coordination and outcome*.

B.   A Review of the Debate on Monetary Policy and Financial Stability

5.   **Much of the debate on the interaction between monetary policy and financial stability has focused on whether monetary policy should be "leaning against the wind."** Two schools have emerged in this debate (Box 1). The "separation" school argues that price stability should be the primary mandate of monetary policy. As such, policy should react to changes in asset prices and credit only to the extent they affect inflation and output. Given its broad impact, monetary policy also is not a well-targeted instrument to address risks to financial stability, which should therefore be addressed through other instruments, such as macroprudential measures. In contrast, the "leaning against the wind" school argues that monetary policy should play an active role in maintaining financial stability. The argument is based on the view that monetary policy is a main driver of financial cycles. In particular, loose monetary policy has contributed to financial crises. By setting policy rates to lean against asset prices or credit, they will not be at the level required to stabilize prices only (IMF (2015).

6.   **The typical trade-off of leaning against the wind involves short-term costs of lower output and medium-term benefits in the form of a lower probability of a financial crisis.** As illustrated in Figure 1, there are no policy trade-offs in periods which financial risks increase with inflation pressures building in an economic expansion. In contrast, policy trade-offs arise when high financial risks appear to require a larger interest rate hike than necessary to achieve inflation objectives. In such a scenario, the traditional approach for monetary policy would justify a hike in interest rates only to meet price stability objectives. Macroprudential policies could address financial risks. In contrast, the leaning against the wind approach would involve raising interest rates, paying a short-term cost arising from higher unemployment or lower output from higher interest rate for a medium-term benefit of lower expected costs from a financial crisis.

Box 1. Debate on the Role of Monetary Policy in Achieving Financial Stability

- The ongoing debate among academics and policymakers can on the role of monetary policy and its interaction with financial stability policy can be grouped broadly in two schools of opposing views:

- One school ("the separation school") views that monetary policy should consider asset prices only to the extent that it contains information about likely economic developments and risks, in particular, the outlook for inflation and other objectives such as full employment. Financial stability concerns should be addressed through other instruments, such as macroprudential measures. This is in part under the Tinbergen instrument rule, for each and every policy target, there must be at least one policy tool.

- In the early debate, Bernanke and Gertler (1999) viewed that "Inflation-targeting provides an effective, unified framework for achieving both general macroeconomic stability and financial stability. Given a strong commitment to stabilizing expected inflation, it is neither necessary nor desirable for monetary policy to respond to changes in asset prices, except to the extent that they help to forecast inflationary or deflationary pressures."

- Vickers (1999) viewed that "asset prices matter for monetary policy simply because they help inform judgments about inflation prospects." However, "if asset prices were a substantial element of the targeted inflation measure, then policy would respond partly automatically to asset price inflation or deflation, but he doubted that assets prices should be a targeted measure of inflation."

- IMF (2015) concluded that "based on current knowledge, the case for leaning against the wind is limited, as in most circumstances costs outweigh benefits," while at the same time acknowledging that in future research "more circumstances may be uncovered in which deviations from a traditional policy response are warranted." These discussions focus on the need to know more on initial conditions such as when rate increase has smaller macroeconomic costs, and structural conditions when costs of financial crisis are high.

- In a similar vein, Svensson (2018), while acknowledging that "conducting monetary policy and macroprudential policy separately has the considerable advantage that each policy, with its separate goals and instruments, becomes more distinct, more transparent, and easier to evaluate", he noted that on rare occasions (the Swedish example) some explicit coordination of policies may be warranted when monetary policy might pose a threat to financial stability that cannot be contained by macroprudential policy.

- The other school which advocates "leaning against the wind" views that monetary policy cannot completely neglect financial stability risks, given risks to the economy, and that it should lean against the wind in some cases. Studies by BIS often advocate a stronger role for monetary policy in maintaining financial stability. This means "leaning more deliberately against financial booms even if near-term inflation stays low and stable or may be below numerical objectives, and easing less aggressively and, above all, persistently during financial busts" such that "these adjustments should help reduce the risk of a persistent easing bias that can lead to a progressive loss of policy room for maneuver over time" (Borio, 2015). The BIS view sees that one main driver of financial cycle is loose monetary policy and the costs brought about by financial crises (e.g., GFC) are large and very persistent. As such, "leaning against the wind" is an optimal policy reflecting the trade-off between short-run macroeconomic costs and the longer-run benefits of stabilizing the financial cycle. In addition, they view that the uncertainty about the effectiveness of macroprudential tools has left open room for the policy rate and macroprudential tools to be used as complements in the pursuit of financial stability.

- Bayoumi and others (2014) also questioned if there should be new objectives for monetary policy as the GFC showed that long-term price stability is not a sufficient condition for macro stability. They noted that "additional intermediate objectives (such as financial and external stability) may play a greater role than in the past and these should be targeted with new or rethought instruments (macroprudential tools, capital flow management, foreign exchange intervention)" whereas "interest-rate policy might have to play a role, should these prove insufficient".

Figure 1. Monetary Policy and Financial Stability
To Lean or Not to Lean and their Trade-offs

| Monetary Policy Response	Condition	Financial Stability	Welfare Implications
Traditional	Deviations from targets in short-term and growing financial risks	Improves	No welfare loss in forecast period and medium term
	MP targets (inflation, employment) achieved ✚	Improves	No welfare loss in forecast period
			Tradeoffs ↕
	Growing financial risks	Worsens	Expected loss from crisis in medium term
Lean against the wind	Deviations from targets in short-term ✚	…	Welfare loss in forecast period
			Tradeoffs ↕
	Growing financial risks (lower in medium term)	Improves	Lower expected loss from crisis in medium term

Source: Adapted from IMF(2015).

7. **On balance, recent empirical studies recommend against a leaning against the wind policy strategy.** For example, Svensson (2016) argued against the strategy, based on the insight that with less effective macroprudential policy in the context of a credit boom, the cost of leaning against the wind would be higher. Instead, the optimal policy would be to lower the policy rate and reduce the probability of a crisis. Moreover, deviations from a traditional policy response might also undermine the credibility of the central bank and the effectiveness of monetary policy.

C.   Macroprudential Policy, Financial Stability, and Monetary Policy

8. **Macroprudential and other policies also influence financial stability.** It is now well established that macroprudential policy is the primary policy tool for managing financial risks, but financial stability is also affected by other policies, both *ex ante* and *ex post* (Figure 2). There are complementarities and interactions between monetary policy and macroprudential measures, as discussed in the previous section. Macroprudential and microprudential policies are often complementary, but there can be tensions. The latter may arise in bad times, as macroprudential perspective may call for a relaxation of regulatory requirements while the microprudential perspective may require tightening of these requirements to protect banks' balance sheet. Taxes can affect asset prices, and tax policies can create biases that contribute to systemic risk. Similarly, competition in the financial sector may create incentives for excessive risk-taking. Finally, effective and credible resolution regimes can reduce incentives to take excessive risks, thereby reducing the need for macroprudential intervention (IMF, 2013).

Figure 2. Achieving Financial Stability: Relationship between Macroprudential and Other Policies

Source: Adapted from IMF (2013).
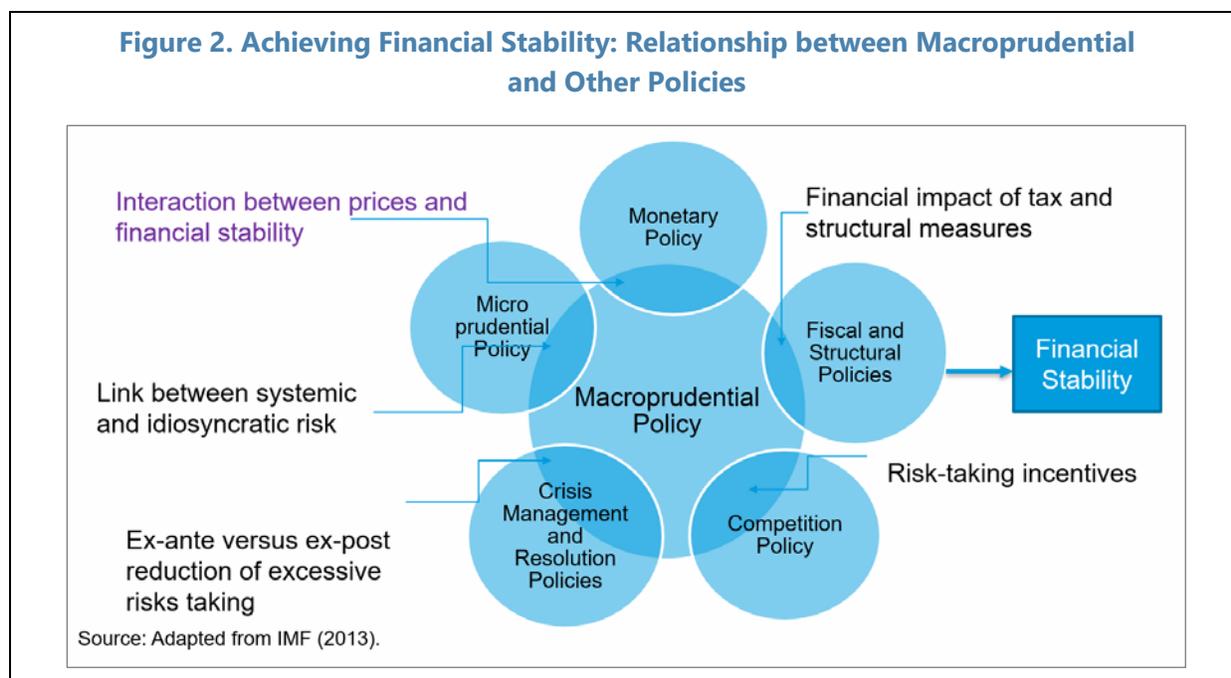
9.   There can be some role for monetary policy in achieving financial stability objectives even if macroprudential policy is the primary instrument. International experience has shown that a strong macroprudential framework, with a broad range of tools, can help to reduce the need for monetary policy to lean against adverse financial developments. The larger the reduction of financial vulnerabilities by macroprudential policy, the smaller the need for monetary policy to lean against emerging imbalances. Similarly, macroprudential policy may play an important role in reducing the likelihood of a severe economic stress resulting from financial instability, thereby, in turn, limiting the likelihood of monetary policy getting stuck at the zero-lower bound for interest rates. Nonetheless, since macroprudential policy may not be fully effective, there are times when monetary policy should take account of financial stability considerations, as long as in doing so it does not compromise the price stability objectives (see IMF, 2011 and RBNZ, 2019).[4]

D.   Monetary Policy and Financial Stability in New Zealand

10.   New Zealand has faced tensions between macroeconomic stabilization and financial stability objectives in the current economic expansion. While inflation has remained subdued and has been below the mid-point of the RBNZ's target range for most of the period since 2011, house prices have risen sharply in real terms over the past 8 years or so (Figures 3, 4 and 5, Table 1). As in many advanced economies, these price increases were in part driven by persistently low inflation and very low interest rates, even though fundamental supply-demand imbalances have also contributed, particularly in Auckland where housing demand growth from population growth is the

---

[4] Similarly, the desirability for coordination also exist between monetary policy and fiscal policy. For example, if low interest rates are undesirable, expansionary fiscal policy could enable higher interest rates while also allowing monetary policy to be consistent with its price stability and employment mandate.

strongest (Wong, 2018). The rise in house prices has occurred on the back of a trend increase in real house prices since the 1970s, a concentrated exposure of the banking system to residential mortgages, and high, housing-related household debt (Figure 6). Much of the housing-related macro-financial vulnerabilities were built up before the current economic expansion, but they were not unwound during the global financial crisis and have increased further in recent years, albeit at a slower pace.

Figure 3. House Prices
(Annual percent change; Index: 2010=100)
Sources: BIS; and IMF staff calculations.

Figure 4: Financial, Housing and Business Cycles
(In percent, y/y change)
Sources: BIS; RBNZ; and IMF staff calculations.

Figure 5. Policy Rates, Inflation Gap, and Output Gap
(In percent)
Sources: RBNZ; and IMF staff calculations

Figure 6. Policy Rates, House Prices, and Household Debt
(In percent, change y/y)
Sources: BIS; and IMF staff calculations.

11.   New Zealand's monetary policy framework has largely followed the separation school, although financial stability was introduced as a secondary consideration in 2012. The RBNZ's policy objectives are to maintain a stable general level of prices and, since 2018, maximum sustainable employment. Nevertheless, in the 2012 Policy Targets Agreement, financial stability ("efficiency and soundness of the financial system") was introduced as a secondary consideration for the RBNZ to consider when pursuing the policy targets, a consideration that has been maintained in

subsequent Agreements and the Remit for the MPC.[5] Shortly after this secondary consideration was established, the RBNZ also introduced a macroprudential policy toolkit in 2013 (Box 2). Thereafter, Spencer (2014) termed New Zealand's framework as a "conditional coordination approach," in which the monetary policy targets agreement has financial stability as a secondary objective and macroprudential policy is required to have regards to its impact on monetary policy. More recently, Bascand (2019a, 2019b) illustrated that in the context of New Zealand, macroprudential policy (e.g., loan-to-value ratios, LVRs, and countercyclical capital buffer, CCyB), prudential policy (e.g., capital buffers, liquidity policy), and crisis management measures (e.g., collateral standards, open bank resolution, minimum capital) could contribute to financial stability by addressing different risks.[6]

Table 1. New Zealand: Housing Price Cycles, 2000-2018

		Real House Prices National		Real Cash Rate		Real Housing Credit	Household Debt to Income	
Trough	Peak	% Change 1/	Duration 2/	Trough 3/	Peak 3/	Peak 4/	%	% ppt Change 1/
2000Q4	2007Q2	90.7	26	-2.0	2.6	2.0	158	50
2011Q2	2018Q4 5/	60.4	30	-3.8	-0.3	0.1	164	14

Sources: Stat NZ; RBNZ; OECD; Haver Analytics; and IMF staff calculations.
1/ Percent change from trough to peak.
2/ Number of quarters of rising natioanl house prices .
3/ Change in percent points compared to 4 quarters ago.
4/ Annual growth in real housing credit compared to annual growth one year ago.
5/ Peak shows quarter of latest data.

12.   LVR restrictions on residential mortgage lending have lowered the risks from high housing price inflation and high growth in household debt. Macroprudential tools are designed to enhance financial system resilience. The implementation of the LVR restrictions on residential mortgage lending to owner occupiers and investors since 2013 has largely eased the buildup of riskier loans with high LVRs, thereby mitigating potential stress on banks' balance sheets from negative equity if house prices were to fall and moderating the accumulation of household debt with rising house prices.[7] Notably, the share of mortgages outstanding with LVR of above 80 percent has declined to 7 percent in end-2018 from about 20 percent in 2013 (RBNZ, 2019). The share of new mortgage lending to investors has also reduced to 18 percent in end-2018 from the peak of 35 percent in mid-2016 (see also Figures 7 and 8). Overall, this easing in the build-up of household vulnerabilities has allowed the RBNZ to gradually ease restrictions on high LVR lending effective January 2018 and January 2019. Nonetheless, structural vulnerabilities remained as

---

[5] Other secondary considerations are to (i) seek to avoid unnecessary instability in output, interest rates, and the exchange rate; and (ii) discount events that have only temporary effects on inflation, setting policy with a medium-term orientation.

[6] Bascand (2019b), Table 1 outlined how prudential banking tools in New Zealand work together to delivery financial stability.

[7] See assessments of LVRs by IMF (2017a, 2017b) and by RBNZ in Lu (2019) and Ovenden (2019).

households are still vulnerable to adverse shocks given high household debt and high house prices. More active use of macroprudential policy should be considered.

Figure 7. New Residential Mortgage by Borrower Type and LVR
(Percent of new mortgage lending)

Figure 8. Existing Residential Mortgage Lending
(Percent share of total)
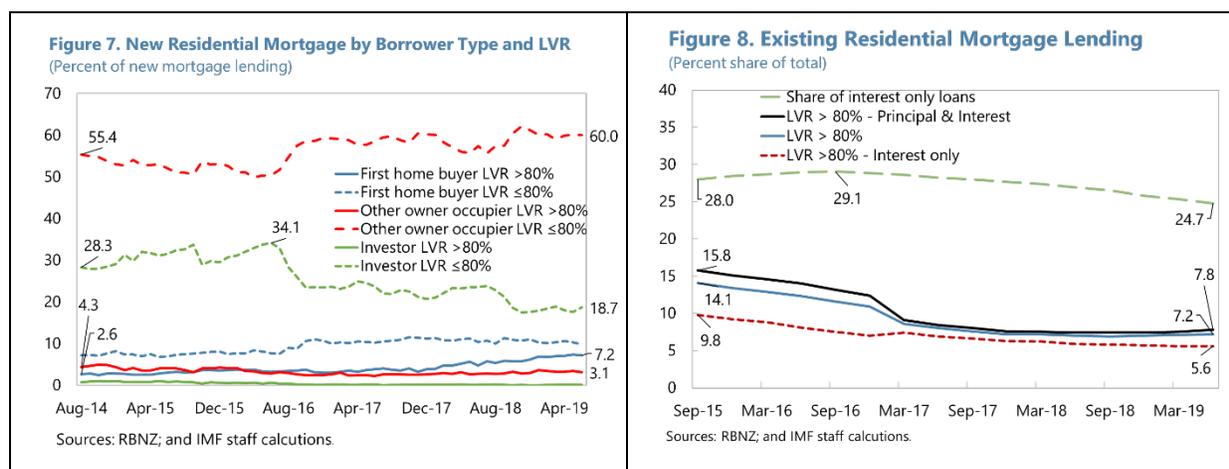
Box 2. Macroprudential Policy Framework

- The RBNZ's mandate for macroprudential policy stems from its legislative purpose of "promoting the maintenance of a sound and efficient financial system" (Reserve Bank of New Zealand Act 1989). Macroprudential policy framework in New Zealand is based on a clear mandate for financial stability, operationally clarified by objectives set out in a memorandum of understanding (MoU) between the RBNZ and the Minister of Finance. The MoU, signed in May 2013, establishes that the RBNZ initiates any macroprudential policy action, after consultation with the Treasury and Minister (even though the RBNZ has the existing legal powers to use prudential tools in a cyclical fashion). The use of macroprudential policy is currently one of the topics under the phase two Review of the RBNZ Act.

- RBNZ is the single prudential regulator with responsibilities and powers for the supervision of financial institutions and macroprudential policies. Under a full integration model, given RBNZ's role in central bank's functions as in monetary policy, payment systems, and as lender of last resort, it has expertise in the analysis of systemic risk that help inform macroprudential policies.

- The MOU sets out four macroprudential tools: the countercyclical capital buffer (CCyB), adjustments to the minimum core funding ratio (CFR), sectoral capital requirements (SCR) and temporary restrictions on high loan-to-value ratio (LVR) residential mortgage lending. LVR restrictions is the only instrument that is currently turned on.

- In the implementation of macroprudential policy, the RBNZ has explicitly acknowledged the efficiency costs of macroprudential or prudential instruments such as LVR or debt-to-income (DTI) restrictions and the possibly unintended distributional consequences since they may restrict home purchases by owner-occupiers, including first home buyers.

---

13. **Financial stability as a secondary consideration of monetary policy has however introduced new policy communication challenges.** Since its introduction, the role of financial stability considerations in monetary policy decisions has appeared unclear, as much of the communication focused on traditional considerations. For example, when the RBNZ raised the policy rate in March 2014 for the first time since March 2011, the Monetary Policy Statement (MPS) referred to "inflationary pressures [that] are increasing and are expected to continue doing so over

the next two years" and the importance of "inflation expectations [to] remain contained." It also noted that "the speed and extent to which the official cash rate (OCR) will be raised will depend on economic data and our continuing assessment of emerging inflationary pressures." Similarly, after the RBNZ started lowering rates in 2015, the June 2015 MPS explained that "a reduction in the OCR [was] appropriate given low inflationary pressures and the expected weakening in demand, and to ensure that medium term inflation converges towards the middle of the target range." That said, in the same statement, the RBNZ noted that "proposed LVR measures and the Government's tax initiatives planned for 1 October 2015 should ease the impact of investor activity [on house prices]." While an RBNZ Bulletin article had noted that one way to address tension posed by weak inflation pressure and high house price inflation was to allow inflation to return to the target midpoint at a slower rate than in the absence of risks to financial stability (Dunstan, 2014), this consideration was not mentioned explicitly in MPS statements during which the policy rate was kept constant in 2017 and 2018.

14.   Looking forward, policy communication could focus more on implications of the interaction between monetary and macroprudential policies. In IMF staff's view, New Zealand's monetary policy framework appropriately follows the recommendations of the separation school and focuses on price stability and employment objectives. At the same time, as the coordination of objectives and implementation of monetary, macroprudential, and micro prudential policies all take place within the RBNZ, policy deliberations can, in principle, internalize any potential trade-offs (Nier and others, 2011). Against this backdrop, better communication on how the interaction of monetary policy and macroprudential policy has affected monetary policy decisions because of the secondary consideration for financial stability under the remit for the MPC, could enhance transparency and policy effectiveness. The *Monetary Policy Statements* and the *Financial Stability Reviews* could be used as vehicles for such communication. On a broader perspective, there could be potentially a role for the joint committee of the Council of Financial Regulators (CoFR)— comprising members from RBNZ, the Financial Market Authority, the Ministry of Business, Innovation and Employment (MBIE), and Treasury—or a separate committee to enhance the coordination of monetary, macroprudential and fiscal policies.[8]

15.   A strengthening of the macroprudential framework would support the monetary policy focus on price stability and supporting maximum sustainable employment. The IMF's 2017 Financial Sector Assessment Program recommended that the macroprudential framework could be adjusted along the transparency and governance dimensions, and the macroprudential toolkit could be broadened to include a debt-to-income (DTI) or a debt service-to-income (DSTI) instrument (IMF, 2017a). The LVR instrument has helped to slow house price growth and reduce the share of risky high LVR mortgages in bank's balance sheets. As such, the banks' recovery value in the event of a mortgage default should be higher. But LVRs are likely to be less effective in other dimensions, including for example, in limiting high household debt exposure or ensuring debt service capacity, dimensions relevant for the probability of default. A broader macroprudential

---

[8] CoFR only considers financial regulation. For it to consider monetary, financial and fiscal policy, its remit and membership would need to change.

toolkit (e.g., including DTI and DSTI thresholds) would allow for more targeted interventions. These enhancements would strengthen the effectiveness of the macroprudential policy, thereby reducing the possible burden on monetary policy from financial stability considerations.

E.   Conclusions

16.   Price stability and supporting maximum sustainable employment should remain the primary monetary policy objectives for the RBNZ. Recent studies have broadly established that monetary policy generally is not an effective instrument for maintaining financial stability, given its frameworks and instruments. Seeking to achieve other objectives, such as financial stability objectives, even if only in the form of leaning against asset or credit booms, typically involves costly trade-offs with regards to primary monetary policy objectives. Against this backdrop, the monetary policy objectives set in Phase One of the RBNZ Act meet the recommendations of the separation school.

17.   The interaction of monetary policy and financial stability, and the role of the latter as a secondary consideration for monetary policy suggest the need for enhanced policy communication. Much of RBNZ's current monetary policy communication is presented along standard inflation, output, and employment dimensions. This communication focus is appropriate, given the primary monetary policy objectives. Nevertheless, it also creates some uncertainty about the weight given to financial stability considerations in monetary policy decisions, notably in the context of housing market imbalances and house price inflation, and related macro-financial vulnerabilities. A more explicit discussion of financial stability considerations, in *Monetary Policy Statements* or the *Financial Stability Review*, could reduce uncertainty, and improve the understanding of the monetary policy strategy and its outcome.

18.   A strong micro-prudential framework and macroprudential tools should continue to be the primary means to address systemic financial risks, and a stronger framework would support the updated monetary policy regime. Limits on DTI and DSTI could usefully be included in the toolkit to complement the LVR restrictions and more directly reduce households' exposure to high debt.

References

Bascand, G., 2019a, "Reviewing the RBNZ's Approach to Financial Stability," speech delivered to 15th Financial Markets Law Conference in Auckland, June 26, 2019.

Bascand, G., 2019b, "Macroprudential Policy: Past, Present and Future," speech delivered to 54th University of Otago Foreign Policy School in Dunedin, June 30, 2019.

Bayoumi, T., G. Dell'Ariccia, K. Habermeier, T. Mancini Griffoli, and F. Valencia, 2014, "Monetary Policy in the New Normal," IMF Staff Discussion Notes, 4(3).

Bernanke, B. and M. Gertler, 1999, 'Monetary Policy and Asset Price Volatility,' Federal Reserve Bank of Kansas City, Economic Review, Fourth Quarter, 17–51.

Borio, C, 2014, "Monetary policy and financial stability: what role in prevention and recovery?", BIS Working Papers, No. 440, January 2014.

Borio, C, 2015, "Revisiting Three Intellectual Pillars of Monetary Policy Received Wisdom," speech, November 2015.

Dunstan, A., 2014, "The Interaction between Monetary and Macro-prudential Policy," *Reserve Bank of New Zealand Bulletin* 77(2), June 2014.

Hunter, L., 2008, "The Relationship between Monetary and Financial Stability," *Reserve Bank of New Zealand Bulletin* 71(2), June 2008

IMF, 2013, "Key Aspects of Macroprudential Policy," IMF Policy Paper.

IMF, 2015, "Monetary Policy and Financial Stability," IMF Policy Paper.

IMF, 2017a, "New Zealand: Financial Sector Assessment Program: Financial System Stability Assessment," May 8, 2017.

IMF, 2017b, "New Zealand: Financial Sector Assessment Program: Technical Note- Macroprudential Institutional Framework and Policies," May 10, 2017.

Jeanneau, S., 2014, "Financial Stability Objectives and Arrangements- What's New?" BIS Papers No. 76

Lu, B., 2019, "Review of the Reserve Bank's Loan-to-Value Ratio Policy," *Reserve Bank of New Zealand Bulletin*, 82(6), May 2019.

Nier, E., L. Ignacio Jácome, J. Osinski, and P. Madrid, 2011, "Institutional Model for Macroprudential Policy," IMF Staff Discussion Note SDN/11/18.

Ovenden, P., 2019, "Macroprudential Policy Framework: Mitigating the Likelihood and Severity of Boom-Bust Cycles," Reserve Bank of New Zealand.

Reserve Bank of New Zealand (RBNZ), 2019, *Monetary Policy Handbook*, Version 1, April 1, 2019.

Spencer, G, 2014, 'Coordination of Monetary Policy and Macro-prudential Policy', speech delivered to Credit Suisse Asian Investment Conference in Hong Kong SAR.

Svensson, L., 2016, "Cost-Benefit Analysis of Leaning Against the Wind: Are Costs Larger Also with Less Effective Macroprudential Policy," IMF Working Paper, WP/16/3.

Svensson, L., 2018, "Monetary Policy and Macroprudential Policy: Different and Separate?" *Canadian Journal of Economics* 51(3).

Vickers, J., 1999, 'Monetary Policy and Asset Prices,' speech given at the Money, Macro and Finance Group 31st Annual Conference, Oxford University, September 22, 1999, printed in *Bank of England Quarterly Bulletin*, 39(4): 428–435, November 1999.

Williams, R. 2017, "Characterizing the current economic expansion: 2009 to present day," *Reserve Bank of New Zealand Bulletin* 80(3), June 2017.

Wong, Y.C., 2018, "Housing Affordability in New Zealand and Policy Response," *New Zealand: 2018 Article IV Consultation—Selected Issues*, International Monetary Fund, IMF Country Report No. 18/203