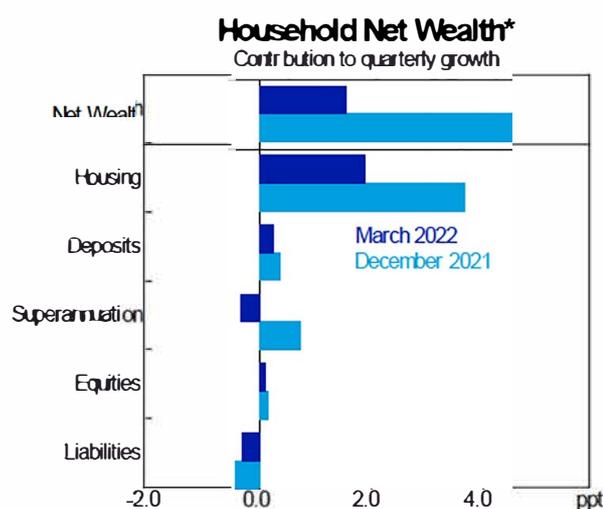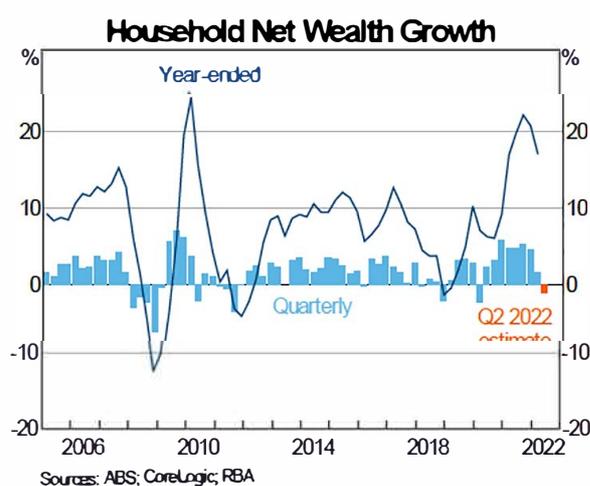Household net wealth increased by 1.6 per cent in the March quarter, to be 17 per cent higher over the year. Housing wealth was the main driver in the quarter as dwelling prices continued to increase, albeit at a slower pace than in recent quarters. Financial assets fell by 0.1 per cent, as an increase in deposits and equities was offset by a decrease in superannuation reserves. The decrease in superannuation reserves was driven by revaluations due to the negative performance of overseas share markets. Household deposits rose at a relatively slower pace than in previous quarters, consistent with savings starting to normalise as consumption opportunities broaden. Household liabilities continued to rise, driven mainly by owner-occupier loans. Partial data suggest that household net wealth will decrease in the June quarter, driven by a decrease in the value of financial assets from declines in equity prices.

Table 1: Household Net Wealth[a]
Percentage change

	Quarterly		Year to
	Mar-22	Dec-21	Mar-22
Net wealth	1.6	4.6	17.1
Total assets	1.6	4.2	15.5
Non-financial assets	2.7	5.3	21.0
Housing	*2.8*	*5.5*	*21.7*
Consumer durables	*1.7*	*1.9*	*7.6*
Financial assets	-0.1	2.6	8.2
Liabilities	1.6	2.2	8.0
Excluding unincorporates	1.7	2.0	7.1
Memo item			
ASX 200	2.5	-0.2	10.4

(a) Includes unincorporated enterprises.
Sources: ABS; RBA

Household Net Wealth Growth
Sources: ABS; CoreLogic; RBA

Household Net Wealth*
Contribution to quarterly growth
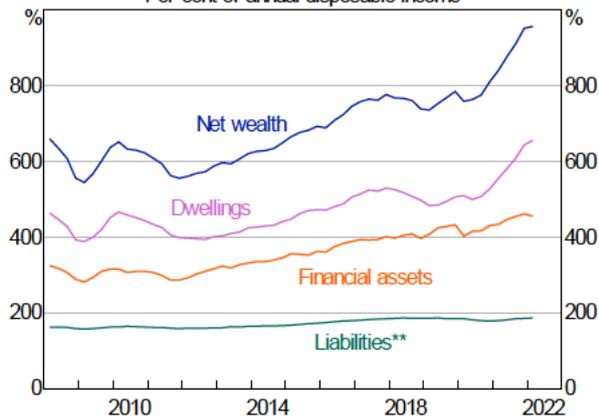
* Household sector includes unincorporated enterprises.
Sources: ABS; RBA

Household Assets and Liabilities*
Per cent of annual disposable income
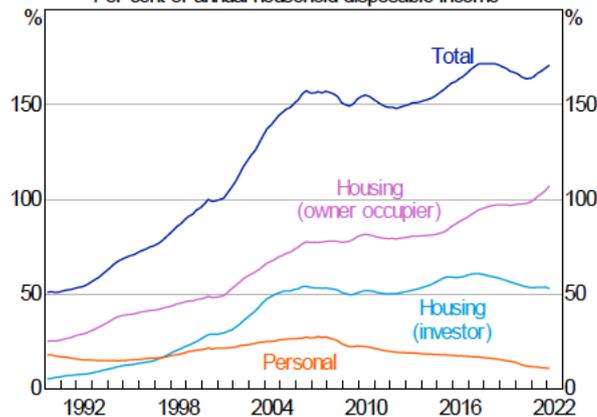

- Net wealth
- Dwellings
- Financial assets
- Liabilities**

Household Debt*
Per cent of annual household disposable income**

- Total
- Housing (owner occupier)
- Housing (investor)
- Personal

Net Saving Plus Financial Asset Revaluations
Per cent of quarterly household disposable income*

- Total
- Saving
- Equity revaluation
- Superannuation revaluation
- Other financial asset revaluation
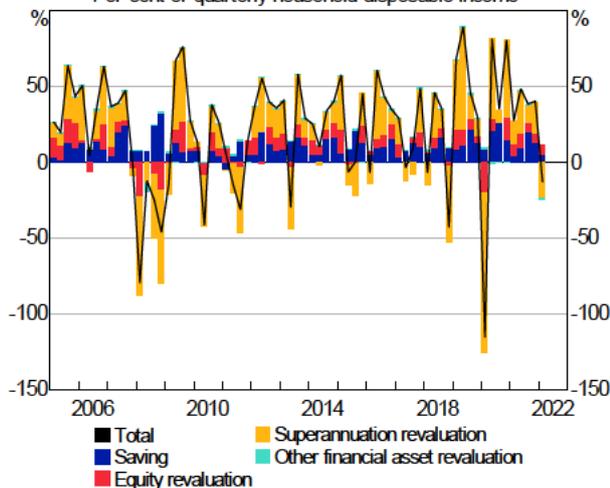
Household Financial Asset Flows
Per cent of household disposable income
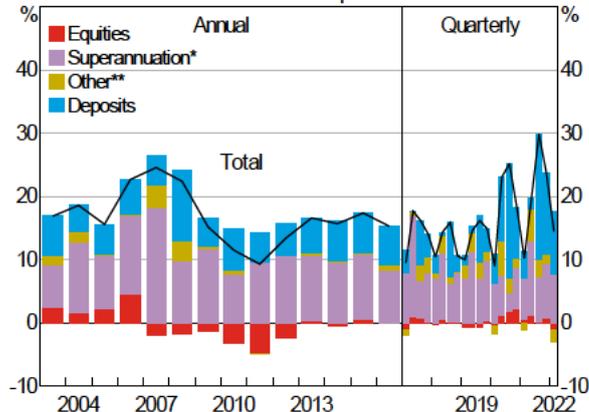
- Equities
- Superannuation*
- Other**
- Deposits
- Annual
- Quarterly
- Total

Household Saving Ratios*
Per cent of household disposable income
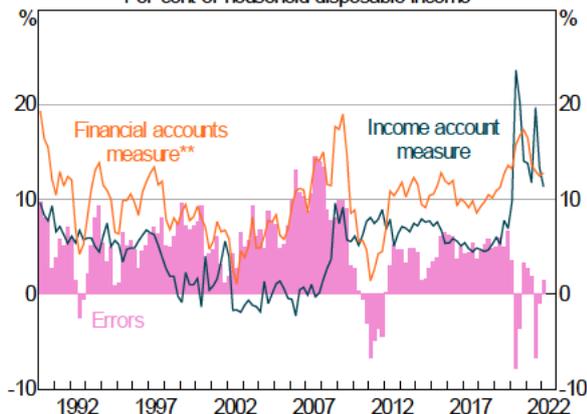
- Financial accounts measure**
- Income account measure
- Errors

Housing Equity Injection*
Per cent of household disposable income

- Investment in housing**
- Change in housing credit***
- Housing equity injection

Next release: 29 September 2022

Domestic Activity and Trade / Economic Analysis Department / 23 June 2022

Appendix

Table A1

Household Assets and Liabilities*

	Mar-22 Level $b	Dec-21 Level $b	Quarterly Net Flows $b	Quarterly Valuation Effect $b	Quarterly Growth %	Year Ended Growth %
Net Financial Wealth	3,987	4,041	7.8	-61.6	-1.3	8.3
as a percentage of HHDY	286	291			-5.1pp	26.2pp
Net Wealth	14,189	14,025	50.3	107.6	1.2	17.1
as a percentage of HHDY	1,019	1,012			7.5pp	162.7pp
Total Assets	16,966	16,757	94.9	107.6	1.2	15.5
Tangible Assets	10,203	9,984	42.5	169.9	2.2	21.0
Dwellings	9,724	9,513	40.5	169.9	2.2	21.7
Consumer Durables	479	471	8.2	--	1.7	7.6
Financial Assets	6,763	6,773	52.4	-62.3	-0.1	8.2
Cash & deposits	1,477	1,443	35.2	-1.0	2.4	12.2
Equity	1,233	1,219	-4.4	18.4	1.1	7.7
Superannuation and Life Insurance	3,802	3,853	28.4	-79.7	-1.3	6.8
Fixed Interest	7	8	-0.3	-0.1	-5.9	-9.6
Other	243	250	-6.4	0.1	-2.5	10.6
Total Liabilities						
Including Unincorporates	2,776	2,733	44.5	-0.7	1.6	8.0
Excluding Unincorporates	2,201	2,166	35.9	--	1.7	7.0

* Includes financial assets of unincorporated enterprises.
Sources: ABS; RBA

DAT Forecast Meeting

July 2022

Session 1

Housing Prices

Housing price growth

Saunders Tulip model decomposition*

Scenario →
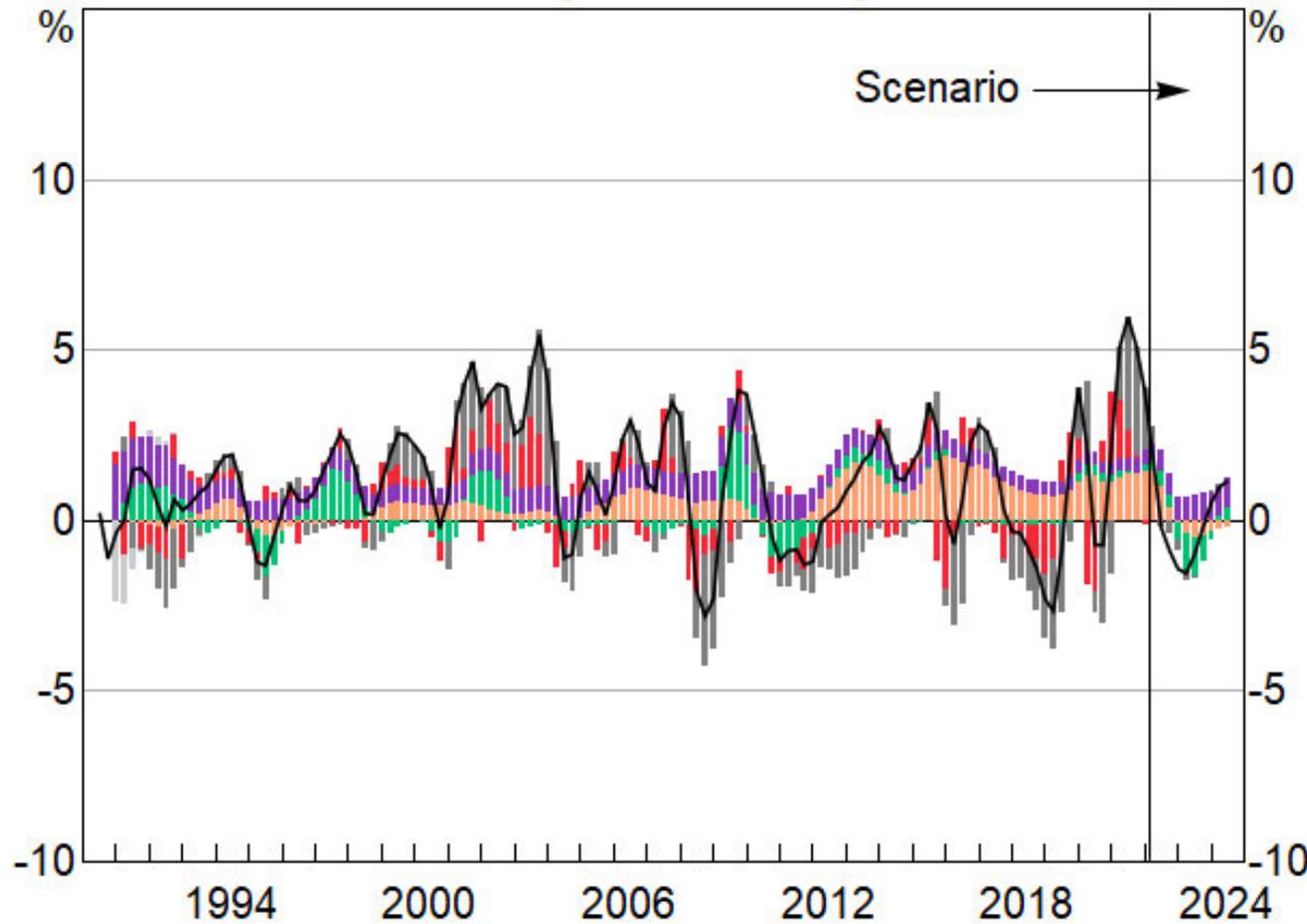
Legend:
- Actual housing price growth
- Long-run term
- Real variable mortgage rate
- Inflation
- Contemporary residual
- Lagged residuals
- Initial

*   Contribution of each variable reflects the cumulative effect over time.
     This is because the model has autoregressive components, which have
     been decomposed.

Source: RBA

Income, Saving and Wealth

Household Disposable Income
Nominal, quarterly
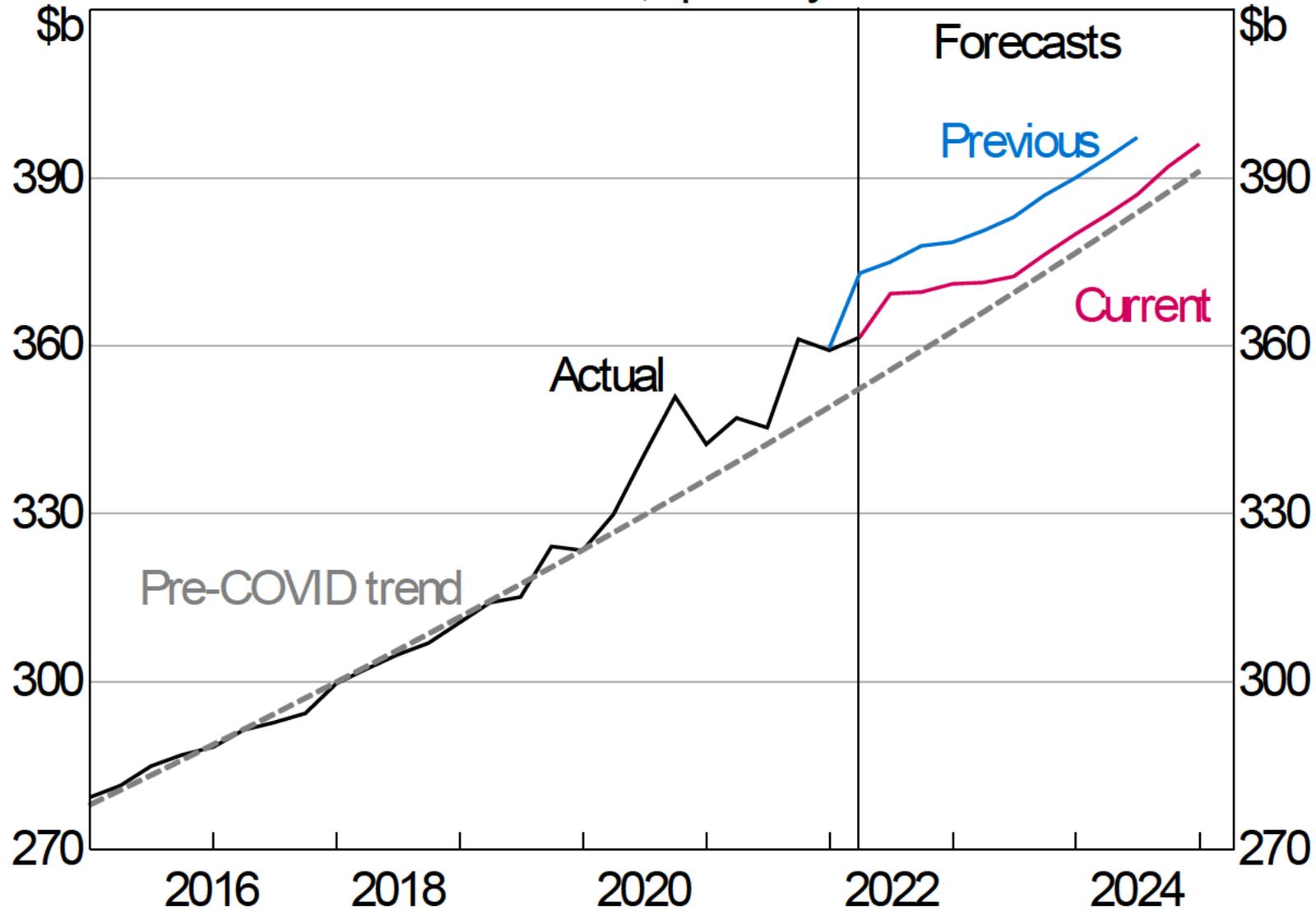
Sources: ABS; RBA

Household Net Saving Ratio
Quarterly
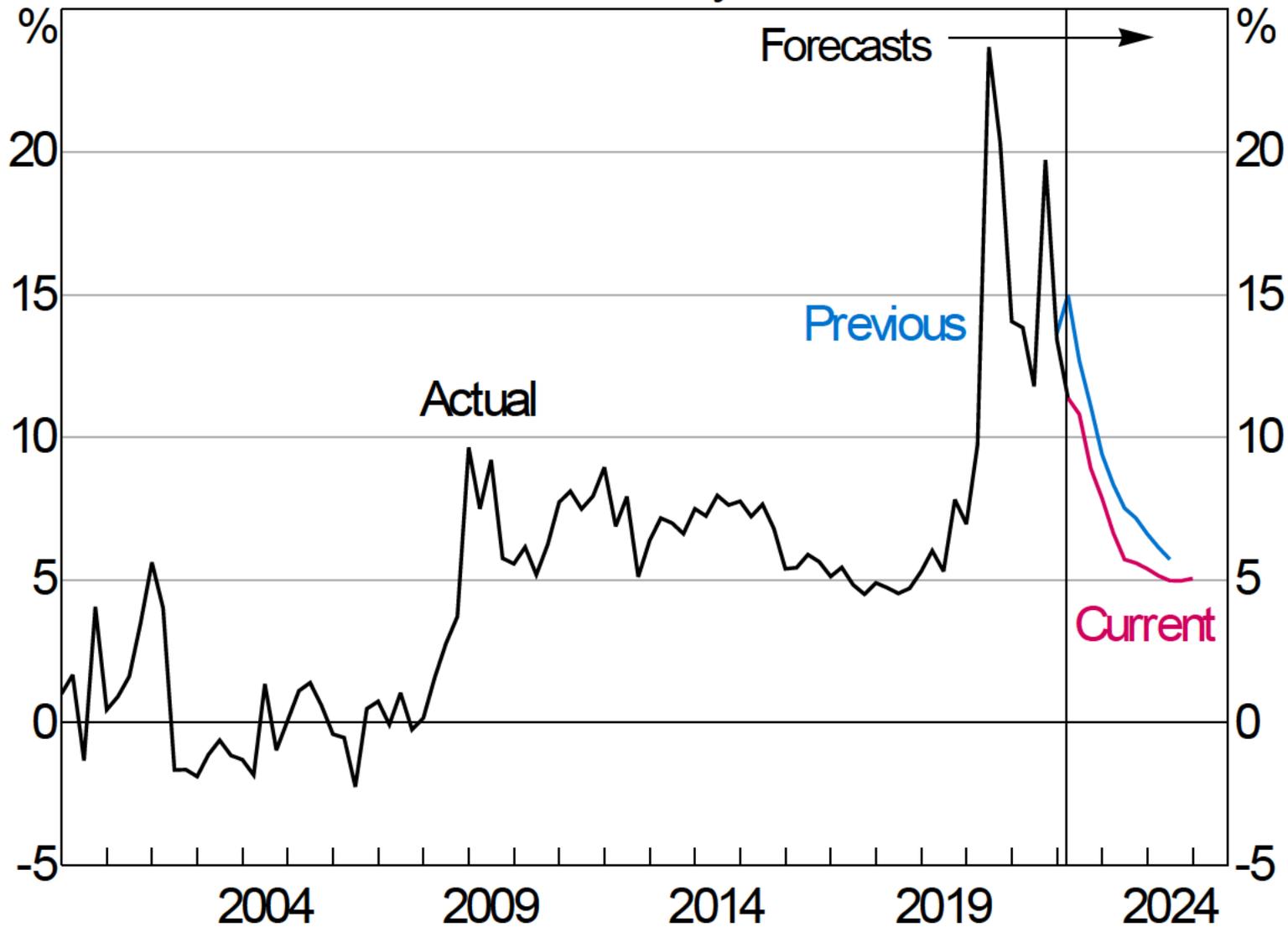
Sources: ABS; RBA

Household Net Wealth
Levels
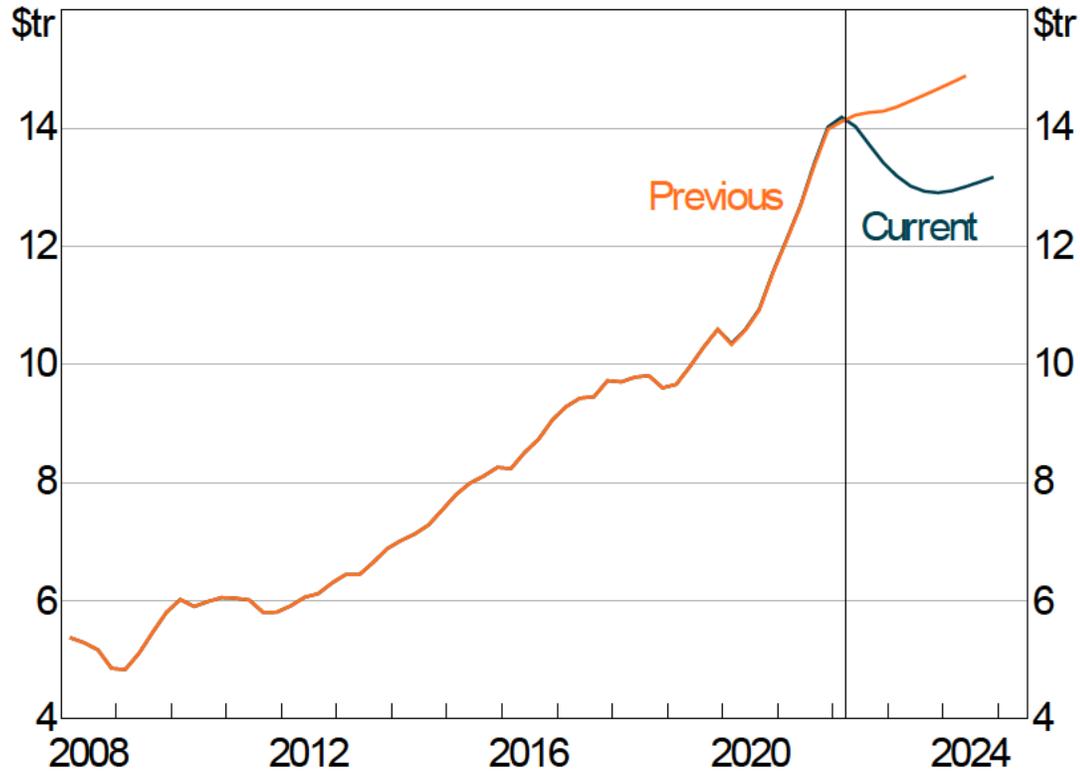
Sources: ABS; RBA

Household Net Wealth
Contributions to quarterly growth
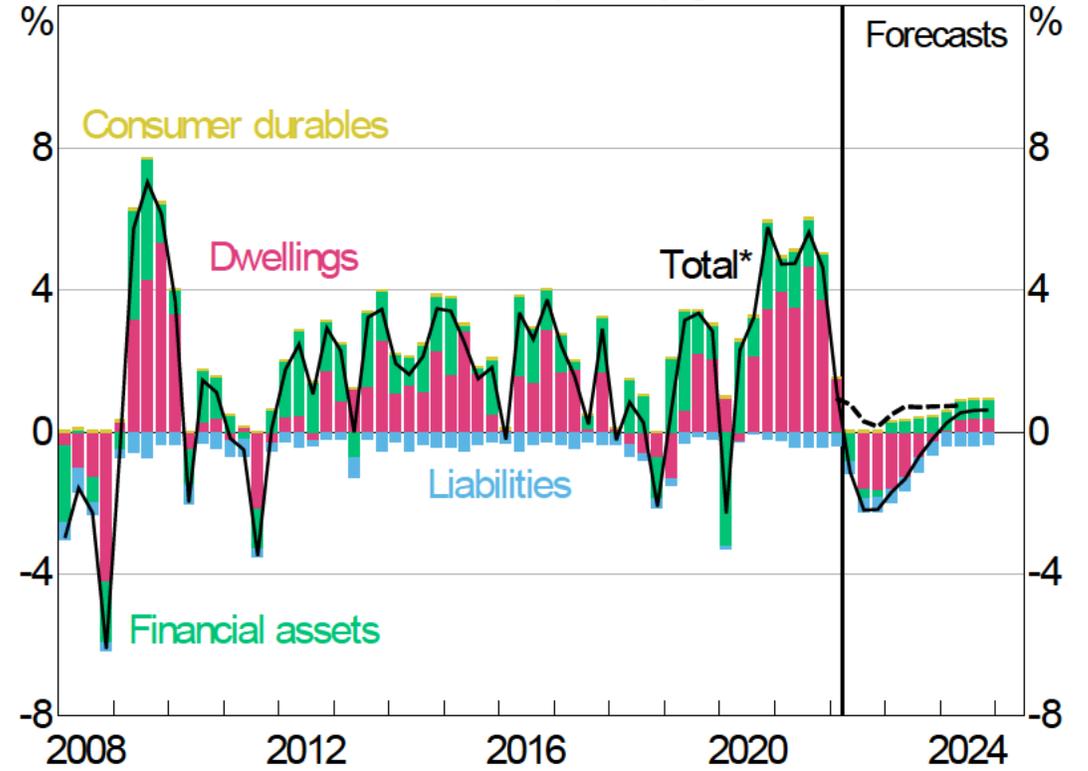
*   Dashed line indicates forecast from previous SMP

Sources: ABS; RBA

Income, Saving and Wealth Spares

Household Disposable Income
Real, quarterly
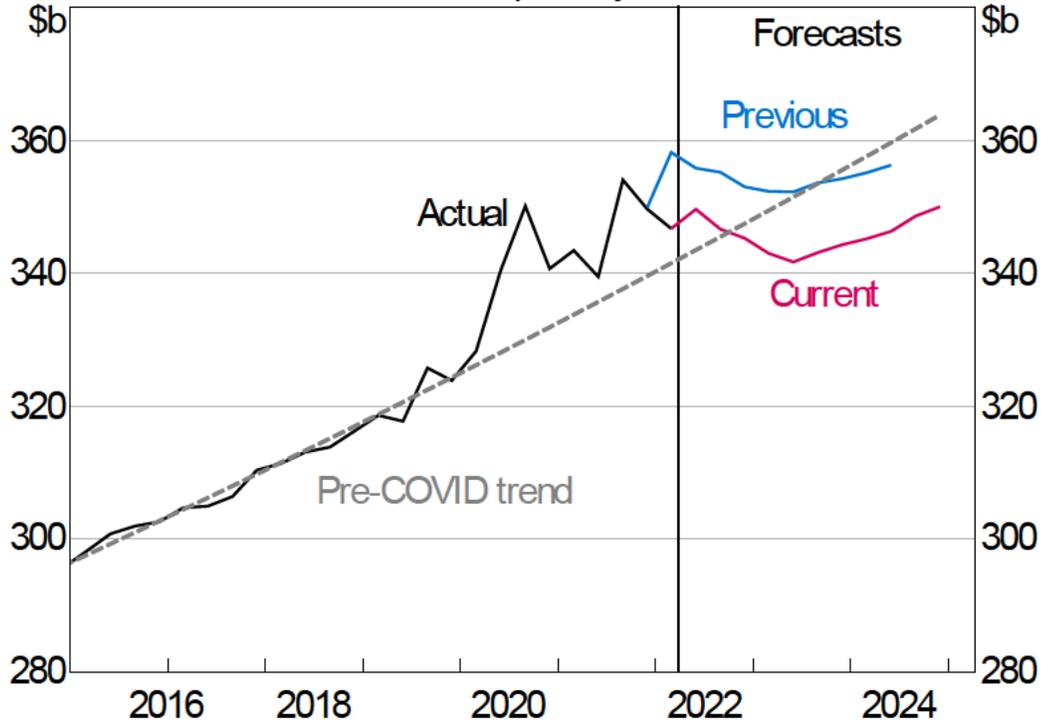
Household Disposable Income
Real, per capita, quarterly

Sources: ABS; RBA

Household Disposable Income

Nominal, quarterly

Forecasts

Current

MARTIN

Previous

Actual

Pre-COVID trend

$b
- 380
- 340
- 300
- 260

2016 2018 2020 2022 2024
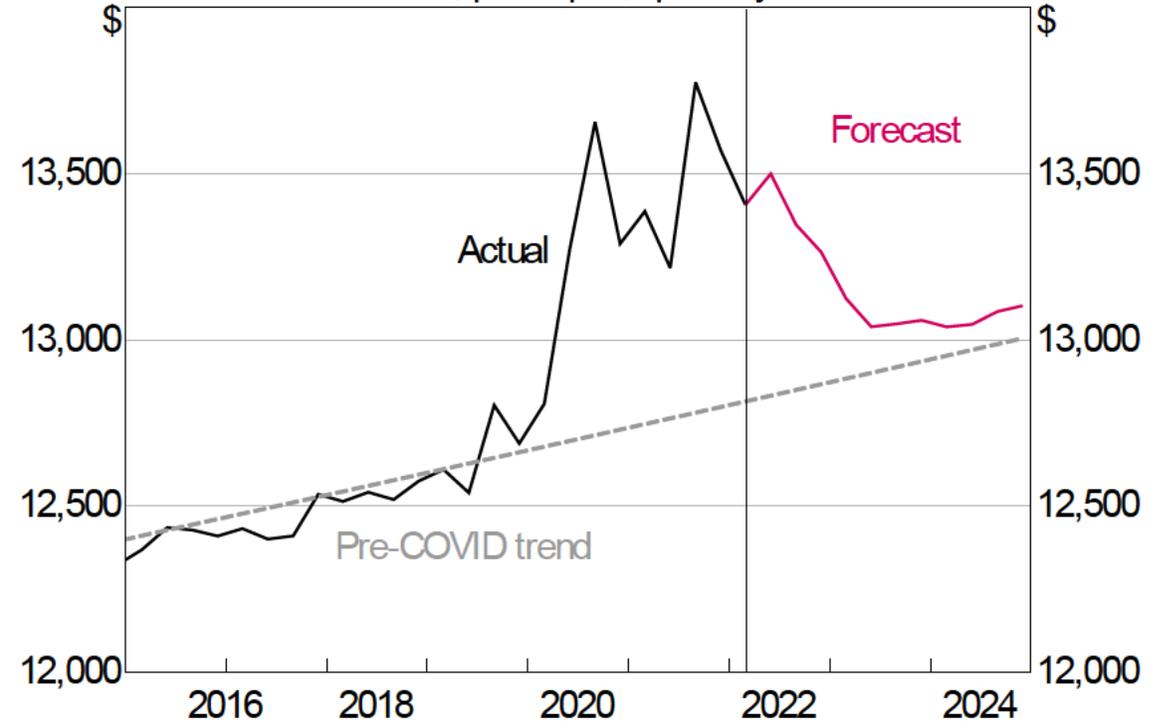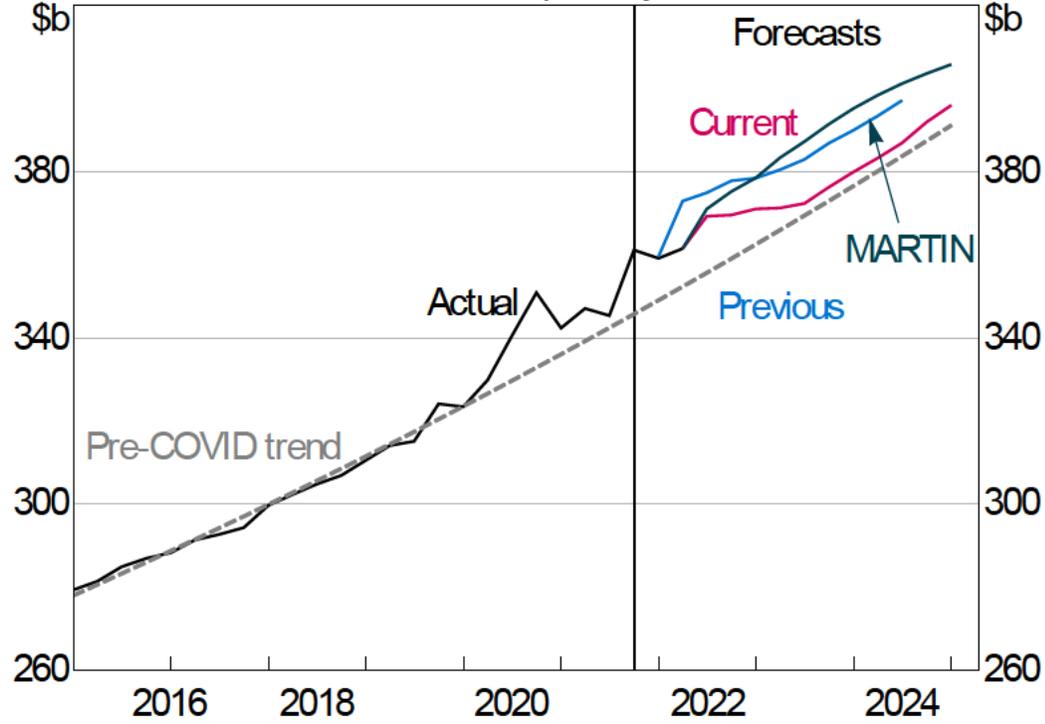
Sources: ABS; RBA

COE

Nominal, quarterly

$b
- 300
- 275
- 250
- 225
- 200

Current

Previous

MARTIN

Actual

2016 2018 2020 2022 2024
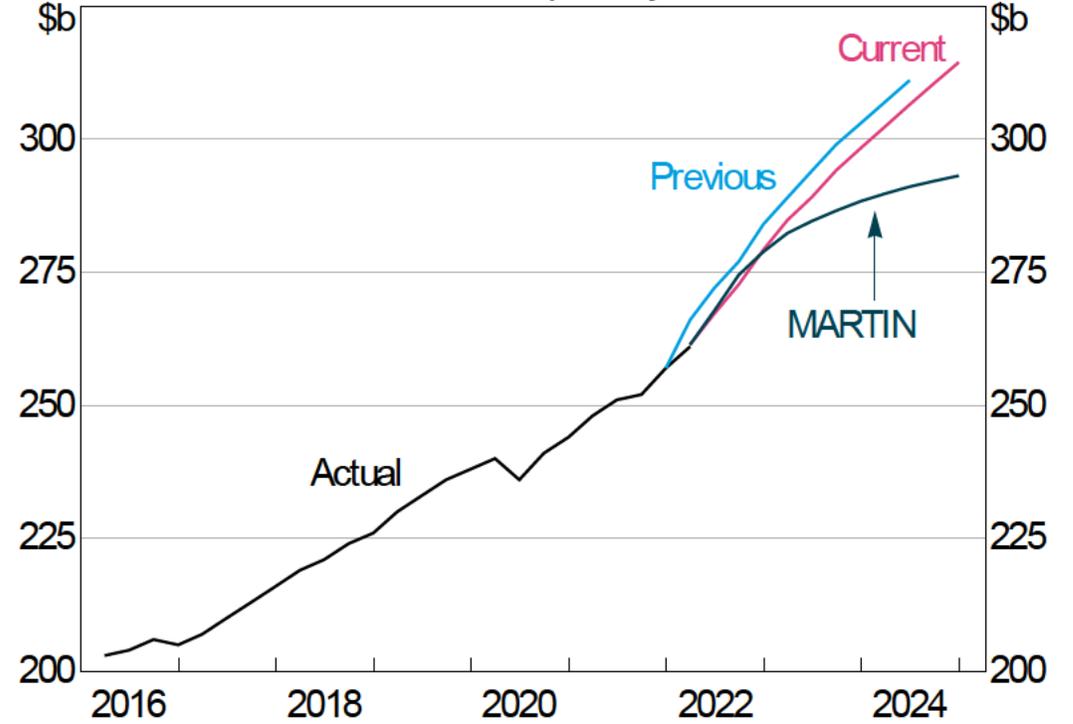
Source: RBA

Household Disposable Income
Nominal, contributions to quarterly growth

Forecasts

Legend:
- Total
- Rent
- Other income
- Other payable
- Labour
- Financial income
- Tax payable
- GMI
- Social assistance
- Interest payable
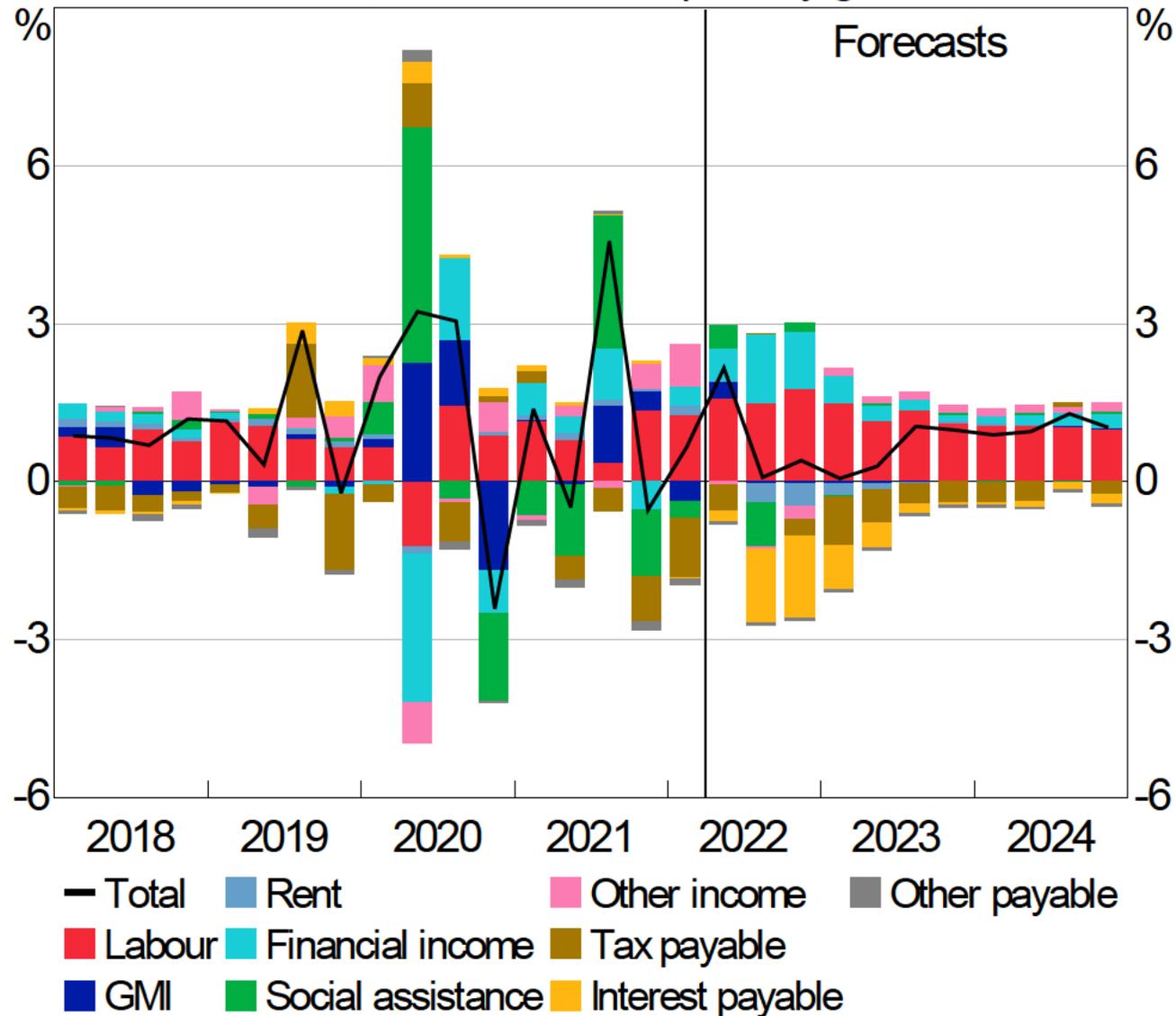
Sources: ABS; RBA

Change to Household Income Forecasts
Current versus previous profile
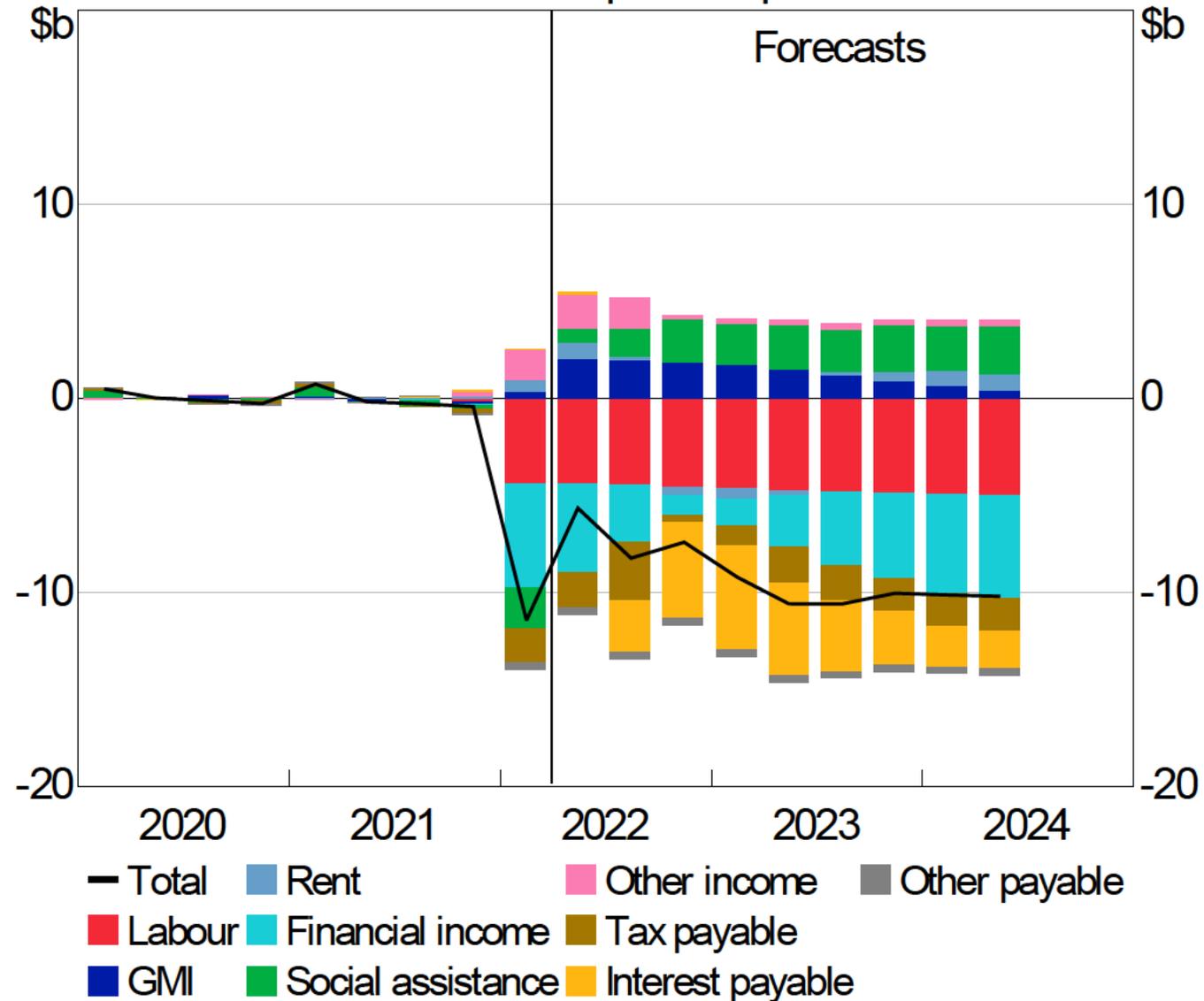
Sources: ABS; RBA

Household Disposable Income
Selected components, nominal, quarterly
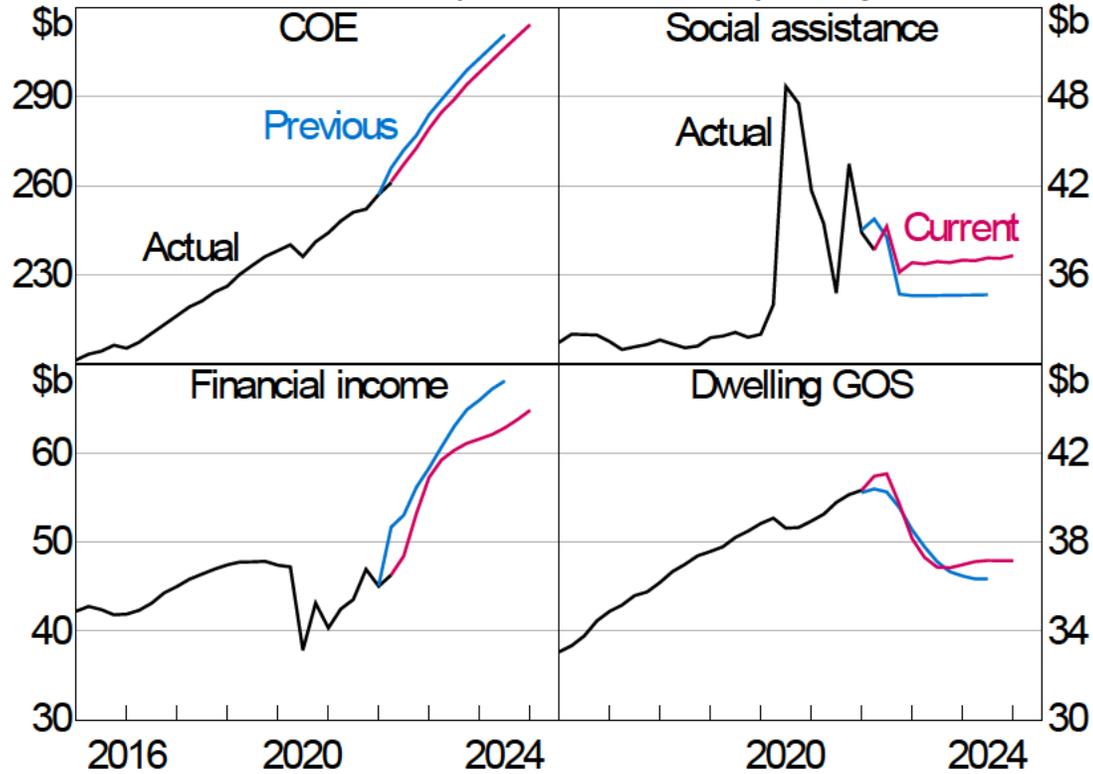
COE
- \$b
- 290
- 260
- 230
- Previous
- Actual

Social assistance
- \$b
- 48
- 42
- 36
- Actual
- Current

Financial income
- \$b
- 60
- 50
- 40
- 30

Dwelling GOS
- \$b
- 42
- 38
- 34
- 30

2016   2020   2024
2020   2024

Sources: ABS; RBA

Household Disposable Income
Selected components, nominal, quarterly

Tax payable
- %
- 75
- 60
- Current
- Actual
- Previous

Interest payable
- %
- 30
- 20
- 10

2016   2018   2020   2022   2024
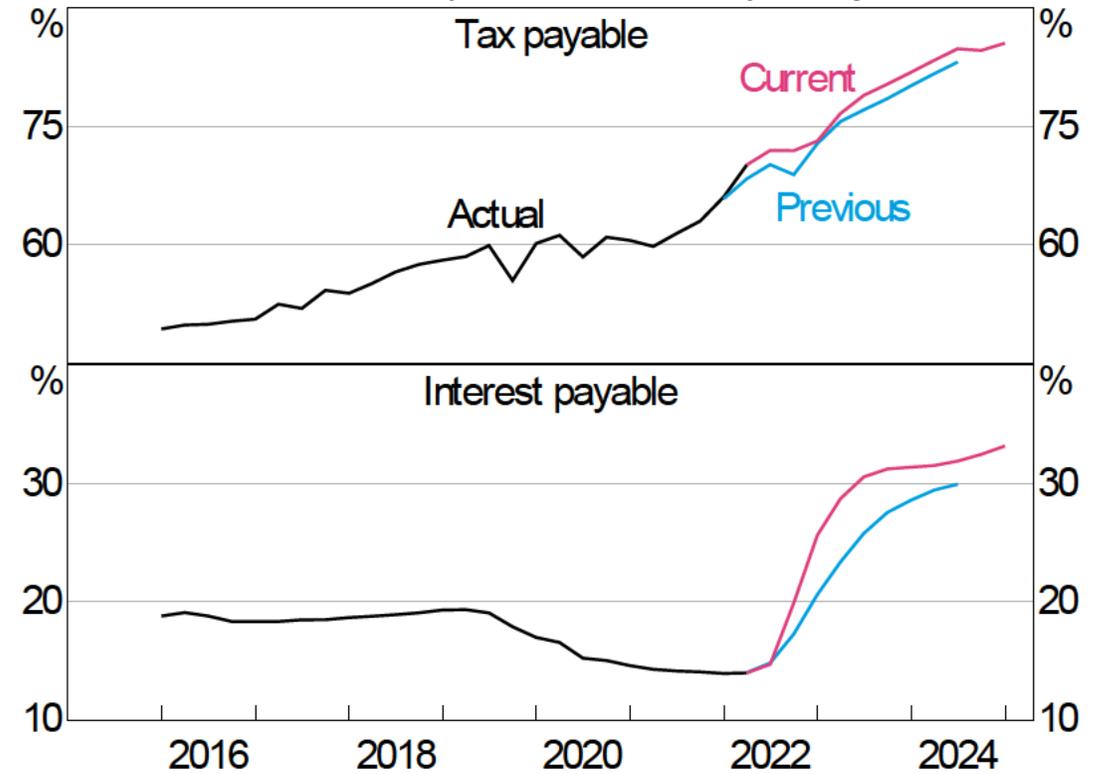
Sources: ABS; RBA

Additional Household Savings

Nominal, quarterly
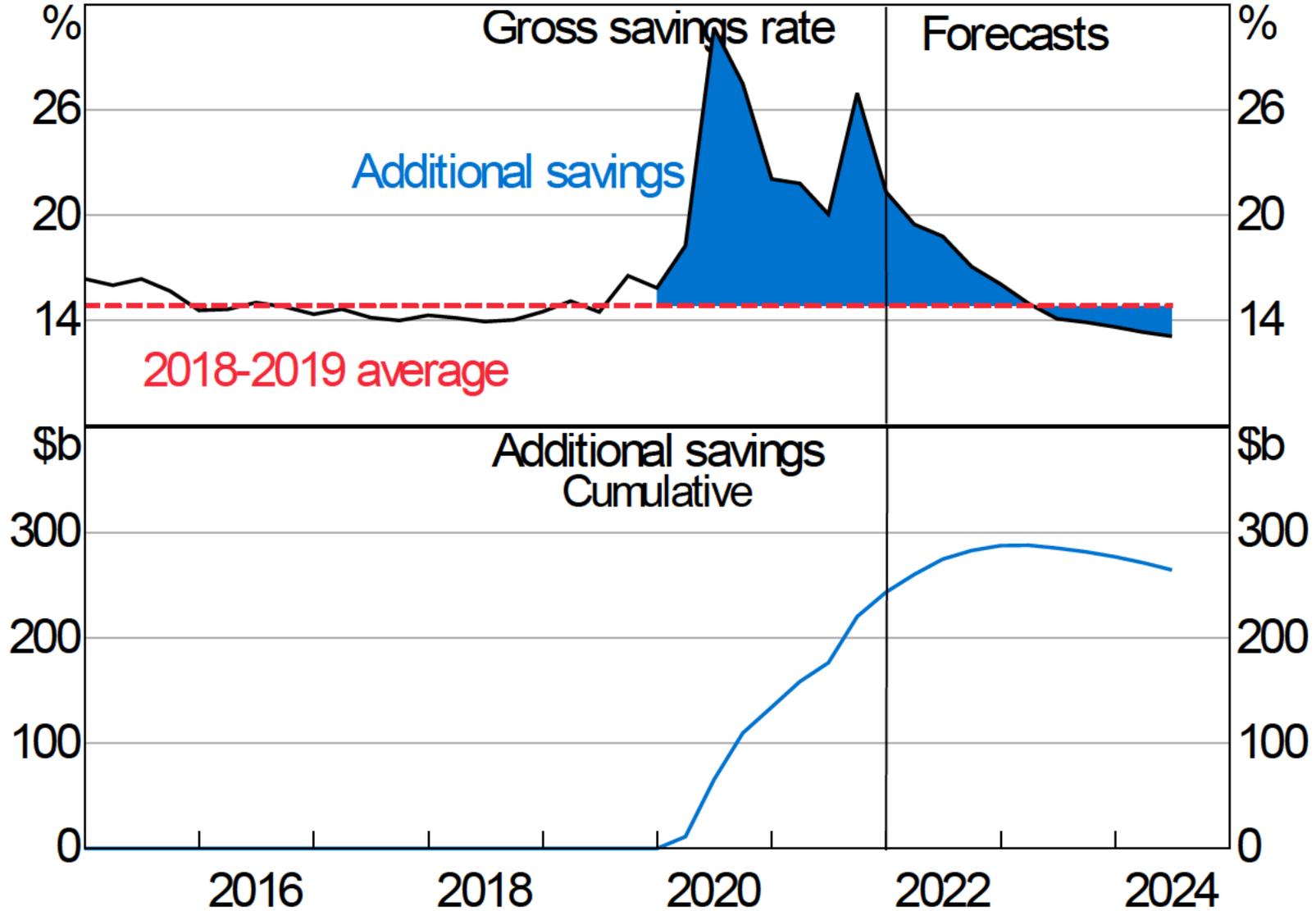
Sources: ABS; RBA

Household Net Wealth
Quarterly
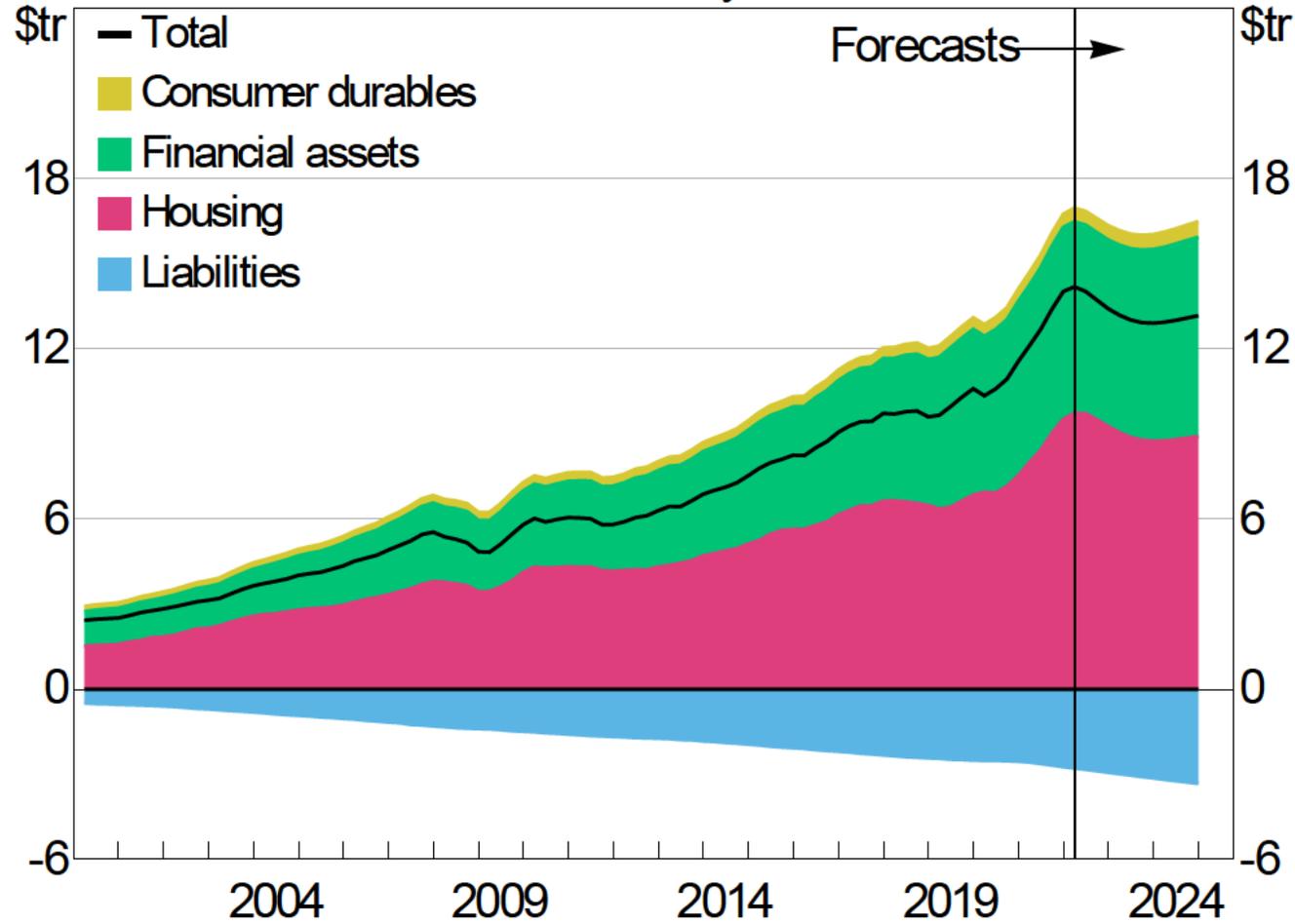
Sources: ABS; RBA

Consumption

Household Consumption Forecasts
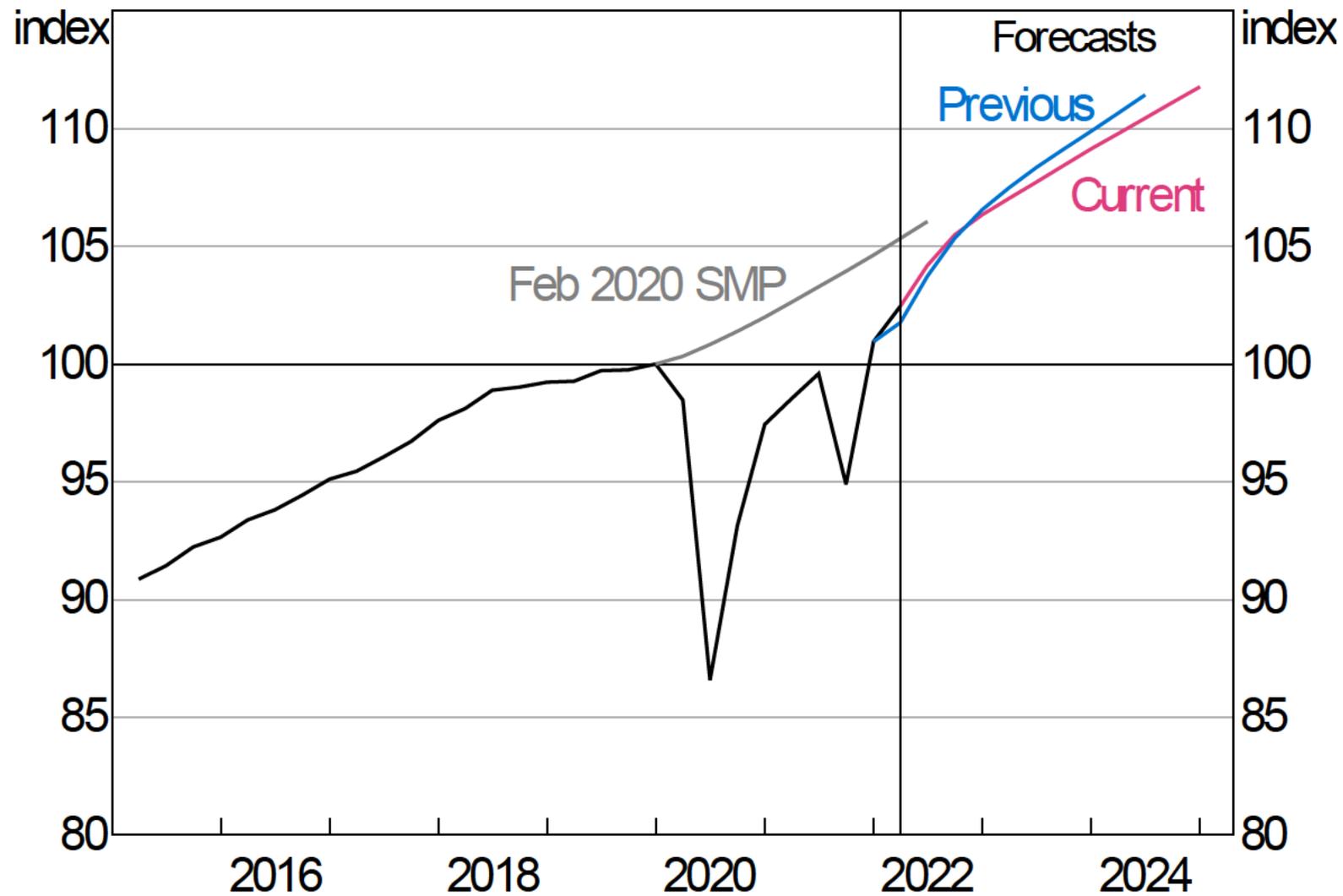
December 2019 = 100

Sources: ABS; RBA

Household Consumption

December 2019 = 100
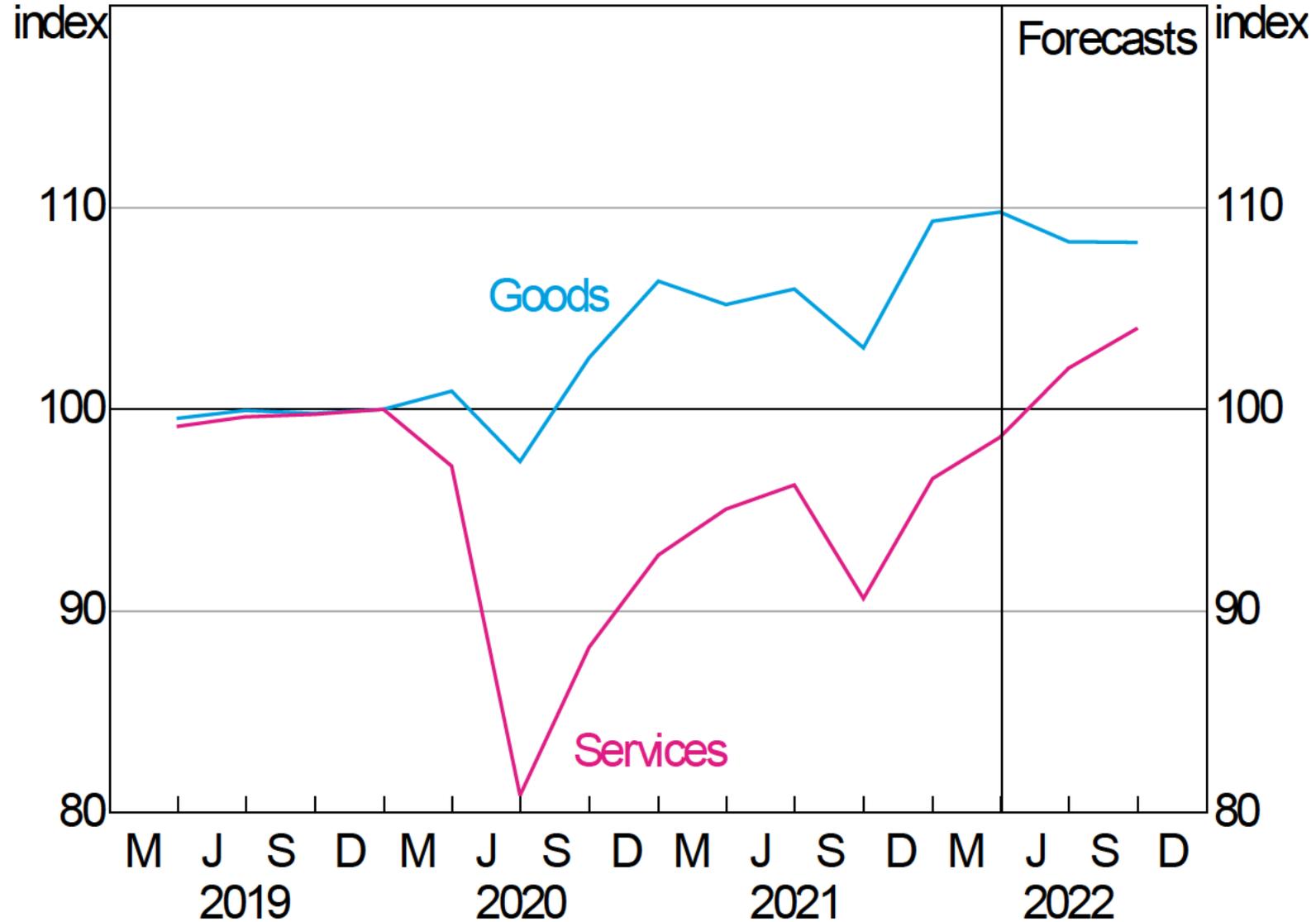
Sources: ABS; Miscellaneous sources; RBA

Household Consumption Growth
Quarterly with contributions

Forecasts

Total

Spending overseas*

Domestic spending
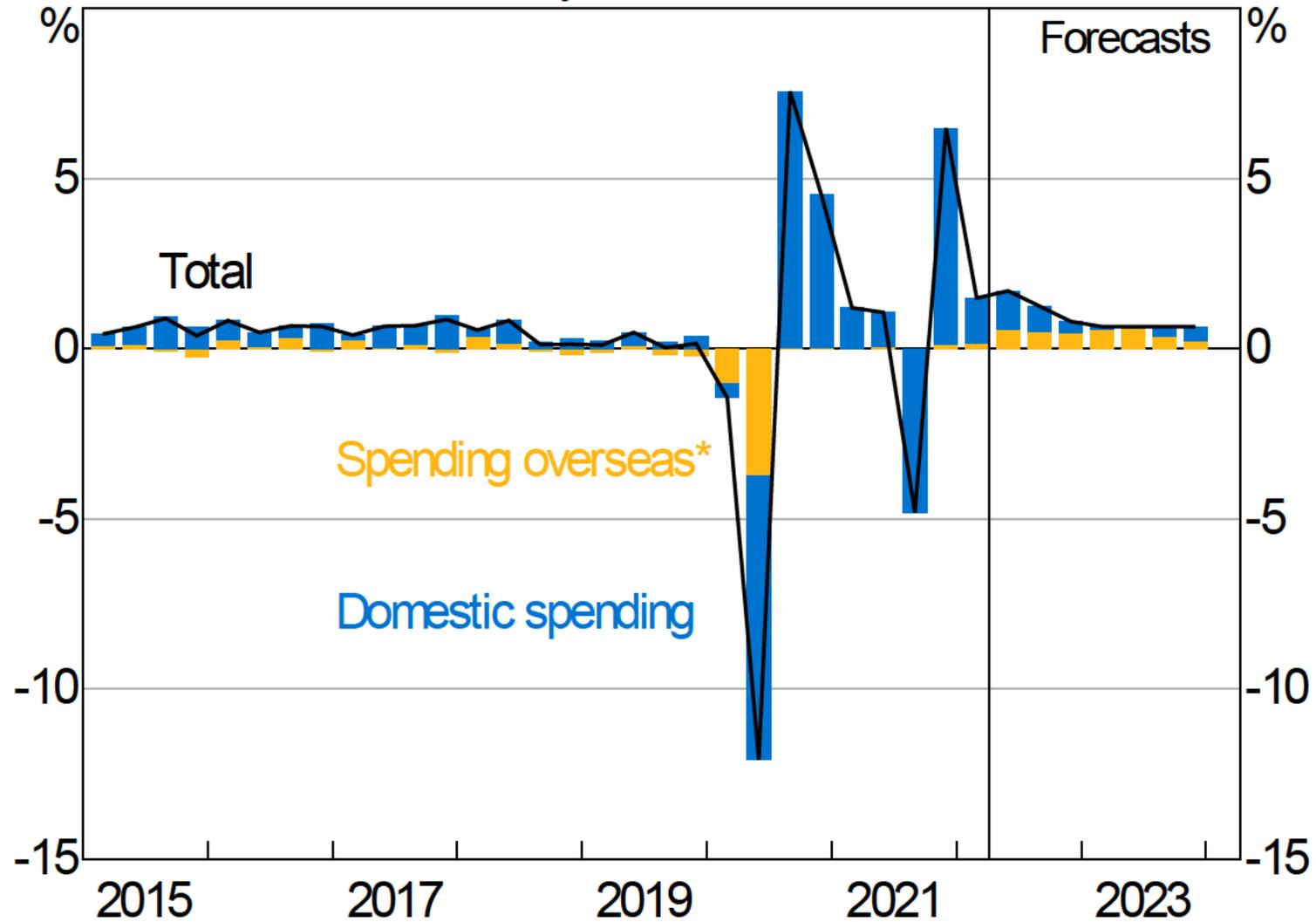
*   Personal travel and passenger transport services

Sources: ABS; RBA

Household Consumption Model Forecasts
December 2019 = 100
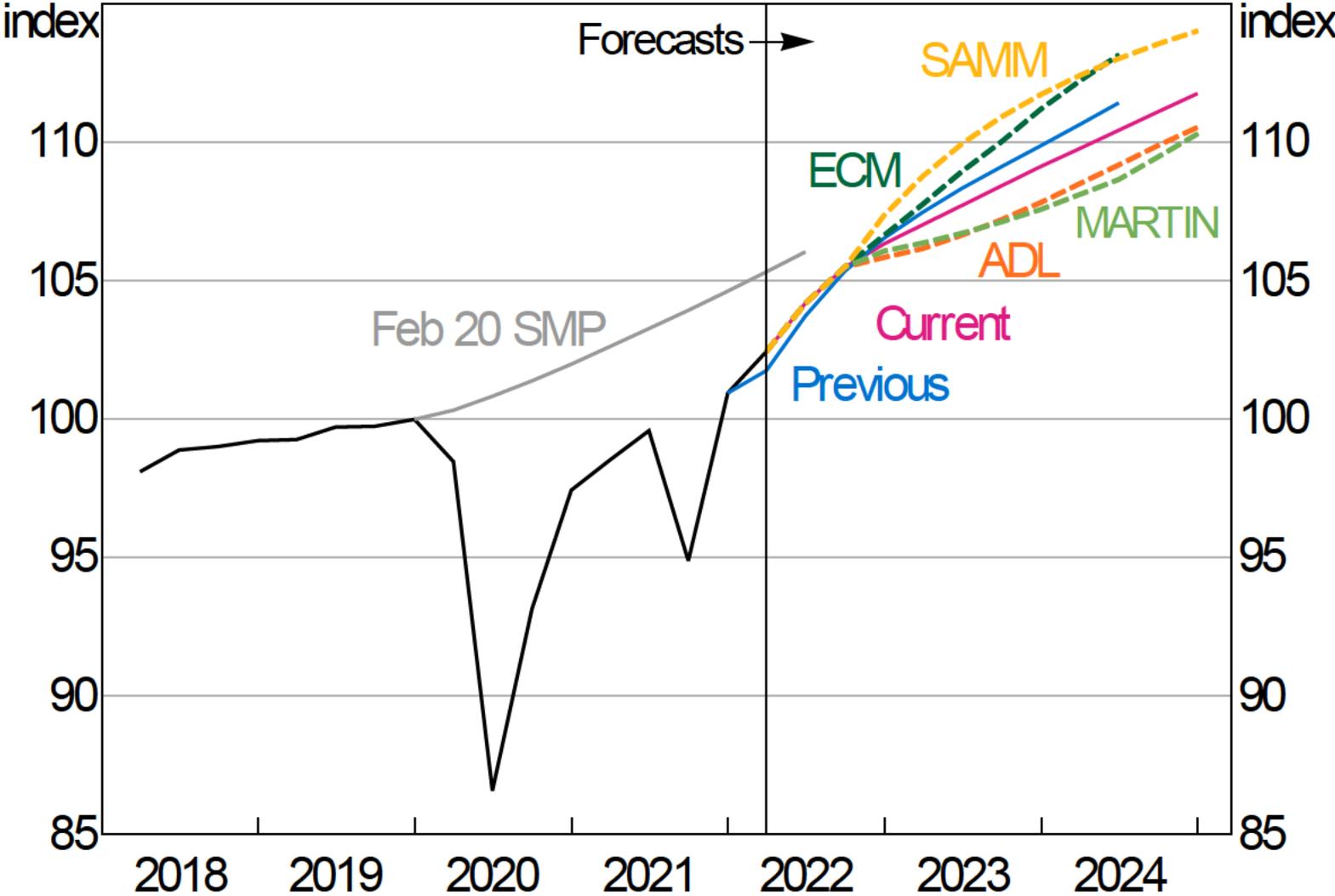
Sources: ABS; RBA

Household Consumption

Comparison to other forecasts; December 2019 = 100
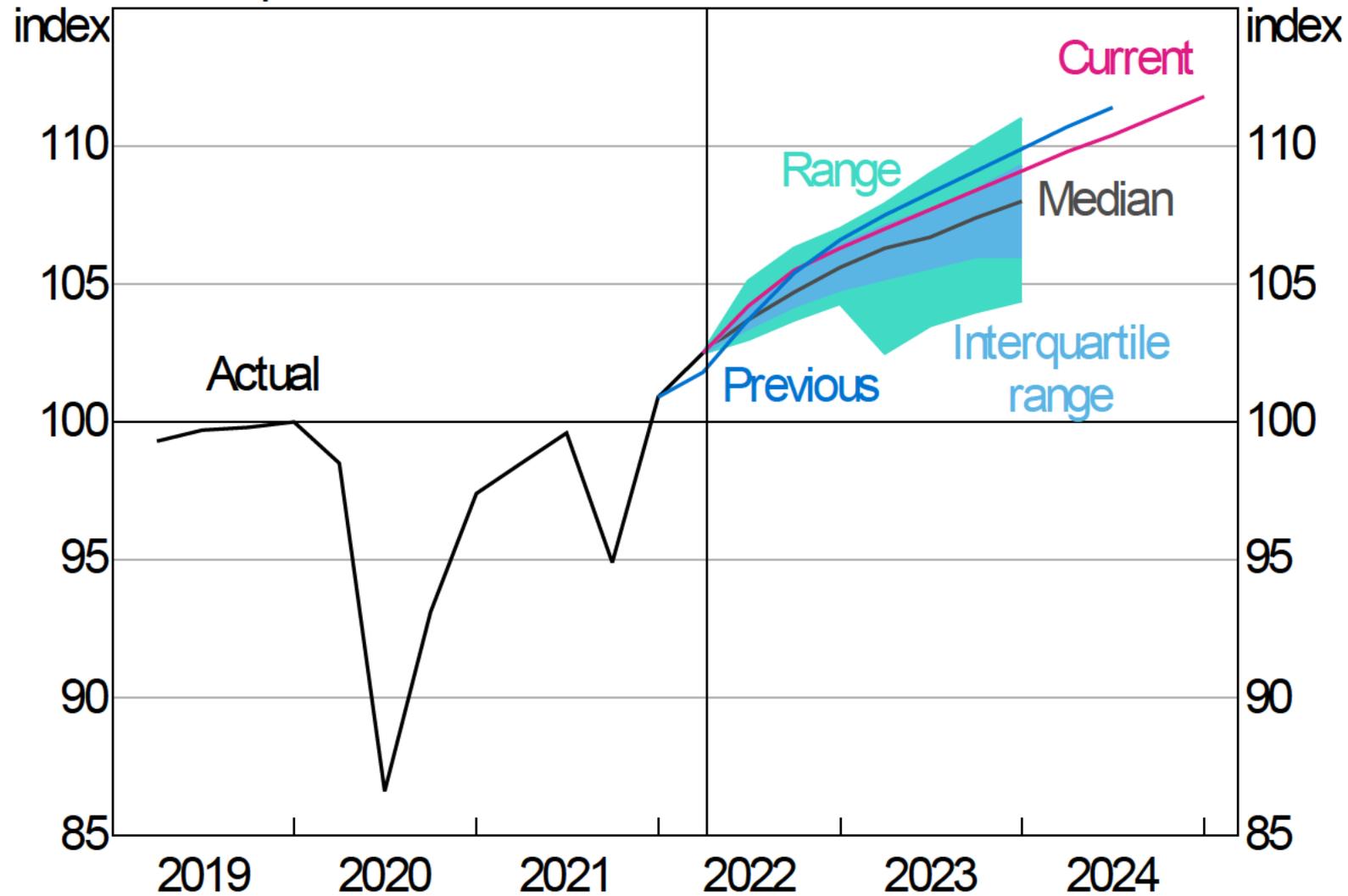
Sources: ABS; Bloomberg; RBA

Consumption Spares

Monthly Consumption Tracker
Real, deviation from December 2019
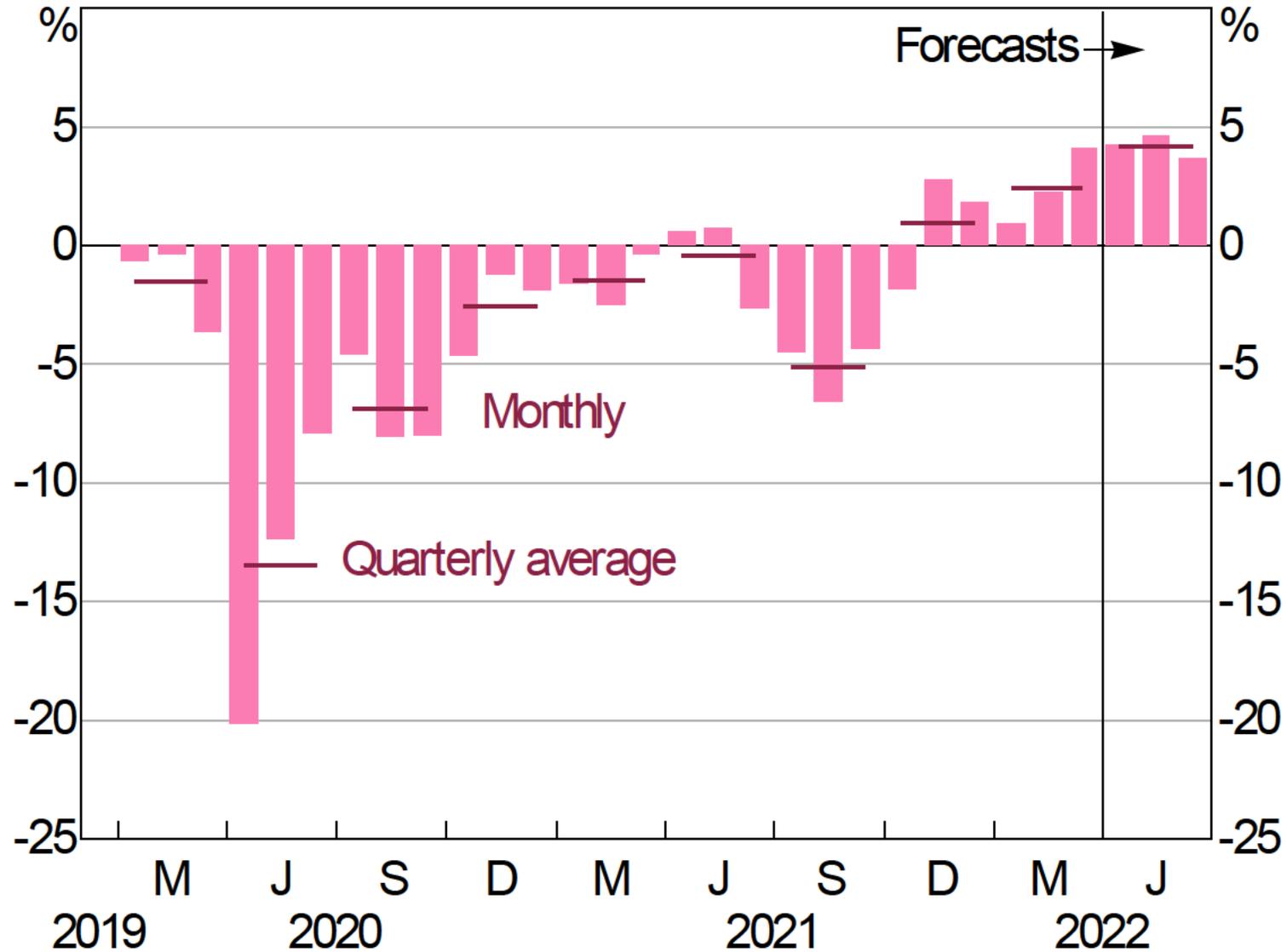
Source: RBA

Household Consumption Per Capita

Quarterly
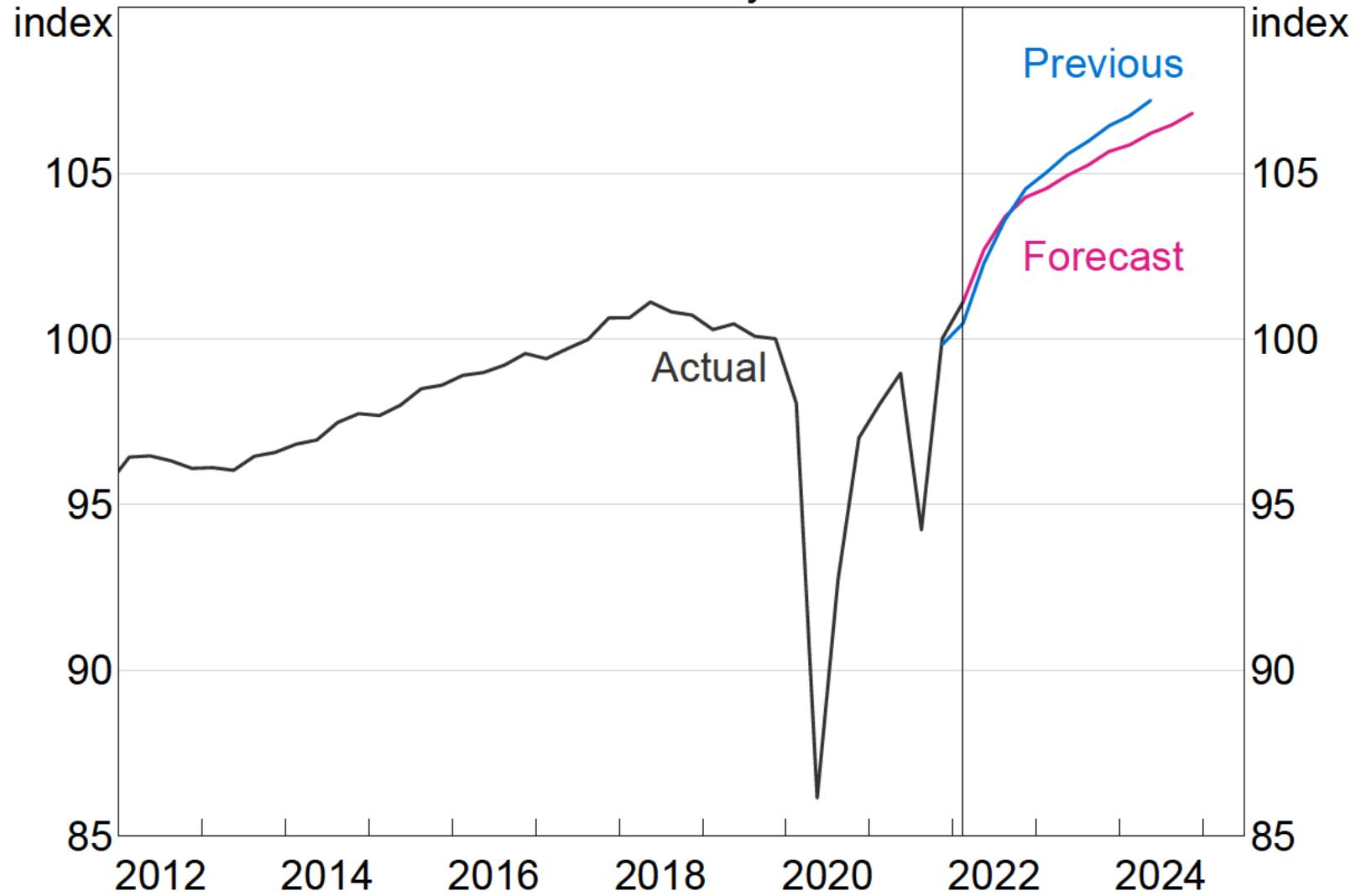
Sources: ABS; RBA

Household Consumption Growth
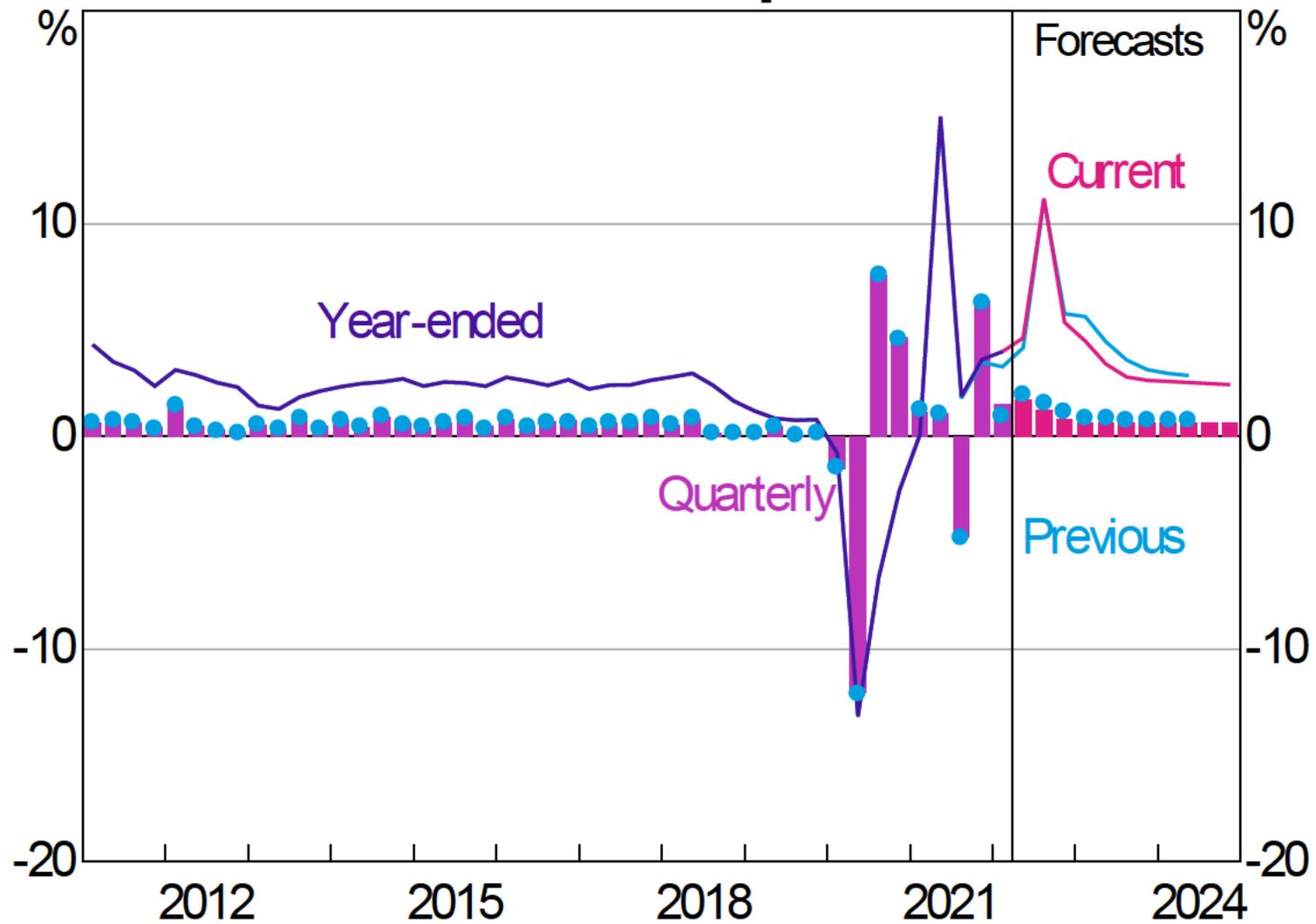
Sources: ABS; RBA

Household Consumption
Dec 2019 = 100

MARTIN

Current
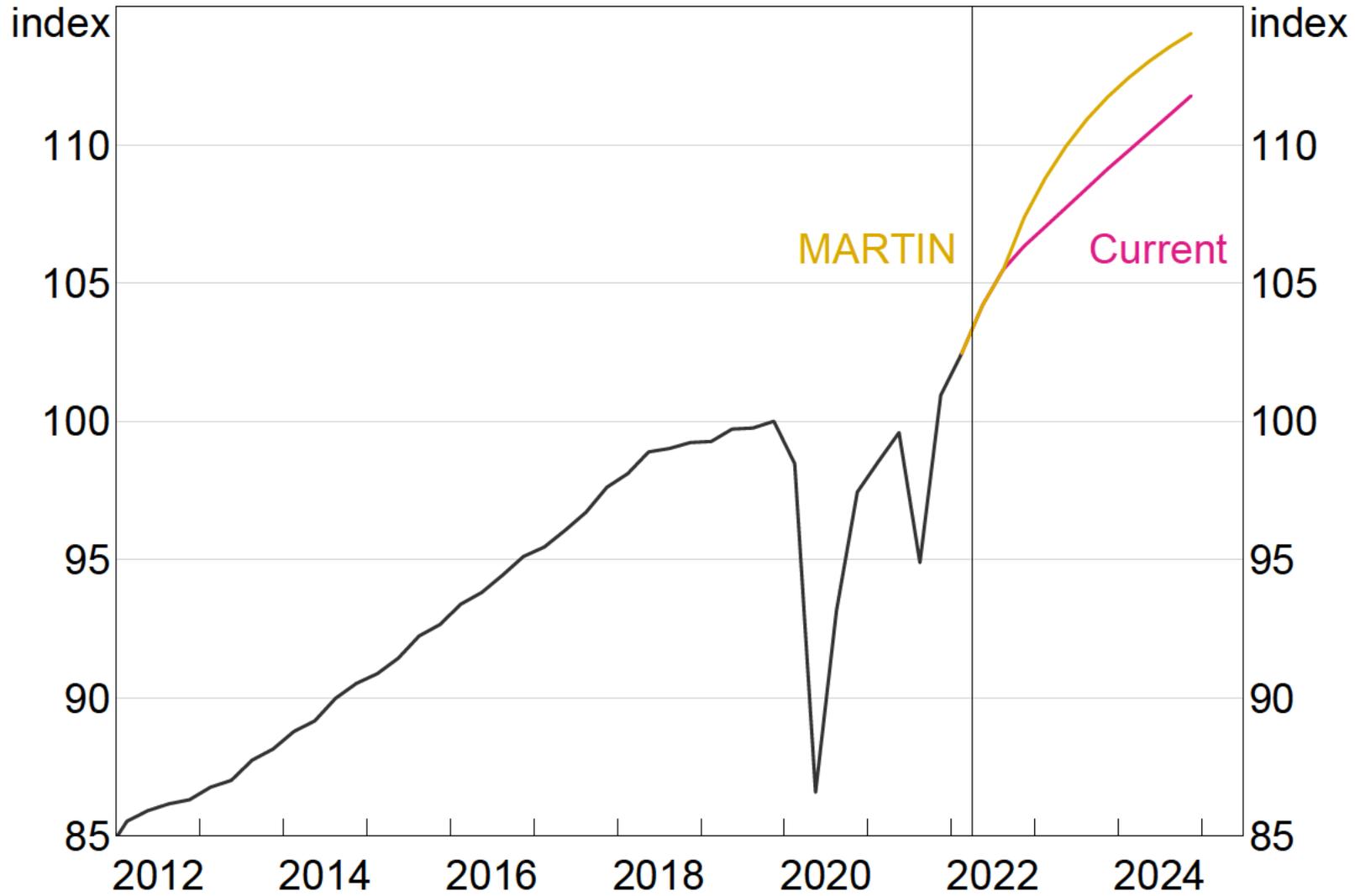
Sources: ABS; RBA

Household Consumption Growth
Year-ended with contributions
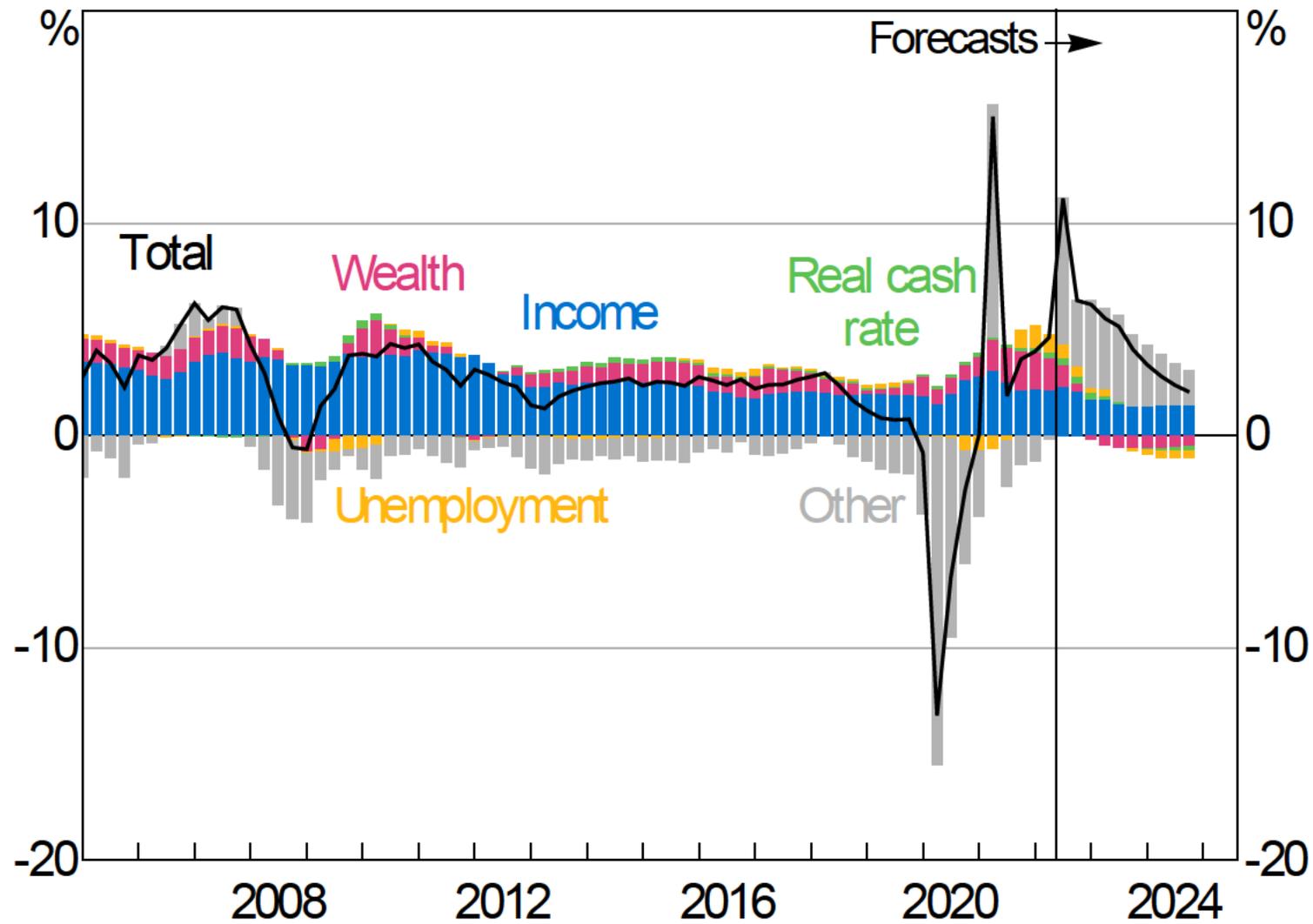
Sources: ABS; RBA

Session 2

Dwelling Investment

Dwelling Investment
Chain volume measure
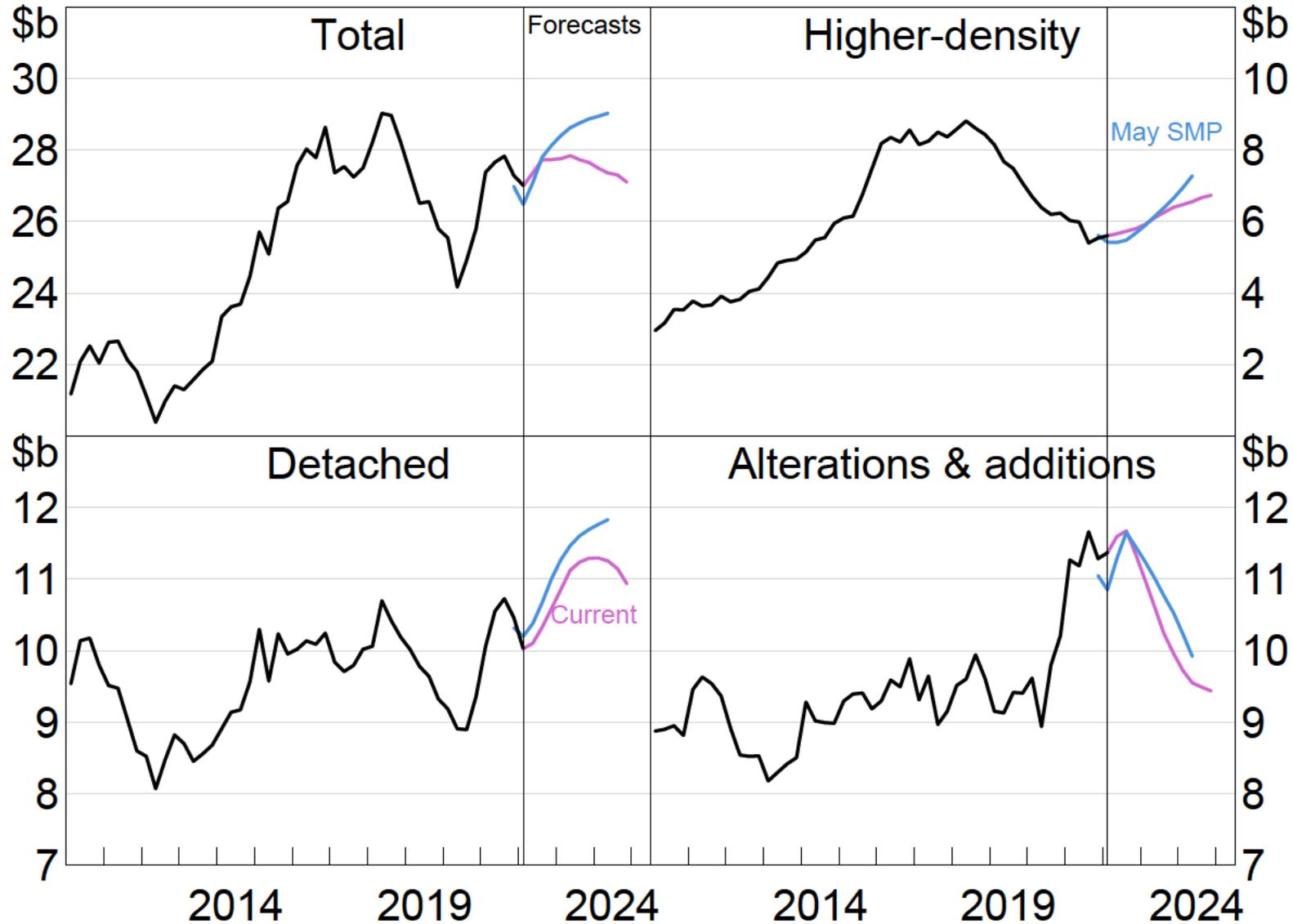
Sources: RBA; ABS

Summary of Preliminary Domestic Activity Forecasts – August 2022

The text in the grey boxes is intended to form Outlook, with additional information for each component below. The table of key judgments should be used to anchor discussions on Monday.

Overall Summary

The Australian economy is expected to grow strongly this year, with the pace of growth then slowing in the face of increasing headwinds. Activity growth in the near term is expected to be supported by robust growth in household spending and a recovery in services exports. Further ahead higher consumer prices, rising interest rates and declining housing prices are forecast to weigh on growth in private activity, while public demand growth also slows. The elevated terms of trade continues to provide a substantial boost to national income over the forecast period. GDP is forecast to grow by 3½ per cent over 2022, by 1¾ per cent over 2023 and by 1¾ per cent over 2024. The outlook for activity is somewhat weaker overall than three months ago. The key source of uncertainty for the domestic outlook is around how households, firms and asset prices will respond to higher inflation and interest rates.

Summary for Domestic Activity Section

The Australian economy is expected to grow solidly over the forecast period as whole, supported by growth in household consumption, a positive outlook for business investment, and a recovery in exports. Activity growth is expected to be strong this year as the tight labour market and resulting rapid labour income growth, along with the further normalisation of spending patterns, drives a continued expansion in household spending. Exports are also forecast to grow strongly in the next few quarters as travel and education services exports start to recover post-pandemic, and resource exports pick up after weather and maintenance disruptions. Activity growth is expected to slow over 2023 to below the growth rate of potential output. The slowing is broad-based and reflects the impact of rising headwinds to household spending; an expected slowing in housing activity as prices decline; a stabilisation of public demand at high levels after recent rapid growth; and a slowing in exports growth as the recovery in services exports nears completion.

Growth is now forecast to be somewhat weaker than anticipated three months ago. The downward revision is largest over 2022, reflecting in part that the recovery in services exports has proceeded more slowly than expected. Over the forecast period as a whole the downgrade reflects weaker consumption growth and a weaker outlook for dwelling investment as housing price falls gain momentum.

There are a number of key risks and uncertainties around the outlook for activity:

- *An ongoing uncertainty for the economy is the way governments, firms and households will respond in the event of further waves of COVID-19 that have widespread or severe health effects. While the reimposition of activity restrictions seems unlikely, widespread sickness and/or an increase in precautionary behaviour on the part of consumers could pose a downside risk to economic activity.*

- *Housing prices are now declining nationally, and the pace and extent of the eventual decline is a key uncertainty for activity. The effect of interest rate increases on housing prices is uncertain, especially given the high level of prices relative to incomes, and the evolution of sentiment can play an important role and potentially amplify the impact rising interest rates. Larger than expected falls in housing prices and hence household wealth would pose a downside risk to consumption. The outlook for residential construction is also sensitive to the path of housing prices, adding to the broader uncertainty associated with the end of the Homebuilder scheme.*

- *More broadly, the outlook for consumption is a key risk. On the upside, many households have built considerable savings buffers during the pandemic. If the willingness of households to spend from these liquid savings is higher than from other forms of wealth, consumption (or dwelling investment)*

would be stronger than expected. However, on the downside, consumption growth could be weaker than forecast if rising interest rates and inflation were to weigh on spending by more than anticipated. That could occur via larger than expected falls in house prices, as noted above, or falls in other asset prices. In addition, while many households would be well placed to absorb higher interest costs without sharp adjustments to spending, some households have low savings buffers and high debt relative to incomes, and their spending may fall more sharply than others. The additional pressure on household budgets from rising prices could exacerbate these downside risks to consumption, particularly for lower-income households.

_

Key judgment calls and assumptions	
Housing prices	Downward momentum in housing prices continues in the near term, including due to the higher cash rate path. Housing prices are 11 per cent lower than peak by mid-2023. Preferences for housing during the pandemic partly unwind. No additional prudential measures are announced.
Dwelling investment	Constraints on labour and materials are assumed to persist until mid-2023, and limit how fast the current pipeline of residential construction is worked through. A higher cash rate path and the decline in housing prices reduces demand for new housing.
Household consumption	Consumption has been downgraded driven by lower household income and wealth, reflecting a higher cash rate path, decline in housing prices and rising cost of living. The saving ratio declines across the forecast horizon to around pre-pandemic levels.

Household consumption, income and saving

Further out, consumption growth is forecast to moderate as rising prices and higher net interest payments weigh on real income growth, and declines in housing prices in some regions lower net household wealth. The household saving ratio is expected to decline over the forecast period to around its average level in the years leading up to the pandemic.

Household Consumption and Income
Nominal, quarterly

Sources: ABS; RBA
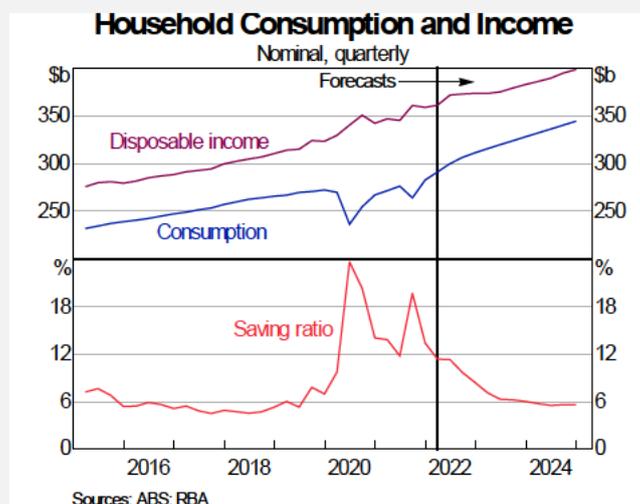
- **Household wealth** has been revised lower over the forecast horizon. In the June quarter this reflects recent falls in equity prices, but beyond this the main driver is the downgrade to wealth from lower housing prices.

Demand for new dwellings has eased after strong growth over the past few years, but a large pipeline of residential construction work is anticipated to sustain activity over the next year or so. Capacity constraints and poor weather in eastern Australia have led to longer construction times, which will limit the pace of work in the near term. Rising costs have compressed margins on fixed-price contracts, and the increased risk of insolvency for builders has added to expected delays. Prospects for higher density residential projects are expected to improve following the decline in vacancy rates in Sydney and Melbourne and the reopening of the international border.

Construction Pipeline
Nominal, projects already commenced
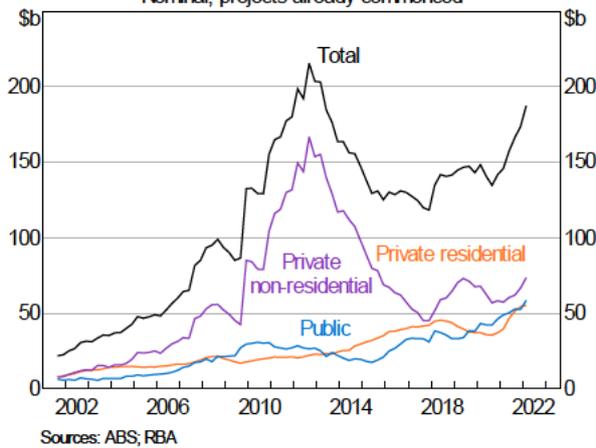
Sources: ABS; RBA

Investment
Real, year-ended growth to December quarter with contributions

*   Includes ownership transfer costs, net purchases of second-hand assets, and other items.

Sources: ABS; RBA
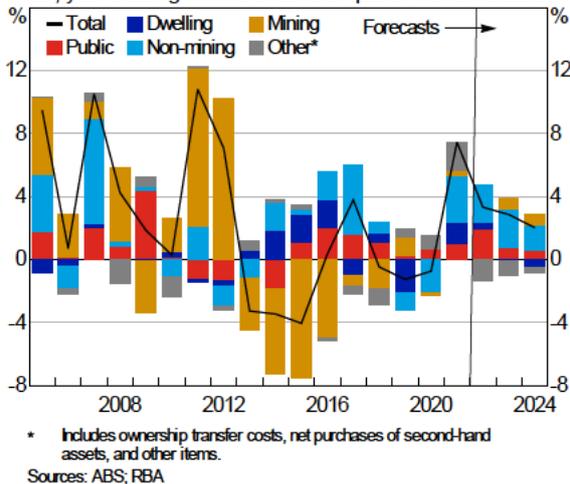
Housing activity detail:

- The profile for **housing price** growth has been downgraded. Housing prices unexpectedly declined in the June quarter, and the higher path for interest rates has pushed down the profile relative to the previous *Statement*. In addition, we have applied some downward judgement to our housing price profile to reflect downward momentum in the housing market. Housing prices are now expected to decline by 11 per cent by mid-2023.

- **Ownership transfer costs** are expected to decline in the June quarter, and subtract from activity over the remainder of the profile as housing market turnover moderates. The profile is lower in levels terms

from the previous *Statement*, due to a lower starting point and expectations of larger declines in housing prices.

• **Dwelling investment** has been revised lower. Binding capacity constraints, which are expected to last until mid-2023, are now expected to limit the rate of growth and the level of dwelling investment. Strong growth in labour and materials costs are expected to compress margins and increase the risk of insolvencies. Flood repair works will add to the pipeline of work for alterations and additions, but are not expected to add to growth in the near term as capacity constraints bind. Further out, dwelling investment growth declines reflecting the higher cash rate path and declines in housing prices.

Housing prices
Nominal, quarterly growth

Sources: Corelogic; RBA

Dwelling Investment
Chain volume measure

Sources: RBA; ABS

Private Investment
Quarterly growth, with contributions

Sources: ABS; RBA
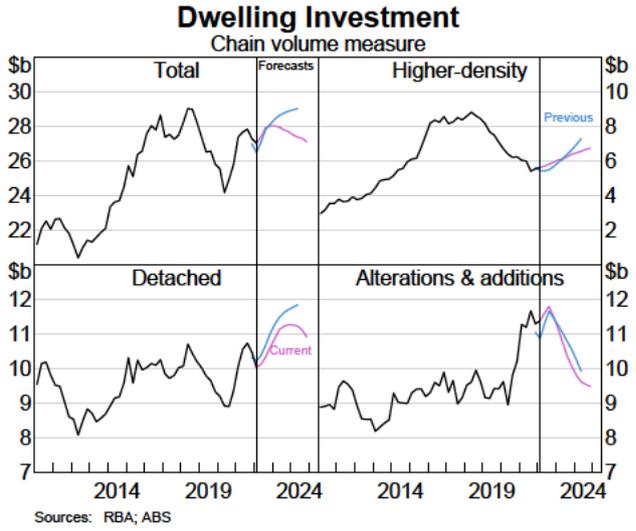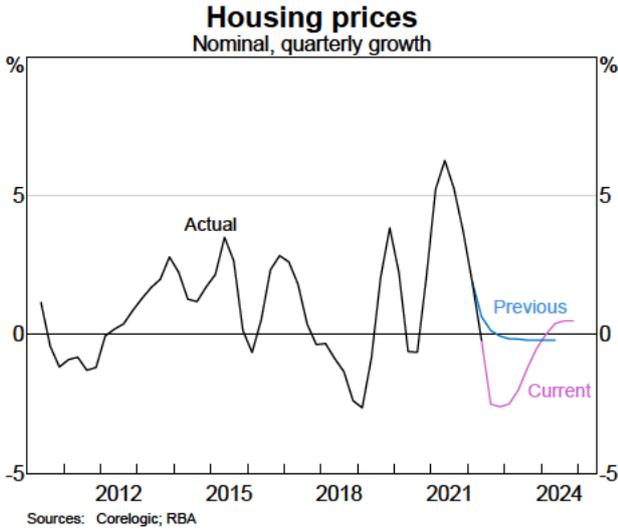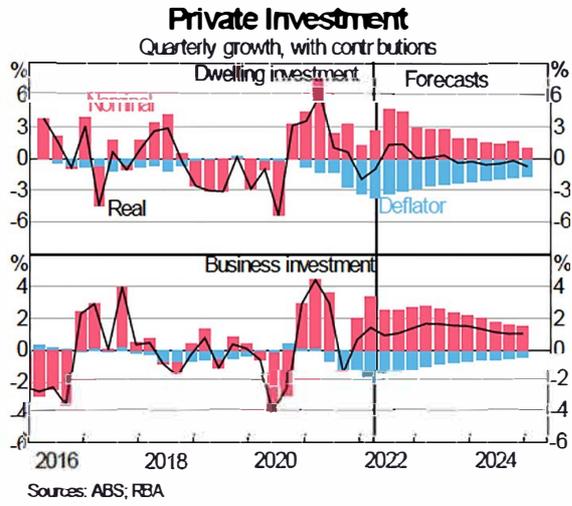
Domestic Activity & Trade
15 July 2022

HOW DO CHANGING INTEREST RATES AFFECT MORTGAGE REPAYMENTS FOR NEW LOANS?[1]

A change in interest rates directly affects a household's mortgage payments, but also has an opposing indirect effect on mortgage payments for new loans due to the effect of interest rates on housing prices. Combining a user-cost model with the standard mortgage repayment formula implies that the long-run indirect effect of real rates, via prices, more than offsets the direct effect of rates on repayments. This framework suggests the downward trend in real mortgage rates since the 1990s has increased mortgage payments for new buyers, as the upward effect through prices has outweighed the direct effect of lower rates. That said, the user-cost approach is at the upper end of empirical estimates of the responsiveness of prices to mortgage rates. A less responsive pricing model, which assumes prices are set so that a fixed fraction of income is spent on mortgage payments over time, fits the price data about as well as the user-cost model. In any case, the short-run effect of rate changes on mortgage payments for new loans is quite different to the long-run effect. Because the effect of rates on mortgage payments is immediate and the price response takes time, the rate effect dominates in the short-run. The currently unfolding rise in mortgage rates will make servicing new loans harder, before the negative price effect takes hold over time.

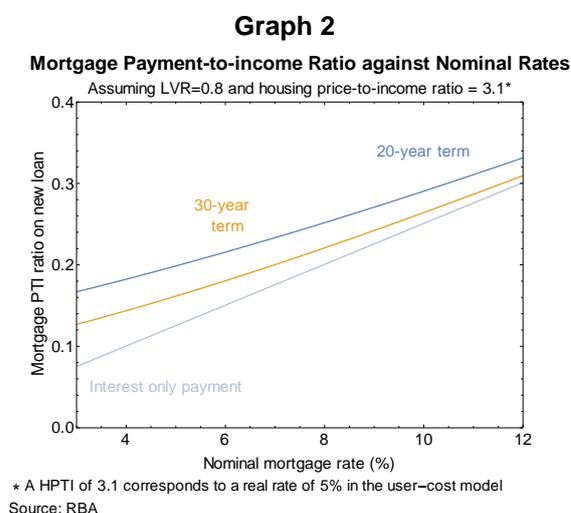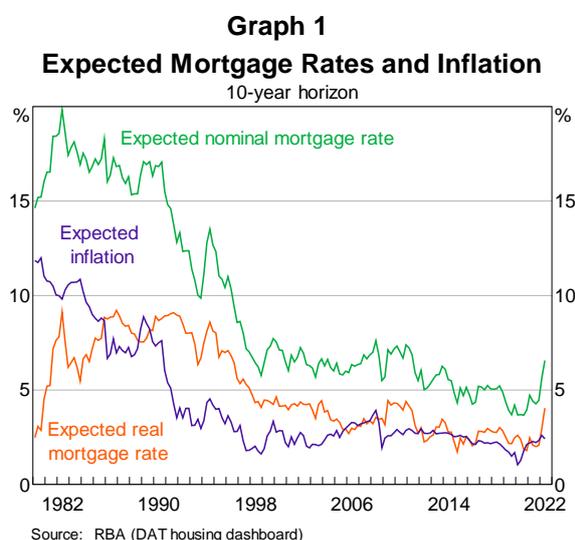## Nominal rates, real rates and mortgage serviceability

Changes in nominal interest rates, holding prices and incomes constant, have a clear mechanical relationship with mortgage serviceability at origination, taken as the mortgage payment to income ratio (MPTI). This relationship has been considered extensively in the context of the early 1990s disinflation, where nominal rates and inflation expectations fell sharply, but real rates fell by less (Graph 1).[2] As pointed out in Stevens (1997), a fall in nominal rates with a constant real rate need not change prices so it can be reasonable to interpret lower nominal rates as an easing of mortgage serviceability constraints (Graph 2). Equation 1 shows the MPTI formula for a credit foncier mortgage at origination (i is the nominal mortgage interest rate, T is the loan term and LVR is the loan-to-valuation ratio).

$$\frac{Payment}{Income} = \frac{LVR * Price * i(1+i)^T}{Income[(1+i)^T - 1]} \tag{1}$$

Graph 1
Expected Mortgage Rates and Inflation
10-year horizon

Source: RBA (DAT housing dashboard)

Graph 2
Mortgage Payment-to-income Ratio against Nominal Rates
Assuming LVR=0.8 and housing price-to-income ratio = 3.1*

* A HPTI of 3.1 corresponds to a real rate of 5% in the user–cost model
Source: RBA

Changes in real rates are more complicated because the real mortgage rate is a key determinant of house prices. As noted in La Cava, Leal and Zurawski (2017), a fall in real rates has the direct effect of lowering mortgage payments but any rise in prices opposes that effect. To model the net effect on new mortgages, I augment the mechanical analysis of the effect of interest rates on mortgage repayments with a user-cost model of prices. This note focusses on serviceability of new lending; for analysis of the effect of mortgage rates on existing borrowers see Gao, A (2022).

Mortgage serviceability according to the user-cost model

I use the national user-cost model in Fox and Tulip (2014), following the method in [Evans and Lancaster (2021)](#). The components of the user-cost of housing (expressed as a fraction of price) are the expected real mortgage rate over the next 10 years (r), running costs (c), annualised transaction costs (s), depreciation (d), minus expected real capital gains (π). I make the additional assumption that households spend a constant share of income on housing costs (Equation 2). This assumption allows me to map the user-cost model to a price to income ratio (Equation 3).

$$Price^{UC} = \frac{Rent}{r + c + s + d - \pi} = \frac{s^{UC} * Income}{r + c + s + d - \pi} \tag{2}$$

$$\Rightarrow \frac{Price^{UC}}{Income} = \frac{s^{UC}}{r + c + s + d - \pi} \tag{3}$$

I combine the user-cost housing price-to income ratio (HPTI) equation with the MPTI calculation in Equation 1 to express the MPTI as a function of the real interest rate and calibrated parameters (Equation 4). For the comparative statics in Graphs 3, 4 and 7, I set all other elements of the user cost at their average rates since 1980 (Equation 5). I set the share of income spent on the user cost to the average of the rental yield used in the user-cost model multiplied by the aggregate housing-price-to-income ratio.[3]

$$\frac{Payment^{UC}}{Income} = \frac{s^{UC} * LVR * i(1 + i)^T}{(r + c + s + d - \pi)[(1 + i)^T - 1]} \tag{4}$$

$$\frac{Payment^{UC}}{Income} = \frac{0.185 * LVR * i(1 + i)^T}{(r + 0.9\%)[(1 + i)^T - 1]} \tag{5}$$

Graph 3 shows this convex negative relationship of steady-state HPTI ratios with the long-run real mortgage rate for the calibrated user-cost model. The strong price effect more than offsets the direct effect of mortgage rates on serviceability, so the net effect of a reduction in the real mortgage rates is to increase the MPTI ratio in this model (Graph 4).[4]

Graph 3
Price-to-income against Real Rates
Pricing based on user-cost model

Source: RBA

Graph 4
Mortgage Payment-to-income Ratio against Real Rates
Assuming user-cost pricing, with inflation = 2.5% and LVR= 0.8

Source: RBA
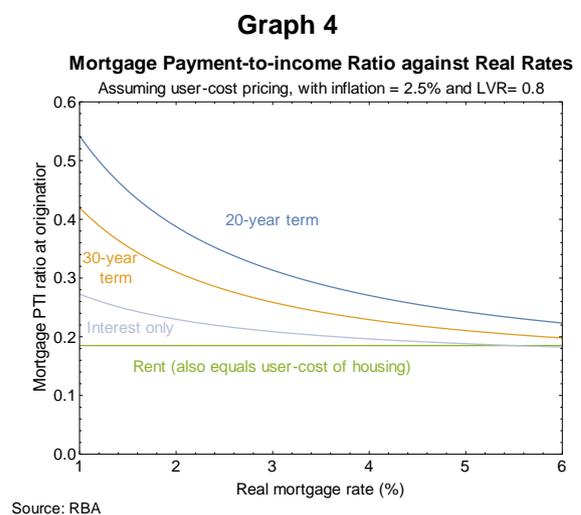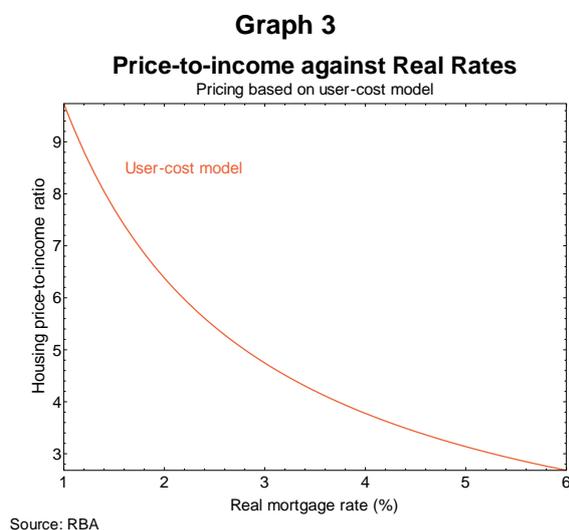
This steady-state relationship between interest rates and MPTI ratios does not consider how the effect of a rate change unfolds over time. In practice the direct effect of a rate change on new mortgage payments is immediate, while the indirect effect that operates via prices is more gradual. To quantify this process I combine the steady-state model with dynamics from [Saunders and Tulip (2019)](#). Given the current focus on rising long-run rates after decades of decline, I illustrate the effects of a 100 basis point increase in the mortgage rate from 2.5 to 3.5 per cent, assuming the model starts in equilibrium. Prices gradually decline

---

3   The 18.5 per cent average is lower than the actual share of rent paid among renters, which is around 27 percent. Lower income households tend to rent and to spend a larger share of income on housing ([La Cava, Leal and Zurawski (2017)](#))
4   The calibration of Graph 4 can be manipulated in a Mathematica notebook: [D22/74323](#)

toward their new steady state level, 22 per cent lower than the pre-shock level (Graph 5). The immediate effect is to increase mortgage payments, as interest rates rise before prices respond (Graph 6). As prices gradually fall, the indirect effect on the MPTI begins to dominate. After 6 quarters prices have fallen enough to bring the MPTI ratio back to its pre-shock level, with further declines towards its new steady-state level, almost 4 per cent of income below its pre-shock level. Gao, R (forthcoming) will analyse the effects of more realistic and varied outlooks for mortgage rates and user costs on housing prices.

Graph 5

Effect of 100bp Rise on Housing Prices*

Housing price to income ratio

Ratio

Dynamic response**

5.25

5.00

4.75

4.50

Steady-state response

4.25

4.00

0   4   8   12   16   20   24

Quarters after rate rise
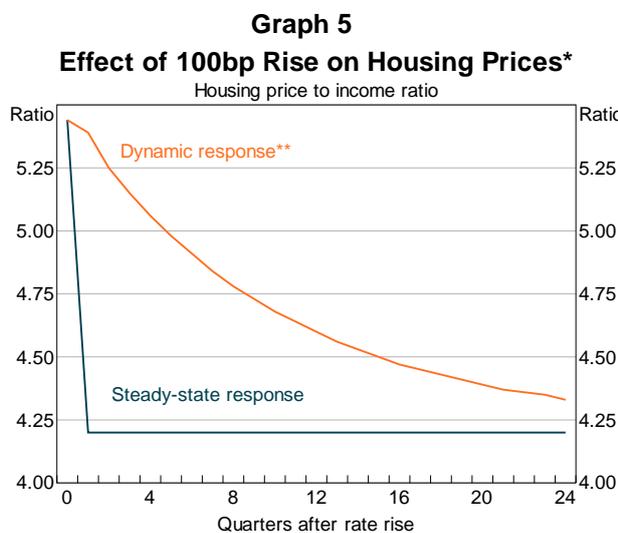
* Permanent rise in real mortgage rate from 2.5% to 3 5%.
** Speed of adjustment to steady state is based on the housing price ECM in Saunders and Tulip (2019)
Source: RBA

Graph 6

Effect of 100bp Rise on Mortgage Serviceability*

Mortgage payment-to-income ratio for new loans

Ratio

Dynamic response**

0.30

0.28

0.26

Steady-state response

0.24

0   4   8   12   16   20   24

Quarters after rate rise

* Permanent rise in real mortgage rate from 2.5% to 3 5%. Inflation is 2 5%
** Speed of adjustment to steady state is based on the housing price ECM in Saunders and Tulip (2019)
Source: RBA

Alternative pricing model: Fixed mortgage payment vs user-cost model

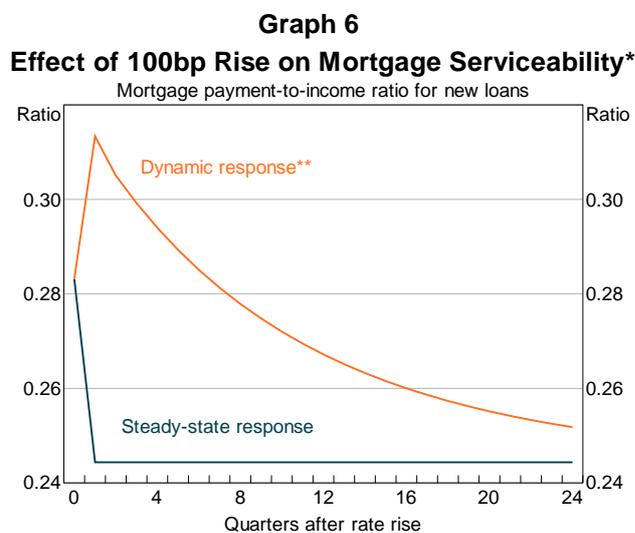The user-cost model is a popular approach among many economists, but it arguably overstates the sensitivity of housing prices to interest rates.[5] Other economists (and many non-economists) emphasise mortgage payment and deposit constraints as determining prices. In this section I compare the user-cost model with a fixed-MPTI pricing model. That is, I assume households spend a fixed fraction of their income at origination on their mortgage payment (Equation 6). This model rules out any long-run effects of rate changes on mortgage serviceability, but it provides a useful benchmark to compare the sensitivity of house prices to interest rates in the user-cost model. I combine the fixed-MPTI assumption with the MPTI formula in Equation 1 to determine the equilibrium HPTI ratio (Equation 7). This is an aggregate model, so I use the average historical MPTI on new mortgages of 25 per cent, as described in La Cava, Leal and Zurawski (2017).[6]

$$\frac{Payment}{Income} = s^{FMPTI} = 0.25 \tag{6}$$

$$\frac{Price^{FMTPI}}{Income} = \frac{s^{FMPTI} * [(1 + i)^T - 1]}{LVR * i(1 + i)^T} \tag{7}$$

I use the expected 10-year average nominal mortgage rate in the servicing calculation (i.e. the real rate in the user-cost model with inflation expectations added back in). This is the equivalent concept to the user-cost model so helps compare the two models. Further, the forward-looking rate may proxy for interest rate buffer requirements of lenders and regulators, as well as household expectations.

The fixed-MPTI model implies prices rises as rates fall, although not as steeply as in the user-cost model (Graph 7). Implicitly this means prices set by the fixed-MPTI model would be viewed by the user-cost model as 'overvalued' at high mortgage rates and 'undervalued' at low mortgage rates. Graph 1 in in Evans and Lancaster (2021) (Graph 8 below) shows the user-cost model views housing as mostly overvalued before the mid 2000s and undervalued since then as mortgage rates have fallen.


5   For example Liu, Lucca, Parker & Rays-Wahba (2021), which compares the semi-elasticity of house prices to interest rates implied by a user cost model to empirical estimates.

6   This is calculated using actual data for the mean house price to income ratio and a hypothetical mortgage with an LVR of 0.8 and a term of 25 years (see Graph 10).

Graph 7

Price-to-income against real mortgage rates

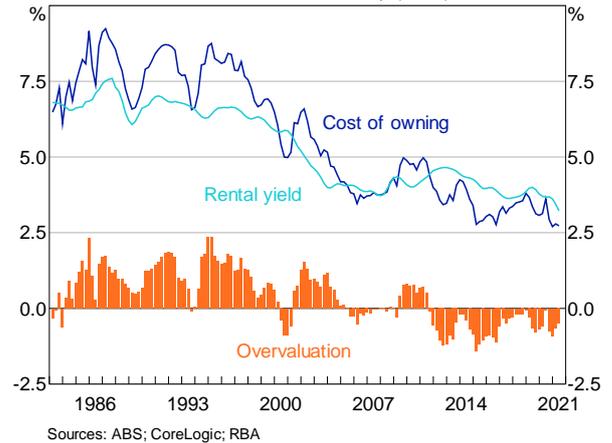Comparing pricing models, assuming inflation=2 5%, LVR=0.8
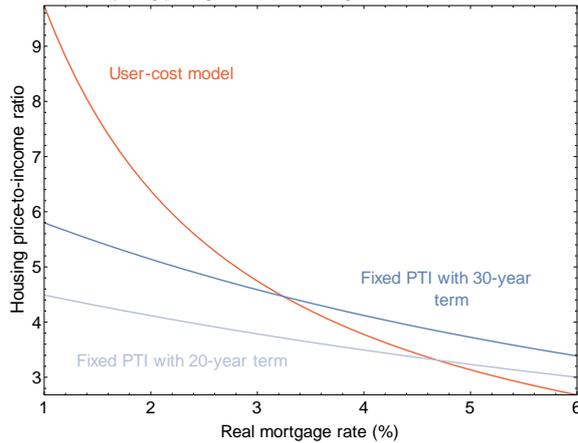
Source: RBA

Graph 8[7]

Cost of Owning and Renting

Based on Saunders & Tulip (2019)

Sources: ABS; CoreLogic; RBA

Despite these different pricing gradients against the real rate, both the fixed-PTI and user-cost model do a decent job at tracing out the long-run increase in the aggregate housing price-to-income ratio (HPTI) since the early 1980s (Graph 9).[8] Nominal rates have fallen more than real rates over this period, so the shallower gradient of the fixed-MPTI model compared to the user-cost model is partly offset by the larger movements in nominal rates compared to real interest rates.

Graph 9

Housing Price-to-income Ratios
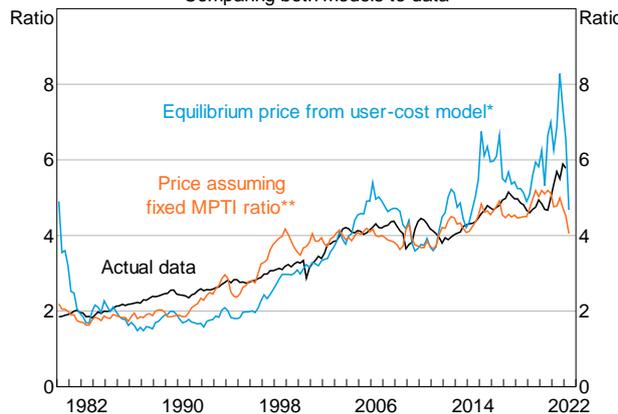
Comparing both models to data

*   Uses inputs from DAT housing dashboard and assumes 18.5% of
     income spent on user-cost

**   Assumes mortgage payment-to-income ratio of 25%, with 0.8 LVR
     and 25-year term

Sources: ABS; CoreLogic; RBA

Graph 10

Mortgage Payment-to-income Ratios*
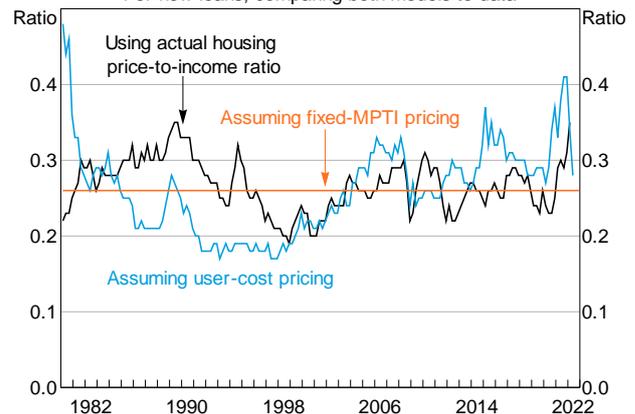
For new loans, comparing both models to data

*   Each mortgage payment series uses a different housing price-to-income
     series and assumes a 0 8 LVR at origination and 25-year term

Sources: ABS; CoreLogic; RBA

The changes over time in the modelled HPTI ratios from the user-cost and fixed-MPTI methods are determined by the real and nominal mortgage rates (Graph 9). The upward trends in the models are not calibrated, flowing directly from the decline in rates shown in Graph 1. The user-cost income share of 18.5 per cent is set to match the average rental yield in the user-cost model, which means the average price level is inherited from the average fit of the user-cost model. For the fixed-MPTI model, the 25 per cent income share spent on mortgage payments is set to match the average of the actual HPTI data (Graph 10). Changing either share would scale the HPTI series linearly.

The biggest differences between the two models are during the period of high inflation expectations in the 1980s, when real and nominal interest rates diverged, and recently when real rates were very low. During the early 1980s inflation expectations (and thus real rates) were much harder to measure and the more regulated mortgage market may mean the user-cost model is less suitable for that period. More recently the

---

7   Graph 1 in Evans and Lancaster (2021).

8   I ran some preliminary regressions that suggest replacing the user-cost cost model with the fixed-MPTI model in the long-run part of the pricing equation in Saunders and Tulip (2019) slightly improves the fit.

very strong response of prices at low rates in the user-cost model (see Graph 7) has been suggesting prices much higher than the data or fixed-MPTI model. Whether this is attributable to slow price adjustment or a misspecified model is hard to say.

Conclusion

The user-cost model suggests that the general equilibrium effect of changing mortgage rates on prices – combined with credit foncier mortgages – more than offsets the direct effect of mortgage rates on the serviceability of new mortgages in the medium term. However, aggregate data suggest the response of housing prices implied by the user-cost model might be too strong, with a fixed-MPTI model explaining the run-up in prices at least as well. The gradual response of housing prices to mortgage rate changes means that in the short run the direct effects of rates dominate. The current period of rising rates is likely to increase MPTIs on new lending in the short term.

Modelling serviceability, constraints and liquidity in aggregate can only get you so far.   and I are currently exploring this same issue in a heterogeneous agent framework that can consider realistic distributions of income and wealth. That model will consider owning vs renting decisions and equilibrium prices in a dynamic setting so will also be able to consider deposit constraints, which I have not covered in this note.

Frameworks and Macroeconomics (FAM)
Economic Research Department
21 July 2022

References

[Ellis (2021)](#), Opening Remarks to the Inquiry on Housing Affordability and Supply in Australia

[Evans and Lancaster (2021)](#) Is There Evidence that Australian Housing is Overvalued, EC Note

[Fox and Tulip (2014)](#), Is Housing Overvalued, RDP 2014-06

[Gao, A (2022)](#). The Impact of Interest Rate Rises on Mortgage Repayments

[La Cava, Leal and Zurawski (2017)](#), Housing Accessibility for First Home Buyers, RBA Bulletin December

[Liu, Lucca, Parker & Rays-Wahba (2021)](#), The Housing Boom and the Decline in Mortgage Rates, Liberty Street Economics

[Saunders and Tulip (2019)](#), A Model of the Australian Housing Market, RDP 2019-01

[Stevens (1997)](#), Talk to the Real Estate Institute of Australia Conference on 'New Horizons for Property', 8 October Canberra

Data Appendix

I use the same data for the user cost model as in [Evans and Lancaster (2021)](#). The HPTI data series is Gertrude series [AUP30005960.RSF](#), which is the mean housing price from CoreLogic divided by disposable income per household from the ABS (including unincorporated businesses income; after tax and before deductions for interest payment).

From:
Sent: Thursday, 21 July 2022 9:57 AM
To: ELLIS, Luci
Cc:
Subject: RE: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans?

Hi Luci, I'll just copy here the result I mentioned yesterday because it's buried a bit deep in the note. Graph 9 below shows both the user-cost model and the assumption that people have an LVR of 80% with 25% of income for mortgage servicing give similar price trends. The elasticity of prices to real rates is higher in the user costs model, but because nominal rates have fallen by more than reals the differences almost cancel out.

Graph 9
Housing Price-to-income Ratios
Comparing both models to data

(Chart showing three lines from 1982 to 2022: "Equilibrium price from user-cost model" (light blue), "Price assuming fixed MPTI ratio**" (orange), and "Actual data" (black). Vertical axes labeled "Ratio" on both sides, ranging 0 to 8.)*

* Uses inputs from DAT housing dashboard and assumes 18.5% of income spent on user-cost

** Assumes mortgage payment-to-income ratio of 25%, with 0.8 LVR and 25-year term

Sources: ABS; CoreLogic; RBA

Cheers

From:
Sent: Thursday, 21 July 2022 9:49 AM
To: Notes policy groups
Subject: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans?

A change in interest rates directly affects a household's mortgage payments, but also has an opposing indirect effect on mortgage payments for new loans due to the effect of interest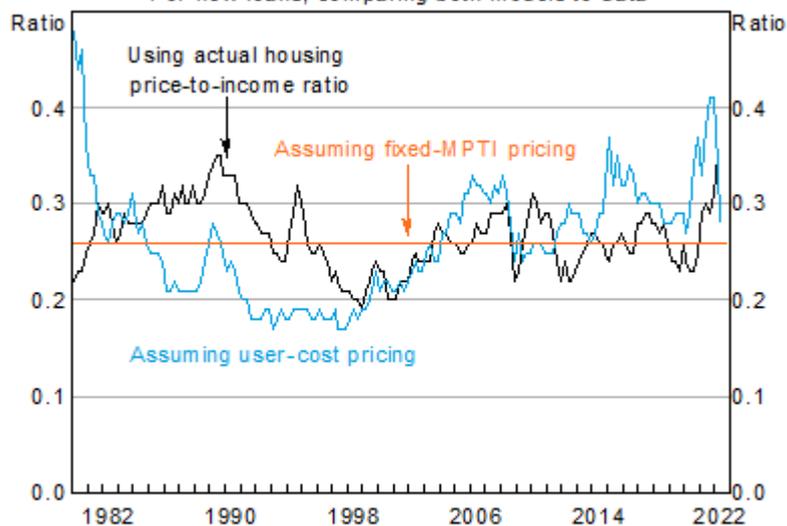 rates on housing prices. Combining a user-cost model with the standard mortgage repayment formula implies that the long-run indirect effect of real rates, via prices, more than offsets the direct effect of rates on repayments. This framework suggests the downward trend in real mortgage rates since the 1990s has increased mortgage payments for new buyers, as the upward effect through prices has outweighed the direct effect of lower rates. That said, the user-cost approach is at the upper end of empirical estimates of the responsiveness of prices to mortgage rates. A less responsive pricing model, which assumes prices are set so that a fixed fraction of income is spent on mortgage payments over time, fits the price data about as well as the user-cost model. In any case, the short-run effect of rate changes on mortgage payments for new loans is quite different to the long-run effect. Because the effect of rates on mortgage payments is immediate and the price response takes time, the rate effect dominates in the short-run. The currently unfolding rise in mortgage rates will make servicing new loans harder, before the negative price effect takes hold over time.

Mortgage Payment-to-income Ratios*

For new loans, comparing both models to data

Using actual housing price-to-income ratio

Assuming fixed-MPTI pricing

Assuming user-cost pricing

Ratio

0.4

0.3

0.2

0.1

0.0

1982 1990 1998 2006 2014 2022

* Each mortgage payment series uses a different housing price-to-income series and assumes a 0.8 LVR at origination and 25-year term

Sources: ABS; CoreLogic; RBA

Effect of 100bp Rise on Mortgage Serviceability*

Mortgage payment-to-income ratio for new loans

Dynamic response**

Steady-state response

Ratio

0.30

0.28

0.26

0.24

0 4 8 12 16 20 24

Quarters after rate rise

* Permanent rise in real mortgage rate from 2.5% to 3.5%. Inflation is 2.5%

** Speed of adjustment to steady state is based on the housing price ECM in Saunders and Tulip (2019)

Source: RBA

For more information, see: D22/107843

Economic Research Department
RESERVE BANK OF AUSTRALIA | 65 Martin Place, Sydney
| w: www.rba.gov.au

From:
Sent: Thursday. 21 July 2022 10:42 AM
To:
Subject: RE: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans? [SEC=OFFICIAL]

Follow Up Flag: Follow up
Flag Status: Flagged

Yes that's right. I have two models in the note. One is user-cost, and I assume people spend the same fraction of income on the user cost. The other model has a fixed-mortgage-payment-to-income ratio, so in that model P+I payments are fixed so you are right that the user-cost will change as rates change (i.e. user cost doesn't include principal payments). Sort of a cashflow equivalent an elasticity of 1.

And yes anything CRS has constant income elasticity I suppose. I was just noting that for mu user-cost assumption I require both income and price elasticity to be 1. Not sure if Cob Doug is the only one that fits that bill

From:
Sent: Thursday, 21 July 2022 10:36 AM
To:
Subject: RE: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans? [SEC=OFFICIAL]

I wasn't thinking about income elasticities. I was thinking about price elasticities. So, constant shares = price elasticity of 1, which is Cobb Douglas (you can have many other preferences that give you constant income shares can't you?)

But don't you suggest here that the fraction of income spent on housing changes as the user cost changes? "A less responsive pricing model, which assumes prices are set so that a fixed fraction of income is spent on mortgage payments over time, fits the price data about as well as the user-cost model."

From:
Sent: Thursday, 21 July 2022 10:32 AM
To:
Subject: RE: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans? [SEC=OFFICIAL]

I think of constant fraction of income as having a price elasticity of 1 and an income elasticity of 1. Cobb-Douglas has income elasticity of 1 but I can't remember price elasticity off the top of my head (I suppose it is 1 given the 'stylized fact' of constant factor shares)

Are you suggesting that empirically the fraction of income on housing has increased as incomes (and prices) have risen? Data I have seen look reasonably flat I think, but I guess it's kind of hard to measure.

Another aspect I have been thinking about is how this structure of demand can manifest in very different prices and quantities depending on supply elasticity,

From:
Sent: Thursday, 21 July 2022 10:19 AM
To:
Subject: RE: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans? [SEC=OFFICIAL]

Interesting

I don't have time to read it in detail, but basically assuming a constant fraction of income is spent in housing is basically assuming Cobb-Douglas, right? Am I understanding things correctly? But empirically, it looks like that's not a great assumption and demand is more inelastic in the long run? (or elastic?, I can't get it straight in my head)

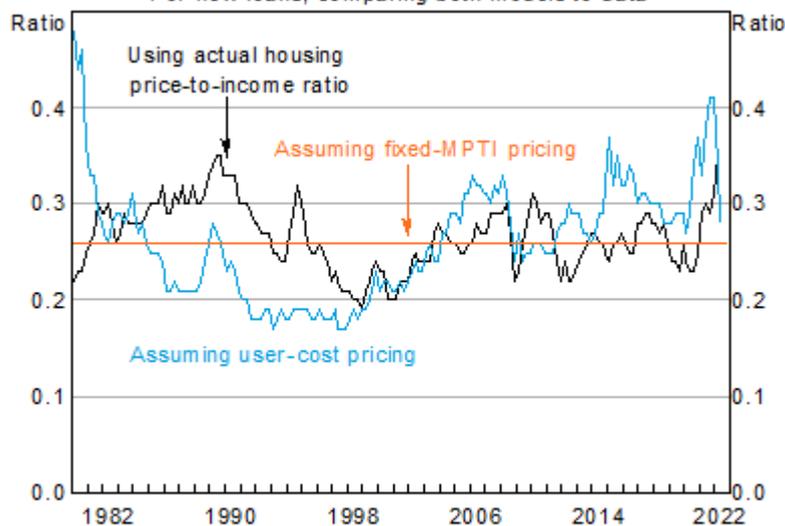---

From:
Sent: Thursday, 21 July 2022 9:49 AM
To: Notes policy groups
Subject: Note ER: How Do Changing Interest Rates Affect Mortgage Repayments For New Loans?

A change in interest rates directly affects a household's mortgage payments, but also has an opposing indirect effect on mortgage payments for new loans due to the effect of interest rates on housing prices. Combining a user-cost model with the standard mortgage repayment formula implies that the long-run indirect effect of real rates, via prices, more than offsets the direct effect of rates on repayments. This framework suggests the downward trend in real mortgage rates since the 1990s has increased mortgage payments for new buyers, as the upward effect through prices has outweighed the direct effect of lower rates. That said, the user-cost approach is at the upper end of empirical estimates of the responsiveness of prices to mortgage rates. A less responsive pricing model, which assumes prices are set so that a fixed fraction of income is spent on mortgage payments over time, fits the price data about as well as the user-cost model. In any case, the short-run effect of rate changes on mortgage payments for new loans is quite different to the long-run effect. Because the effect of rates on mortgage payments is immediate and the price response takes time, the rate effect dominates in the short-run. The currently unfolding rise in mortgage rates will make servicing new loans harder, before the negative price effect takes hold over time.

Mortgage Payment-to-income Ratios*

For new loans, comparing both models to data

Using actual housing price-to-income ratio

Assuming fixed-MPTI pricing

Assuming user-cost pricing

*   Each mortgage payment series uses a different housing price-to-income series and assumes a 0.8 LVR at origination and 25-year term

Sources: ABS; CoreLogic; RBA

Effect of 100bp Rise on Mortgage Serviceability*

Mortgage payment-to-income ratio for new loans

Dynamic response**

Steady-state response

Quarters after rate rise

*   Permanent rise in real mortgage rate from 2.5% to 3.5%. Inflation is 2.5%
**   Speed of adjustment to steady state is based on the housing price ECM in Saunders and Tulip (2019)

Source: RBA

For more information, see: D22/107843

From:
Sent: Wednesday, 27 July 2022 4:02 PM
To: ROSEWALL, Tom
Subject: RE: Housing model question [SEC=OFFICIAL]

Thanks   for summarising. I've also done some work trying to replicate the following article: RBA model points to a house price slump of around 30% - Kieran Davies | Livewire (livewiremarkets.com). The key differences in assumptions are:

- They look at a horizon until the end of 2025.
- A steeper cash rate of 3.6 per cent by end of 22, 4.2 per cent by end of 23, 4 per cent by end of 24, and 3.7 per cent by end of 25.
- Their working age population assumption assumes that growth rates remain at where they currently are.
- They've also said they've refined the model since it was published, but haven't revealed what they've done.
- They've used their interpretation of the May SMP forecasts for other economic variables.

Running this scenario, real prices decline by around 20 per cent to the end of 2025. Comparing this with a flat cash rate path of 0.39 per cent across the horizon and also a flat 10Y bond yield (and other variables following the May SMP), this is around 25 per cent below this scenario. Relative to the Aug 2021 SMP ST scenario, it is also around 20 per cent below the baseline.

I'm currently working on comparing our current ST runs to the scenario runs you outlined Tim.

Thanks,

From:
Sent: Wednesday, 27 July 2022 11:01 AM
To: ROSEWALL, Tom

Subject: RE: Housing model question [SEC=OFFICIAL]

This is a q that has puzzled me in the past.

There are a few things to consider

- Going back a while he was quoting numbers in ST that were based on (i) an instantaneous increase in rates and (ii) the effect at a 7 year horizon. Whereas in the forecast we had (at that time) a gradual increase in rates and were looking at a 2 year horizon. Plus the absolute fall in house prices was not the right thing to look at, rather the difference to a counterfactual with unchanged rates (which was still rising). So the impacts weren't that comparable.
- However the April FSR experiment of an instantaneous increase of 200bp having a 15% impact (or whatever it was) highlighted that we seemed to have quite different effects (he had 100bp = 30% I think). We spent some time trying to understand this and could mostly reconcile through:
  - A non-linearity in the model. I think Chris J was basing his numbers on the original paper which quoted the impact of a decrease in rates. But in the model increases in rates have less effect on prices than decreases in rates (I think intuitively as max downside for house prices is 100% whereas the max upside is unlimited).
  - The different time horizons
  - The treatment of income as exogenous in the FSR scenario, which reduces the impact of interest rate shocks
  - Different assumptions about the way 10year rates are assumed to evolve.

- The attached emails unpick this difference a bit.
- That leaves the question of why, with the current interest rate path now having a very rapid increase to 3%, we don't have a weaker ST model profile. Elements of the above will still be true:
  - The non-linearity is still a thing
  - The implicit counterfactual may still be for rising prices (this is easy to check)
  - ST may get much weaker beyond the horizon (again easy to check)

Suggests the following action for you   :
  - Can you compare current ST projection for prices 7 years out to an alternative scenario where rates are flat? One option would be to use Aug last year as the comparator, though of course incomes etc will be different. An alternative comparator would be to construct a new ST house price profile based on incomes/rents as in the current forecast, but where the cash rate stayed at 0.1% (you would have to make a sensible assumption about 10 year rates in that scenario)

-----Original Message-----
From: ROSEWALL, Tom
Sent: Wednesday, 27 July 2022 9:14 AM
To:

Subject: Housing model question

Morning

Why do we generate relatively minor house price declines with the ST model, while Coolabah (Joye) generates 20-30% declines? Our assumed cash rate profile seems broadly the same.

Tom

Tom Rosewall
Economic Analysis Department

From:
Sent: Friday, 29 July 2022 9:40 AM
To: EC - Economists
Subject: How do our housing price forecasts compare to previous downturns?

Hi all,

The housing price forecast for this round projects prices to decline by 11 per cent over 2022 and 2023. How does this compare to past downturns? Graph 1 compares the current downturn in nominal terms (red line), compared to previous periods of housing price declines. Current forecasts are the red dashed line. The forecasted decline is the biggest and longest since at least 1980.

1980s and the GFC
The downturns which had a similar pace of decline were in 1982 and 2008. However, they troughed around 11 months after the peak, and only declined by around 8 per cent.
Some **similarities** of these episodes to the current downturn include:
- Prices tend to decline or stagnate after periods of price booms, which is the case for each downturn mentioned (Abelson, Joyeux, Milunovich, & Chung, 2005).
- Mortgage rates increased (Graph 2).
- Consumer confidence declined significantly (Graph 3).

Some **differences** include:
- 1982: Mortgage rates had increased by 3 per cent from 1980 to 1982 (Graph 2). The Australian economy also entered a severe recession, prompting a decline in housing prices (Graphs 2). While mortgage rates declined after this in 1982/83, these were extremely high mortgage rates of 10+ per cent. Currently, while interest rates are still relatively low, they are assumed to increase by 3 per cent in just one year.
- 2008: Prices declined by around 8 per cent over 2008. The start of the price declines coincided with an increase in mortgage rates of 0.5 per cent over February and March 2008, with prices declining further through the early stages of the GFC.

While the current forecasts suggest we are not entering a period of recession or crisis, consumer sentiment has similarly deteriorated.
2010 and 2017
The downturns with a similar peak to trough duration were in 2010 and 2017, around 20 months after the peak. The 2010 downturn was similar in the factors:
- 2010: The post-GFC tightening cycle pushed mortgage rates up, likely causing housing price to decline. Consumer confidence was also declining in this period. In this case, cash/mortgage rate increases were smaller and over a longer period, by about 2 per cent over 1.5 years.
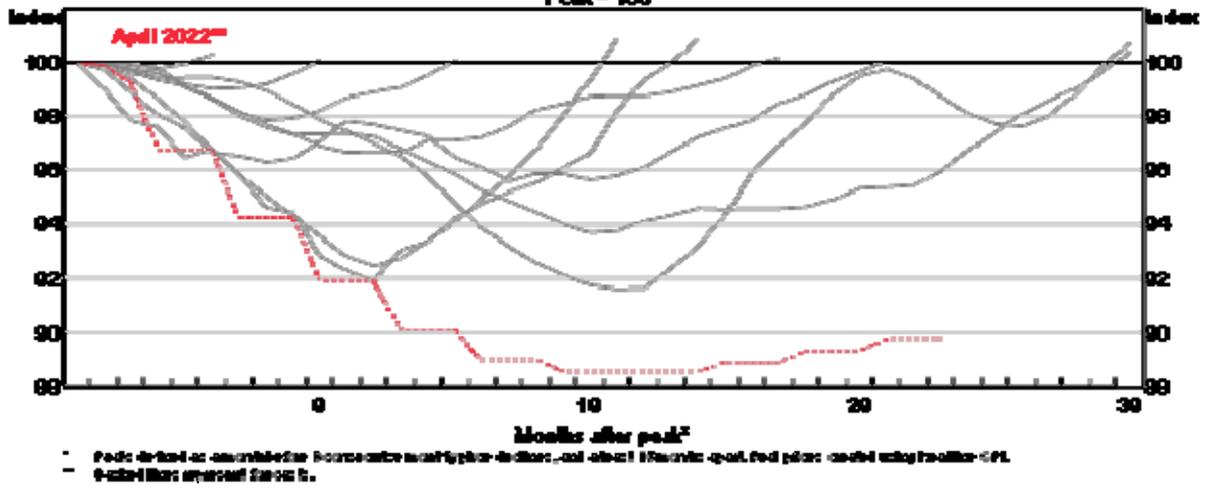
However, the 2017 downturn was quite different:
- 2017: In a time where mortgage rates were largely flat, the apartment boom, introduction of some macro-prudential regulations by APRA, and waning investor demand dragged on prices. Prices declined by a little over 8 per cent.
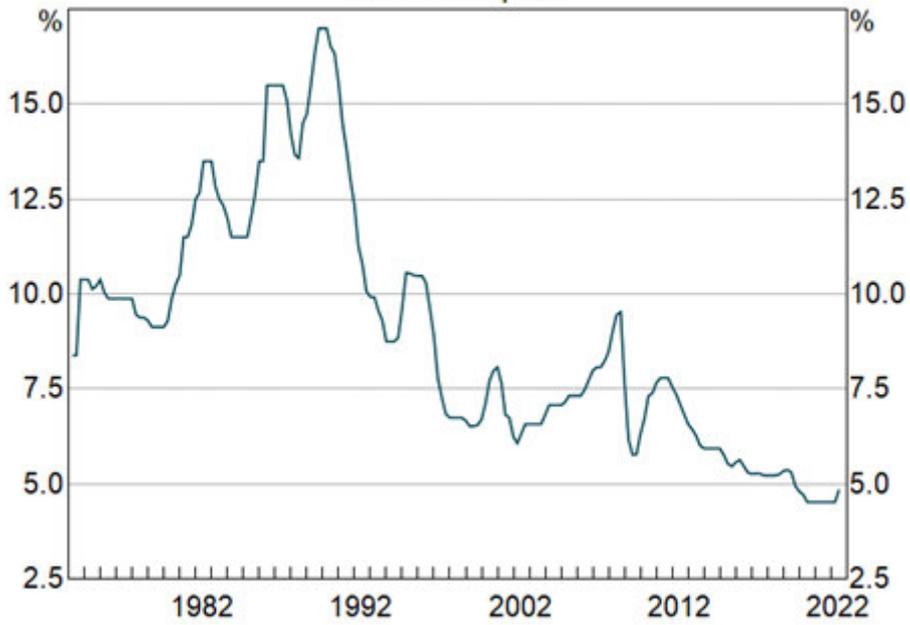
Graph 1

Housing Prices Peak to Trough
Peak = 100*

April 2022***

* Peak defined as cumulative 5 consecutive monthly price declines, and at least 5% cumulative fall; Real prices deflated using headline CPI.
** 6-month moving average of 3 months.

Graph 2

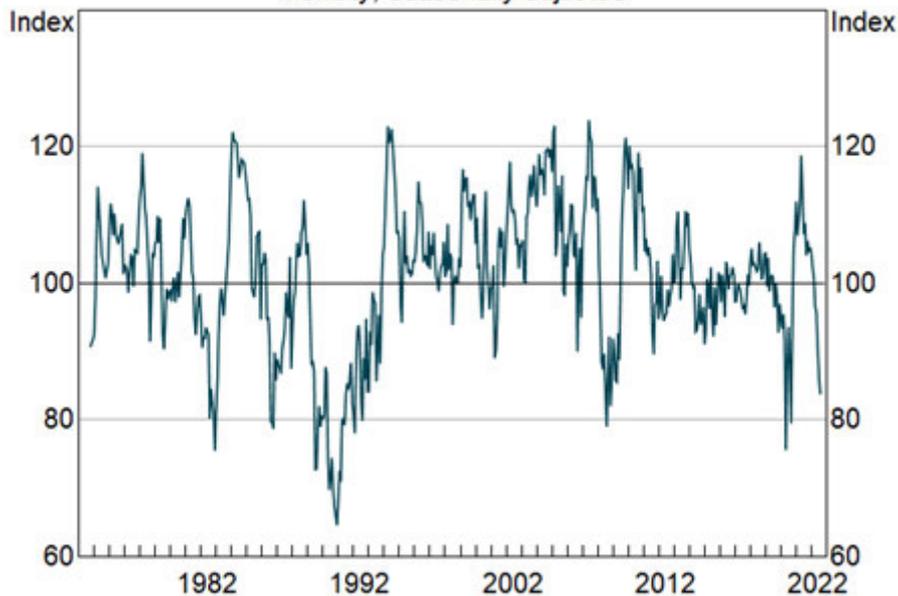## Housing Loan Lending Rate
Owner occupiers

Source: RBA

Graph 3

Consumer Sentiment
Monthly, seasonally adjusted

Sources: RBA; Westpac & Melbourne Institute of Applied Economic and
Social Research

Real housing prices

In real terms, prices are forecast to decline by almost 20 per cent (Graph 4).

- This is also the biggest decline since at least 1980.
- The previous real-terms decline that comes closest to that forecast is the 1982 episode.
- As noted that reflected interest rate increases and deteriorating sentiment. As Kohler and van der Merwe (2015) highlight, inflation was high during the 1980s, supporting nominal housing prices relative to real prices.

Graph 4

Housing Prices Peak to Trough
Real, Peak = 100*
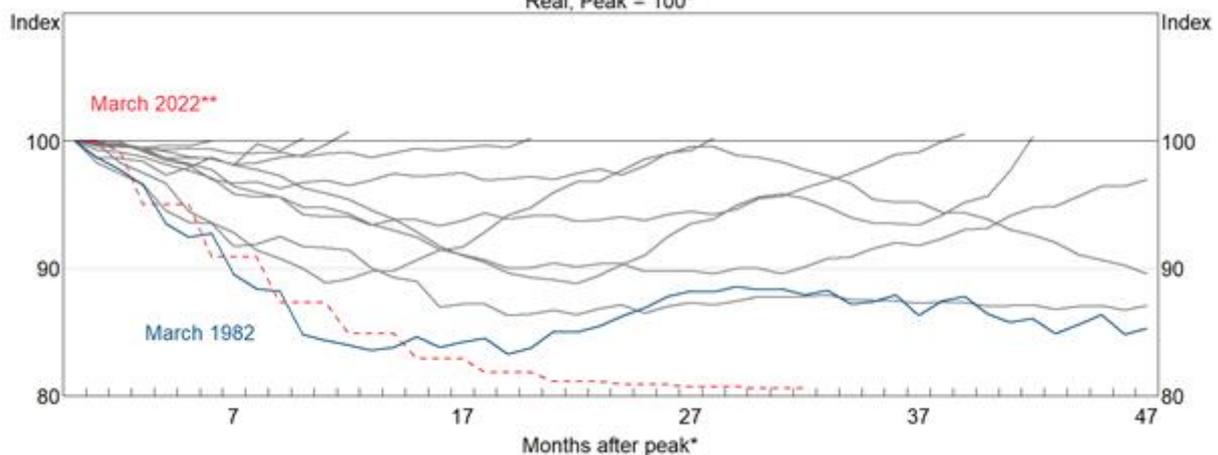
*   Peaks defined as a month before 3 consecutive monthly price declines, and atleast 15 months apart. Real prices created using headline CPI.
**   Dashed lines represent forecasts.

Speaking notes

Current conditions

- For those of you who don't know me, I started in the Domestic Activity and Trade team a few months ago. I'm managing the team that looks at housing market conditions so if anyone wants to get in touch on anything housing market related please feel free to give me a shout.

- I'm going to give a quick update on the current state of the housing market

- In terms of what has happened, in the first two charts you can see that there has been a slowing in price growth in most areas such that nationally prices have been declining since the end of April [-0.9% in July].

- I should say that the first graph is missing data for July – so that would be showing continued price declines in Sydney and Melbourne, and prices declining in Brisbane too.

- Last time this group met we talked about a slowing in momentum – I'd say now that we've entered a downturn.

- So prices as I said have declined across the eastern seaboard in recent months.

- We've also seen auction clearance rates continue to decline in Sydney and Melbourne, which you can see that in the third chart.

- Auction volumes have also fallen but do remain around reasonable levels relative to history.

- New listings – especially in Sydney and Melbourne – are generally elevated

- [Total property listings remain below usual levels in Brisbane and Adelaide, but in Brisbane are creeping up towards historical range. Syd and Melb. Within historical range.]

- In G4 you can see that, consistent with the decline in prices, the number of people expecting increases in housing prices is quite low [~5%].

- We know that estimates of housing turnover have continued to decline as well.

- And Graph 5 shows that the slowing in price growth has been most marked for expensive homes.

- I should acknowledge that there are still some positive growth rates in Perth, Adelaide and Darwin, but taking a step back the key point is that there is a definite slowing of momentum and a downturn occurring across the nation.

Outlook

- So turning to the outlook for prices, which you can see in graphs 6 and 7, there is some uncertainty around how prices are going to respond to rising interest rates.

- We've adjusted down our expectations for housing price growth since the last time we met – so we're now anticipating housing prices to decline over the next few years.

- That reflects the ongoing slowing in momentum in the market and the steepening of expectations for the future path of interest rates.

- For some context, the median market economist forecast is for roughly a 15 per cent decline.

- And graph 8 shows that these scenarios all result in a declining price to income ratio – it is worth noting that last time we met this reflected strong income growth but it now also reflects our expectation for falling housing prices.

- Given the significant uncertainty associated with the outlook for prices, it is worth looking to history to get a sense of how past downturns have played out and you can see that on graphs 9 and 10

- Based on the scenarios I showed you in graphs 6 and 7, price declines could be similar to pace and extent seen in 1980 and GFC.

- If you are looking at graph 9 I'm referring to the two troughs you can see at the 11 month point.

- In terms of where we are today, there are some common themes.

- All of these declines occurred following housing price booms – I think that's important, because it has implications for wealth effects and household consumption.

- There were also sharp declines in consumer sentiment and the pace of inflation was high in 80s too.

- One difference I'd point out is that the level of interest rates is now much lower [+10% and +5%].

Rental market

- Just to finish off on the rental market.

- Advertised rents which you can see in Graph 11 have continued to grow at a rapid pace.

- But so far broader CPI rents growth – which reflects the stock of rentals in Australia – has only picked up a little

- So rising advertised rents are consistent with declining vacancy rates, which you can see in Graph 12.

- And we're still expecting the strong labour market to support household income growth

- So that, along with low vacancy rates and the increase in population that is expected to occur looks to be supportive of a positive outlook for rents.

- And I want to finish by noting that the decline in prices and rising rents means that rental yields continue to increase.

- And that's important, because it potentially supports a shift in the composition of home sales towards investors

- And at the risk of getting into the technical details, in theory rising rents should provide some support for prices that partly offsets rising interest rates and the downwards momentum we're currently observing in the market.

References

- Housing market review: D22/201003

- Housing price downturns: D22/198009

- Dashboard: Housing Market Dashboard (rba.gov.au)

- Cash rate path

	SMP	OIS path
end 2022	2 ¾ (DQ)	2.7
end 2023	2 ¾ (DQ)	2.9

Possible questions

Downside risks to housing price expectations

- I'd go back to the housing price scenarios shown on graphs 6 and 7

- At the top of the range what you can see is our standard workhorse user cost model, but that model has housing price appreciation expectations built into and we know that those have deteriorated recently

- At the bottom of the range what you can see is our momentum-based model – to me, at the moment that represents a more accurate reflection of what might happen

- In other words, that model perhaps centralises one of the downside risks which is momentum/expectations based.

- I'd also say that rising rents implicitly provides support for housing prices, so I think there is some upside risk

- In the user cost framework, rental yields adjust to be in line with the user cost if housing.

- UC has risen as interest rates have risen

- In this framework declining expectations for capital appreciation would also increase the user cost

- So rental yields need to rise.

- At the moment, that is happening via rents so prices need to do less of the heavy lifting.

- In a practical sense, you can think of rising rents encouraging more investors to purchase homes if their expectations are that the NPV is still positive.

- There has been upwards revisions in the CPI over the forecast periodCPI up 11% over the forecast period, upwards revision to price level of around 3.5% (so real house prices revised down more than nominal)

What is expected to happen in real terms?

- If you take the more pessimistic scenario in graph 6 and subtract a realistic scenario for CPI you do get a downturn similar to that which occurred in the 80s

- That is the sharpest decline that you can see on Graph 10

- So inflation is providing support for housing prices in nominal terms

How do rising interest rates/declining housing prices effect consumption?

There are a few things going on here:

- There's the cash flow channel, where declines in household disposable income due to rising interest payments will weigh on spending.

- At face value we don't think that has changed materially to what we would normally expect, but larger debt and asset positions and the coincidence with rising cost of living pressures creates some uncertainty around that.

- When we're talking about housing prices wealth effects also matter.

- It is hard to disentangle wealth effects from housing and overall wealth effects, e.g. equity prices, but we've done work in the past that shows that a change in housing wealth does impact consumption.

- Where we tend to see the effects most are in durable goods consumption. E.g. cars and household furnishings – makes sense if you think about it alongside declining housing market turnover. Less incentive/ability to refinance and withdraw equity to finance these purchases.

- Another thing that matters here is perhaps overall consumer confidence/sentiment. Certainly the case that consumer sentiment has declined sharply to levels not seen since the GFC. But so far consumption appears to have held up fairly well.

- The other thing I would say is that household incomes are expected to grow given the outlook for the labour market – that and the fact that household balance sheets are in fairly good shape tempers the potential impact on consumption.

Are preference shifts continuing?

- House price declines outpacing unit price declines, might be some evidence

- Census data confirmed lower household size, but that could easily adjust given rental market situation discussed earlier.
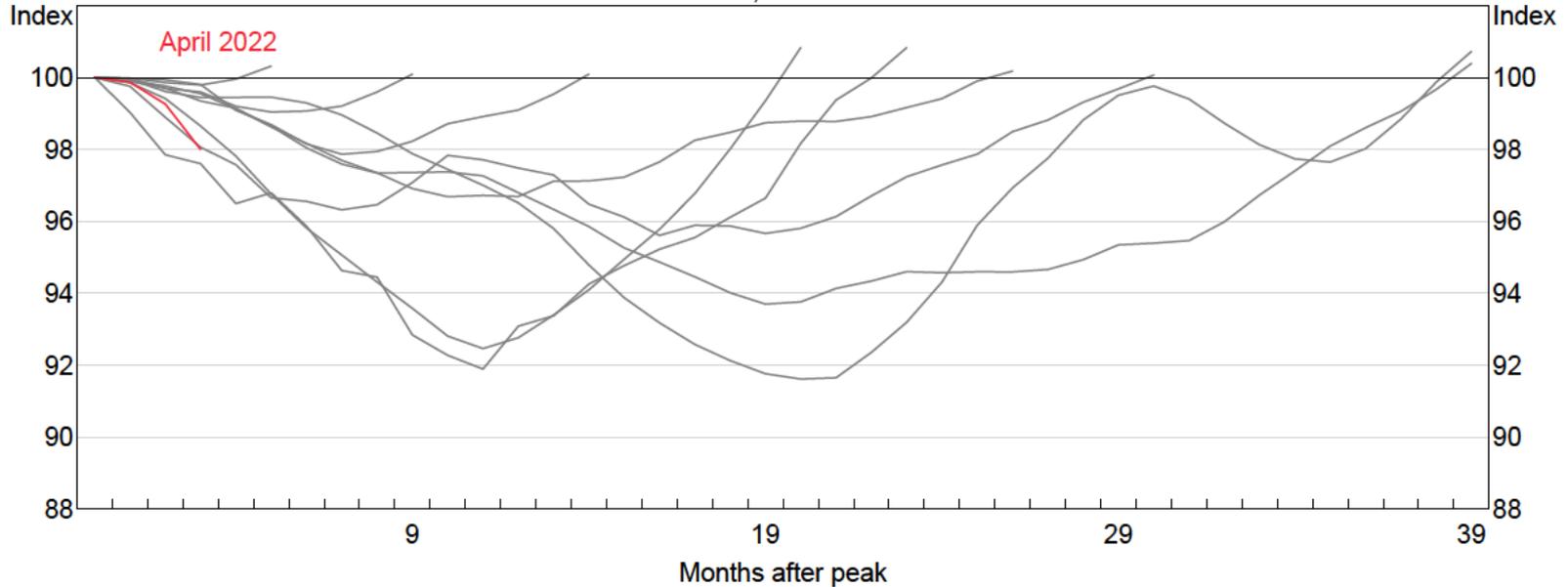
RESERVE BANK OF AUSTRALIA

How Sensitive are Housing Prices to Interest Rate Increases?

19 August 2022

Housing prices have declined since April…

Housing Prices Peak to Trough
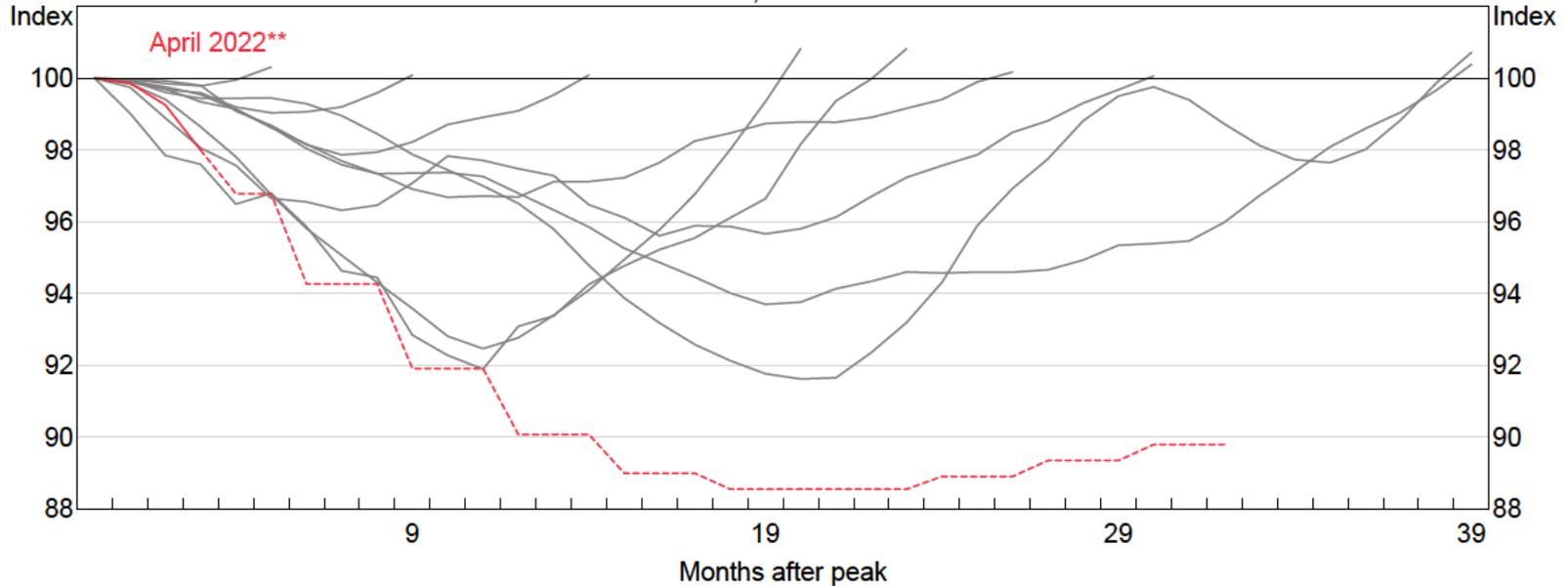Nominal, Peak = 100*

April 2022

Months after peak

*   Peaks defined as a month before 3 consecutive monthly price declines, and atleast 15 months apart.

… and are expected to decline further

Housing Prices Peak to Trough
Nominal, Peak = 100*

April 2022**

Months after peak

*   Peaks defined as a month before 3 consecutive monthly price declines, and atleast 15 months apart.
**   Dashed lines represent forecasts.

Framework

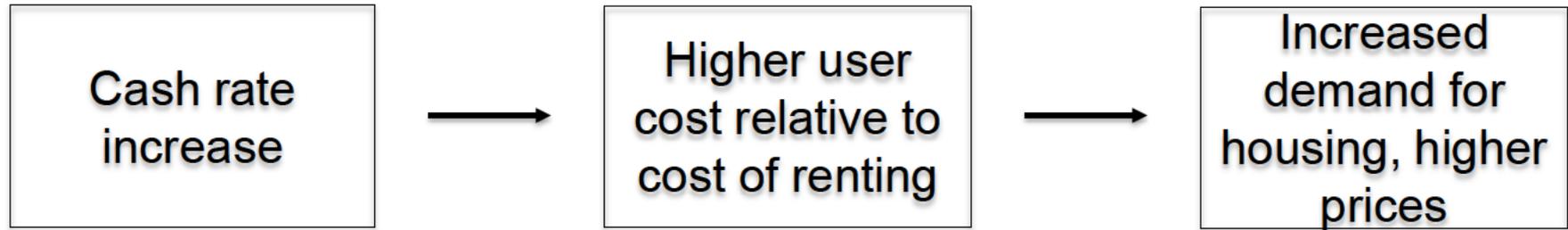- Saunders and Tulip (2019) model

Buy a house

User cost of housing = real variable mortgage rate + depreciation + running costs + transaction costs – expected capital appreciation
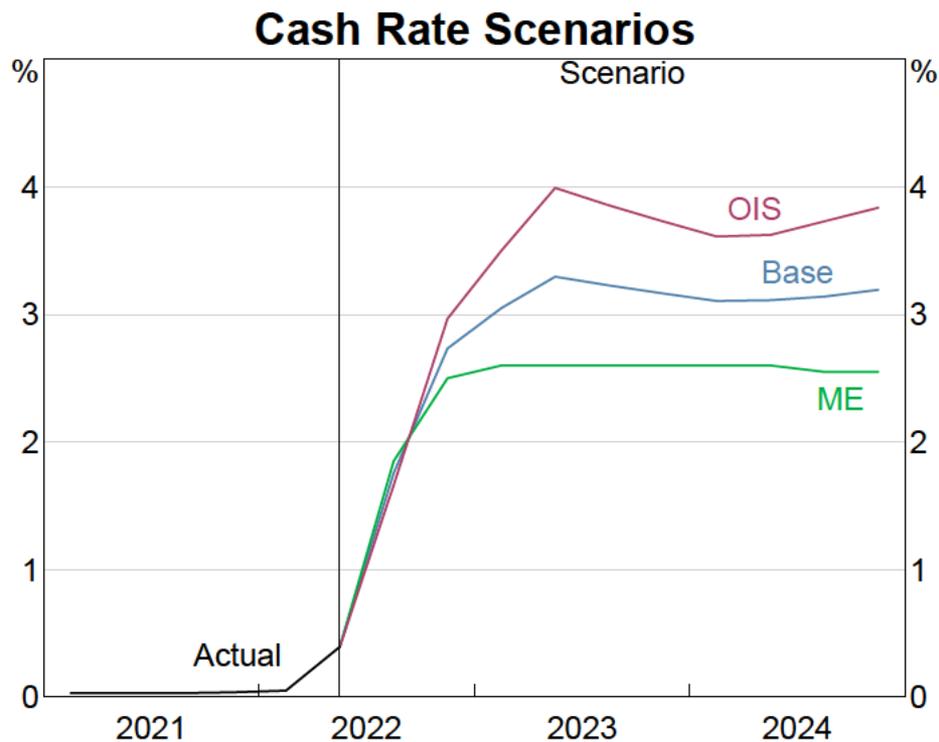
Vs

Renting

Cost of renting= rental payments
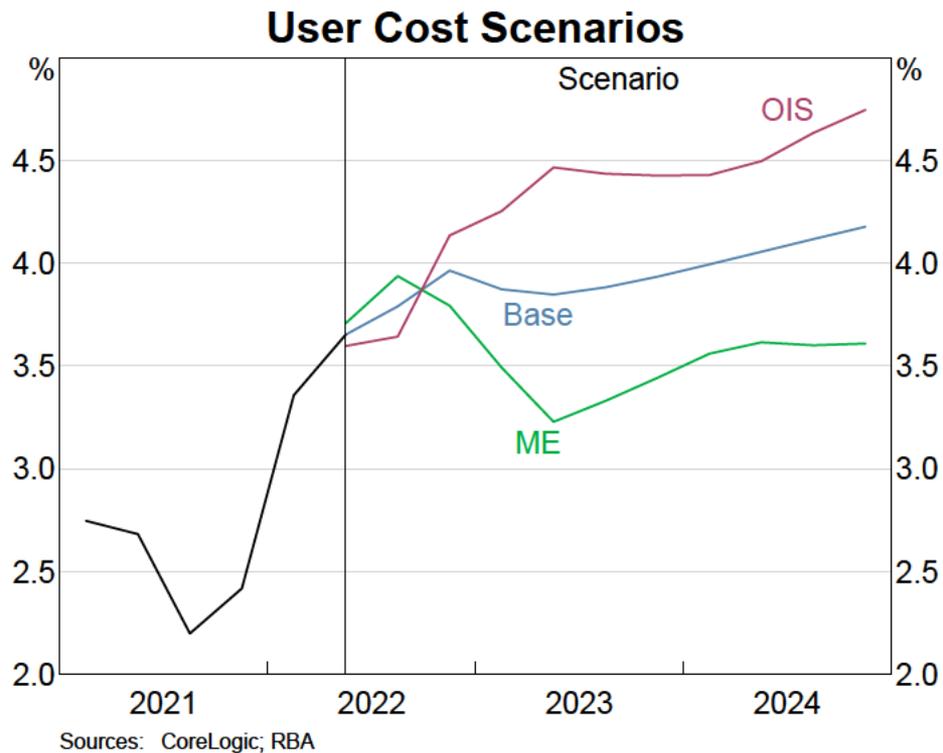
How do cash rate increases affect prices?

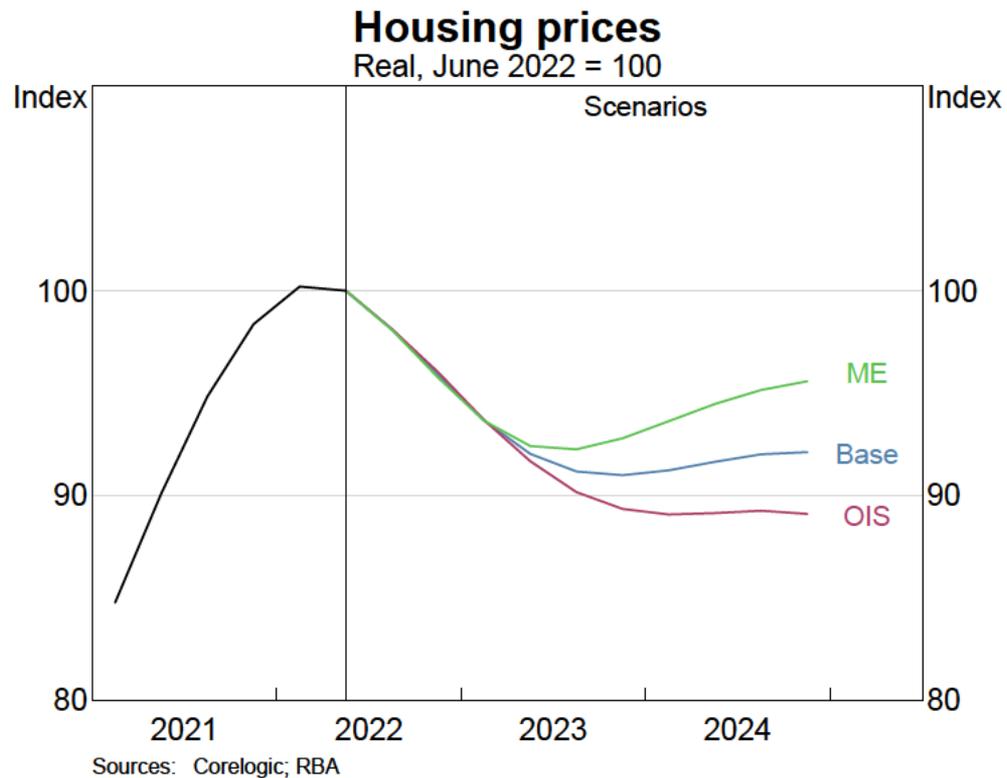| Cash rate increase | → | Higher user cost relative to cost of renting | → | Increased demand for housing, higher prices |

Cash rate paths

Cash Rate Scenarios

User cost paths

User Cost Scenarios

Sources: CoreLogic; RBA

Real housing prices

Housing prices
Real, June 2022 = 100

Sources: Corelogic; RBA

Nominal housing prices

Housing prices
Nominal, June 2022 = 100

Sources: Corelogic; RBA
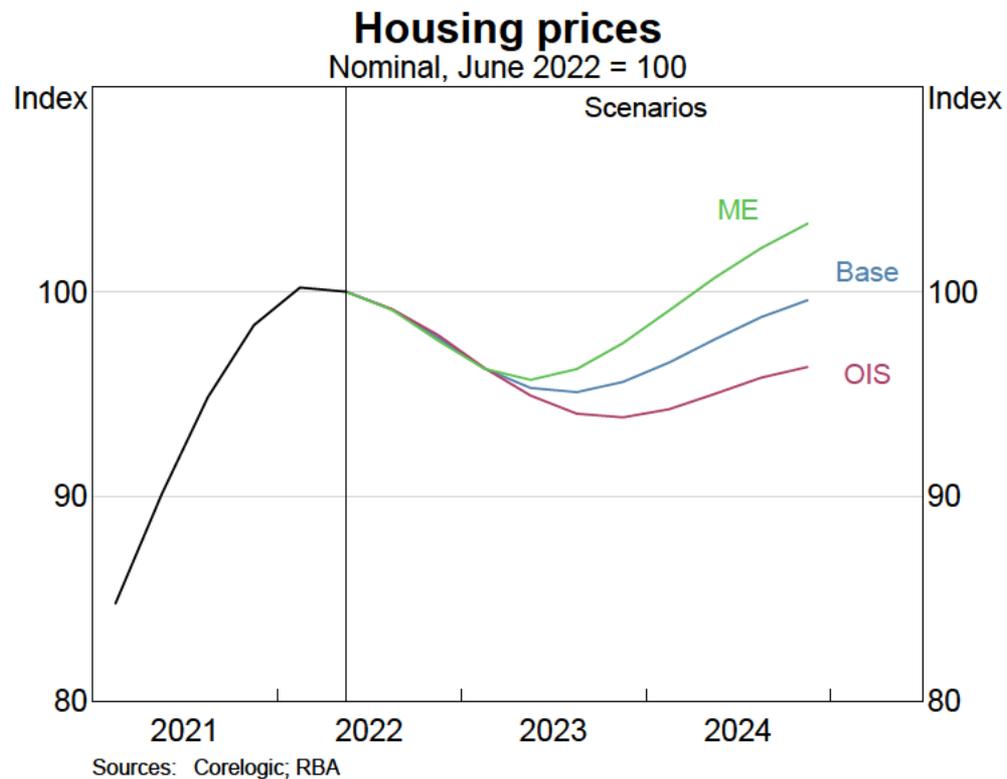
What's driving the model outputs?
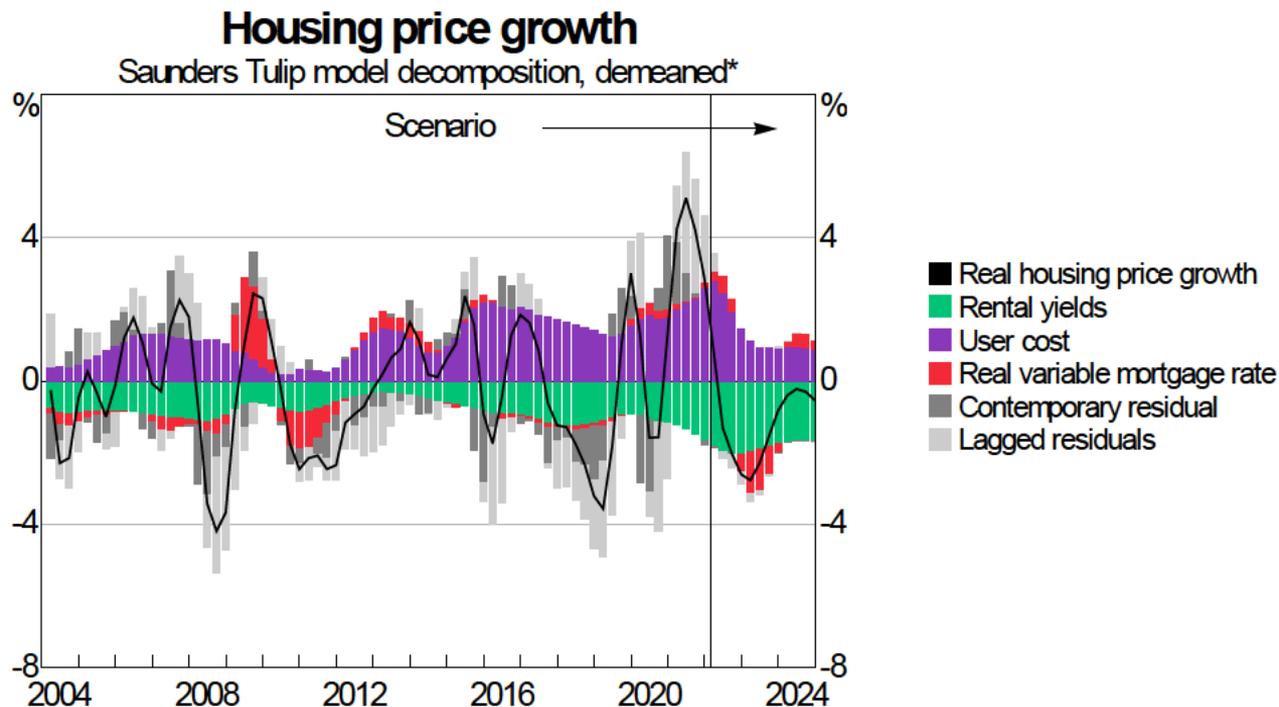
Housing price growth
Saunders Tulip model decomposition, demeaned*

Legend:
- Real housing price growth
- Rental yields
- User cost
- Real variable mortgage rate
- Contemporary residual
- Lagged residuals

* Contribution of each variable reflects the cumulative effect over time. This is because the model has autoregressive components, which have been decomposed.
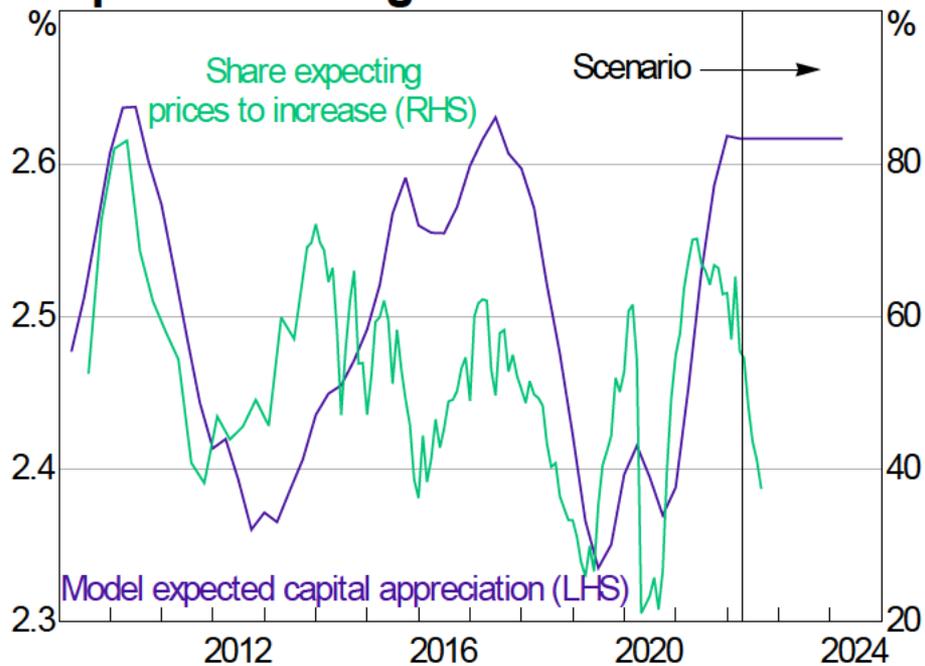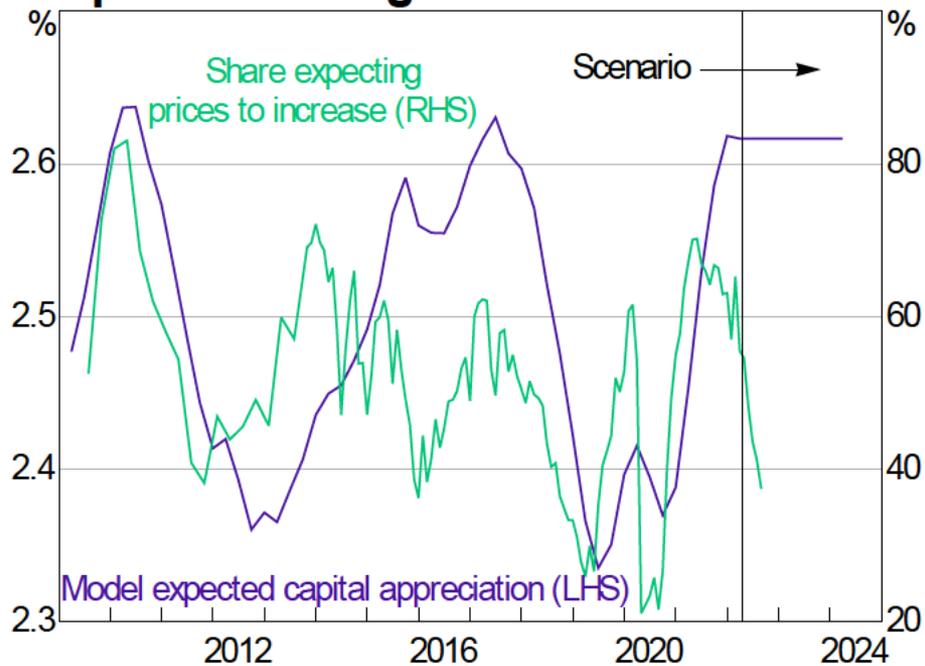
Source: RBA

One possible explanation

<u>Buy a house</u>

User cost of housing = real variable mortgage rate + depreciation + running + transaction costs – expected capital appreciation

Expected Housing Price Growth Measures

Sources: RBA; Westpac & Melbourne Institute of Applied Economic and Social Research

Expected Housing Price Growth Measures

Sources: RBA; Westpac & Melbourne Institute of Applied Economic and
Social Research

Domestic Activity (see [detailed chartpack](#))

- The Australian economy is expected to grow solidly over the forecast period as whole, supported by growth in household consumption, a positive outlook for business investment, and a recovery in exports. Growth in activity is expected to be strong this year as the tight labour market and commensurate rapid labour income growth underpin a continued expansion in consumption as spending patterns normalise. Exports are also forecast to grow strongly in the next few quarters as travel and education services exports start to pick-up post-pandemic, and resource exports recover after weather and maintenance disruptions. GDP growth is expected to slow over 2023 to below the growth rate of potential output. The slowing is broad based and reflects the impact of rising headwinds to household spending; weaker dwelling investment as housing prices decline; a stabilisation of public demand at high levels after recent rapid growth; and slower growth in exports as the recovery in services exports nears completion.

- The outlook for GDP growth is somewhat weaker than expected three months ago. The downward revision is largest over 2022, partly reflecting the slower-than-expected recovery in services exports. The outlook for household consumption has been downgraded as cost of living pressures and rising interest rates weigh on household budgets. A materially weaker outlook for housing prices has also contributed to the downgrade through household consumption and dwelling investment.

GDP Growth Forecasts
Percentage change

Year-ended	Jun-2022	Dec-2022	Jun-2023	Dec-2023	Jun-2024	Dec-2024
Current	3 1/4	3 1/4	2 2/4	1 3/4	1 3/4	1 3/4
May SMP	3 2/4	4 1/4	3	2	2	

Year-average	2021/22	2022	2022/23	2023	2023/24	2024
Current	3 3/4	4	3 3/4	2 1/4	1 3/4	1 3/4
May SMP	3 3/4	4 2/4	4 2/4	2 3/4	2	
Treasury*	4 1/4		3 2/4		2 2/4	
Consensus*		3 3/4		2 2/4		

*Treasury forecasts from 2022/23 Federal Budget, Consensus forecasts collected July 2022.

Staff Central Projections for Domestic Economic Activity Variables

Percentage change over year to quarter shown[a]

	Jun-2022	Dec-2022	Jun-2023	Dec-2023	Jun-2024	Dec-2024
Gross domestic product	3.4	3.2	2.5	1.8	1.8	1.7
Consumption	4.6	4.9	2.8	2.4	2.3	2.2
Dwelling investment	-1.7	1.7	2.5	-0.1	-2.6	-4.8
Business investment	1.6	4.9	5.9	6.6	5.7	4.6
Imports	6.8	11.5	4.0	3.4	3.0	2.9
Exports	1.5	8.6	10.6	5.1	2.8	2.2
Memo items						
Real household disposable income	3.9	-0.9	-3.1	-0.9	0.9	1.6
Household saving ratio[b]	11.4	8.3	6.0	5.6	5.1	5.1

(a)   Rounding to the nearest decimal point; (b) Per cent of nominal disposable household income

August SMP

- I'm not going to say too much about the actual forecast profiles today, but instead focus on some of the uncertainties and judgements we've made this round. Thanks, of course, to the DAT team who have worked tirelessly once again this round to consider all the issues at hand and put together the forecasts.

- So today I'm going to focus on judgements in   key areas to help frame the discussion:
    1. The first is the signal we've taken from recent weakness in housing prices, particularly in Sydney and Melbourne, and the effect this has on dwelling investment;
    2. The second are the judgements underpinning a lower level of consumption over the forecast horizon, including the impact of lower housing prices via wealth;

- ***Starting with the outlook for housing prices, where the profile has been downgraded…***
    o National housing prices unexpectedly fell in the June quarter, reflecting declines in Sydney and Melbourne, and auction volumes and clearance rates in these cities have declined.
    o While there's a lot of downward momentum in the market, this is not necessarily captured in our models, so we've applied some judgement in the near term. We assume that price declines in Sydney and Melbourne continue over the second half of this year, with prices in those cities falling by around 1½ per cent per month.
    o At the same time, price growth has slowed in other capital cities and regional areas, and this is expected to continue into next year and prices in these markets to also fall.
    o The cash rate path is also steeper this round, and the terminal rate higher.
    o Taken together, this sees national housing prices decline by 11 per cent peak-to-trough by late 2023.
    o The outlook for residential construction is sensitive to the path of housing prices, and dwelling investment has been downgraded over the forecast horizon as a result. While ongoing capacity constraints are expected to constrain activity in the near term (and I'll touch on these shortly), a steeper cash rate path and declining housing prices are expected to deter demand for new housing which weighs on dwelling investment further out.

- o The pace and extent of the eventual decline in housing prices is a key uncertainty for activity through its effects on both dwelling investment and consumption, and something we'd appreciate feedback on.

- *Turning to consumption…*

- o Further out, the level of consumption has been downgraded reflecting rising prices, a lower income profile because of higher net interest payments from the steeper cash rate path, and a lower level of net wealth driven by the decline in housing prices.

  - Consumption is sensitive to the outlook for housing prices, and so larger than expected falls in prices pose a risk.

So to open the discussion, we'd appreciate feedback on these three areas of judgment. To recap:

1. First, we've proposed a large downgrade to the housing price profile, with prices expected to fall 11 per cent peak-to-trough. Do people think this profile captures the risks around the housing market?
2. Second, we've downgraded the level of consumption reflecting the rising cost of living, impact of lower housing prices, and a steeper cash rate path. We're open to feedback whether people think this is a reasonable downgrade in light of these factors – have we gone too far, or not far enough?

And with that, happy to open it up for discussion.

August SMP

- Today I'll be presenting an updated set of domestic activity forecasts. As always, a huge thanks to the DAT team who have worked tirelessly once again this round to consider all the issues at hand and put together these forecasts and this presentation.

Slide: real GDP levels

- But the economy faces increasing headwinds in the form of higher interest rates, the rising cost of living, and declining housing prices.
  - Reflecting this growth in activity is expected to slow, and the outlook for activity is weaker than at the time of the May *Statement*, especially over the next two quarters.

  - Over the forecast period as a whole, the downgrade reflects weaker consumption and a weaker outlook for dwelling investment as declines in housing prices gain momentum.

- It's likely these pressures build, and further out, the level of consumption has been downgraded reflecting rising prices, a lower income profile in part because of higher net interest payments from the steeper cash rate path, and a lower level of net wealth driven by the decline in housing prices.
- In all, based on our range of models, we have the level of consumption around 1½ per cent lower.
    - Of this downgrade, a little over a third is because of lower wealth driven by declines in housing prices, and around two-thirds is driven the recent flow of data and lower income.

Slide – housing prices

- Turning to housing prices, and the outlook has been downgraded this round.
  - National housing prices unexpectedly fell in the June quarter, reflecting declines in Sydney and Melbourne, and auction volumes and clearance rates in these cities have declined.
  - While shifts in sentiment can be important in driving the dynamics of the housing market, this isn't well captured in models such as Saunders-Tulip.
  - This round we've put more weight on the mortgage VAR model, which does a better job at picking up recent momentum in the housing market, and less weight on the Saunders-Tulip model, which sits at the top end of the range of model estimates.
  - Our forecast sees national housing prices decline by 11 per cent peak-to-trough by late 2023.

- As a rough cross check on that, we get a similar outcome if we assume price declines in Sydney and Melbourne continue at their recent rate and fall by around 1½ per cent per month over the second half of this year, and at the same time price growth in other capital cities and regional areas continues to slow and later fall.

- As a second cross-check, it's worth noting that our baseline scenario sits within the range of estimates from market economists, though there some market commentators [and I should note commentators, not necessarily forecasters…] that suggest housing prices could decline by more.
  - But the pace and extent of the eventual decline in housing prices is a key uncertainty for activity through its effects on both dwelling investment and consumption.
  - And we acknowledge that there are a range of plausible assumptions that can be applied to generate a weaker profile than what we currently have.

Slide – dwelling investment

- For dwelling investment, the profile has been lowered relative to last round. There is still a large pipeline of work to be done which will support the level of dwelling investment.
  - But growth has been lowered in the near term as capacity pressures in the sector have intensified, and are a binding constraint on activity which will limit the pace at which work can be completed in the near term.
  - Further out the level has been downgraded reflecting the steeper cash rate path and declining house prices.

A key risk is that housing prices fall by more than we expect.

Slide – housing prices scenario

- To investigate this, we've constructed a downside housing price scenario within the Saunders Tulip framework by assuming people become pessimistic about the outlook for housing prices.
  - That could be a response to ongoing price declines, or could be prompted by higher interest rates.
  - [Specifically we adjust the expected capital appreciation term to be -1.5% pa rather than the long run average of 2.6% pa]
- In this scenario, housing prices decline by 20 per cent peak-to-trough by the end of 2024.
  - So this is roughly twice as large as what we've assumed in our baseline, and sits below the range of estimates from our suite of models and most market economists.
- This would have an effect on both dwelling investment, especially later in the forecast horizon, and consumption.

Slide – consumption scenario

- This chart shows the consumption effect of larger than expected falls in housing prices, working via lower household wealth.
  - In this scenario, the further downgrade to wealth results in the level of consumption being ¾ per cent lower than our baseline.
  - This is potentially somewhat of a conservative estimate given the L/R wealth multipliers in the models and the fact that housing prices don't reach their trough until the end of the forecast horizon.
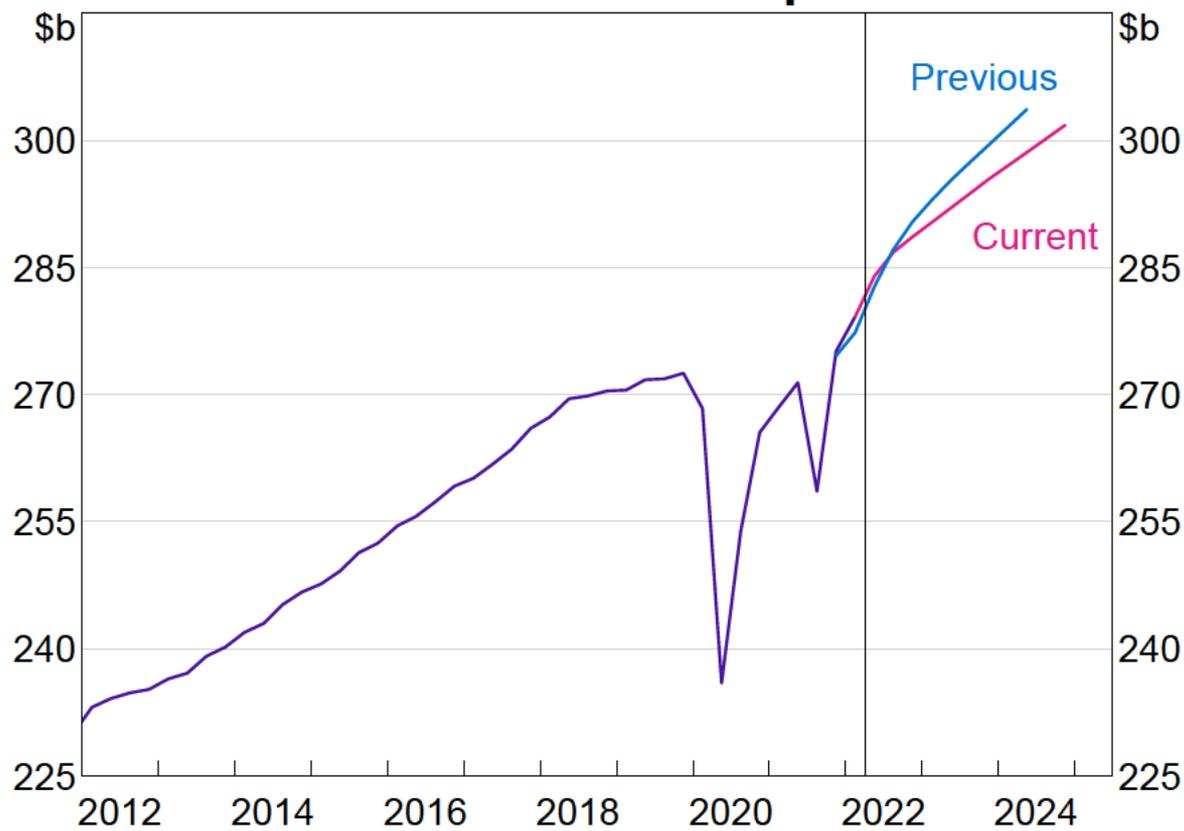
EC Policy Meeting
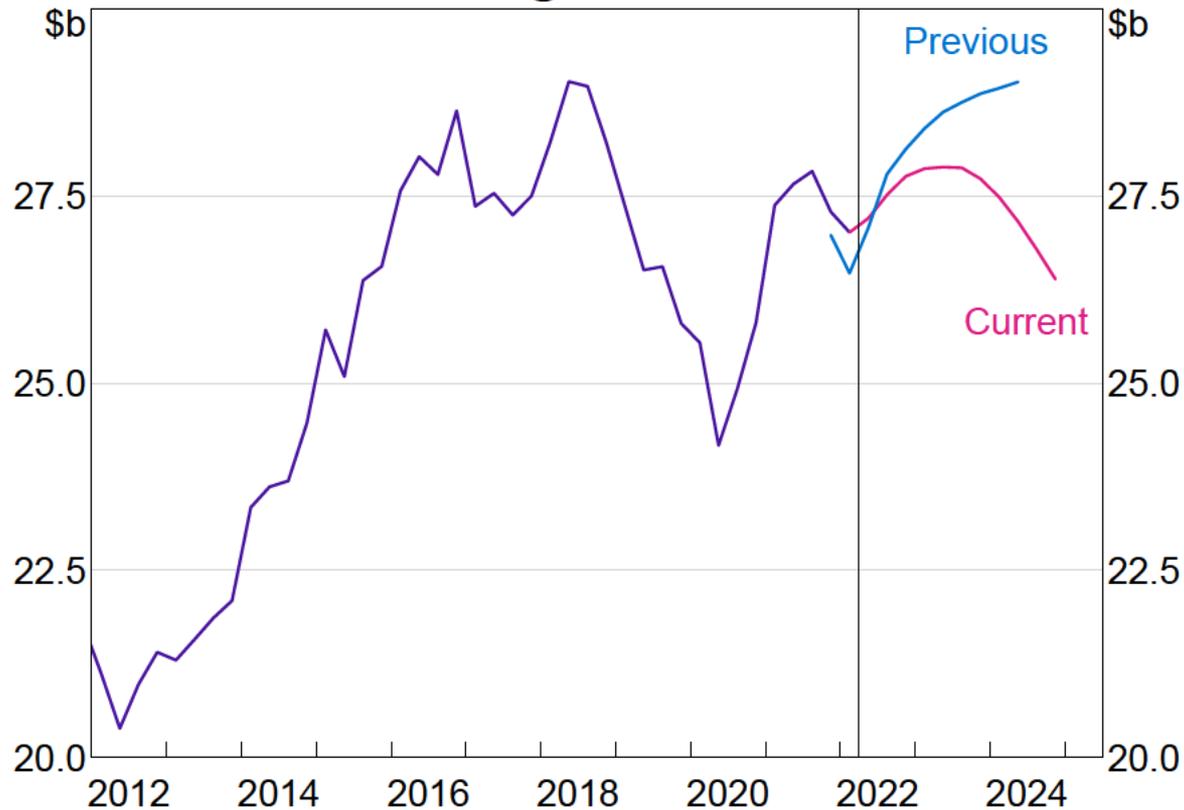
21 July 2022

EC Policy Meeting Agenda

2.   The outlook for domestic activity

3.   What this all means for the labour market, wages and inflation

Household Consumption

$b

Previous

Current

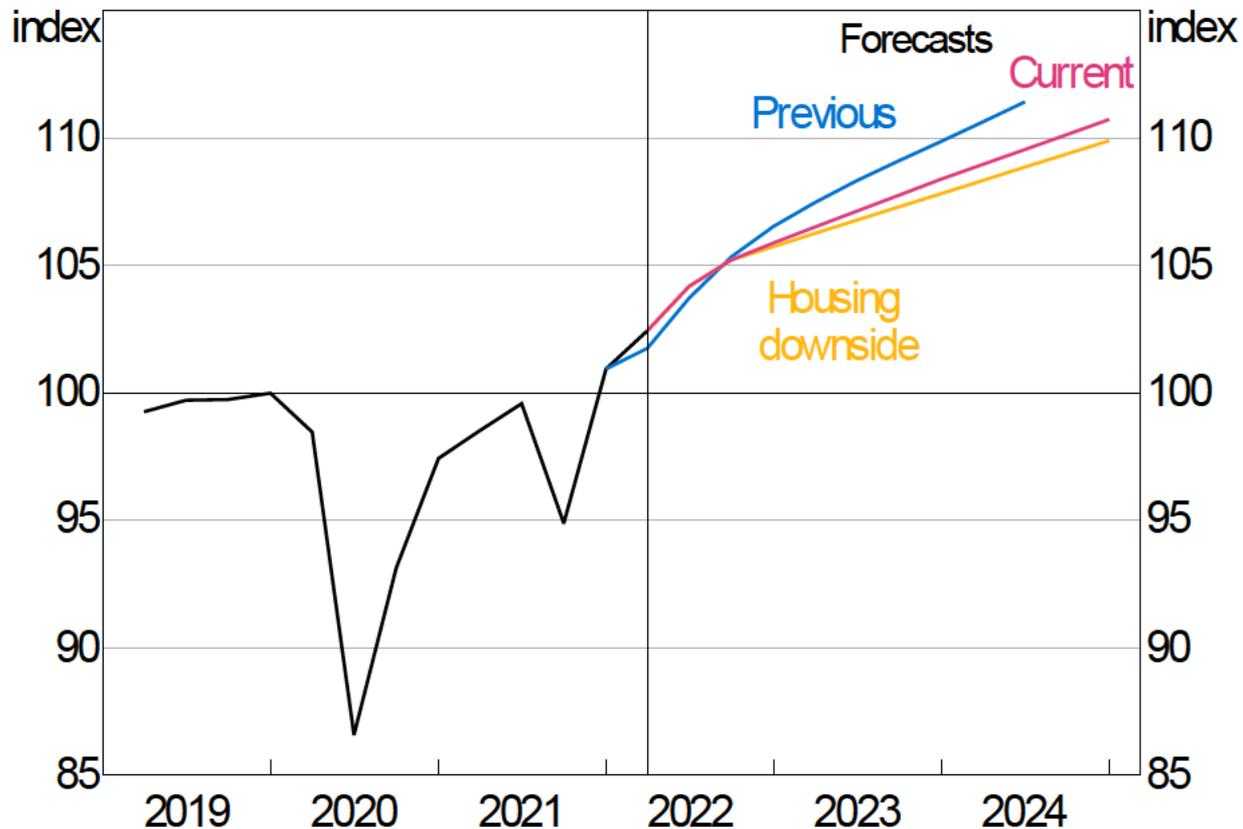Sources: ABS; RBA

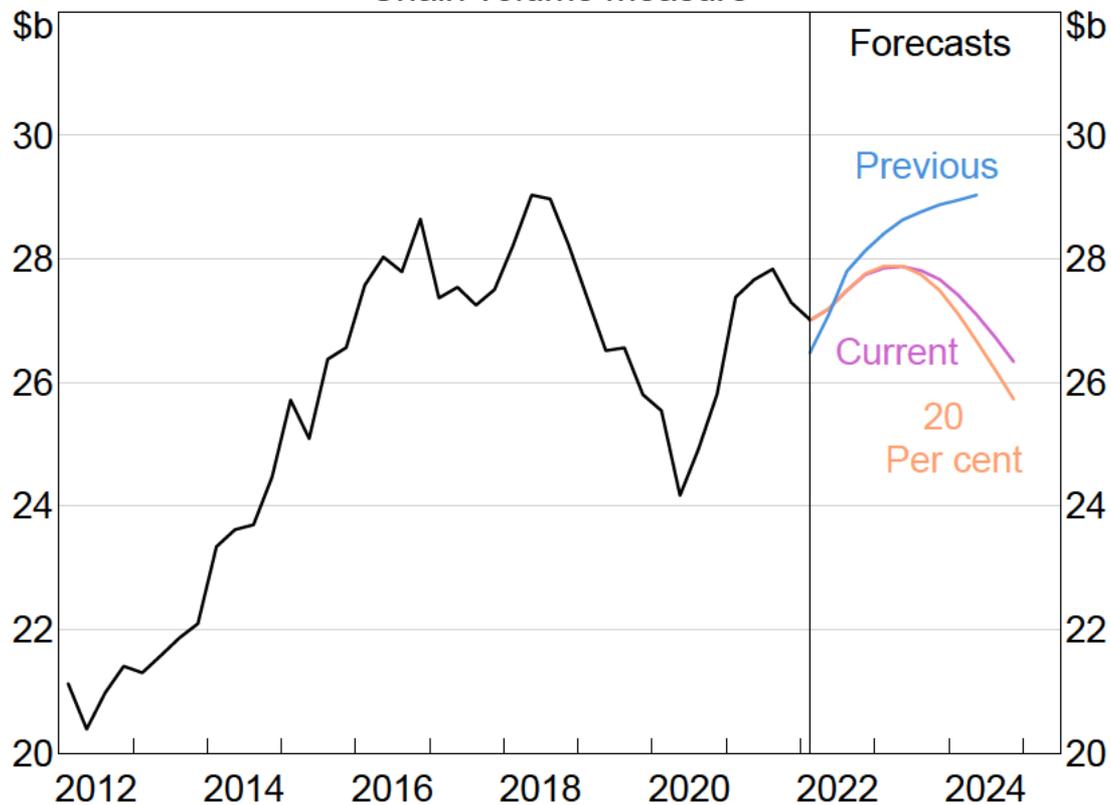**Dwelling Investment**

Sources: ABS; RBA

Household Consumption Forecasts
December 2019 = 100

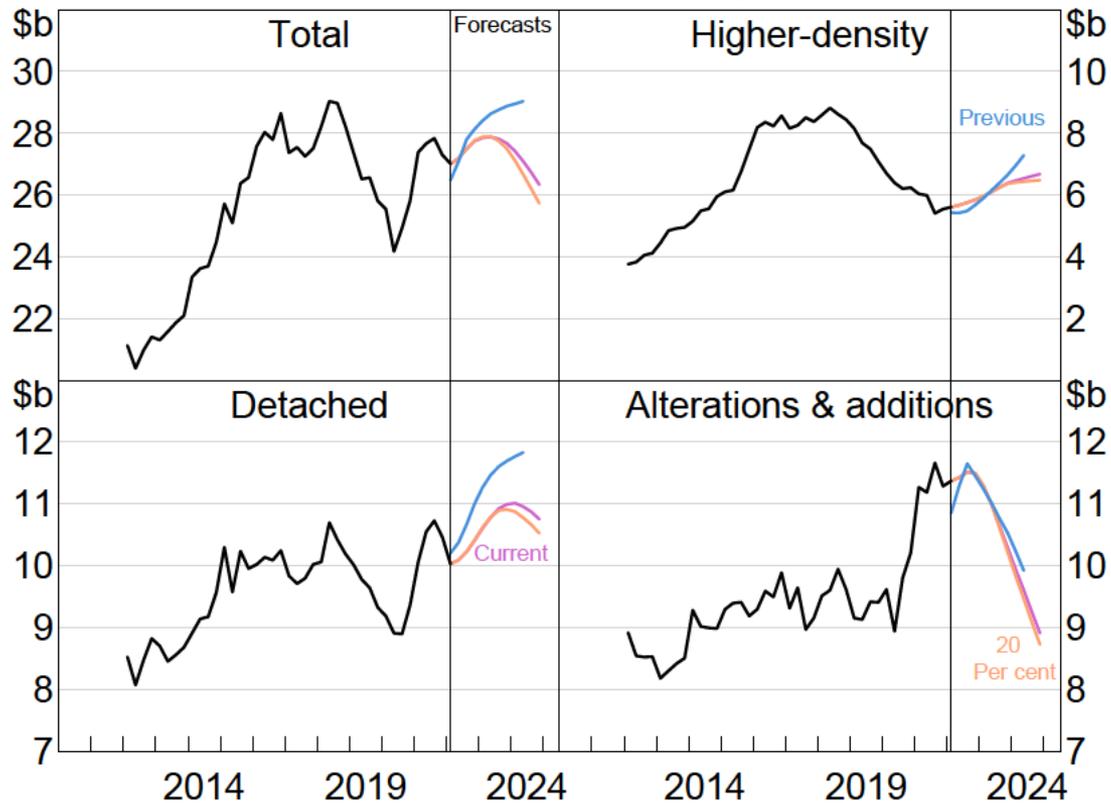

Sources: ABS; RBA

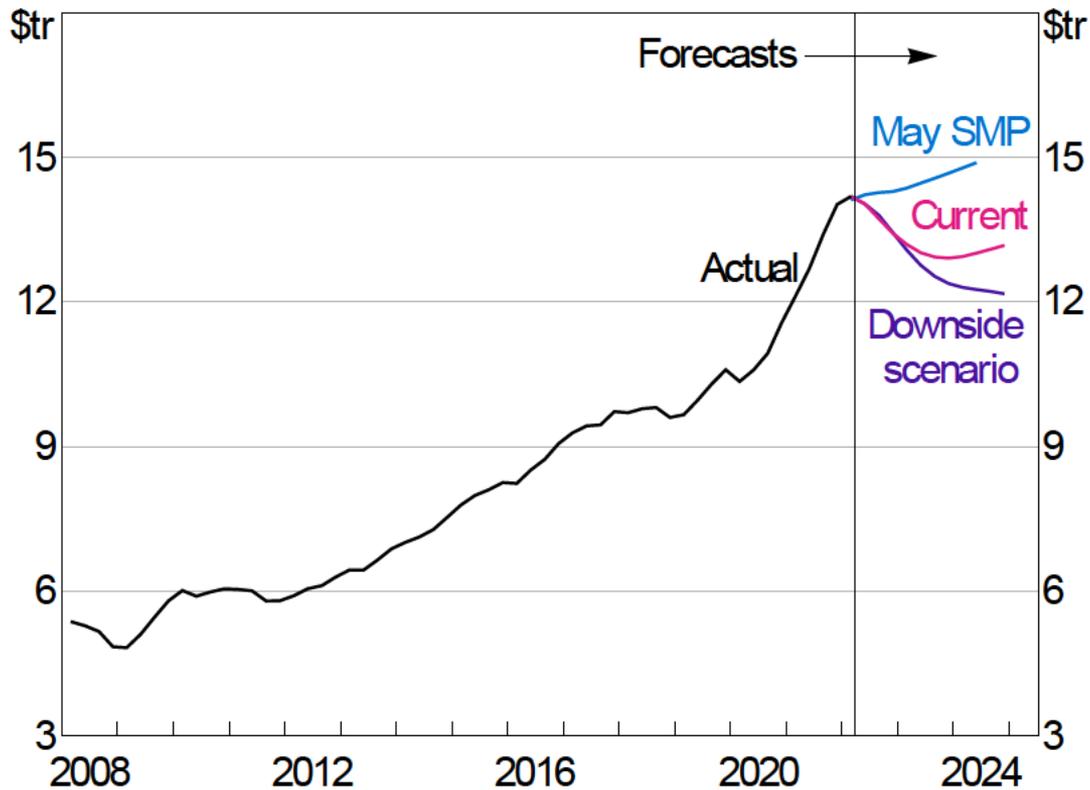# Dwelling Investment
Chain volume measure

Sources: RBA; ABS

Dwelling Investment
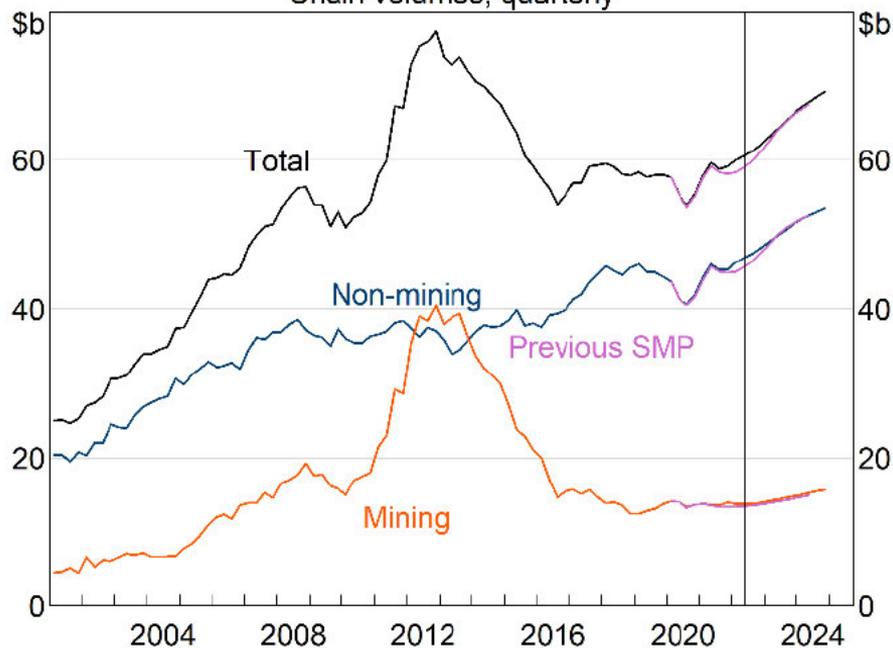## Chain volume measure

Sources: RBA; ABS

Household Net Wealth
Levels

Sources: ABS; RBA
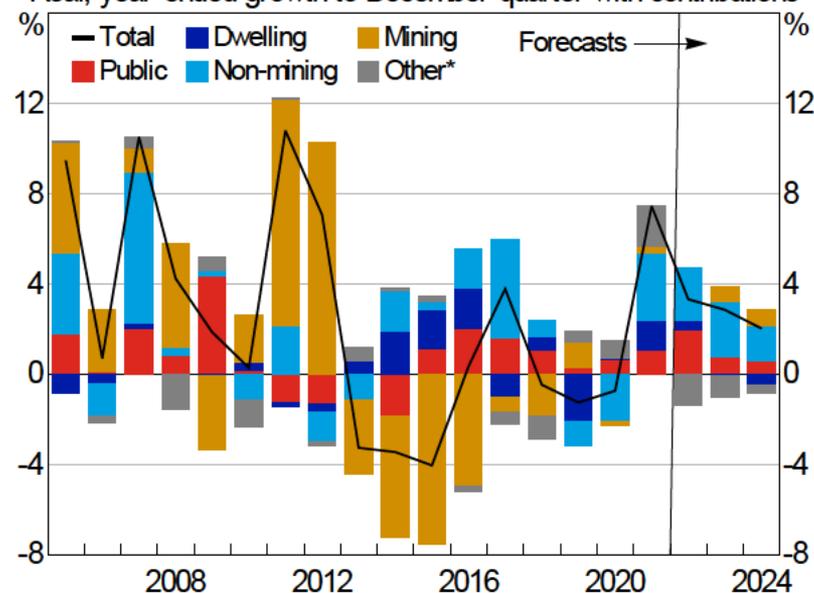
Business Investment

Chain volumes, quarterly

Sources: ABS; RBA

Investment

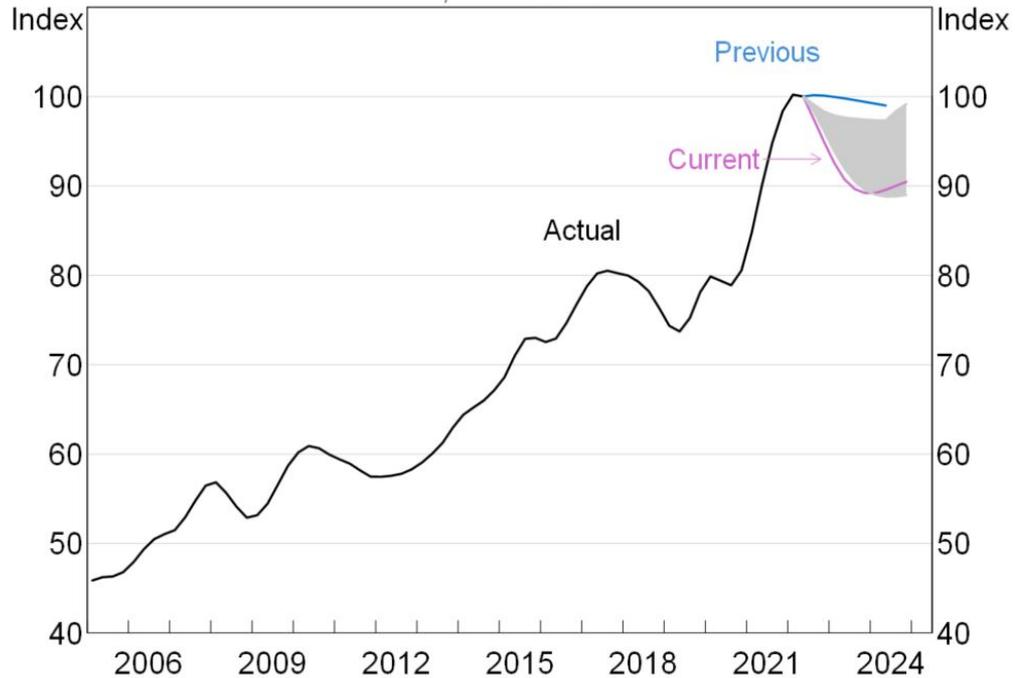Real, year-ended growth to December quarter with contributions

* Includes ownership transfer costs, net purchases of second-hand assets, and other items.
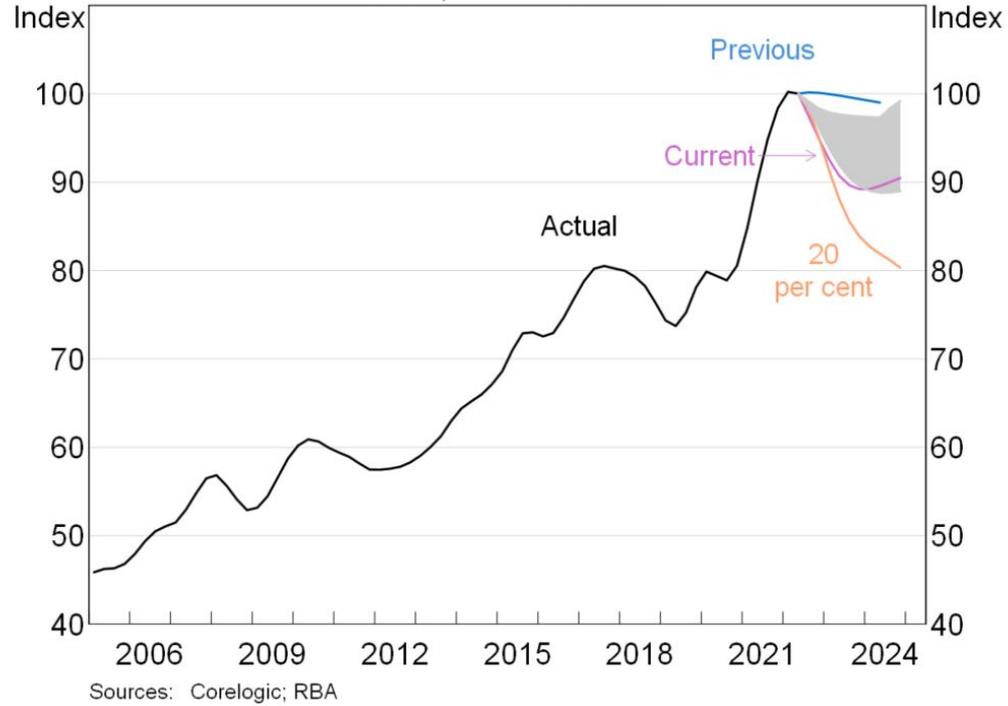
Sources: ABS; RBA

Housing prices

Nominal, June 2022 = 100
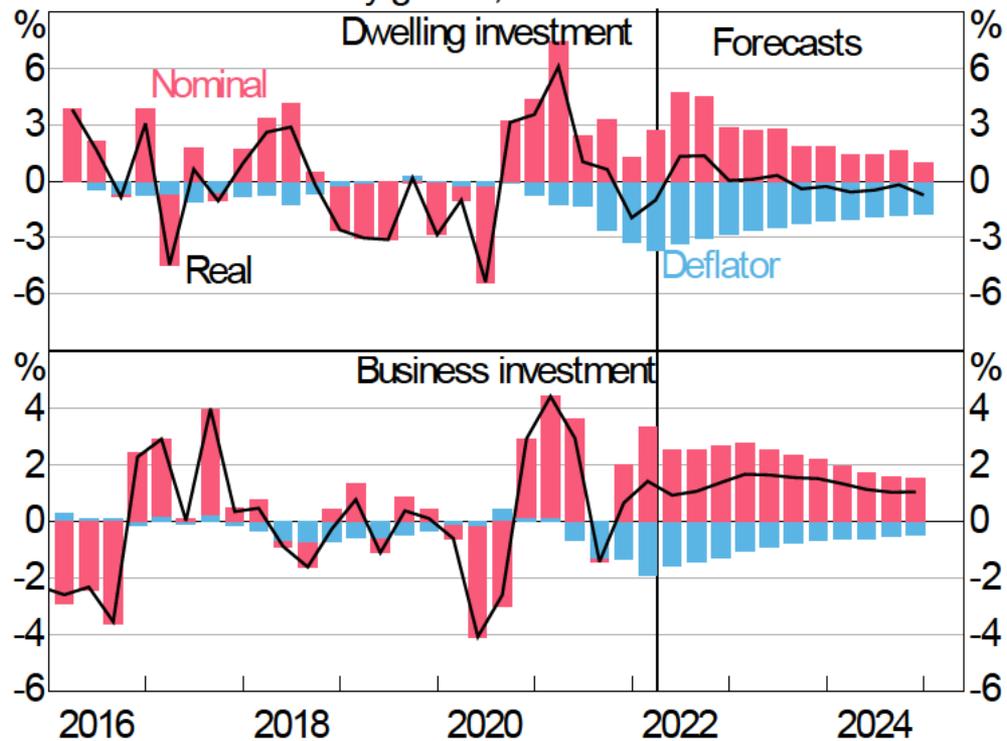
Sources: Corelogic; RBA

Housing prices

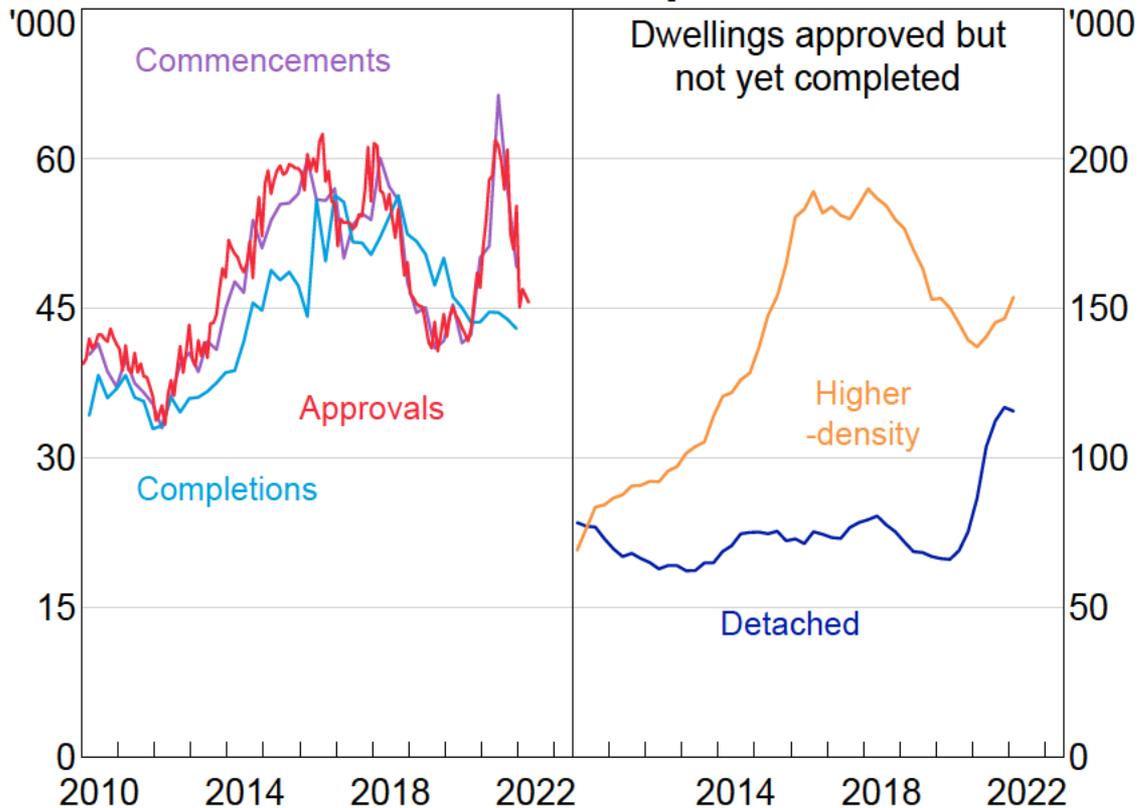Nominal, June 2022 = 100

Sources: Corelogic; RBA

Private Investment

Quarterly growth, with contributions
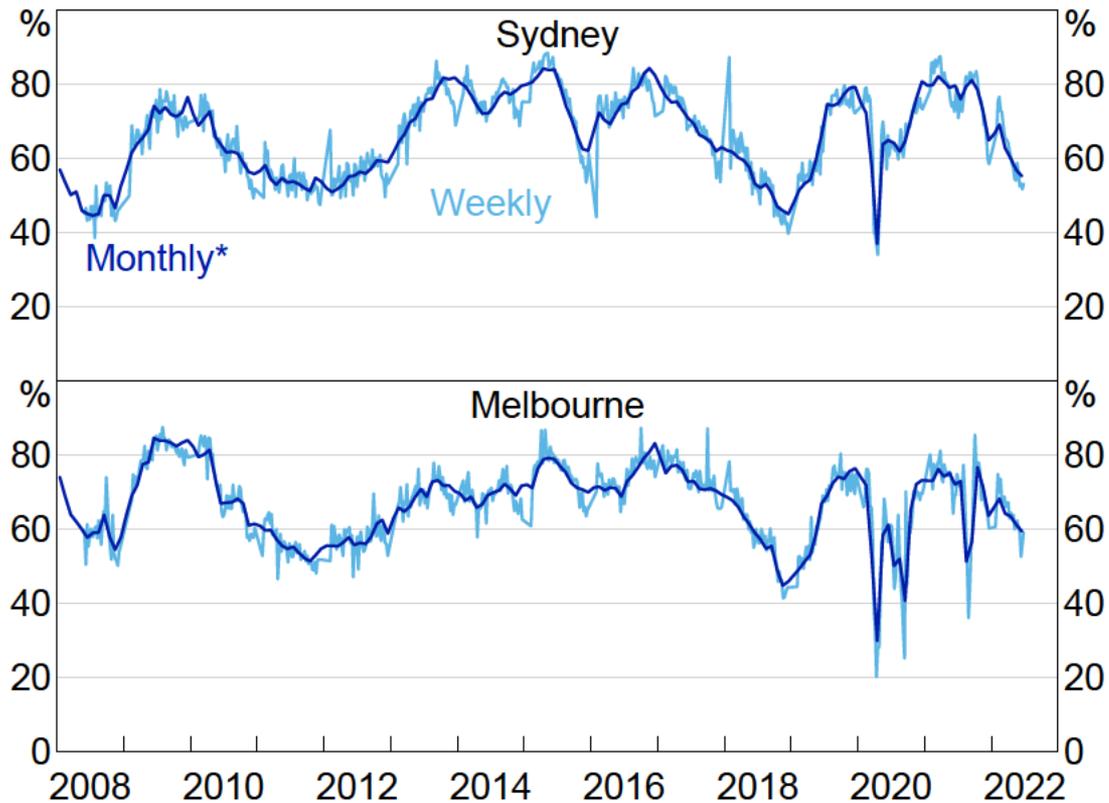

Sources: ABS; RBA

Residential Pipeline

Sources: ABS; RBA

Auction Clearance Rates
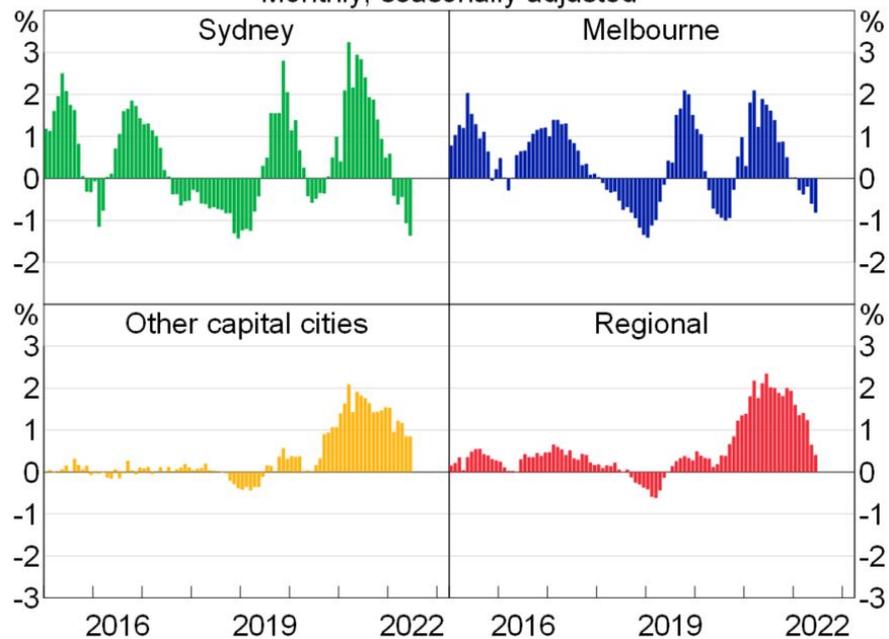

Sources: APM; CoreLogic; RBA; REIV

* Seasonally adjusted

Housing Price Growth
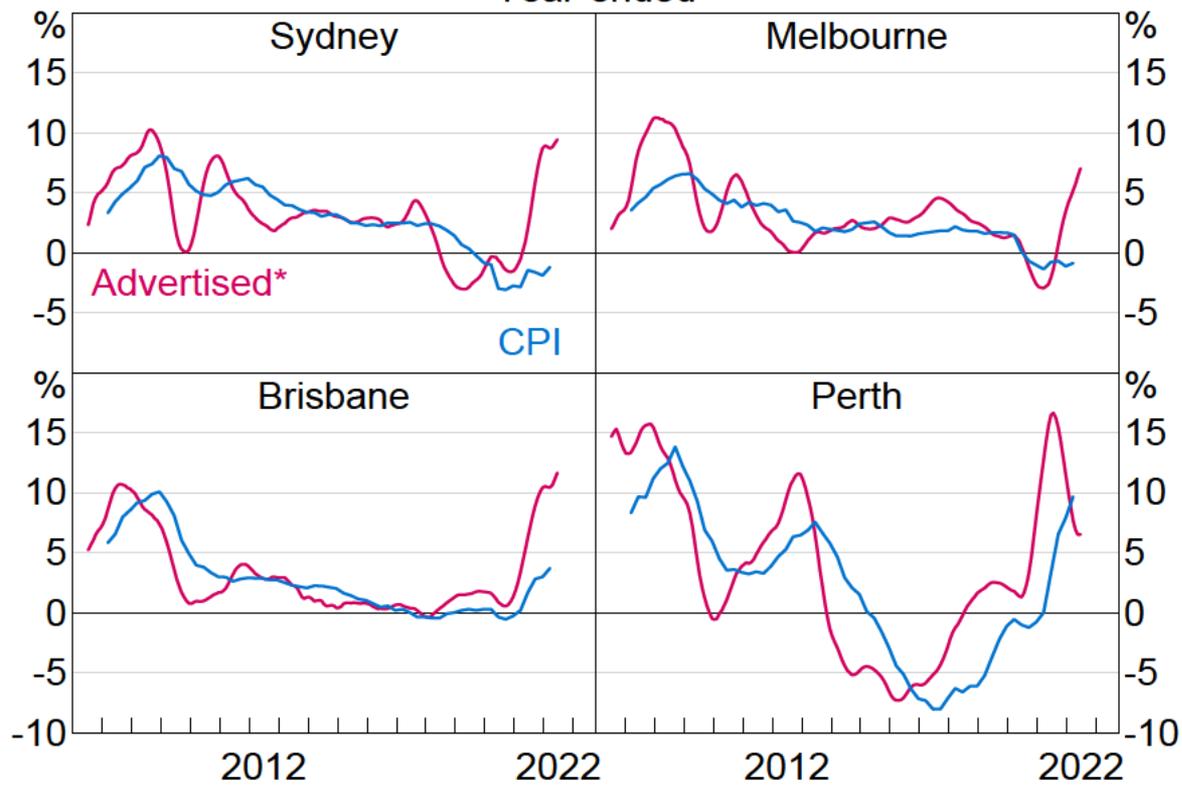
Monthly, seasonally adjusted

Sources: CoreLogic; RBA

Rent Inflation

Year-ended

* Hedonic rolling three-month average

Sources: ABS; CoreLogic; RBA

From:
Sent: Monday, 15 August 2022 9:22 AM
To:
Cc: FS - HBC Management
Subject: RE: Forecasts - housing price scenarios // dwelling investment [SEC=OFFICIAL]

Thanks James – you're right that the higher inflation forecasts are supporting nominal prices at the moment. The other thing that we think is important is the expectations term (currently +2.6%) in the model. On top of all of that, vacancy rates are quite low => supporting rents => supporting prices. But we do think that the more momentum-based measures that we track (the VAR model and a simple projection forward of recent price moves) provide more sensible forecasts in the near term.

From:
Sent: Monday, 15 August 2022 8:24 AM
To:
Cc: FS - HBC Management
Subject: Re: Forecasts - housing price scenarios // dwelling investment [SEC=OFFICIAL]

Thanks   and   , this is useful background.
It's interesting that the ST model predicts a fairy muted decline in nominal prices, given the outsized effects (nonlinearity) at low rates in that model. I'm guessing it has something to do with the inflation adjustment being so large at the moment.

Thanks again
James

> On 12 Aug 2022, at 2:48 pm,   wrote:
>
>
> In cleaning out my inbox post SMP I found this, which has everything you should need.
>
> Cheers,
>
>
> ---
>
> **From:**
> **Sent:** Monday, 18 July 2022 4:42 PM
> **To:**
> **Cc:**
> **Subject:** RE: Forecasts - housing price scenarios // dwelling investment [SEC=OFFICIAL]
>
> Hi
>
> **Housing price scenarios**
>
> Here's graph with the ST forecast, mortgage VAR forecast, AR(3) and a downside scenario of a 20 per cent decline via a downgrade in the capital appreciation assumption from 2.62 per cent annual growth (from long-run post 1955 average – 10 year average was at 3.78 per cent this round), **to an assumption of expectations of a 1.5 per cent annual decline.**

And the graph with the model range:

- As for the numbers, a rough estimate of the market economist forecast is a 15 per cent decline (this number is roughly the most recent forecast from ANZ, CBA, NAB). A table of the most recent market forecasts can be found [here](#).

- As for the rule of thumb, I've attached an email of the rule of thumb _____ requested on Friday for today's 8.50 as a primer for the management forecast meeting. To summarise, **a rough estimate of the downside for the next quarter would be 0.9 per cent decline each month** (Scenario 1). This roughly equates to 2.7 per cent in the quarter, a slightly larger decline than our quarterly estimates for Sep and Dec 2022 (2.5 and 2.6 per cent declines respectively). **Overall, this would be a 5.4 per cent over the rest of this year.** If this 0.9 per cent average monthly decline were to continue over the whole of 2023, this would give a 15 percent decline peak to trough – **this is also in line with the market forecast in terms of trough size and troughing at the end of 2023.**

- I might note that we assume a trough end of 2023 as well, but assume that the rate of declines slow in mid-2023, when the cash rate is assumed to flatten out. This rule of thumb is also roughly what has happened in the past (Macquarie JUST CHARTS).

- In a more extreme downside scenario, not necessarily for the next few months but in late 22/early 23, which assumes that the current rate of decline in the growth rate doubles, we'd have a 1.1 per cent decline each month, equating to a 3.3 per cent quarterly decline. This would be a 6.6 per cent decline over the rest of this year.

Dwelling investment
I have attached the new smoothed dwelling investment. I have also taken into account some feedback from James regarding capacity constraints and detached, and have decreased the rate of increase. Full forecasts are attached in the spreadsheet.

Thanks,

From:
Sent: Monday, 18 July 2022 11:17 AM
To:
Cc:
Subject: Forecasts - housing price scenarios // dwelling investment [SEC=OFFICIAL]

Hi

Can you do a few things for us today and tomorrow ahead of pre-PDG? This echoes some of the comments we got at the forecast meeting.

Give me a shout this afternoon if you need to reprioritise work and you want to talk about that or the suggestions below.

_____ – please also weigh in here with any additional requests for information as you see fit.

Housing price scenarios

Can you please prepare a few numbers and slides for _____ on housing price scenarios.

To start with, it would be good to see a version of this graph that has a few different scenarios on it. Suggest the existing Saunders-Tulip forecast and another line that shows a downside scenario coming from a deterioration in house price expectations (i.e. a line that is below the current line). I'd also like to see the AR(3) line, but I don't think we should show that one at pre-PDG.

I guess the implicit question is what change do we need in expectations, alongside the forecast assumption for the cash rate, to get a worse than currently forecast price decline.

Can you please put together the following numbers for us:

- The range of market economists' expectations for housing prices over the next 12 or so months
- A simple rule of thumb based on the continuation of the recent monthly Sydney and Melbourne price data over the rest of 2022. I.e. what change in aggregate prices do we get if we do a weighted average of no change in the rest of the country + Sydney and Melbourne persisting at current changes.

Dwelling investment

Can you please have a think about some ways to smooth the quarterly growth rates of the dwelling investment profile? How might a worse than expected housing price profile flow into this? How sharp would the declines in housing prices need to be to materially affect the profile?

Thanks,

Domestic Activity and Trade | Economic Group
RESERVE BANK OF AUSTRALIA | 65 Martin Place, Sydney NSW 2000
| w: www.rba.gov.au