

House Prices, Rents, Home Ownership and Affordability: The Facts and a Mainstream Economics Explanation

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Presentation: Sydney University
31 May 2018

1 Presentation Outline

This presentation aims to promote understanding of the nature, causes and major consequences of rising house prices.

The presentation is structured as follows:

- House Prices, Rents and Home Ownership: The Facts
- Key Drivers: Population, Housing Supply, Incomes, Interest rates: The Facts
- House Prices, Rents and Home Ownership: General explanations
- House Prices, Rents and Home Ownership: Empirical explanations
- Housing Affordability in Sydney
- Conclusions

- The focus is on capital cities, especially Sydney

This is work in progress: many issues are not fully resolved here, e.g. the full causes of recent declines in home ownership and, importantly, details of housing affordable problems for low income households.

However, we argue that the main conclusions are robust.

In the conclusions, we make a few brief observations about policy responses, but these are not focus of presentation.

2 Acknowledgments

- The presenter is part-time consultant to NSW Treasury. All views are the presenter's responsibility.
- Oxford Economics: *Forecasting UK House Prices and Home Ownership (1992 to 2014)*
<https://www.oxfordeconomics.com/my-oxford/projects/351906>
- Thanks to Sydney University for hosting this presentation
- Full version of this presentation plus references and detailed tables is available at:
 - www.applieconomics.com.au/publications/papers/index.htm

3 House Prices, Rents and Home Ownership: The Facts

House prices in Australian capital cities: 1970 to 2017

- Median nominal detached house prices
- Median real detached house price indices
- Median real attached house price indices

Sources

- 2003-2017 ABS
- Earlier data Valuer-General / REIA

Abelson., P and D. Chung, 2005, "The Real Story of Housing Prices in Australia from 1970 to 2003", *Australian Economic Review*, 38, 3, pp.1-17.

Housing quality

- ABS data are quality adjusted
- The data series are spliced together taking ABS data as the standard
- Earlier data are not quality adjusted – this could overestimate price rises by 0.5% to 1.0% p.a.

Summary data in next 3 slides. Full data are given as annexes in accompanying paper.

4 Capital Cities: Median Nominal House Prices

(\$'s, average over year)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra
Year								
1980	71,787	41,952	36,700	36,496	45,615	33,693		52,070
1990	202,277	139,131	116,903	98,539	114,321	76,215	100,682	140,739
2000	299,244	202,854	175,871	136,860	176,639	109,443	185,294	210,759
2003	473,630	293,130	257,600	228,100	231,750	160,330	209,630	342,280
2005	494,000	325,500	314,730	274,000	311,250	246,880	292,500	375,050
2010	603,380	494,080	405,500	405,500	507,000	344,830	534,750	527,680
2015	880,250	585,880	485,250	432,000	538,250	356,880	586,500	593,000
2016	910,000	627,500	501,250	433,280	522,250	370,080	543,750	625,500
2017	988,800	716,100	517,800	458,500	508,300	398,300	510,000	671,800

Details - See Annex Table 1

5 Capital Cities: Median Real House Price Indices

(2003=100)

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	All cities
1980	45.5	42.9	42.7	48.0	59.0	63.0		44.8	48.1
1990	58.8	65.3	62.5	59.5	67.9	65.4	66.1	56.6	61.3
2000	70.7	77.5	76.4	67.2	85.3	76.4	99.0	68.9	72.7
2003	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2005	99.2	105.7	116.3	114.3	127.8	146.5	132.8	104.3	102.9
2010	104.5	138.3	129.2	145.9	179.5	176.5	209.3	126.5	129.0
2015	135.9	146.1	137.7	138.5	169.8	162.8	204.6	126.7	142.8
2016	139.1	154.9	140.8	137.5	163.1	167.1	187.7	132.3	149.8
2017	148.2	173.5	142.7	142.7	155.7	176.4	172.7	139.4	160.6

Details – Annex Table 3

6 Capital Cities: Real Median Other Dwelling Price Indices

(2003=100)

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	All cities
1980	47.1	36.8	55.6	60.1	72.5			40.1	
1990	51.9	58.8	62.3	70.1	64.9	77.7		52.7	
2000	79.7	76.6	95.1	69.6	79.7	78.8	107.1	61.9	79.5
2003	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2005	96.3	97.4	110.4	112.4	122.7	121.5	143.7	98.8	104.7
2010	102.5	130.1	137.1	146.7	173.0	136.8	259.7	116.4	132.4
2015	129.0	128.3	128.7	135.6	163.3	124.0	249.4	104.7	135.7
2016	135.5	131.0	126.6	132.7	159.2	128.2	232.7	107.4	137.3
2017	138.9	137.4	125.9	145.7	151.3	135.7	203.7	107.6	139.9

Details – Annex Table 6

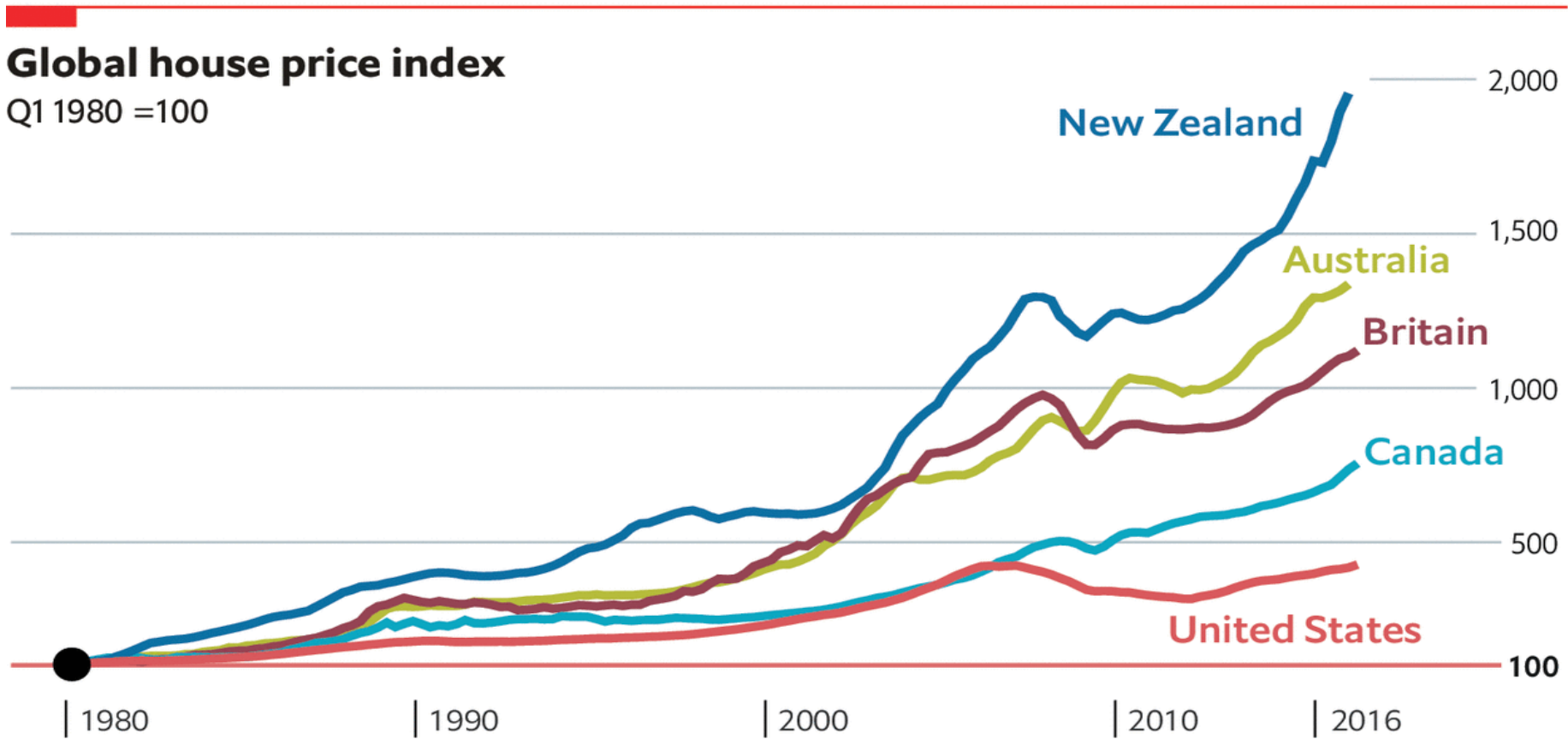
7 Comments

- There are short-term variations in house prices between the capital cities.
- **But the long-term changes are remarkably similar.**
- Since 2000, median detached house prices **have risen less** in Sydney than average of other capital cities.
- Median other dwelling prices have **risen about the same** in Sydney as average of other capital cities.
- **Changes in housing prices are a national phenomenon.**
- The principal cause(s) of rising house prices are likely to be a national drivers / causes.
- As shown in Slide 8 and IMF (2018), house price inflation is also an **international phenomenon.**

8 International House Prices

Global house price index

Q1 1980 = 100



9 Median Housing Rents and Household Income in Sydney: 1990 to 2017

Year	\$ per week		Real indices: 2001=100		
	Houses	Units	Houses	Units	Median gross household income
1990	185	170	104.0	84.7	
1995	190	180	94.7	79.5	90.8
2000	230	250	104.1	100.3	99.9
2001	235	265	100.0	100.0	100.0
2005	260	280	93.6	98.8	115.2
2010	380	420	123.6	125.0	126.5
2015	460	500	127.6	131.4	139.2
2017	485	550	139.3	140.1	145.0

Notes: 2001 = 100.

Middle ring results are similar for all city sales. Units are closer to CBD, so rents higher. Rents increase in line with household incomes. Much lower than house price increases.

Source: *FACs Rent and Sales Reports*. Details – Annex Tables 8 and 9.

10 Home ownership (%) in Australia and Sydney: 2001 to 2016

	2001	2006	2011	2016
Australia	71.6	70.4	69.4	68.0
Sydney	68.4	67.3	67.4	64.6

- Source: Census data: Owned as % of owned and rented. Excludes other tenure type and tenure not stated.

Average may underestimate decline in home ownership – home ownership increases with age. If age profile increases, overall ownership may be constant with occupancy rates falling for all ages.

On other hand, migration / short term worker effects may reduce home ownership rate.

- In Sydney, Australian born residents fell from 62.2% in 2001 to 57.1% in 2016.
- Ideally need to sort out age and migration effects.

Almost certainly, allowing for these factors, home ownership has declined.

We will see the major cause: the increase in FHO deposits.

UK homeownership fell from 69.3% in 2002 to 63.1% in 2014 (Oxford Economics).

11 Key Drivers of Rents and House Prices: The Facts

Key Drivers

- Demand: population, incomes, interest rates
- Supply: housing stock
- Median household incomes in Sydney: slide 9, between 2001 and 2017, real change = 45%
- Population and housing supply in Australia and Sydney: 1991 to 2016 (Census data)

	Period	Population increase	Private housing increase
Australia	1996 – 2016	31.8	40.0
Australia	2001 – 2016	24.7	27.1
Sydney	1991 – 2016	36.3	41.3
Sydney	1996 – 2016	28.9	30.1
Sydney	2001 – 2016	22.3	20.1

- Housing stock generally increased by **more** than population across country.
- Also in Sydney between 1991 and 2016 and between 1996 and 2016.
- Major exception: Sydney 2007-12 – private completions were very low - just under 1% of stock

12 Borrowing Rates: 1991 to 2017

Year	RBS cash rate	Standard mortgage rate	Discounted mortgage rate
June Qtr	%	%	%
1991	10.52	13.42	13.22
1995	7.50	10.50	10.30
2000	6.25	7.72	7.52
2005	5.50	7.30	6.80
2010	4.75	7.27	6.75
2015	2.00	5.45	4.65
2016	1.75	5.40	4.60
2017	1.50	5.25	4.50

- Bergman and Tran (2018) provide strong evidence that discounted mortgage rate is the common rate.
- In a highly competitive mortgage market, borrowing rates for an 80% LTV mortgage may be lower than the discounted mortgage rate.
- Details on rates – Annex Table 7.

13 Other Factors: Taxes / Subsidies, International Demand, Regulation

Taxes and subsidies: main ones have not changed in real terms over last 20 years

- Negative gearing unchanged since 1985
- 1999: CGT changed from 100% on real gains to 50% of nominal gains (real + inflation)
 - This is a concession only if real gain > inflation. This is recent experience.
 - If inflation > real gains, the 1999 change is not concessionary.

International demand has escalated. Reliable data hard to get. FIRB approvals ≠ actual purchases. And money moves in many ways.

Lending regulations: Loan to value (LTV) ratios. Have tightened recently and almost certainly will be having current impacts. (See, for example, Atkin and Cheung, 2017).

Note also the role of substitutes – house prices in other Australian cities (or international cities, IMF 2018).

14 General Explanations: Rents and House Prices

– Core Concepts

There are two distinct concepts: living in a house and owning a house

- Latter is equivalent to consuming housing services and investing in a house

Rents are the price of housing services

- Rental prices balance the supply and demand for **housing services**

House prices are the price of owning houses

- House prices balance the supply and demand for housing **as an asset**

15 Real Housing User Cost

Another key concept: the cost of home ownership is the real annual cost of the owner.

- This is known as the real housing user cost (RHUC)

RHUC is cost of housing that leaves the owner as well off at end of year as at the start.

- $RHUC = f(RMR, RER, D, M, PT, RCG)$
- RMR is real mortgage rate of interest, RER is real post-tax return on own equity, D and M are depreciation and maintenance in real terms, PT is property tax, RCG is real capital gains.
- RHUC is all costs (and gains) of home ownership expressed **in real terms**.
Can estimate in nominal terms and discount for inflation

Repayments of mortgages are **not** part of RHUC - these repayments do not affect net worth.

- They reduce current consumption, but increase future consumption.

RHUC may be calculated in absolute \$s or as % of house price.

16 Drivers of Housing Rents

Three main drivers

Rents depend on:

- Demand (population and income) and
- Supply of housing

Changes in house prices do not influence rents.

17 Drivers of House Prices

Asset prices are the present capital value of an income stream

House price = current net rent / RCC (investor) or = rent / RHUC (owner)

- where net rent is gross rent less operating costs and **RCC is the real cost of capital**.
- This takes inflation out of the both the income stream and the discount rate.
- Thus, changes in rents affect house prices.
- But house price can change **without** changes in rents (the price of housing services).
- Standard asset pricing theory – if RCC (or RHUC) halves, the price of houses doubles.

Analogy: one can buy clothes or invest in a clothing company. The value of the shares may rise without any increase in the price of clothing.

Thus, the core drivers of house prices are drivers of rents plus borrowing (discount) rates.

- Population (inc. migration), income, housing supply and interest rates.
- Other factors (Slide 13): tax / subsidy changes, international demand, prudential regulations.
- And modelling city house prices, prices in other cities.

18 Drivers of Home Ownership

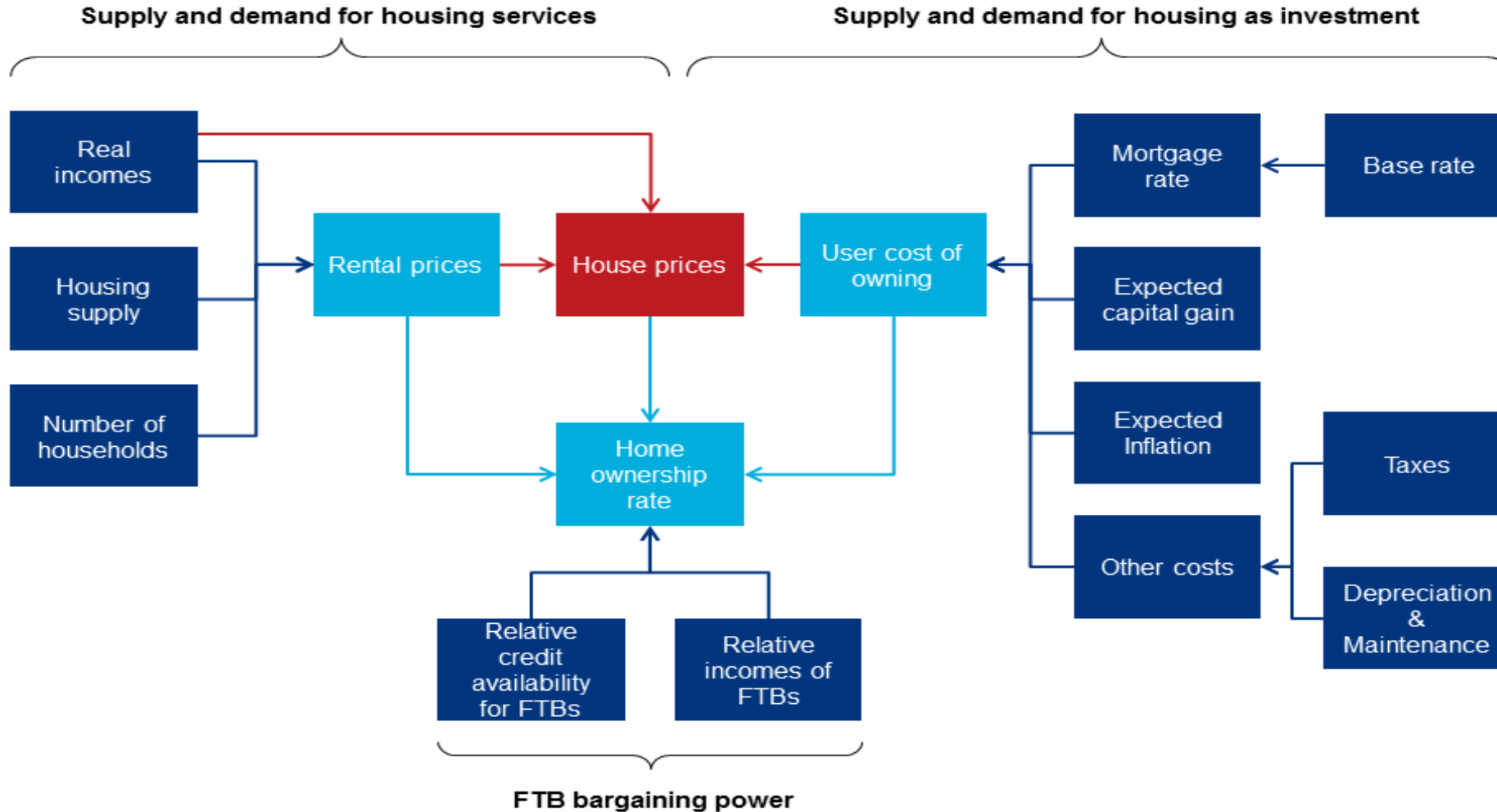
Complex topic with several drivers – the presenter has not researched this in detail

- Demographics of potential FHOs (age structure)
- Earnings of potential FHOs
- Cost of FHO
- Constraints on FHO borrowing for mortgage (high LTV ratios expensive)
- Housing preferences (security of ownership, cf. mobility)
 - Potential differences between native born and new migrants
- The balance between rents and RHUC.

Renting < RHUC → More renting / less home ownership and vice versa

Oxford Economics Report (2016, Section 6.4) estimated these relationships for UK. They found that the home ownership rate is not affected by the supply of housing (more houses reduce RHUC and rents).

19 An Overall Explanatory Diagram: Oxford Economics



20 Rents: Empirical Explanations

- Rents = f (population, income and housing supply)
- Population and housing supply increased similarly over this period offsetting each other.
- We have seen that housing rents have risen almost exactly with household income

In Sydney between 2001 and 2017:

- Real median rent for 3-bedroom houses rose by 39%
 - Real median rent for 2-bedroom units rise by 40%.
 - Real median gross household income rose by 45%;
- Thus, rent increases reflect primarily increases in household income.
 - See Slide 9 and Annex Tables 8 and 9.

21 House Prices: Empirical Explanations

- Simple model: House prices = $f(\text{rents, interest rates}) = f(\text{population, income, housing supply and real interest rates})$
- Between 2001 and 2017, in Sydney real detached house prices rose by 100% and real attached housing prices by nearly 70% - see Slides 3 and 6.
- Rents (i.e. population, housing supply and household incomes) accounted for a 40% increase. The major factor was rise in household incomes.
- Over this period, population increased slightly more than supply in Sydney (slide 11). Thus, low supply presumably made a small contribution to rent increase.
- Therefore, most of the difference between house price and rent rises was due to fall in real interest rates as per explanation / equation in Slide 17 and data in Slide 12 (note mortgage rates there are nominal).
- Between 2001 and 2017, the real discounted mortgage fell by over 40%. Applying equation in Slide 17, this fall accounted for over a 40% real increase in house prices between 2001 and 2017 (i.e. a substantial part of the real increase in prices).
- As noted at start, with house price inflation a national phenomenon, some national factor like interest rates is likely to be a major factor.

22 House Prices: Empirical Explanations (Continued)

More complex econometric modelling

- Abelson et al. 2005, 'Explaining House Prices in Australia: 1970 to 2003', *Economic Record*, 81, pp. S1-S8.

Major findings:

- Real house prices rose by 1.7% for each 1% increase in real disposable income per capita (i.e. elasticity = 1.7).
- A 1% fall in real mortgage rate led to a 5.4% rise in real house prices. Note this was estimated in absolute terms; it is not an elasticity estimate. This would imply that a 3% fall in real interest rates would increase real house prices by around 16%.
- A 1% increase in housing per capita led to a 3.6% fall in real house prices (i.e. an elasticity of -3.6).
- Expectations of real capital gains also explained the demand for housing (lowering RHUC)

In analysis of 20 studies across 12 countries Girouard et al., (2006) found following elasticities:

- Real house prices to real disposable household income = 1.9 (for 20 studies).
- Real house prices to real interest rates = -3.1 (for 18 studies).
- Real house prices to housing stock = -3.1 (for 10 studies).

These elasticities are similar to Abelson et al. for income and housing supply but indicate much higher impact for changes in real interest rates. (Abelson et al. are currently updating 2005 model).

23 Other House Stock Price Supply Elasticities

- Oxford Economics (2016) found a house price elasticity of -1.8 in relation to UK housing stock. They cite (2016, Figure 20) three other studies with price elasticities for housing stock between -1.1 and -2.1.
- They conclude that an increase in housing supply would have little impact on house prices in the UK.
- Critically, these estimates relate to **changes in the housing stock (not to flow figures)**.
- Example: In Sydney, private housing stock is about 1.9 million dwellings. Average annual supply is about 25,000 dwellings. Increasing annual supply by 10,000 per annum (40%) would increase the housing stock by 0.05 per cent.
- Adopting a price elasticity of -3.0, this would reduce real house prices in Sydney by 1.5%.
- Achieving this for 3 years would reduce real house prices by 4.5%.

24 City Substitutes - Inter-City Equilibrium: Another Core Issue

- Cities are substitutes – they are not independent.
- Abelson / Applied Economics and Travers Morgan (1991) study found Melbourne prices followed Sydney and Adelaide followed Melbourne.
- Thus, above housing supply effect for Sydney requires house prices in other cities also to fall by 4.5%.
- At margin, similar households have equal welfare in each city (Glaeser, 2007).
- Welfare = f (income, commuting costs, house prices and amenity).
- To achieve equilibrium, house prices are higher in cities with high incomes and high amenity.
- House prices in Sydney are a national feature. Without lower prices in other cities, lower prices in Sydney would lead to more immigration into Sydney.
- Sydney house prices would rise and prices elsewhere fall until the inter-city equilibrium would be restored.

25 Drivers of Home Ownership

As per slide 10, home ownership rates have fallen in Australia and in Sydney.

Slide 18 discusses possible factors.

- Demographics, migrants, lower earnings of potential FHOs, constraints on FHO borrowing.
- I am not aware of detailed modelling of these factors.

But I note two other factors:

- Government support for FHOs varies. Before September 2012, FHO grant was \$15,000 for any home up to \$650,000. Now \$10,000 only for new homes up to \$750,000.
- On the other hand, FHOs now receive relief from stamp duties on low priced housing.
- But note: the rising cost of the FHO deposit of 20% of the dwelling price (see Slide 30).

26 Housing Affordability in Sydney: Average-Income Renters: 1995 to 2017

Year	Median rent as % of median disposable household income	
	Houses	Units
1995	31.3	29.7
2000	31.3	34.7
2005	26.2	28.2
2010	30.3	33.5
2015	29.4	32.0
2017	28.9	32.8

- General picture: median rents have been broadly constant as a proportion of median household disposable income.
- This indicates that housing affordability has not worsened for middle-income housing renters. (Note also that housing quality has likely increased in this data series).
- See Tables 8 and 9 in Annex.

27 Housing Affordability in Sydney: Low-Income Renters

- First Quartile Rents and Top First Quintile Income

June qtr	Housing 3-bedroom		Unit 2-bedroom		Disposable HH income
	Rent (\$)	% of median rent	Rent (\$)	% of median rent	Top 1 st quintile as % median
2001	195	84.8	195	78.0	48.6

2010	330	86.8	340	80.0	49.2
2015	400	87.0	410	82.0	50.7
2016	410	87.2	420	80.8	49.4
2017	420	86.8	450	81.8	50.4

- Source: *FACs, Sales and Rental Reports*

Table shows:

- First quartile rents (25% level) for all 3-bedroom houses and 2-bedroom units in Sydney.
- These rents as % of median rents.
- Estimated disposable household income at top of first quintile (20% level) as % of median disposable household income.
- See also Annex Table 10.

28 Explaining High Housing Costs for Low-Income Renters

- First quartile rents are typically between **80% and 85% of median rents**. i.e. first quartile rents represent a reduction of 15% to 20% on median rents.
- In 2015-16 \$s, gross household income was \$45,321 at top of 2nd decile compared with \$106,742 at top of 5th decile (median household income).
- Allowing average tax rates of 20% and 5% respectively, households at top of 2nd decile **have approximately 50% of disposable income of median household**.
- Rent as % of disposable household income for a low-income household (R/Y_{LYH}) is given by:

$$R/Y_{LYH} = R/Y_{MYH} \times 0.8/0.5$$

where R/Y_{MYH} = rent as % of income for median income household, 0.8 = rent discount and 0.5 = income discount for low-income household.

- This implies housing rent to income ratio = 60% higher for low-income household (at top of 2nd decile level). In Slide 27, we apply this ratio to results for 3-bedroom houses.
- This shows low-income households pay nearly 50% of their disposable income on housing rents.
- These results are not precise, but **indicate strongly where housing affordability is a major problem**.

29 Affordability for First Home Owners: Four Metrics

Four metrics in relation to median FHO disposable income.

- 1. Interest payments on an 80% mortgage
- 2. Mortgage payments (principle and interest)
- 3. First home owner deposits
- 4. Real housing user costs

Assumptions underlying estimates

- Median FHO income = median Sydney household income. (ABS 4130.0: 55% of FhOs are > median income; 45% < median)
- FHO purchases a dwelling at 70% of median price in Sydney (for all Australia, the ratio is 87%)
- FHOs borrow 80% of house price.
- They have access to discounted mortgages at this LTV ratio.

30 Affordability for First Home Owners: Four Metric Results

- Year 2017 (right hand column) Compared with 1995-2016 Average

Metric	1995-2016 % of income	2017 % of income
Detached dwellings		
Interest payments	40.0	35.3
Mortgage payments	50.5	52.9
First home deposit	174.7	223.9
Real housing user costs	36.2	26.4
All other dwellings		
Interest payments	33.2	26.3
Mortgage payments	41.5	39.4
First home deposit	143.9	167.1
Real housing user costs	30.1	19.7

- On three metrics, affordability in 2017 is no worse than in the previous years.
- If FHO has savings = 20% of value of housing OR can borrow 100% at discounted mortgage rate, affordability in 2017 than 10 or 20 years prior.
- But, when neither of these conditions exist, there is a significant FHO housing deposit problem which deters FHO buyers.

See Annex Table 11.

31 Affordability for First Home Owners: Four Metric Results

- Housing Affordability in 2017 Compared with other 22 Years 1995-2016

Metric	Equally affordable in 2017	More affordable in 2017	Less affordable in 2017
Detached dwellings			
Interest payments	0	14	7
Mortgage payments	0	6	16
First home deposit	0	0	22
Real housing user costs	0	21	1
All other dwellings			
Interest payments	0	21	1
Mortgage payments	1	17	4
First home deposit	0	1	21
Real housing user costs	0	22	0

- This is another way of presenting the previous conclusions.
- Details, see Annex Table 12.

32 Conclusions

This presentation has focused on explaining causes of house price inflation and some of the consequences.

Rents

- Rents have risen broadly with household incomes. They have **not** risen with house prices. Thus median income households are spending a similar % of their income on rents - probably for improved quality housing.
- But rents are a serious problem for low-income households because the distribution of incomes is much greater than the distribution of rents.
- This is ongoing problem (and perhaps worsening with low wage growth) which in my view needs more analysis and action.
- Dealing with this is complicated by Commonwealth / state relationships for welfare support.

House prices

- House prices are an asset pricing issue.
- The key driver of house price inflation (nationally, in Sydney, and internationally) over the last 18 years has been the large falls in the RBA and other Bank Rates and related borrowing rates.
- With borrowing rates likely to rise, house prices are likely to fall in real terms from recent peaks.

33 Conclusions (Cont.) – Final Slide!

- Using 3 metrics (interest payments, mortgage payments and RHUC), the cost of homeownership has been broadly constant relative to income over last 20 years.

First Home Owners

- But there are significant FHO problems as deposits have risen in relation to income which has most likely contributed to a fall in homeownership rate.
- There are (in my view) strong social reasons to support home ownership. One way is assistance for FHOs for low-priced housing. An issue here is whether this pushes up house prices and helps home owners more than the purchasers.

Housing Supply

- Housing supply has a minor impact on house prices. Increasing housing completions by a large amount, say 40% (from 25,000 to 35,000 p.a.) for 3 years would increase housing stock in Sydney by about 1.5% and could reduce real house prices by about 5%.
- However, this assumes no increase in immigration to Sydney as a result. House prices in Sydney can be lowered substantially relative to other Australian cities only by lowering its relative amenity premium.

Environment

- Without investment in infrastructure and environmental amenities, increases in housing density tend to increase congestion and reduce existing amenity. The various trade-offs require careful and fair management.
- As a young Frenchman from Paris planning to settle in Sydney explained his reason to me: **“There are no trees in Paris”!**