Financial Tightening in 2018-19 in Australia Contrasted with the 1974 Credit Squeeze
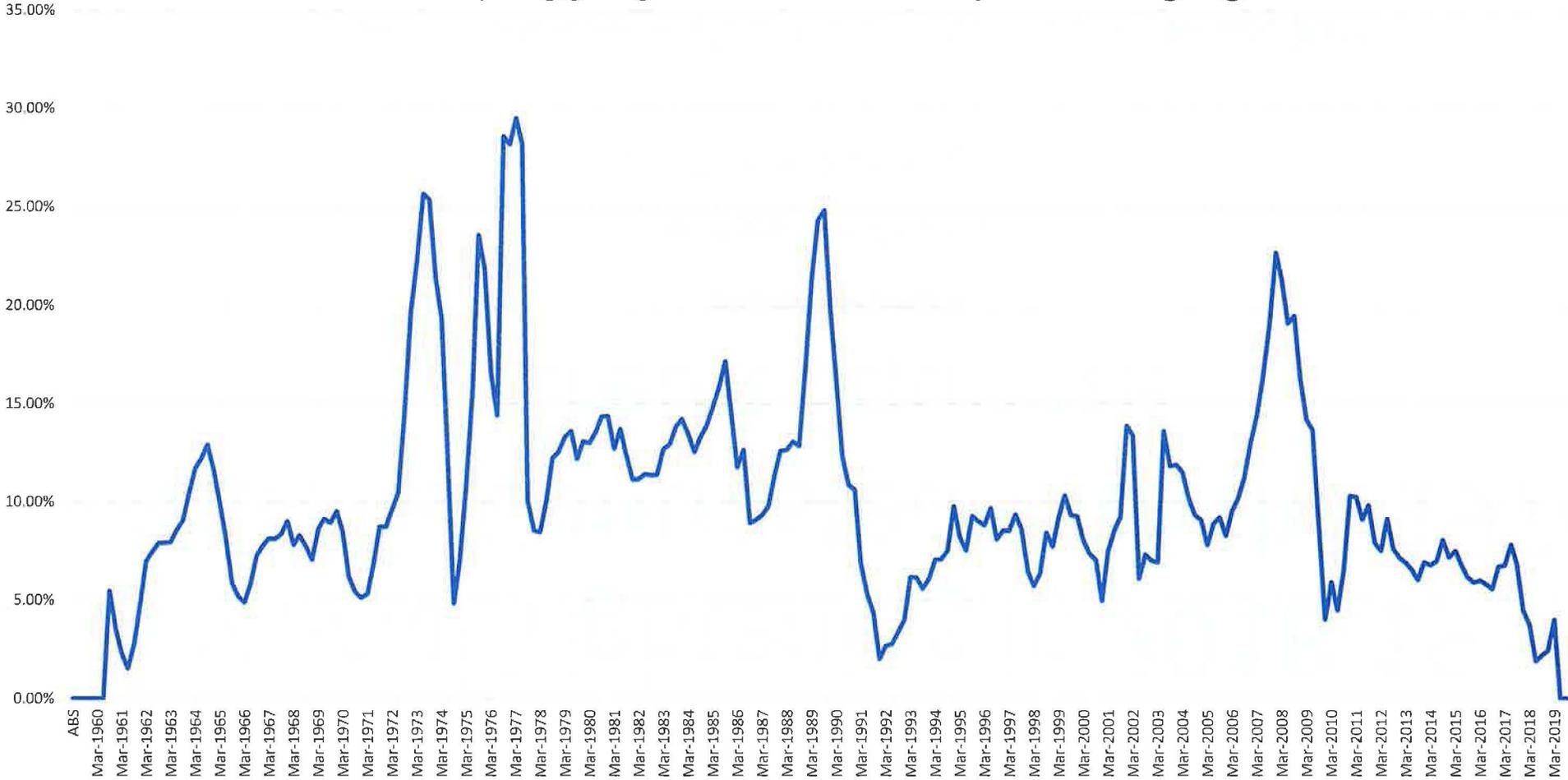
Philip Norman

Dr. Stephen Anthony

Dr. Donatella Cavagnoli

Australia Conference of Economists Melbourne 16 July 2019

1

Monetary Aggregate M3 annual percentage growth rate

International Linkages

1974	Today
Fixed $A Trade and capital flows directly affect monetary aggregates	Floating $A Trade and capital flows have no impact on monetary aggregates
Terms of Trade Up and Down	Export Prices Up for Iron Ore
Trade Volumes Imports up	Trade Volumes Exports down in agriculture
Capital Flows Volatile with some restrictions	

Export price Index/ Import Price Index

Terms of trade: Index numbers – seasonally adjusted – Sept 1959 – Mar 2019
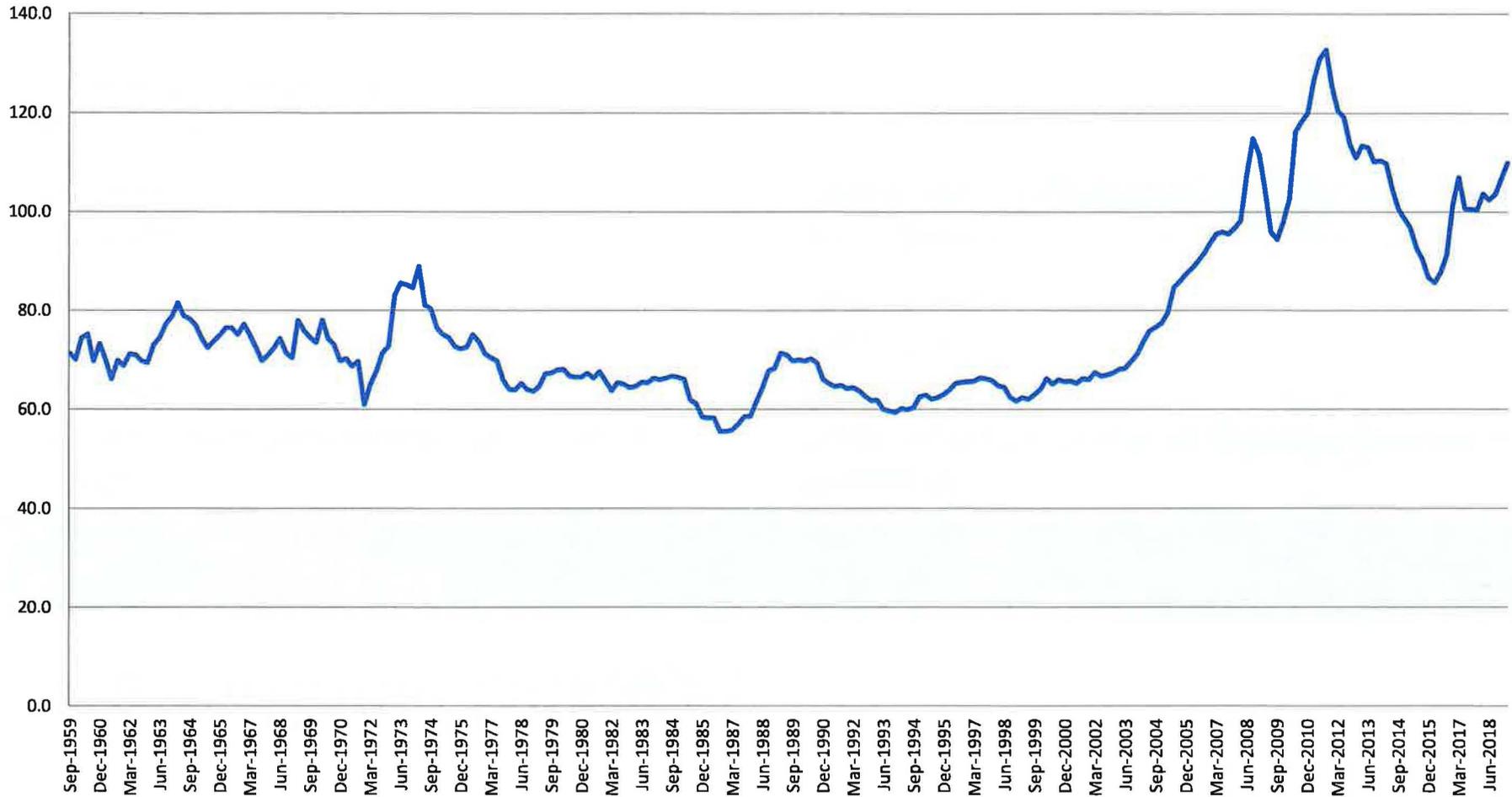
Terms of Trade boom of the early 1970s "ended badly"

Year ended September 1973

- wool prices up 60%

- Cereals and meat up 40%

March Quarter 1974 first OPEC oil price shock

- Petrol price almost quadrupled

"Boom ended badly with big rise in inflation and longer-term unemployment" Dr. David Gruen, *Treasury Round-up* Summer 2006

Goods and Services: GDP

1974	Today
Up and down sharply	Softening towards soft / hard landing OR Growth?

Financial Markets

| 1974	Today
Shallow	Deep
Local; insulated from world markets	Integrated into world economy

"Short, Sharp Credit squeeze to halt 1974 inflationary expectations"
RBA Research Department from memory

90-day commercial bill rate
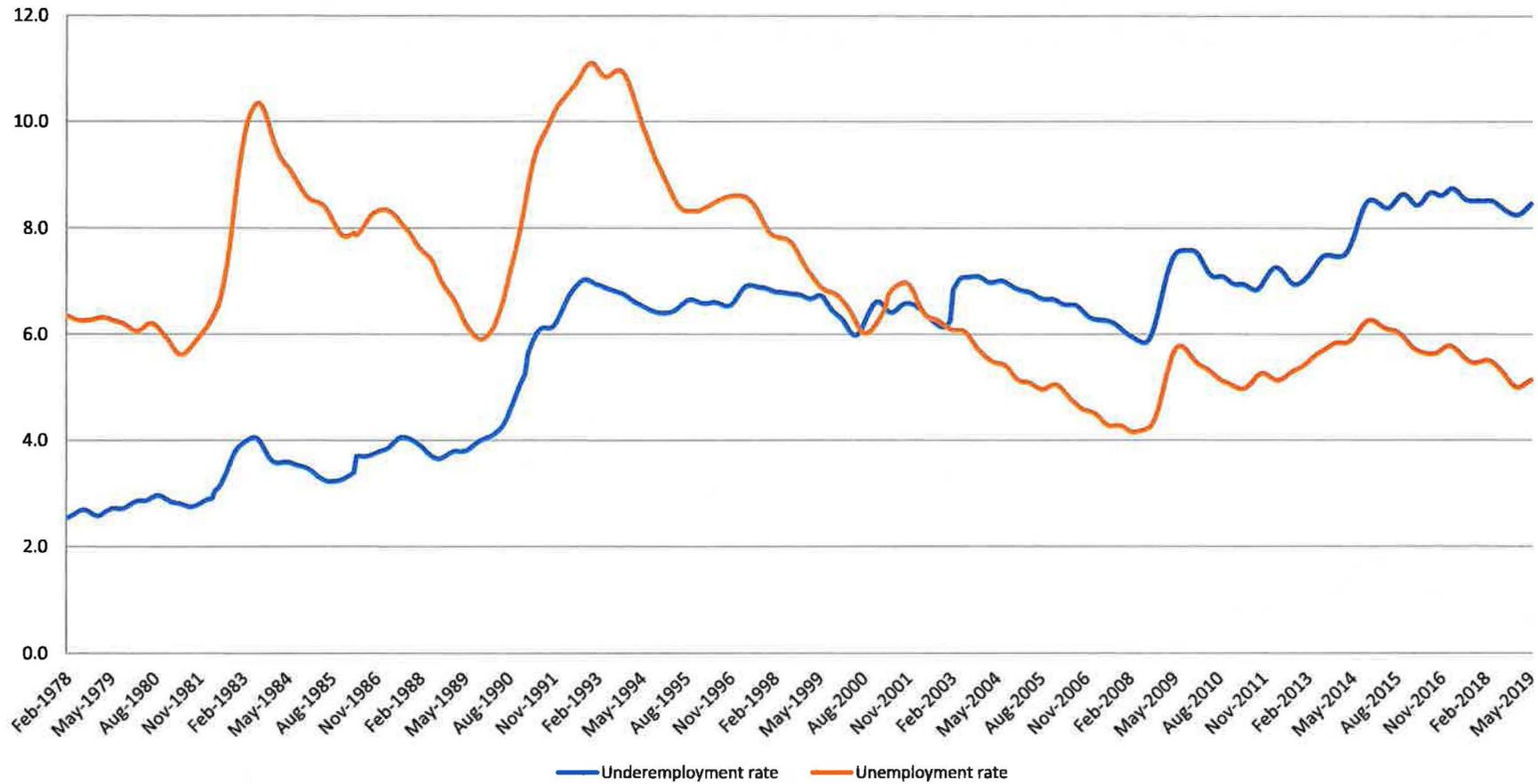
- March Quarter 1974   10 per cent per annum
- June Quarter 1974   18 per cent per annum

The Labour Market
Labour Force Participation rate

Labour Force Participation rate
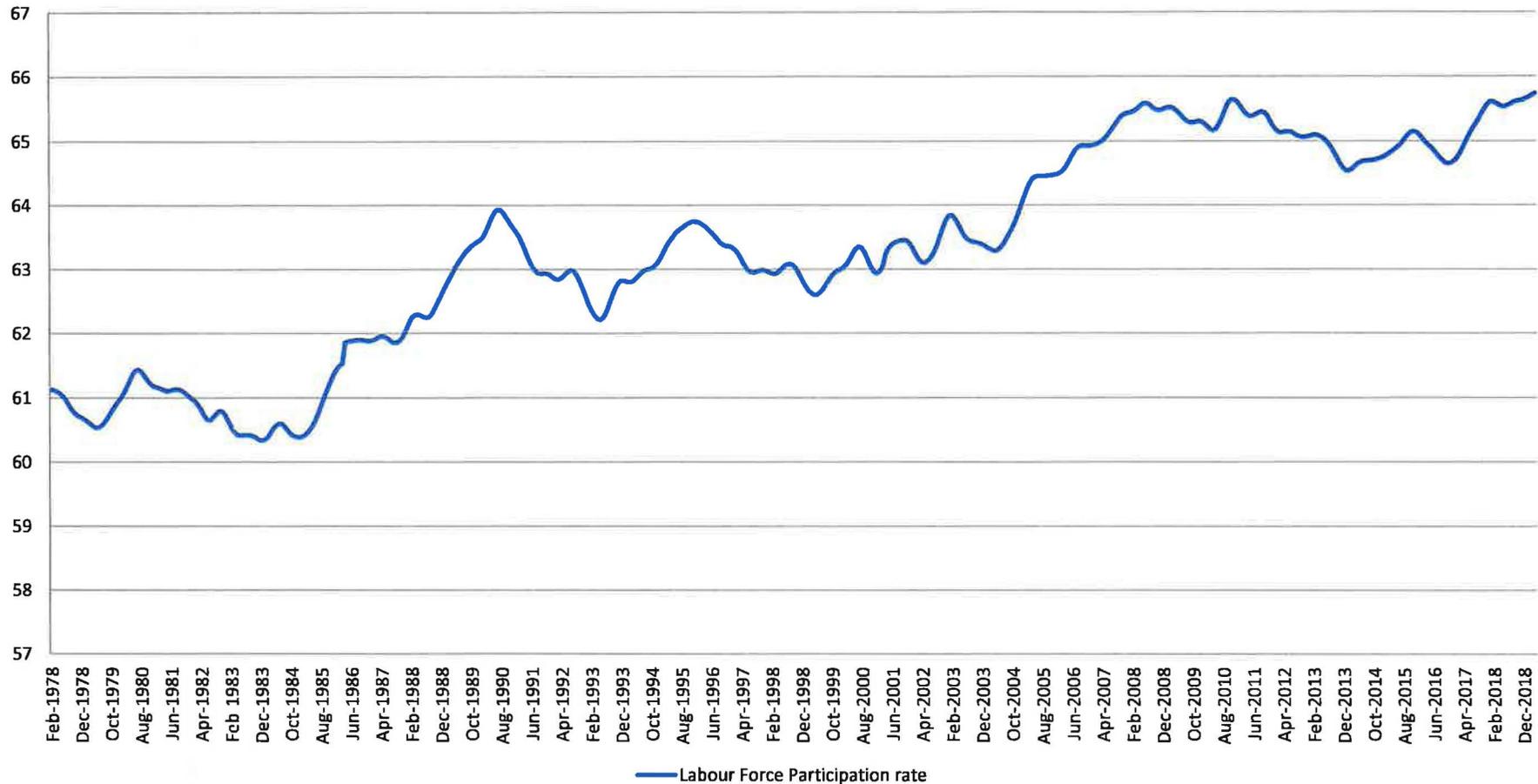
# Unemployment rate and Underemployment rate

The Behaviour of Monetary Aggregates in Australia: Some New Evidence 1975, 77

- Australian Conference of Economists, Brisbane 1975
- *Economic Record* September 1977
- Philip Norman and Dr. Douglas Purvis

The late Canadian economist Dr Purvis studied at the University of Chicago for his PhD. The Reserve Bank of Australia appointed him as a visiting expert in monetary economics about 1975-76 from Queen's University ONTARIO.

RBA Monetary Policy Framework – Domestic
Market Operations
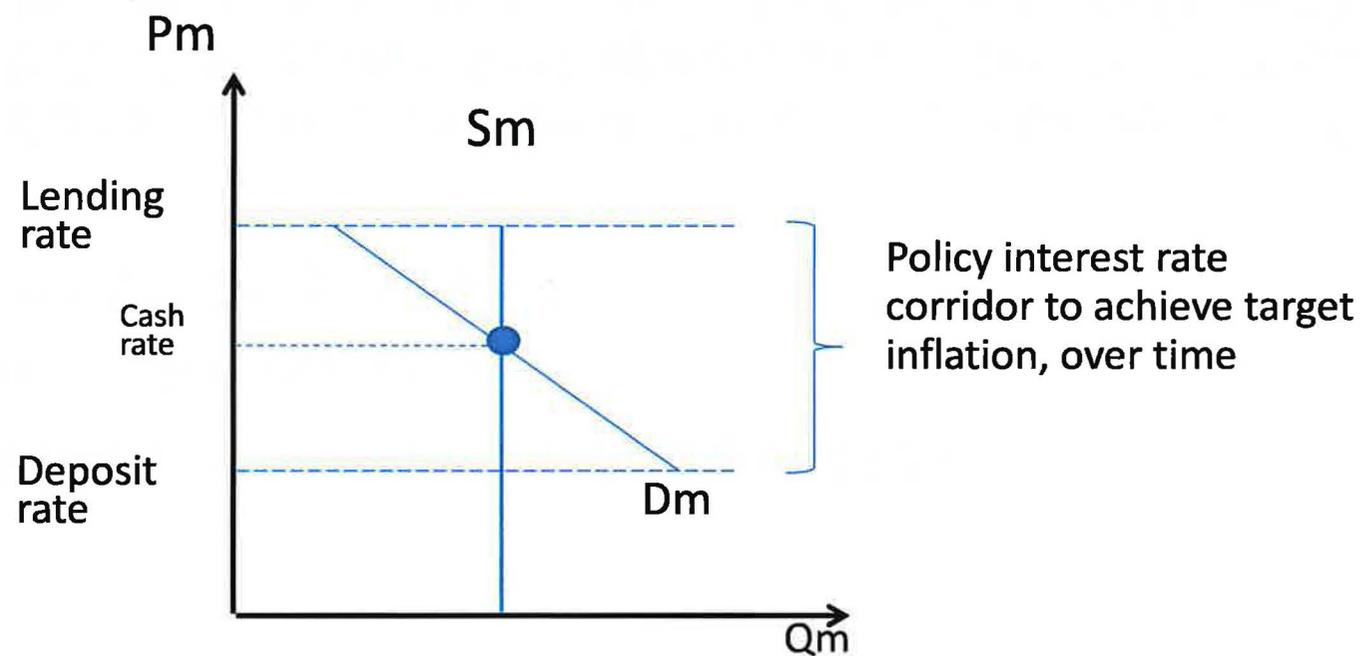
The Behaviour of Monetary Aggregates in Australia: Some New Evidence – Key Findings

"Demand for money is stable" – Norman and Purvis 1977

Ln linear form of equation regressing monetary aggregates M1 or M3 against real GDP, interest rates and a lagged dependent variable.

Quarterly 1965(2) to 1974(4).

Coefficient on the 90-day commercial bill rate was -.07 (t=3 significant)

About a hundred in the audience at ACE5 gave us a good reception and *Economic Record* published the paper.

By 1993, the Reserve Bank disowned the stability of the demand for money function.
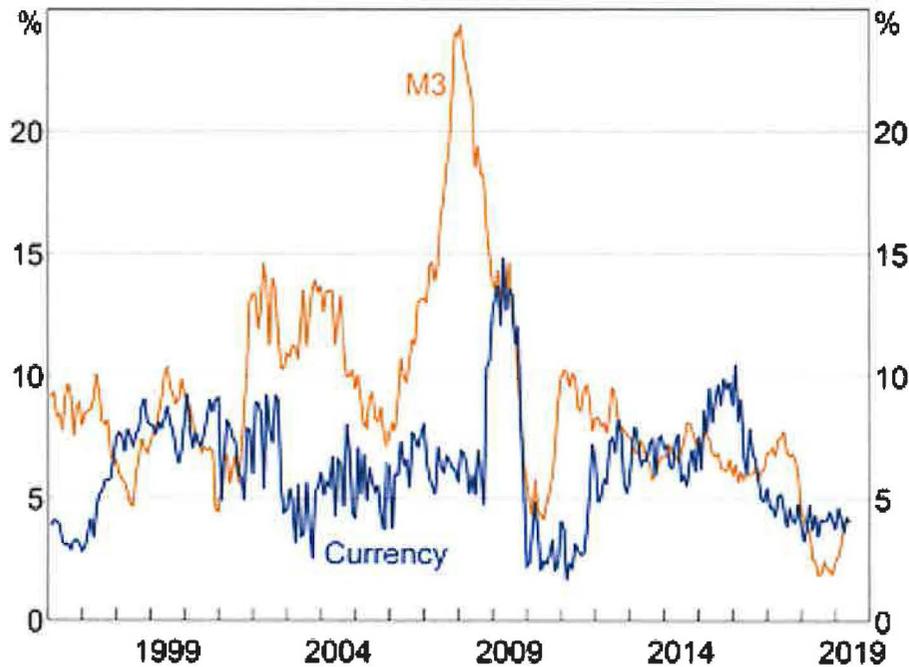
- The Demand for Money in Australia: New Tests on an Old Topic (1993)
Reserve Bank Research Discussion Paper 9314
Gordon de Brouwer et. al.

- "Short-run demand for money balances proved unstable"

- "Implies nothing about causation".

Recent instability in monetary aggregates

Monetary Aggregates Growth
Year-ended

Credit and Broad Money Growth
Year-ended
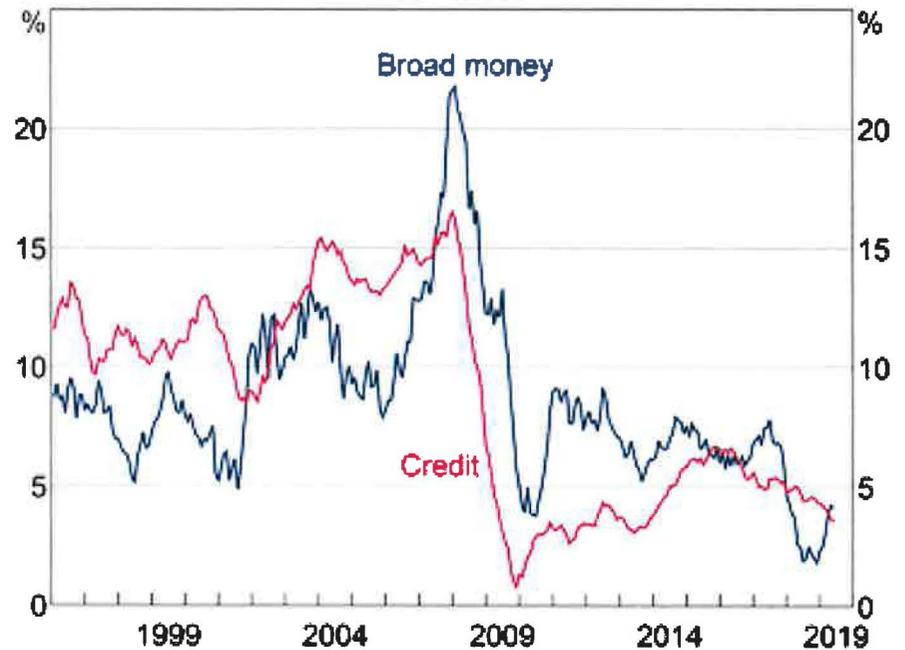
- RBA

The Behaviour of Monetary Aggregates in Australia – Ex Post Simulation of Key Equation

The 1965-1974 "stable" Norman and Purvis demand for money equation did explode in ex-post simulations.

Intuitively, the secular drop in the 90-day commercial bill rate must have pushed the lagged dependent variable to infinity in a simple loop.

Ex post simulation from 1999(1)

90 day commercial bill coefficient	-.03 (P value significant)
Equation estimated fresh today	
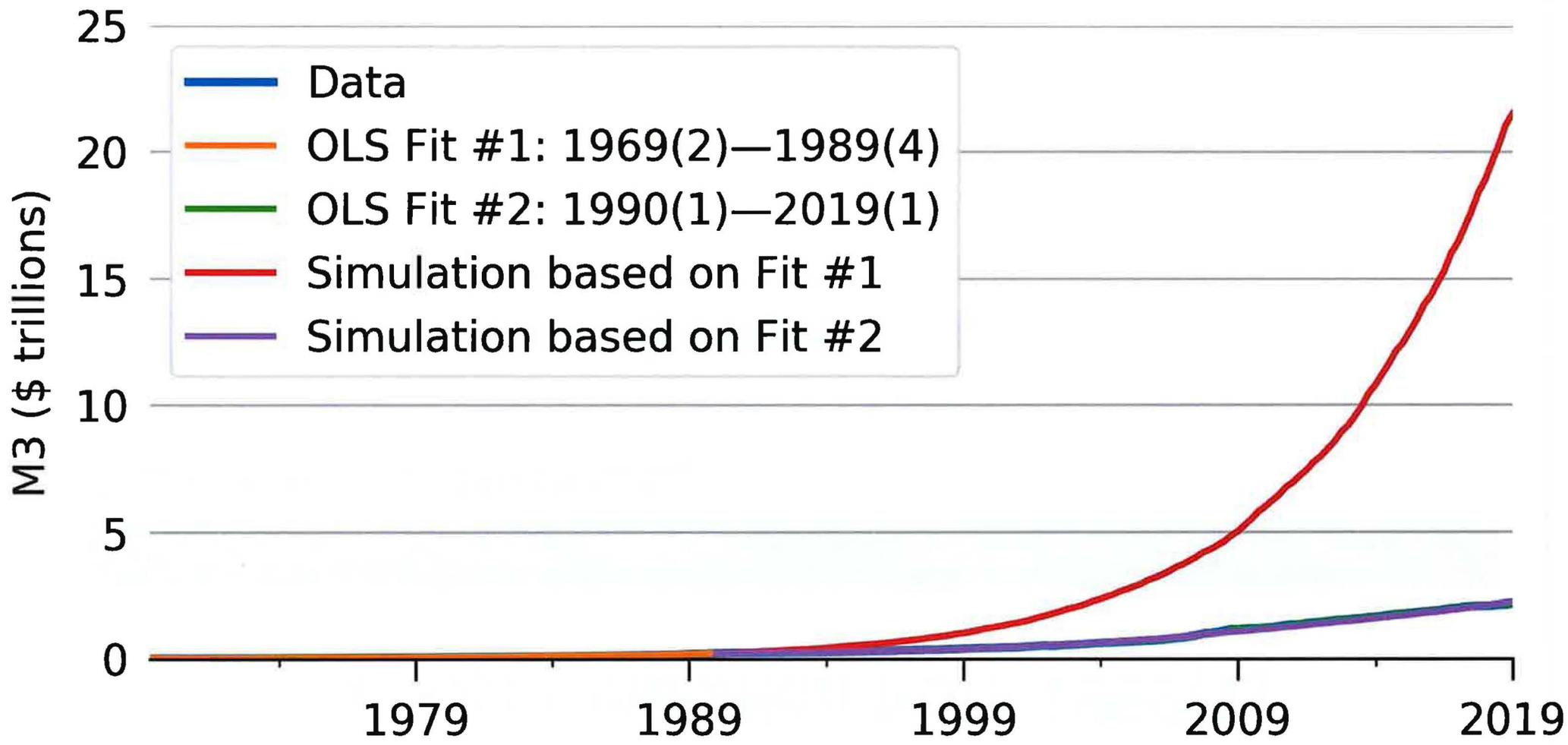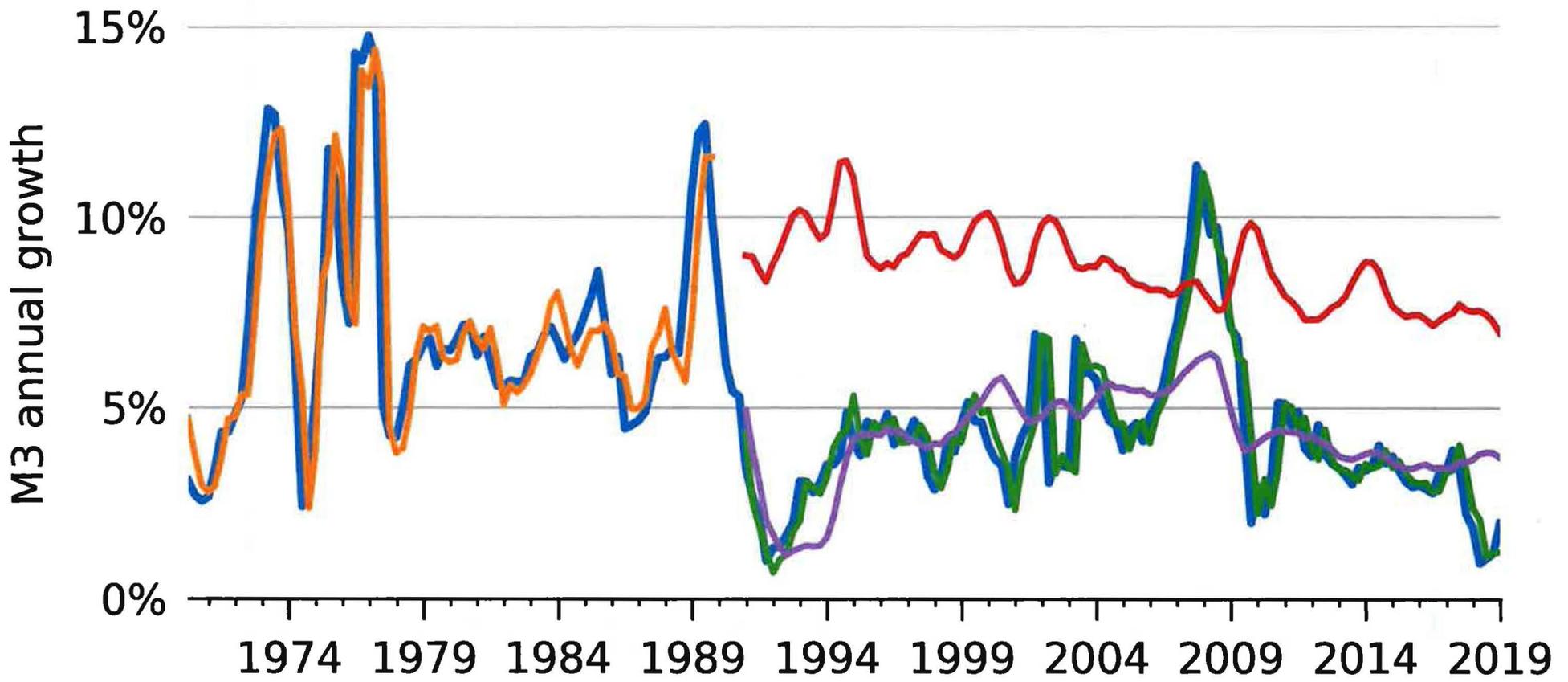
A 1974 Reserve Bank economist might view monetary aggregates as being tight today

The annual percentage growth rate of M3 has not been lower since 1960

Any demand for money equation over-estimates actual M3 today by huge margins.

If Monetary aggregates are tight today, will fresh interest rate reductions need offsetting QE measures?

QE = Quantitative Easing

If the typical mortgagee leaves payments unchanged and converts the interest rate reduction to extra capital repayments, do bank loan books have an inertia to shrink?

Should QE today be discussed more in the economic debate?

Opportunities for Further Research

The social costs of our 1974 credit squeeze experiment were HUGE.

"Does money matter?" "Squeeze it hard and see what happens"

Can we learn more from it?

Especially from published studies done at the time?

We welcome suggestions as we hope to submit at least a Note to the *Economic Record* to follow up the 1977 paper.

Thanks and Questions Please

Thanks to Dr. Herianto Lim, Tung Mai, Nicolas Alexiou, Stewart Jones and Roger Clarke

The superannuation guarantee and wage effects: A work in progress[†]

Bruce Bastian

Industry Super Australia

2 December 2019

[†] Not for citation.

Motivation (1)

- Recent debate around the continuation of the legislated increase in the superannuation guarantee to 12% has focused on the impact on employee's take-home pay and lifetime incomes.
- A number of commentators have asserted either complete or near-complete pass-through to wages.
- That is, they argue that cash wages will be 2.5% lower if the superannuation guarantee rise were to go ahead.

Motivation (2)

- However, there are a number of channels by which increases in the superannuation guarantee can be funded.
- In addition to lower wages, costs can also be borne by employers through a reduction in profits, by consumers through increases in prices, or via lower equilibrium employment.
- Ultimately, who bears the cost will depend critically on competitive factors such as labour supply and demand elasticities and factor substitution, but also on institutional factors such as employment protection legislation, minimum wage determinations and the degree of unionisation.
- In other words, this is an empirical question. But up until recently, there have been very few (if any) empirical studies in Australia.

International evidence (1)

- Internationally, the evidence is mixed.
- **Melguizo and González-Páramo (2013)** surveyed the empirical literature on the incidence of labour taxes and social security contributions across most of the OECD countries and some Latin American economies.
- They construct a database of 124 estimates of the elasticity of wages to taxes, taken from 52 empirical papers.
- They find a high degree of variation in estimates, with a mean estimate of -0.66 (that is, a 1% increase in taxation reduces wages by 0.66%).

International evidence (2)

Figure: Distribution of wage elasticity to taxes
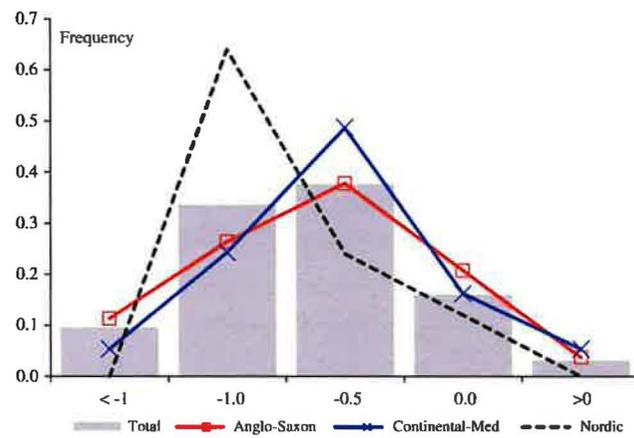
Source: Melguizo, A., and J.M. González-Páramo, (2013)

International evidence (3)

- Internationally, the evidence is mixed, reflecting the range of political and social-economic factors that affect the tax-burden distribution.
- **Melguizo and González-Páramo (2013)** surveyed the empirical literature on the incidence of labour taxes and social security contributions across most of the OECD countries and some Latin American economies.
- They construct a database of 124 estimates of the elasticity of wages to taxes, taken from 52 empirical papers.
- They find a high degree of variation in estimates, with a mean estimate of -0.66 (that is, a 1% increase in taxation reduces wages by 0.66%).
- **They then apply meta-regression techniques to these estimates and find on an elasticity of -0.70 in their preferred model. That is, workers bear 70% of an increase in taxes.**

Australian evidence (1)

- **Taylor (2019)** regresses three broad measures of aggregate wage growth (AWOTE, AENA, AAWI) on changes in the superannuation guarantee and a range of control variables.
- He finds a statistically significant superannuation-wage elasticities of −0.24 with respect to the AWOTE equation and +0.37 with respect to the AENA equation. He finds a positive but insignificant superannuation-wage elasticity with respect to the AAWI equation.
- He concludes that there is insufficient evidence to suggest a one-for-one trade-off between increases in the superannuation guarantee and lower wages.

Australian evidence (2)

- **Stanford (2019)** considers three approaches.
  - He also regresses AWOTE and AWE on changes in the superannuation guarantee and a different set of control variables. He finds a weakly positive, but generally insignificant, relationship.
  - He then uses cross-sectional aggregate industry data and considers the relationship between effective superannuation contributions for each industry and average wages growth between 2012-13 and 2018-19. He finds no relationship between these metrics.
  - He also conducts a similar international comparison. He considers both the relationship between the level of employer social contributions and the unit wage costs (productivity adjusted wages) and cumulative changes in employer payroll taxes and nominal wages growth. He finds no clear relationship.
- Stanford concludes that there is insufficient evidence of any automatic or significant trade-off between wage payments and employer's compulsory contributions.

Data (1)

- We use the Attorney-General's Department's Workplace Agreements Database.
- The database contains information on wage increases and conditions for all public and private federal Enterprise Bargaining Agreements certified from October 1991 to 2018.
- In total, enterprise agreements covered around 38 per cent of Australian employees in 2018 but a large share of these are expired. According to research by the Centre for Future work, only 12% of employed private sector workers were covered by an enterprise agreement in 2017 (down from 19% in 2013).
- One important caveat from this work is that it may not be representative of other wage setting mechanisms. This is particularly the case for wages which are set by awards or with reference to awards.

Data (2)

- Replaced agreements and the construction of grouped identifers.
- Annualised percent increases and expiry dates.
- Economic control variables w.r.t negotiation phase (one-quarter before commencement date). Industry variables considered.
- Data on industry and number of employees, but not much other firm specific information.

A brief history on the sg...
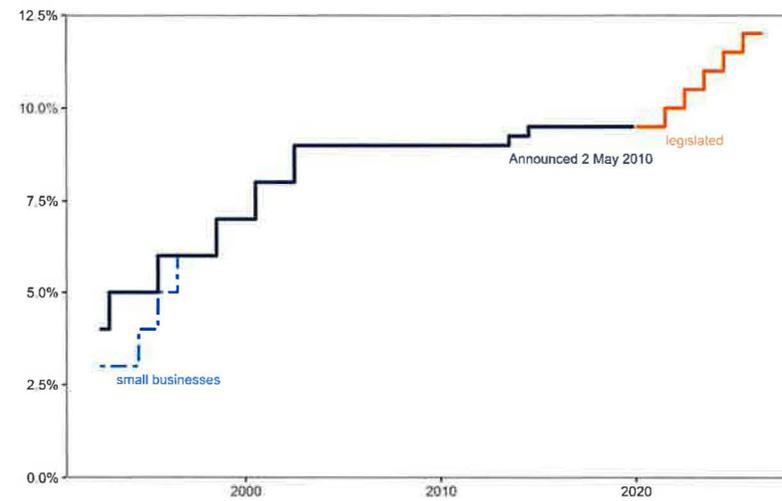
Announcement effect (1)

A brief history on the sg...

Announcement effect (2)

Spread : 2015-16 - 2014-15   Spread : 2016-17 - 2015-16   Spread : 2017-18 - 2016-17
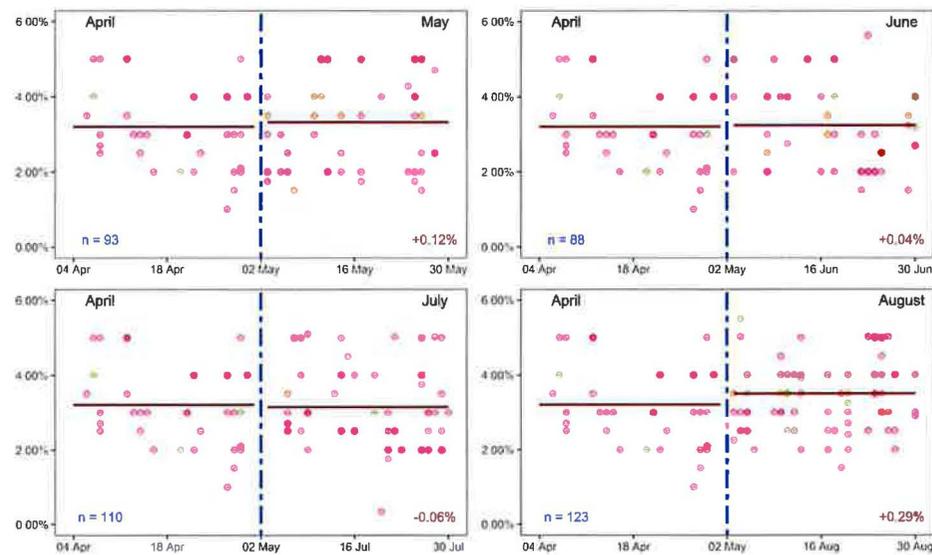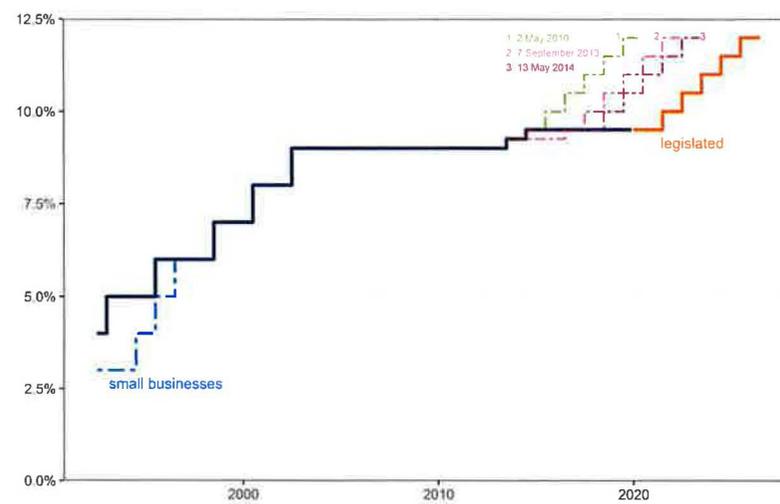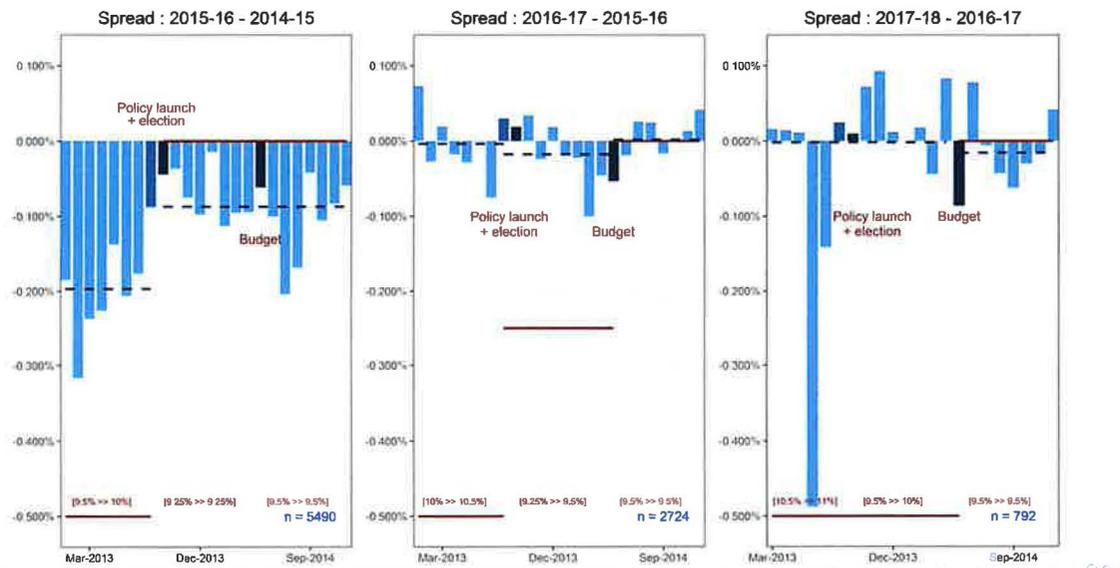
Model

- We consider two-measures of the super-guarantee burden (our variable of interest):
  - sg rate when the agreement commences (**Full**)
  - effective sg rate over the duration of agreement (**Effective**)

  <u>Consider</u>: 3-year agreement, annual pay increases, commencing 1 March 2013

1-Jul-12	9.00%	1-Jul-13	9.25%	1-Jul-14	9.50%	1-Jul-15	9.50%	1-Jul-16

effective sg:	9.19%	9.44%	9.50%
d_sg:	(0.19%)	(0.25%)	(0.06%)

- We use a range of control variables: core inflation, unemployment rate (level & change), change in wage price index at the industry level (AENA pre 1998 w dummy), lagged agreement wage increase.

- Hausman test suggests fixed-effects model (p-value < 2e-16).

- F-test confirms time-effects (p-value < 2e-16), but weak firm-size effects and industry effects. We do both as a check for robustness.

Results (1)

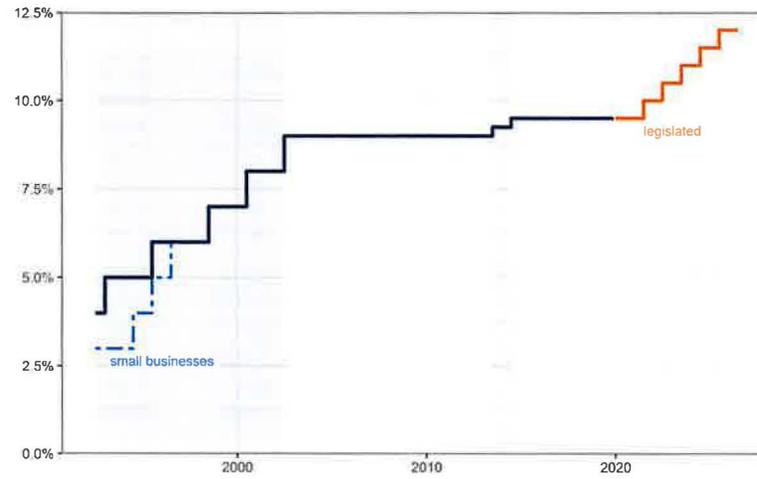| SG Measure	Full	Full	Full	Effective	Effective	Effective
Population	All	All	All	All	All	All
Period	1992-2018	1992-2018	1992-2018	1992-2018	1992-2018	1992-2018
Grouping	ID	ID	AGN	ID	ID	AGN
Δ SG Rate	-0.2720***	-0.2743***	-0.2422***	-0.6536***	-0.6571***	-0.3919***
	(0.0118)	(0.0118)	(0.0114)	(0.0262)	(0.0262)	(0.0296)
Common controls	x	x	x	x	x	x
Year effects	x	x	x	x	x	x
Firm size	x			x		
Industry	x			x		
R^2	0.1386	0.1359	0.3127	0.1391	0.1364	0.3109
p-value	<2e-16	<2e-16	<2e-16	<2e-16	<2e-16	<2e-16
N	226,459	226,459	203,367	226,459	226,459	203,367

■ Estimates based on the effective sg rate applying over the duration of the agreement are higher than the full-year impacts, suggesting enterprises factor the increases when they occur.

■ Estimates based an 'Agreement grouping' are lower, but in broad agreement. Further work is required to provide robust linkage of agreements (missing data and complex grouping arrangements).

Focus on periods of increasing sg...

Results (2)

SG Measure	Effective	Effective	Effective	Effective	Effective	Effective
Population	All	All	All	Unions	Private	Public
Period	1992-2018	1992-2002	2012-2014	1992-2002	1992-2002	1992-2002
Grouping	ID	ID	ID	ID	ID	ID
Δ SG Rate	-0.6536***	-0.4515***	0.9464***	-0.4513***	-0.5435***	0.1394
	(0.0262)	(0.0361)	(0.1312)	(0.0371)	(0.0384)	(0.1092)
Common controls	x	x	x	x	x	x
Year effects	x	x	x	x	x	x
Firm size	x	x	x	x	x	x
Industry	x	x	x	x	x	x
R^2	0.1391	0.3021	0.1132	0.3138	0.3311	0.1783
p-value	<2e-16	<2e-16	<2e-16	<2e-16	<2e-16	<2e-16
N	226,459	50,876	38,469	48,552	45,824	4,828

- Focusing on the period when the SG is rising may provide more robust estimates. Estimates are lower (in absolute terms) for the initial phase-in at -0.45.

- Surprisingly, estimates are positive and statistically significant for the most recent increase. Further work is needed to reconcile this.

- Estimates are larger, in absolute terms, for private enterprises. It is difficult to isolate the impact of unions on estimates because they are involved in the majority of EBA negotiations.

Conclusions

- It is difficult to draw firm conclusions at this stage and further work is needed to provide robust estimates that can be used for modelling purposes. In particular:
  - The analysis is for EBA's only and may not be representative of other wage setting mechanisms. This is particularly the case for wages which are set by awards or with reference to awards, and may have important distributional effects.
  - Coefficients vary significantly depending on the specification and time-period of analysis. Resolving estimates for the most recent rise in 2013 and 2014 will be important.
- However, there does appear to be sufficient evidence to show that increases in SG are not fully incident on wages as some assert. The analysis does point to costs being shared between employers and employees but the extent varies over time.
- Further, interactions with the tax and transfer system are important. Gallagher estimates a reduction in working life disposable incomes of 0.1% to 1% in exchange for a 4% to 20% increase in disposable retirement incomes.

Future work

- Better understand the relationship between replacement agreements across time and parent and child agreements. From this will follow additional robustness checks, including resolving issues around duration.
- Further investigate impact of the most recent increases in 2013 and 2014. Do not find an announcement effect and elasticity is positive and statistically significant.
- Consider additional data sources to provide broader coverage (for example, HILDA and tax data). Any other panel datasets on wage determinations at the firm level?

Overview

- What's going on?

- 2019 key event

- Economic outlook

- Market outlook

- Four waves or cycles

- Take outs

Photograph: Kevin Lamarque/Reuters

What's going on?

	Drivers	Transmission	Effects	Consequences
Demographic	Demographics — *Bulge*	Wealth	MPk ↓ *Return on capital*	Hunt for yield?
Productivity	Concentration — FaANG	Fed QE $ / ¥ China stimulus	CAPEX — *Low*	Crimps wages
Business Cyc.	Debt - short & long-term — *Key to demand*	US/China/Australia — *Exhausted* — **Debt**	Stagnation — *Squeeze*	Synchronous — *Slowdown*
Political	Short-termism	Investor focused policy © Hasbro	Inequality	Populist & Nationalism

Key Event

US Policy Rate Expectations

Legend:
— 17-Sep-18 — 22-Mar-19 — 30-Sep-19

Y-axis: Per cent (0.0 to 3.0)
X-axis: 2018 to 2023

10-Year Government Bond Yields

Legend:
— Japan — Germany — United Kingdom
— Italy — United States

Y-axis: Per cent (-1 to 5)
X-axis: Jan 2018 to Jul 2019

Source: International Monetary Fund

Economic and Financial Outlook

Key Event

United States Yield Curve

Australia Yield Curve

Source: Refinitiv/Eikon

Economic and Financial Outlook
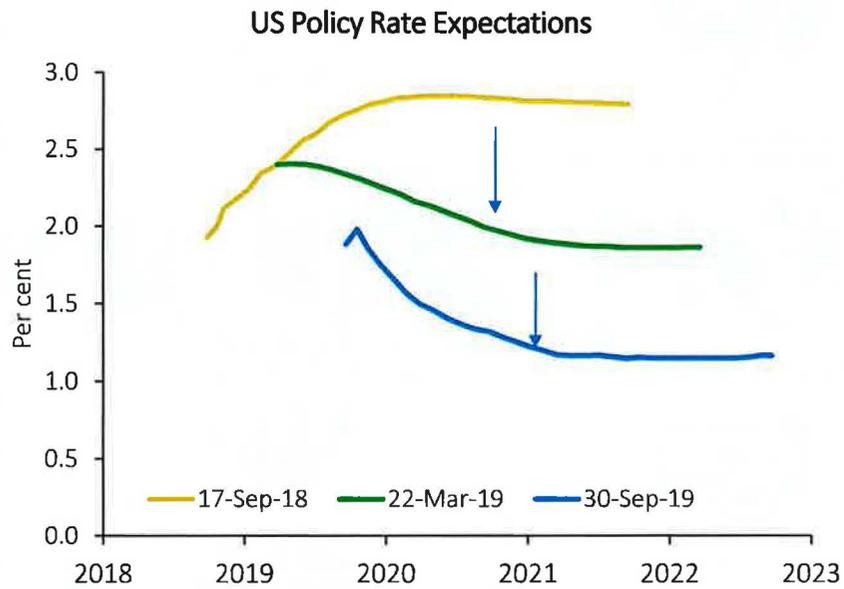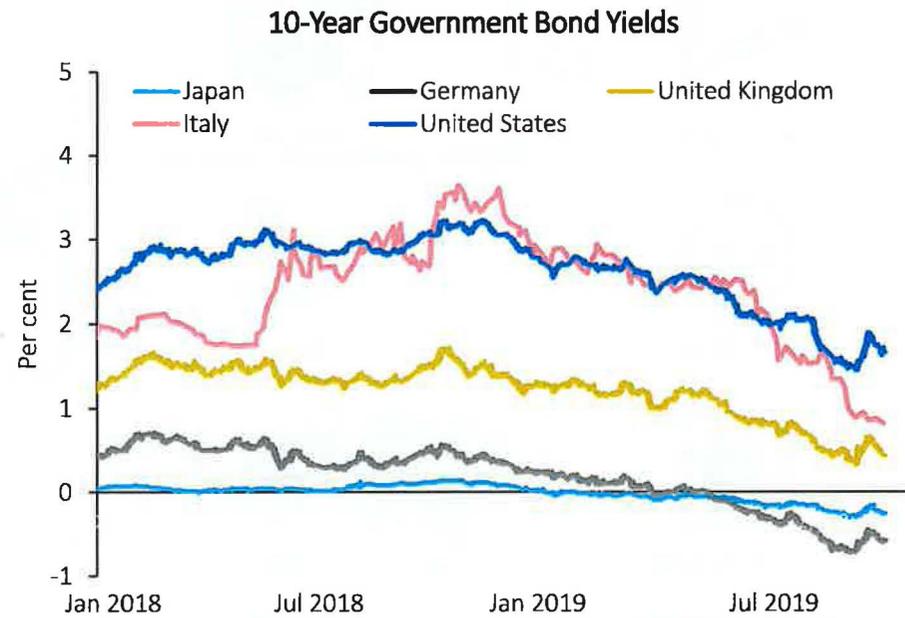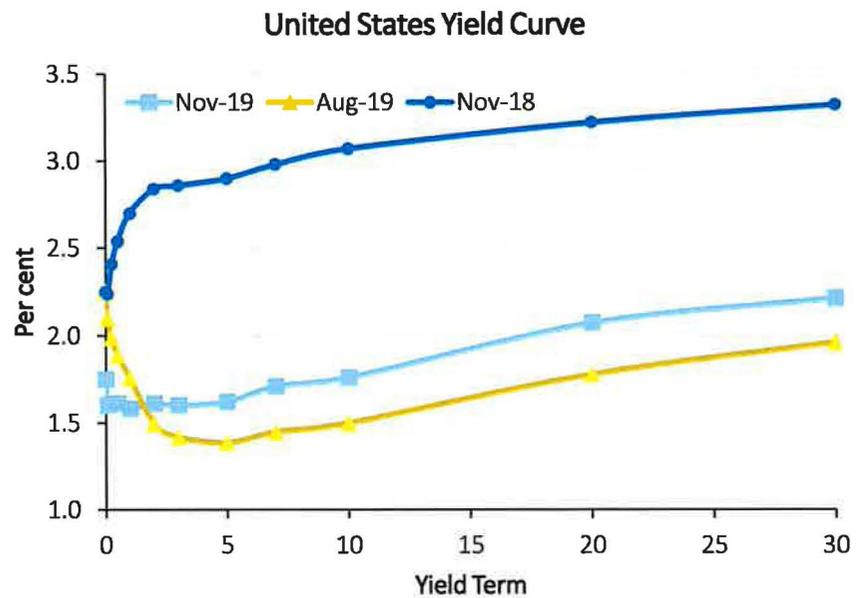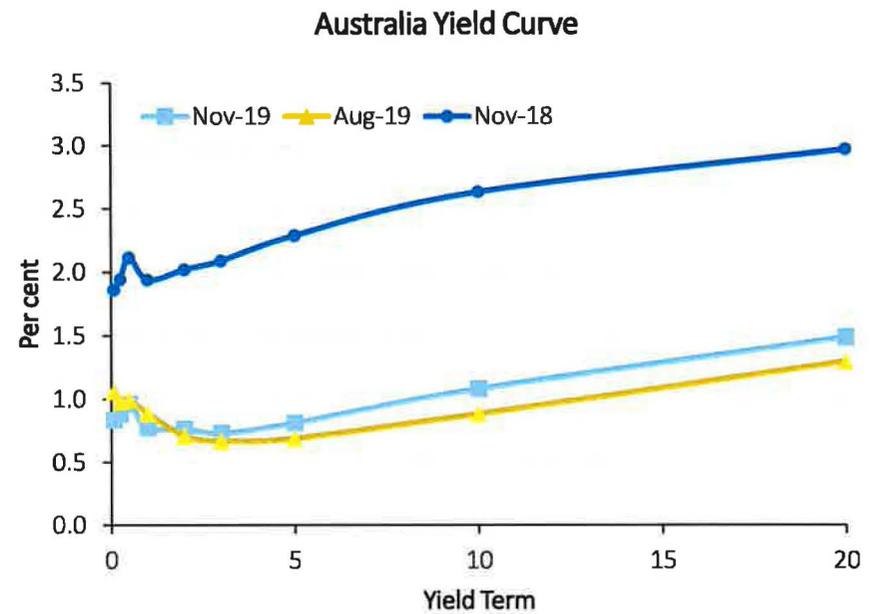
Key Event

Liquidity Growth

Major Central Banks Aggregate

People's Bank of China

US Federal Reserve

Bank of Japan
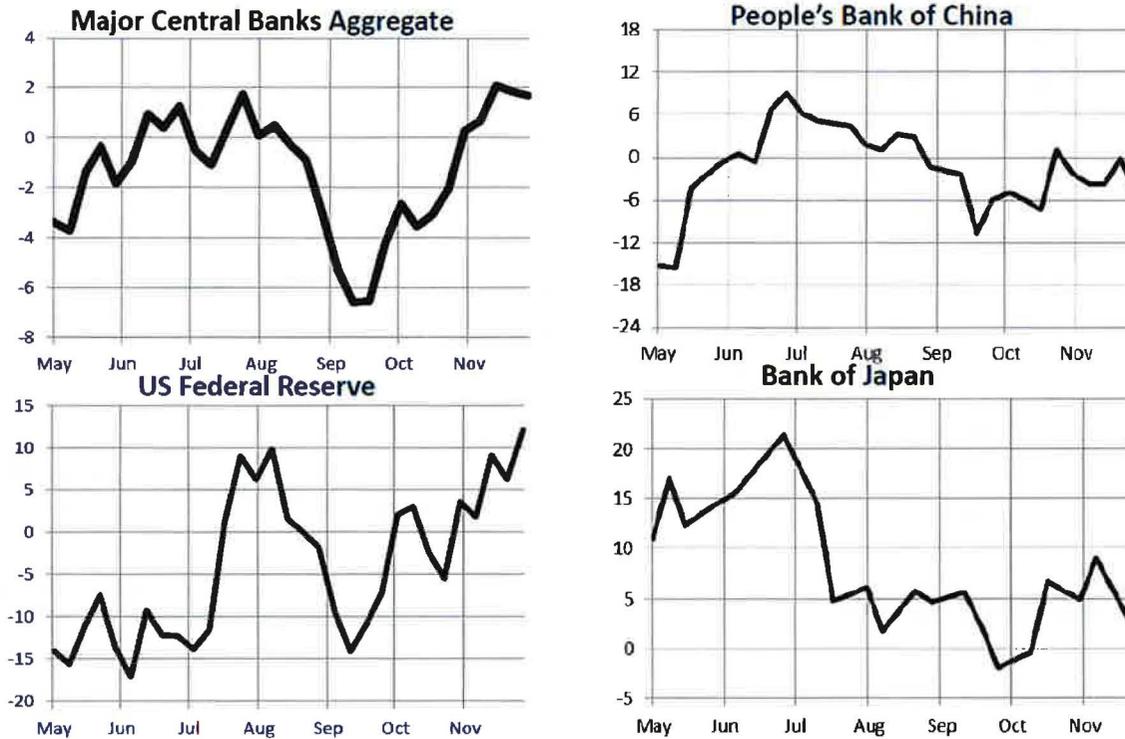
Source: CrossBorder Capital

Domestic Economic Outlook

	2019	2020
Real GDP (a)	1 ½	1 to 1½
Employment growth (b)	1	¾
Unemployment rate (c)	5 ½	5 ¾
CPI (d)	1 ¾	1¾
Nominal GDP (e)	2 ¾	2 ¾
Terms of trade (f)	-8	-15
Cash rate (g)	¾	½

Source: ISA Analysis
Note: (a) YoY growth rate; (b) seasonally adjusted YoY growth rate in employment; (c) seasonally adjusted rate;
(d) YoY growth rate on index; (e) YoY growth rate; (f) change in the index; (g) RBA cash rate.

Domestic Economic Outlook

	% of GDP	2020 Outlook
Consumer spending	55%	Soft
Dwelling investment	5¼%	Falling
Business investment	12%	Falling
Government spending	24%	
- Consumption		Soft
- GFCF		Neutral
Real GDP		Weak
Terms of trade		Soft
Nominal GDP		Weak

Source: ISA Analysis

Market Outlook

United States (1900-2018)
Annualised Average

9.6% Equity
8.7% Housing
4.4% Bonds
2.8% CPI

Australia (1900-2018)
Annualised Average

10.4% Equity
9.0% Housing
5.5% Bonds
3.8% CPI
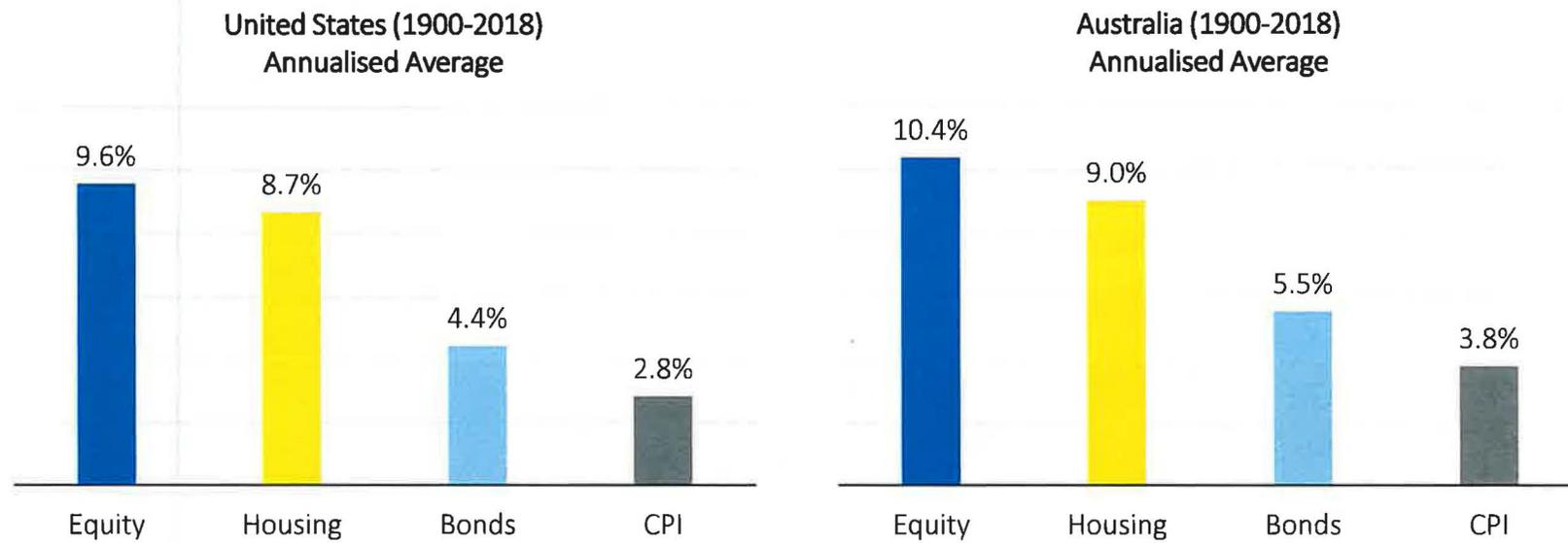
Source: Òscar Jordà, Katharina Knoll, Dmitry Kuvshinov, Moritz Schularick, and Alan M. Taylor. 2019. "The Rate of Return on Everything, 1870–2015." Quarterly Journal of Economics.
Note: Nominal returns

Market Outlook

S&P 500 Index (Annualised Returns and Dividends)

Period	Total return	Dividend yield	Price return*	Average GDP growth
1925 - 2018	**9.6%**	**3.6%**	**6.0%**	**6.0%**
1925 - 1992	9.9%	4.2%	5.7%	6.5%
1993 - 2007	10.5%	2.1%	8.4%	5.4%
2008 - 2013	6.2%	2.3%	3.9%	2.5%
2014 - 2018	8.5%	2.2%	6.3%	4.1%

Source: Refinitiv/DataStream, BEA
Note: Nominal returns and GDP growth. Geometric averages.

Industry Super Australia

Economic and Financial Outlook

Market Outlook

■ FANG – Facebook, Amazon, Apple, Netflix, Google
■ WAAAX – WiseTech, Appen, Altium, Afterpay, XERO

EV / Sales

21 x (WAAAX)
5 x (FAANG)

FAANG WAAAX

P / E

107 x (WAAAX)
42 x (FAANG)

FAANG WAAAX
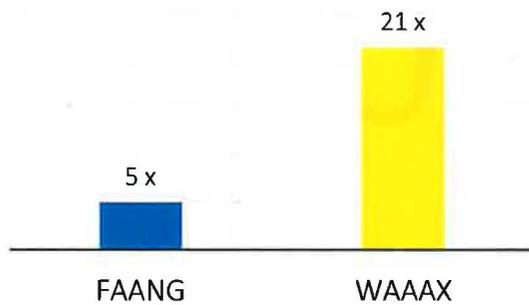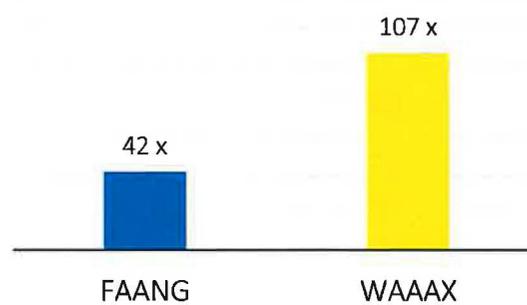
Total return - 5 years

1046% (WAAAX)
256% (FAANG)

FAANG WAAAX
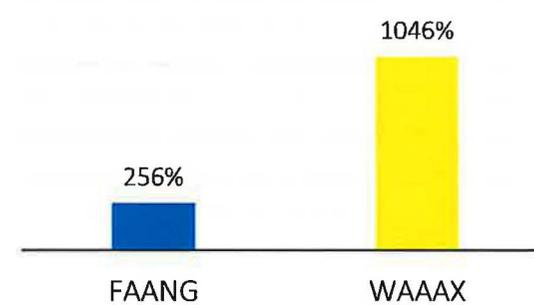
Source: Refinitiv/DataStream, ISA Analysis
Note: Negative P/Es are excluded from analysis.

Internet of Things
Artificial Intelligence
Technology
Driverless Cars
Automation Industry 4.0
Facial Recognition
Innovation
SaaS
Network
Machine Learning
Quantum Computing...

Industry Super Australia

Economic and Financial Outlook

Market Outlook

7-Year Adjustment Path

Portfolio Real Return

10%
8%
6%
4%
2%
0%

0 %

Portfolio

Sharp Draw-down

Portfolio Real Return

10%
8%
6%
4%
2%
0%

? %

Portfolio

Market Outlook

Stocks (Next 7-Years)

Bonds (Next 7-Years)

Annual Real Return

- GMO Forecast performance
- Demographic effects

Category	GMO Forecast	Demographic
U.S. Large	-3.7%	-4.5%
U.S. Small	-1.5%	-2.3%
Intl Large	0.6%	-0.2%
Intl Small	1.9%	1.2%
Emerging	5.2%	4.5%
Emerging Value	9.8%	9.1%
U.S. Bonds	-1.7%	-2.5%
Intl Bonds Hedged	-3.7%	-4.5%
Emerging Debt	0.7%	-0.1%
U.S. Inflation Linked Bonds	-1.4%	-2.2%
U.S. Cash	0.2%	-0.6%

'60/40' Portfolio Return (Next 7-Yrs)

Portfolio Real Return

Annualised historical return of a typical 60/40 portfolio 7.7%

Portfolio	Value
Forecast performance	-1.1%
Demographic	-1.9%
Business cycle	-0.4%
Productivity	0.0%

- Forecast performance
- Demographic
- Business cycle
- Productivity

Source: GMO, Vanguard, ISA Analysis
Note: Historical return of Vanguard (U.S.) Balanced Index 60/40 (1926–2018)

Industry Super Australia

Economic and Financial Outlook

Four Waves or Cycles

|	Drivers	Transmission	Effects	Consequences
Demographic	Demographics *Bulge*	Wealth	MPk ↓ *Return on capital*	Hunt for yield?
Productivity	Concentration	Fed QE / China stimulus	CAPEX *Low*	Crimps wages
Business Cyc.	Debt -short & long-term *Key to demand*	US/China/Australia *Exhausted* **Debt**	Stagnation *Squeeze*	Synchronous *Slowdown*
Political	Short-termism	Investor focused policy © Hasbro	Inequality	Populist & Nationalism

Demographic Wave

Core Working Age Population Growth
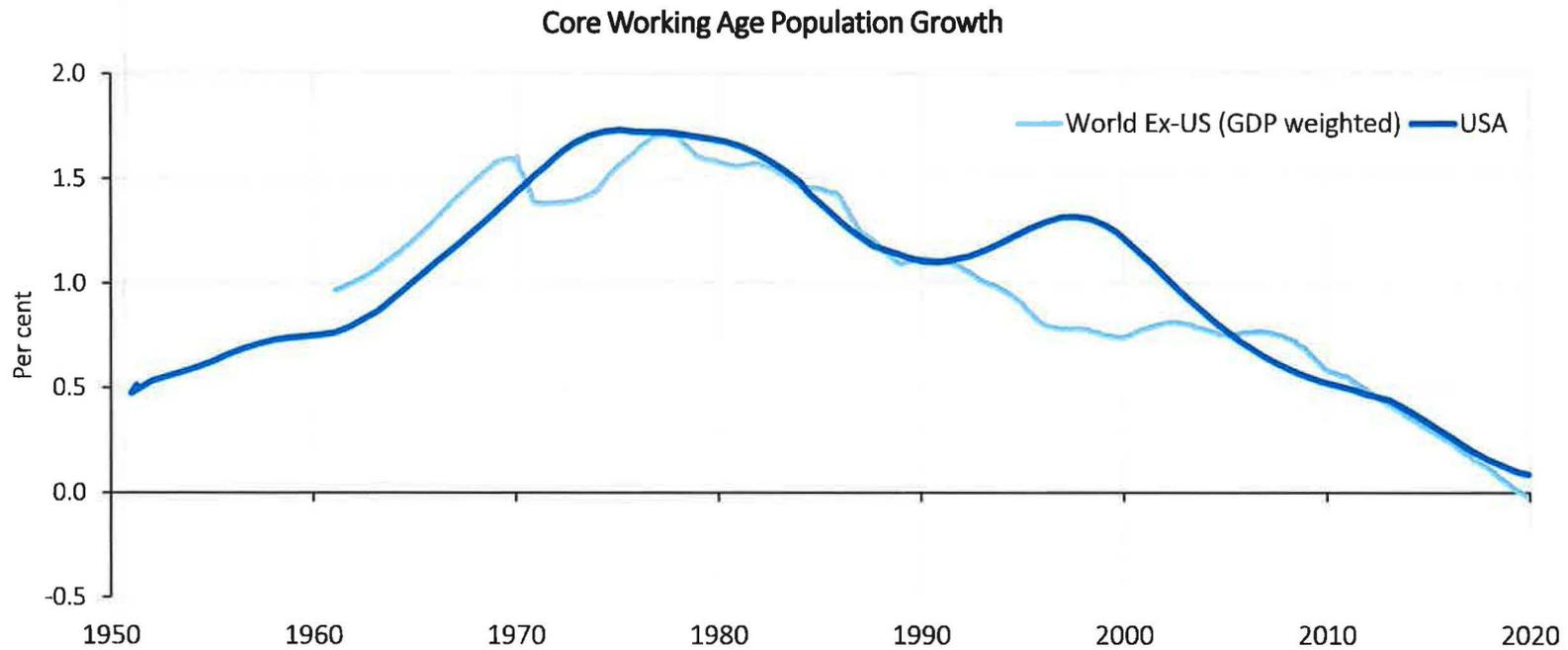
Source: GMO

Demographic Wave

Global Assets as a Share of GDP
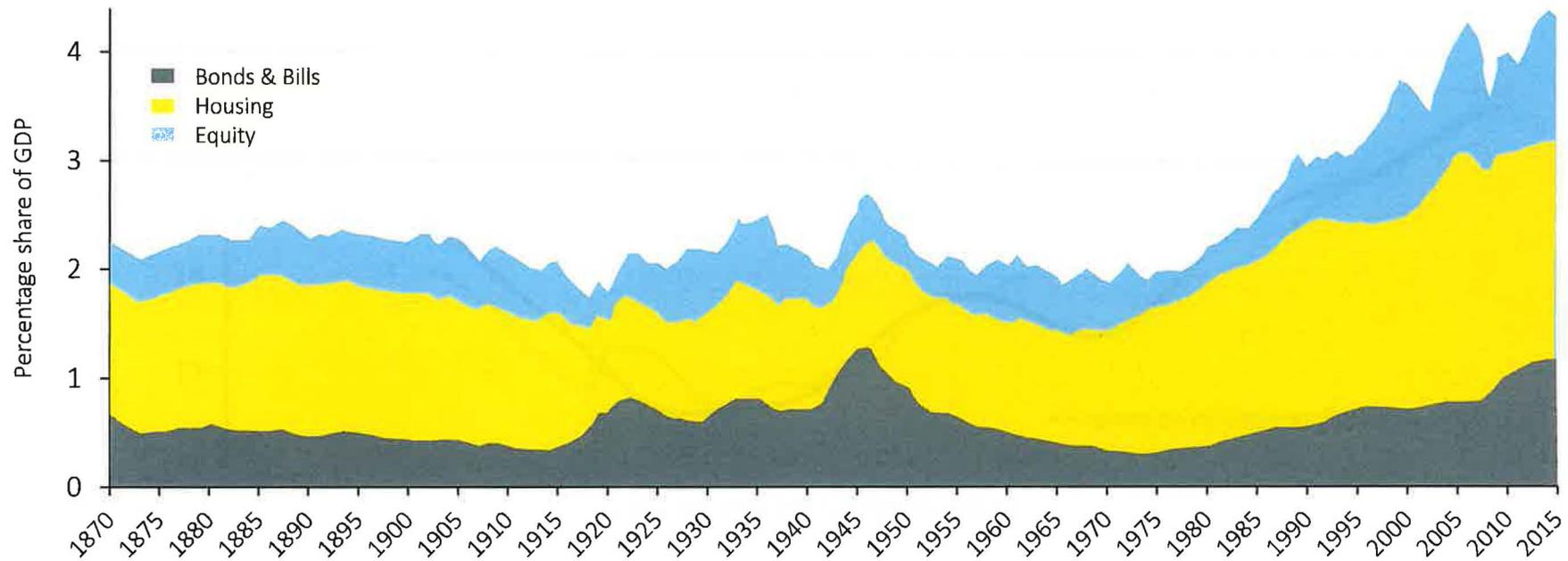
Source: Jordà, O., Knoll, K., Kuvshinov, D., Schularick M., and Taylor, A. 2017. "The Rate of Return on Everything, 1870-2015", Federal Reserve Bank of San Francisco.

Economic and Financial Outlook

Demographic Wave

Assets Held by Various Generations as % of Nominal GDP (U.S.)
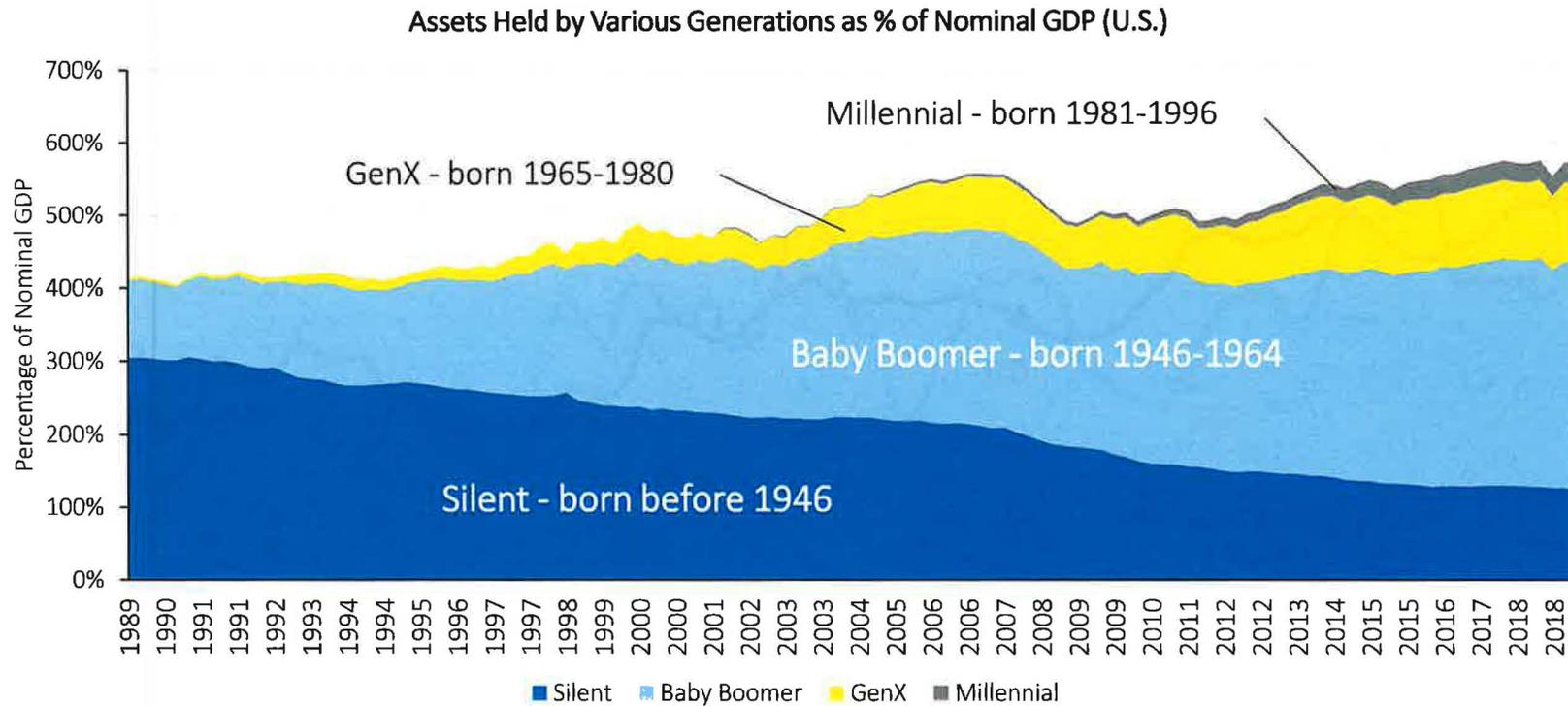
Source: The Federal Reserve Board, BEA

Economic and Financial Outlook

Demographic Wave

Marginal Product of Capital (U.S.)
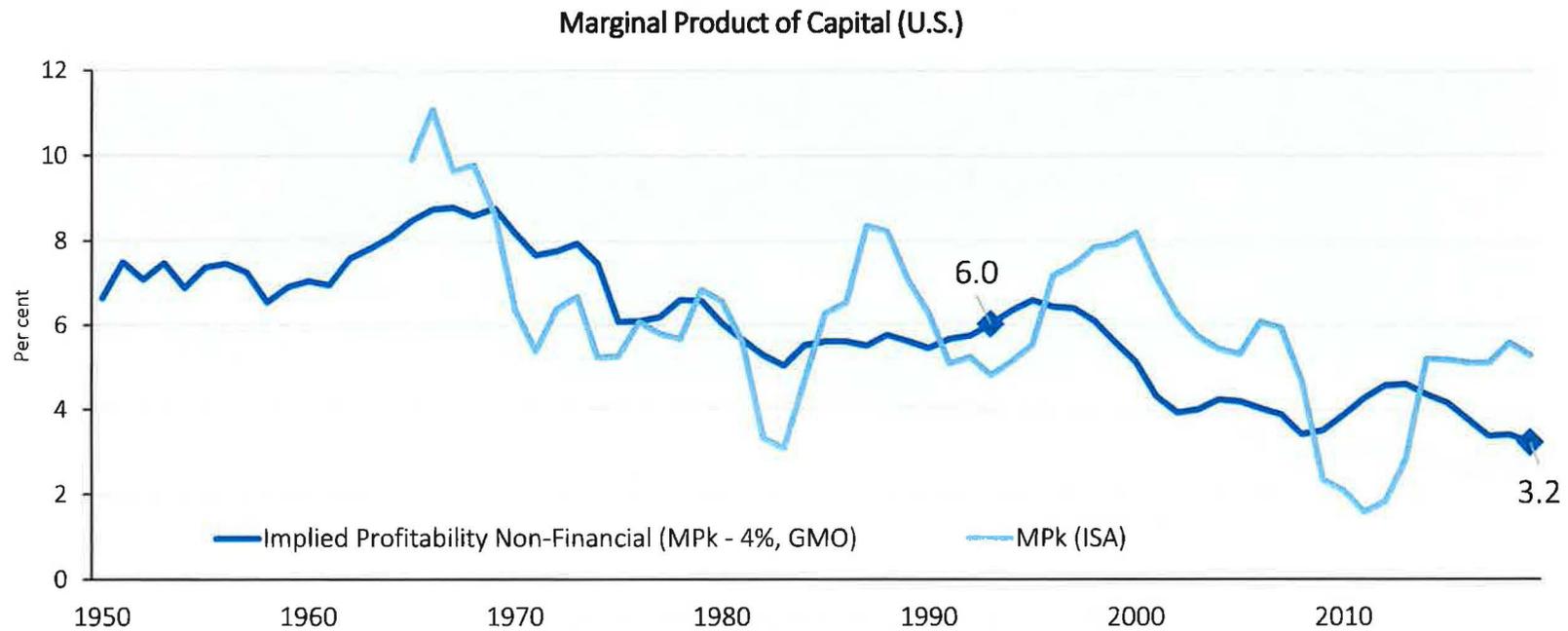
Source: GMO, ISA Analysis (Harrod-Domar growth model)

Productivity Wave

- Trend productivity rates have fallen since the GFC
  - Measured TFP growth rates:

	US	Australia
1993 – 2007	1.1%	0.9%
2011 - 2018	0.2%	0.5%

- Causes: lower CAPEX levels, leisure centric technology bias

- Governments 'kicking the can' down the road, leaning too heavily on monetary policy

- Subsidised duration (growth stocks, PE ecology, bond-like assets, Zombies, Junk bonds)

Productivity Wave

Contribution of 'Stars' to Labour Productivity Growth
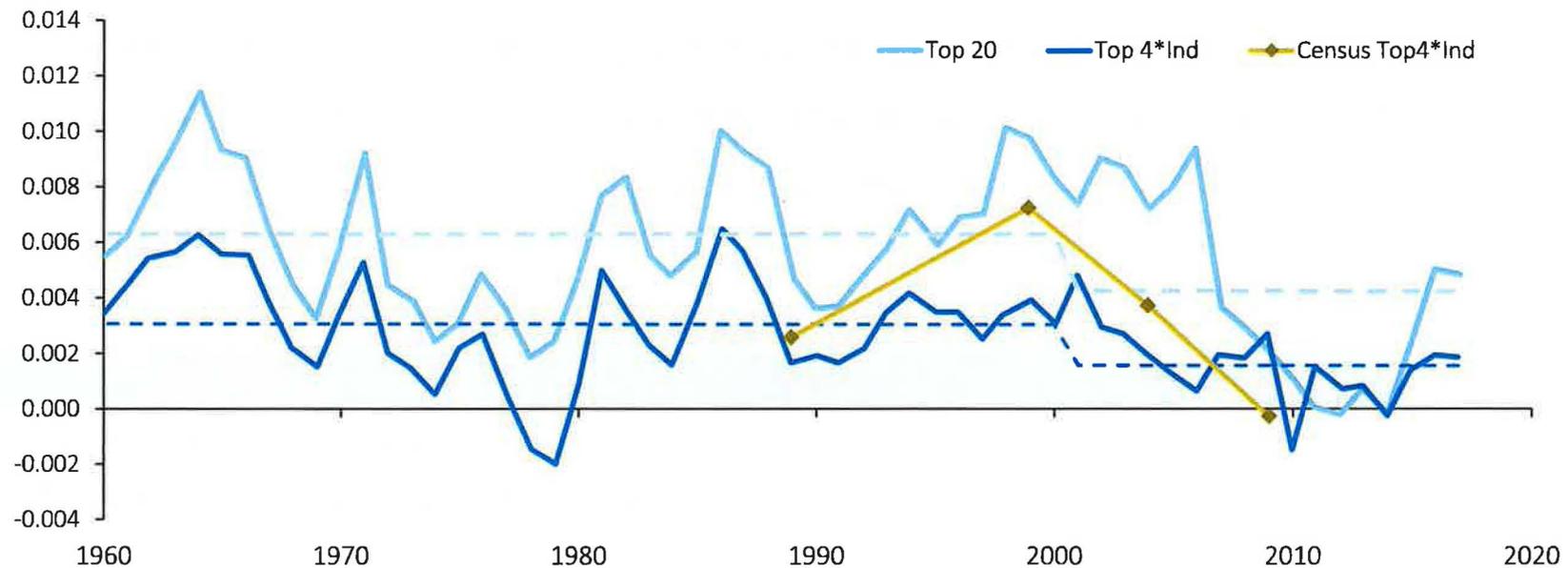
Source: Philippon, T. 2019, 'The Great Reversal – How America Gave Up on Free Markets', The Belknap Press of Harvard University Press, Cambridge, Massachusetts.

Economic and Financial Outlook

Productivity Wave

Buying Dreams...

Tangible and Intangible Assets (U.S.)

Legend: Intangible Assets, Tangible Assets, Llabilities

Y-axis: Asset Mix, percentage of GVA (0, 100, 200, 300, 400, 500)

X-axis: 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015
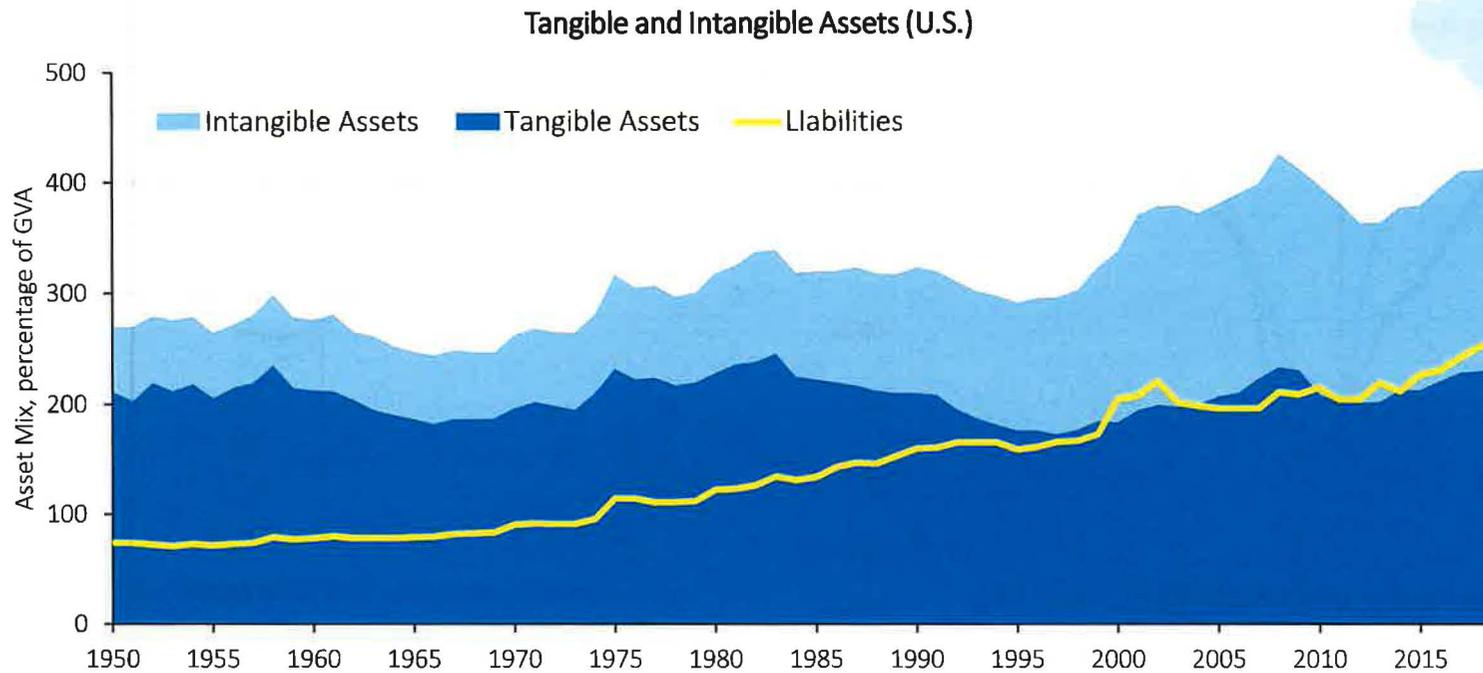
Source: GMO
Note: U.S. Non-financial corporations.

Productivity Wave

Capital Stock Deviations from Pre-Crisis Trends
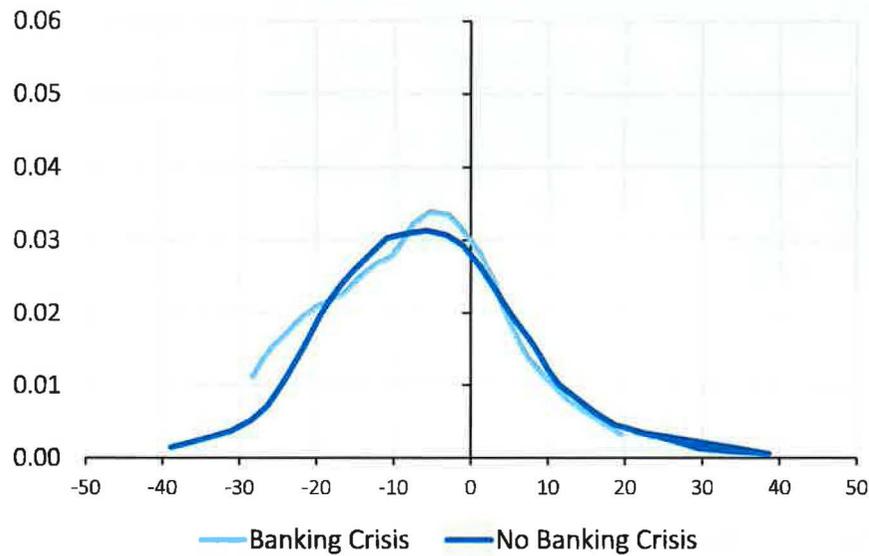
Post-Crisis TFP Deviations from Pre-Crisis Trends
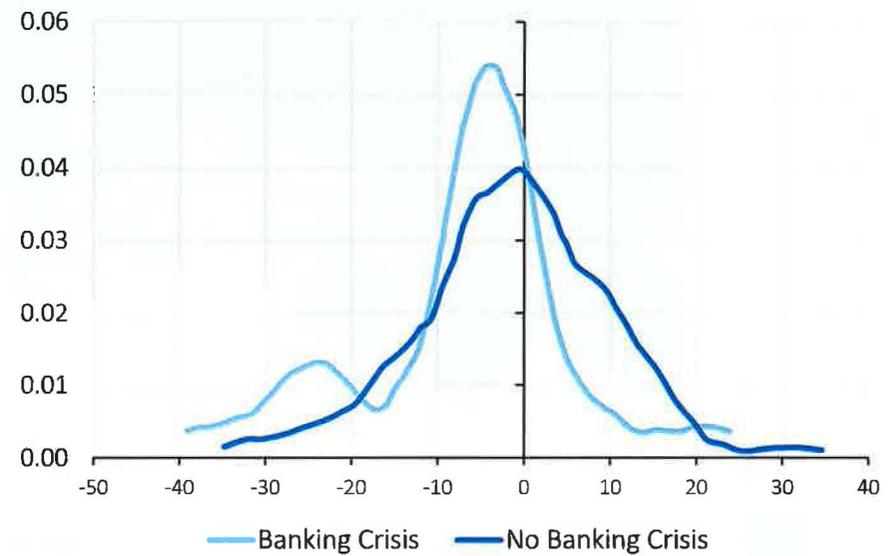
Source: International Monetary Fund
Note: Distribution of average percent deviations from pre-crisis trend, 2015-17

Economic and Financial Outlook

Debt Wave

Debt and Equity (U.S.)

Source: GMO

Economic and Financial Outlook

Debt Wave

Credit to Non-financial Sector
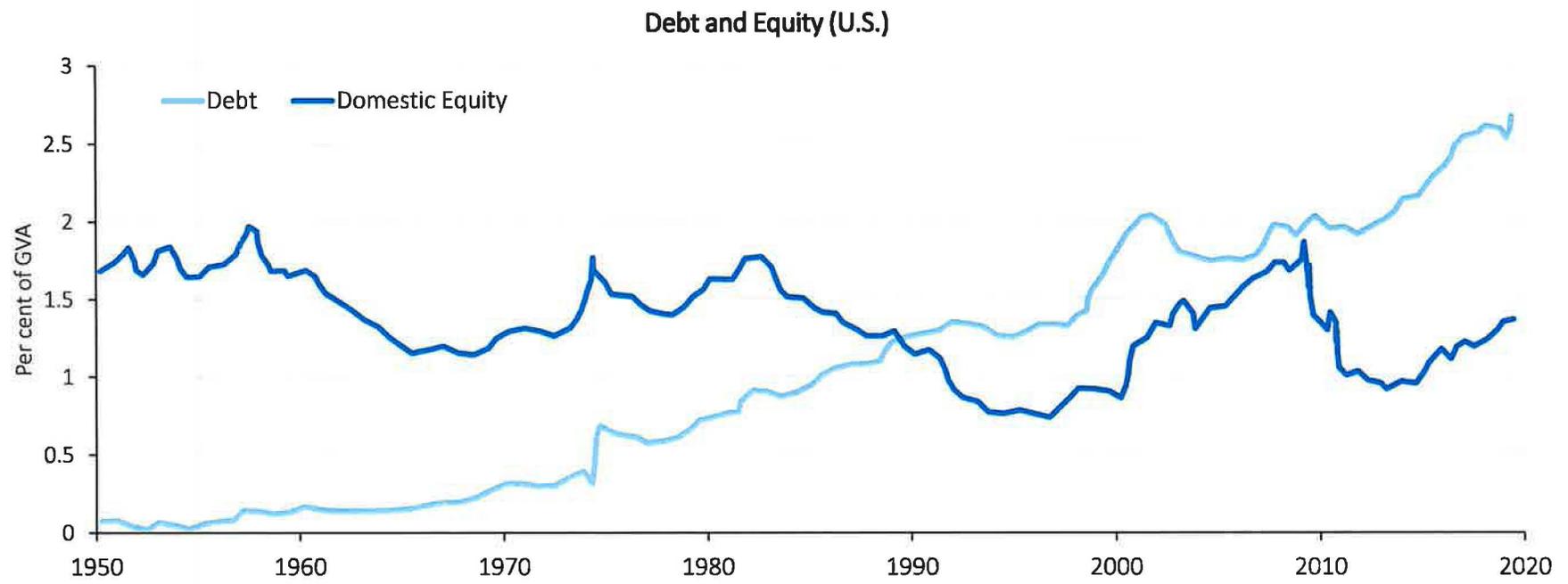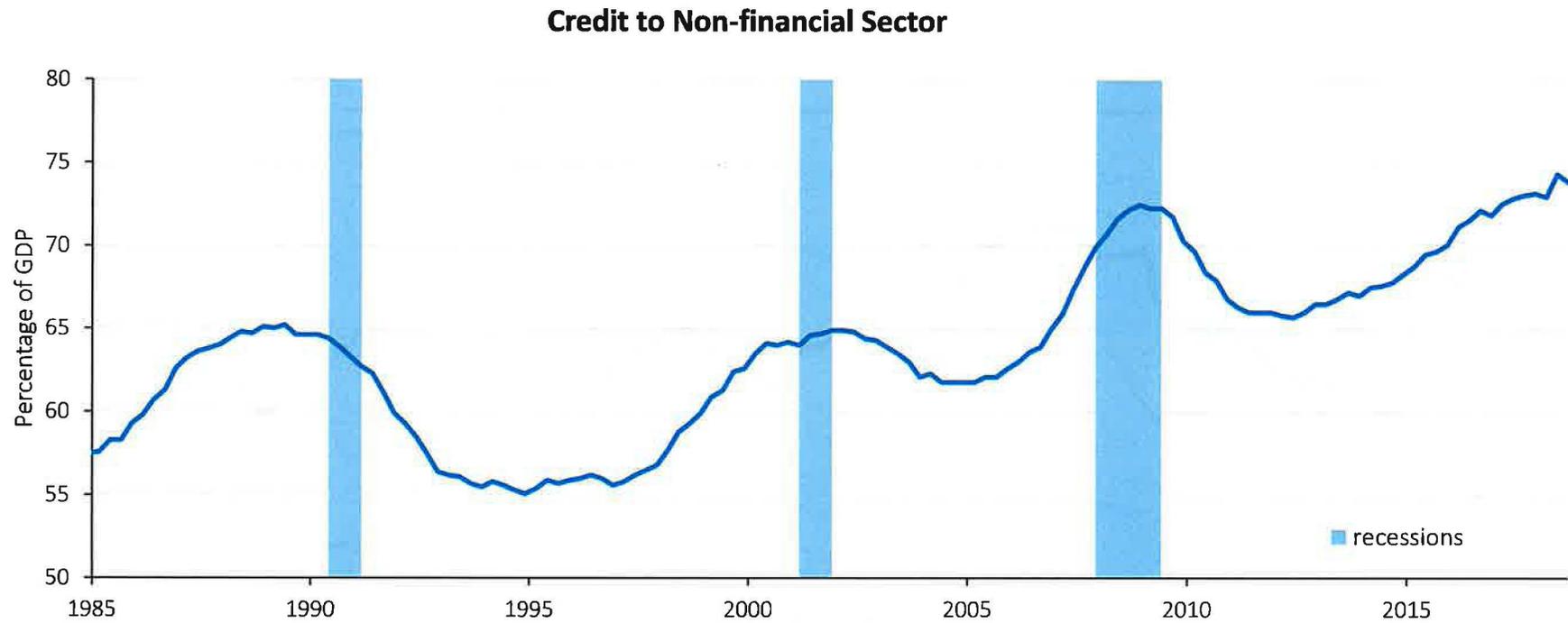
Source: Bank of International Settlement

Economic and Financial Outlook

Debt Wave

Yield Spread Intensity

Legend:
- Annual real GDP growth (-27 months)
- S&P 500 annual total return /8 (-20 months)
- Yield spread intensity ×2
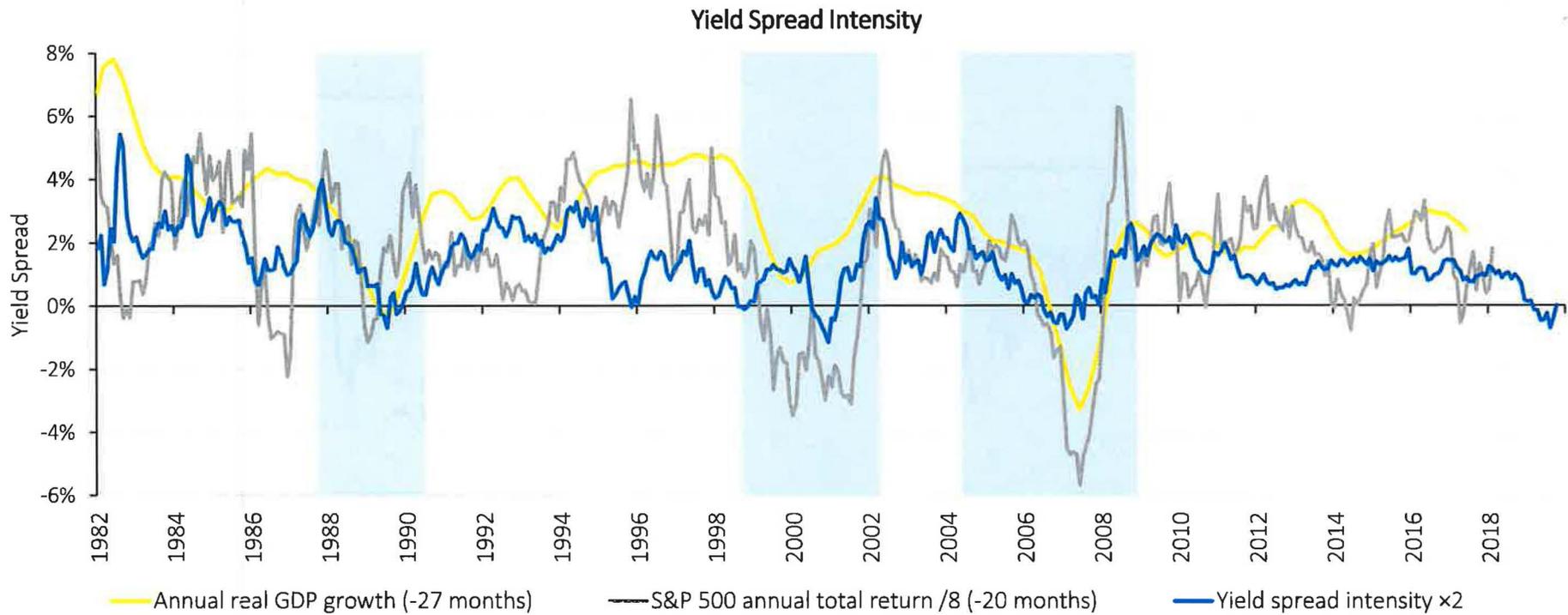
Source: Federal Reserve Bank, S&P

Economic and Financial Outlook

Political Wave

r > g, g falling, more savings that occur, larger capital share / lower wages share & demand
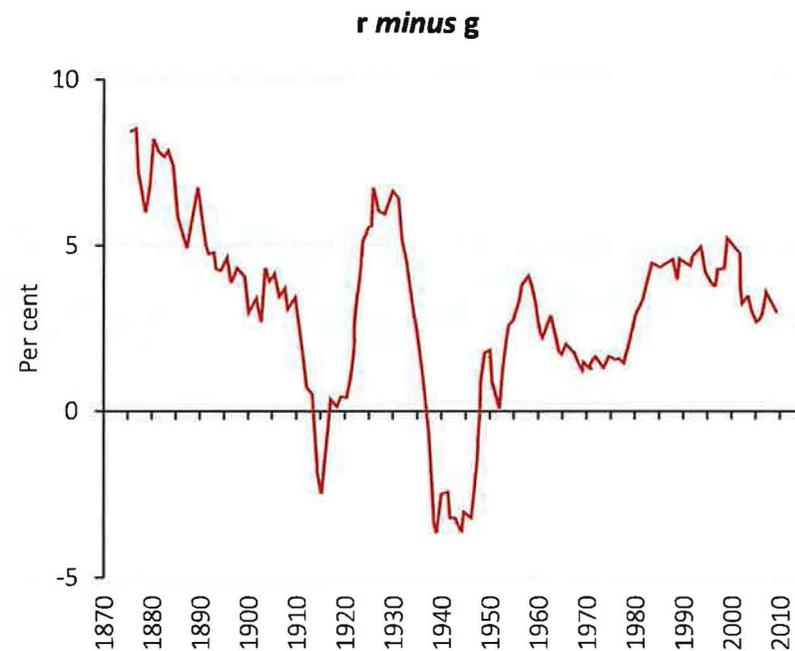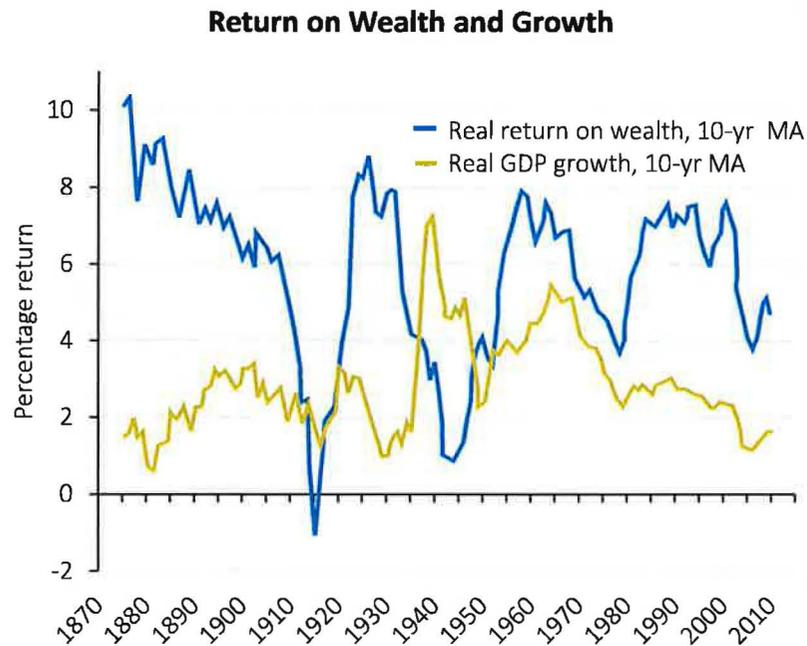
Return on Wealth and Growth

Legend:
- Real return on wealth, 10-yr MA
- Real GDP growth, 10-yr MA

r minus g

Source: Jordà, O., Knoll, K., Kuvshinov, D., Schularick M., and Taylor, A. 2017. "The Rate of Return on Everything, 1870-2015", Federal Reserve Bank of San Francisco.

Political Wave

Source: The World Bank
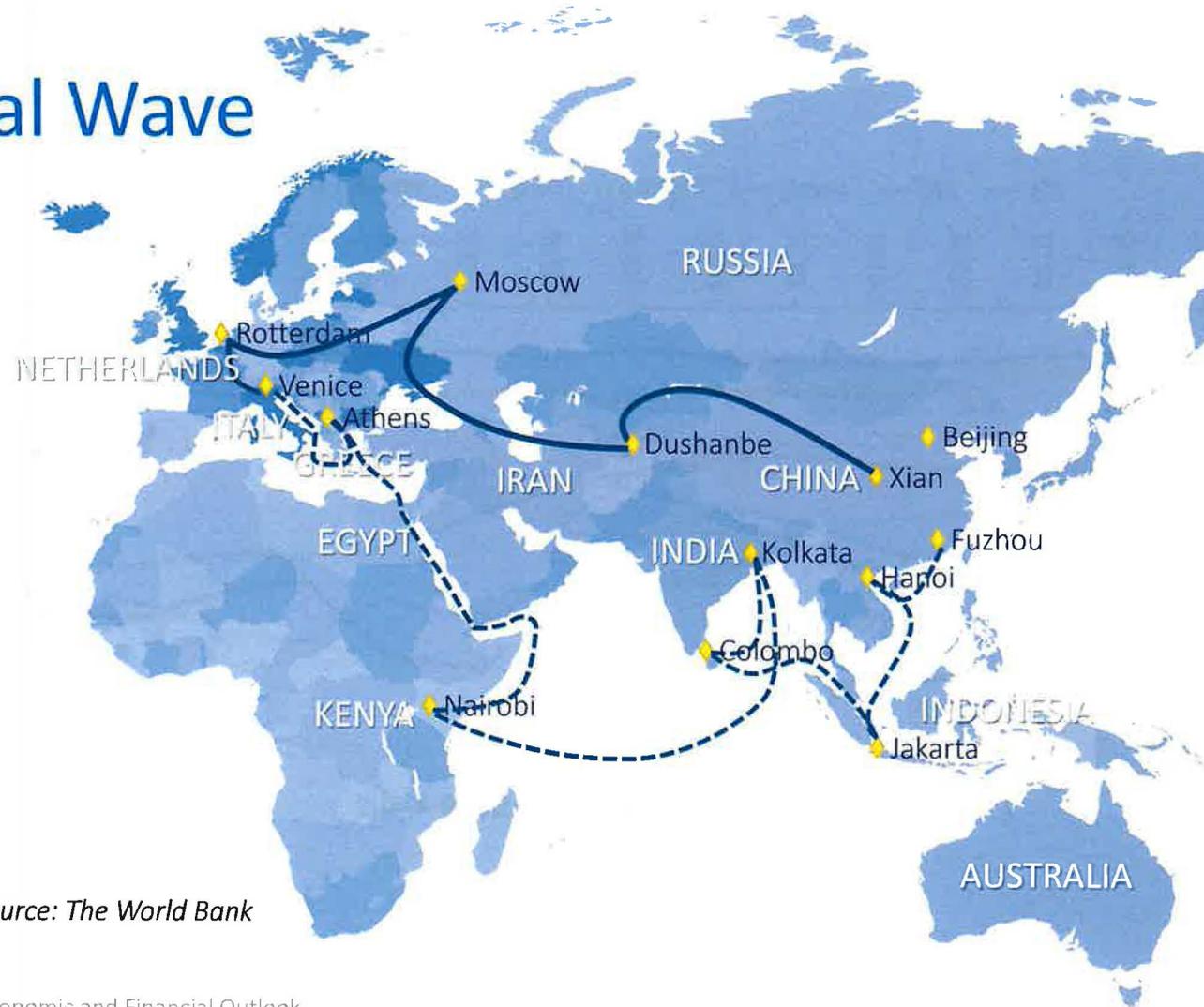
Economic and Financial Outlook

Political Wave

Share of All Global Investment (GFCF)
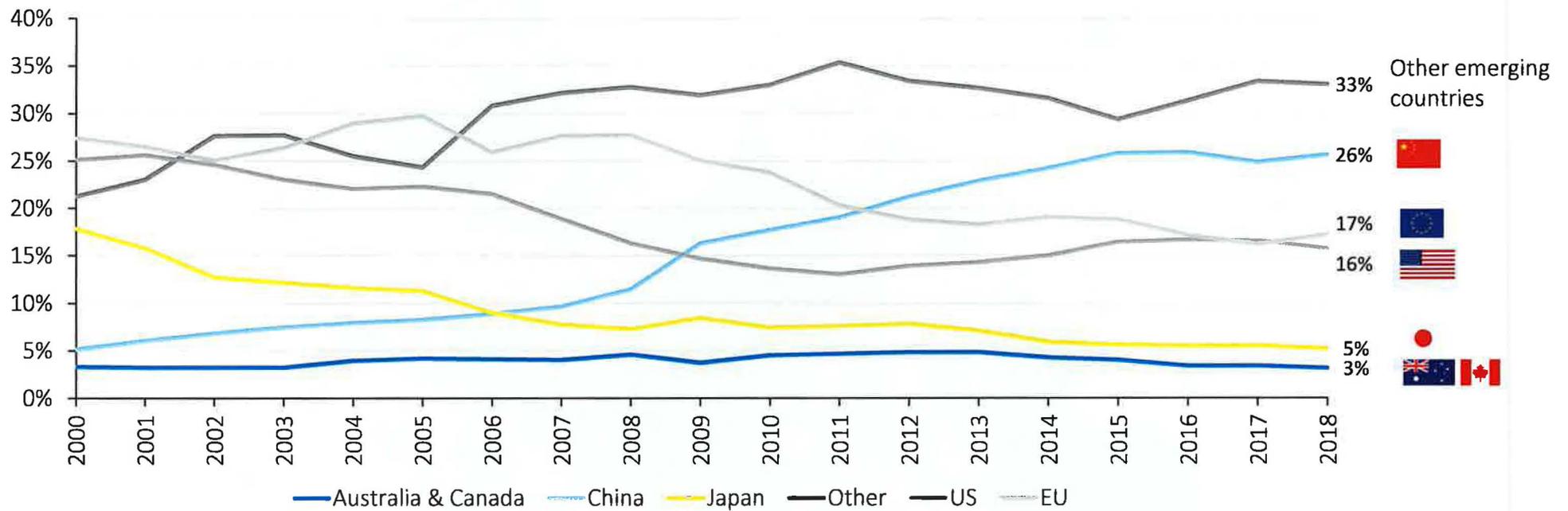
Source: Refinitiv/Thompson Reuters

Take Outs I: Four Waves
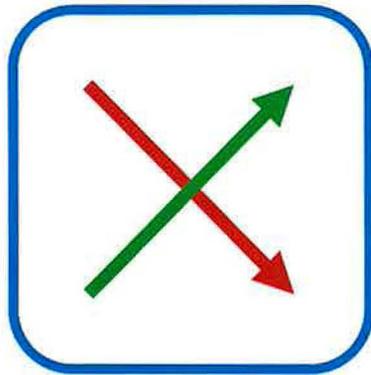
Demographic   Productivity   Debt   Politics
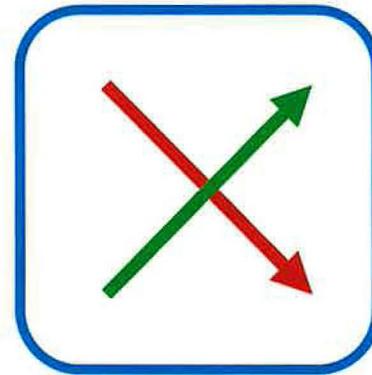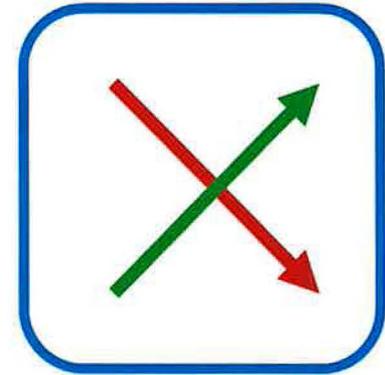
Take Outs II: Domestic Economy

Good news

1. Low is not NO growth

2. Seen it all before – business-as-usual – nothing new to see here

3. Anyone with a twenty year horizon has no problem

4. Recessions usually result from policy tightening or contagion. Piling up of tail events

- Labour markets are still tight, cash rates are low and credit is easing

Storm Clouds

1. Banks especially Westpac / banks investment in technology

2. Household debt

3. China also has massive debt trouble

4. Exports lack diversification

China

Household debt   Banks tech
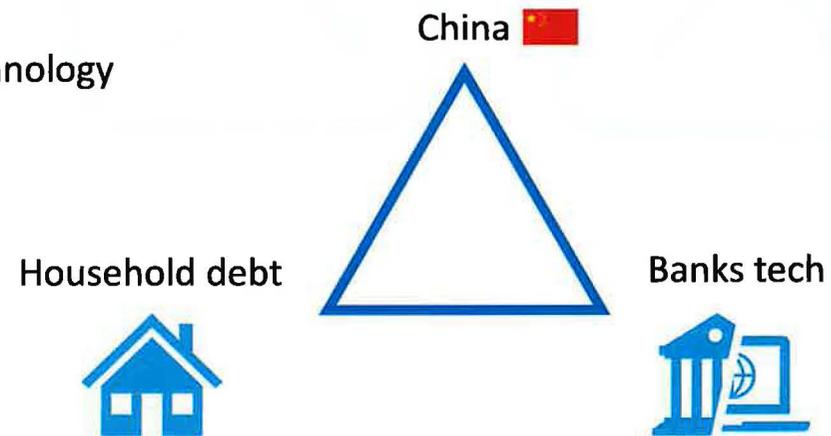
Take Outs III: Markets

1. You would think we might get a run up in Q1 2020

2. Beyond that yield inversion not great sign

3. Recessions usually outcome of some policy mistake / contagion.

4. No obvious driver of global slowdown. No piling up of tail events

5. In US and Australia, labour markets still tight, cash rates are low and credit is easing

6. Perhaps the BIG SQUEEZE is the best analogy

Storm Clouds (not a zero sum game)

1. Biggest worries are Wall Street and Asia debt

2. Portfolio managers carrying duration risks

3. Household debt (especially Australia)

4. Growth stocks

Duration ●

Corporate
debt

Growth stocks
(index funds)

Take Outs IV: Portfolios

Rebound   **Calm**

Low

Credit-arbitrage   **Directional**
High yield bonds   Equities
Defensive growth stocks   Emerging markets
Distress securities   Cyclical growth stocks
                               Long/short equity hedge funds

Credit
risk

Volatility-based   **Equity-arbitrage**
Cash, Gold   Cyclical value stocks
Value stocks   Commodities
Managed futures   Merger arbitrage hedge funds
Hedge funds   Real estate

High

Turbulence   **Speculation**

Market risk

High   Low

Source: CrossBorder Capital

Industry Super Australia

Economic and Financial Outlook

Industry Super Australia

Thank you

Stephen Anthony
@SAnthonyMacro

Australian Retirement Income Adequacy – A Distributional Approach to Cameo Modelling

Phil Gallagher, PSM[1]
Industry Super Australia[2] [3]

Abstract:

Both the Treasury and the Grattan Institute have used inappropriate cameo modelling to look at the effects of increasing the SG rate to 12%.

This study corrects many of the methodological distortions.

Census data from 2016 shows that at that point in time 42.5 per cent of the Australians aged 19 to 65 were not employees. The Grattan study assumes continuous SG eligibility from age 30 to 66 and portrays the results as general population results. In fact, careers for men and women have major breaks in contributions. But we can look at the SG eligible population, and test whether a higher SG contribution rate might benefit them.

When the distributional, microsimulation and cameo analysis is done for the main SG population of 6.8 million people, all of Grattan's results are rejected. With an SG rate of 12% people are better off in retirement, replacement rates move from inadequate to adequate for 5 deciles, and all deciles are better off in spending power across their adult life because of lower personal tax and the compound earnings offered by quality default funds.

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[1] Since 2015, Phil Gallagher PSM has worked for Industry Super Australia as their Specialist Retirement Policy Adviser. From 1993 to 2013, Phil was the Treasury SES manager of the Retirement Income Modelling Taskforce/Unit which costed and modelled superannuation, personal tax and income security policies. He was awarded the Public Service Medal by the Governor General in 2004 for outstanding public service in the statistical modelling of retirement incomes and population ageing. Phil also led the modelling on the first 3 IGRs.
[2] The views expressed in the presentation are those of the author and do not necessarily reflect the views of Industry Super Australia. This paper does not give personal advice.
[3] Bruce Bastian of ISA created the cameo model used I this analysis and then modified it to take decile input and decile output. Bruce also led the ISA econometric research on the offset between an SG rise and wages. The author is responsible for the microsimulation of this relationship.

Introduction

This paper seeks to encourage better cameo modelling of the adequacy of the Australian Superannuation Guarantee (SG) system. It also presents results on the retirement income adequacy for the core SG eligible population which show that increasing the SG rate to 12% is desirable.

Cameo modelling of the SG needs to develop beyond the analysis in *Security in Retirement* (The Treasurer, 1992) which set the approach for the Retirement Income Modelling Taskforce between 1993 and 2002.

There is also a need to improve on the poor distributional modelling and cameo modelling of the Grattan Institute (Daley and Coates 2018, 2019, Coates 2019).

Grattan's GRIM (or GRIP) model claims to be a population model but it is in fact just a set of 10 cameos for people who are always SG eligible employees. It does not have the increment and decrement structure of a group population model. The 2016 Census shows that 42.5 per cent of the population age 19 to 65 are not employees, and they will not be covered by the SG.

The Grattan methodology has been designed to average out people with low balances and interrupted careers. By ignoring the people for whom super is not going well, they pretend that it works well for everyone. Some of the features of the averaging out are that:

- There are no women in the analysis – there are 'its' which average the characteristics of men and women;

- All careers are continuous – there is no allowance for interrupted careers and part-time work;

- There is no allowance for crossing the employee to self-employed divide, which is a big reason for men in blue collar trades/jobs ending up with low super accumulations.

- In summary, there is no allowance for the 42.5% of people aged 19 to 65 without contributions.

The Grattan analysis has rising real retirement spending as people age, corresponding to the wage indexation of the age pension. It then forces everyone to live to age 92 so they get the benefit of the higher real spending. One better approach is to wage deflate so that the wage-indexed age pension does not give rising spending. Another approach would be to calculate the expected retirement spending by weighting each year of age by the proportion of the cohort surviving. By increasing the life expectancies of half the population, Grattan is inflating their age pension received as well as their super spent. They are inflating the replacement rate.

The Grattan analysis has no couples and this overinflates age pension receipts. The couples pension rate is 75 per cent of two single rates. Around 70% of people retire as members of couples. The Grattan analysis has age pension as the adequacy hero by misrepresenting the amount paid.

A very significant error has also been made in over estimating employer contributions. Grattan has added salary sacrifice contributions to employer contributions. But employer contributions on the tax file already include salary sacrifice contributions. This error has been confirmed by ISA checking of the following statement on page 113 of the Grattan 2019 paper:

For example, a person aged 55-59 in the 60th employment earnings decile contributes 6.5 per cent of their employment earnings as voluntary pre-tax contributions.

This rate can be achieved by double counting.

The Grattan model, like many, does not replicate history. It does not have parameters which explain the persistence of low balances. It makes predictions for the age pension which are ludicrous. For example, Figure C4 of the July 2019 paper projects that the bottom 10% of wage earners will be on part-rate pension for the first nine years of their retirement.

In short, Grattan misrepresents SG coverage, overestimates contributions, overestimates payouts, makes half the population live too long, and fails to reflect the distribution of retirement savings and the persistence of low balances.

A core focus of this paper is to remedy the distortions in the Grattan analysis.

Accordingly, this paper builds the argument for more realistic and typical cameo modelling of the distribution of retirement income adequacy across several sections which deal with:

- Restating the twin adequacy objectives of SG policy;
- Examining the characteristics of the main population impacted by the SG and the population not impacted;
- Testing the fit of a decile cameo model to history and making some revisions to get a better fit in the bottom two deciles;
- Demonstrating that 70% of people retire as a member of a couples, and focussing the analysis on couples;
- Restating the case for wage deflation of longer-term incomes to keep them in tune with community standards;
- Reviewing econometric modelling of the effect of the SG on wages;
- Explaining microsimulation modelling of the effect of SG rises on the MTAWE index used for the pension base rate;
- Including personal tax and family tax benefit in the modelling of working life disposable income;
- Making a more appropriate choice of private income source and drawdown rates in retirement; and
- including non-superannuation assets and liabilities in retirement income calculations.

The Twin Adequacy Objectives of SG policy

In the 1990's the twin adequacy objectives of compulsory superannuation were:
- better income in retirement; and
- substantial replacement of working life spending capacity in retirement.

Most people regard *Security in Retirement* (1992) as the crucial direction document for compulsory superannuation. But the preceding direction document, was just as important. *Better Incomes: Retirement Income Policy into the Next Century* was issued by the then Minister for Social Security and future Deputy Prime Minister, Brian Howe, in 1989. The focus was not on replacement rates, it was on better income in retirement than the age pension alone. This 1989 report represented the Australian Government turning away from potential policies such as national superannuation or a pension set at 40% of MTAWE.

Both of these objectives were explicitly recognised in the Henry Tax Review's Report on the Retirement Income System in May 2009 (see pages 10 and 11). Two sentences from page 11 highlight the dual objectives:

- "It enables employees to achieve a level of retirement income above that provided by the Age Pension, with the extent of the increase affected, as for all savings, by the means tests." and
- "However, together with the Age Pension, the superannuation guarantee is expected to provide the opportunity for people on low to average wages with an average working life of 35 years to have a substantial replacement of their income."

The Main Population Impacted by the SG, and by the Planned Increase in the SG Rate to 12%. Plus, the Populations not impacted.

Modelling of the effects of increasing the SG rate to 12% should concentrate on the population most affected, particularly if that population is large. Averaging out the savings of the SG population with those of the self-employed, the retired and the idle rich greatly distorts the contributions and savings of the SG population.

The Superannuation Guarantee employer contribution is received by employees who earn more than $450 in wages in a month and are also over 18 (or under 18 working over 30 hours a week). Although some contractors are covered, ISA research on unpaid super[4] suggests that contractors and those with short term relationships with an employer have low coverage rates.

Chart 1 suggests that employees have significant gaps in coverage caused by early retirement, child raising and the shift into self-employment.

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[4] See Gallagher, Linden and Quinlivan 2019.

Chart 1: Status in Employment by single year of age, Census 2016

Status in Employment by Age and Gender, Census 2016
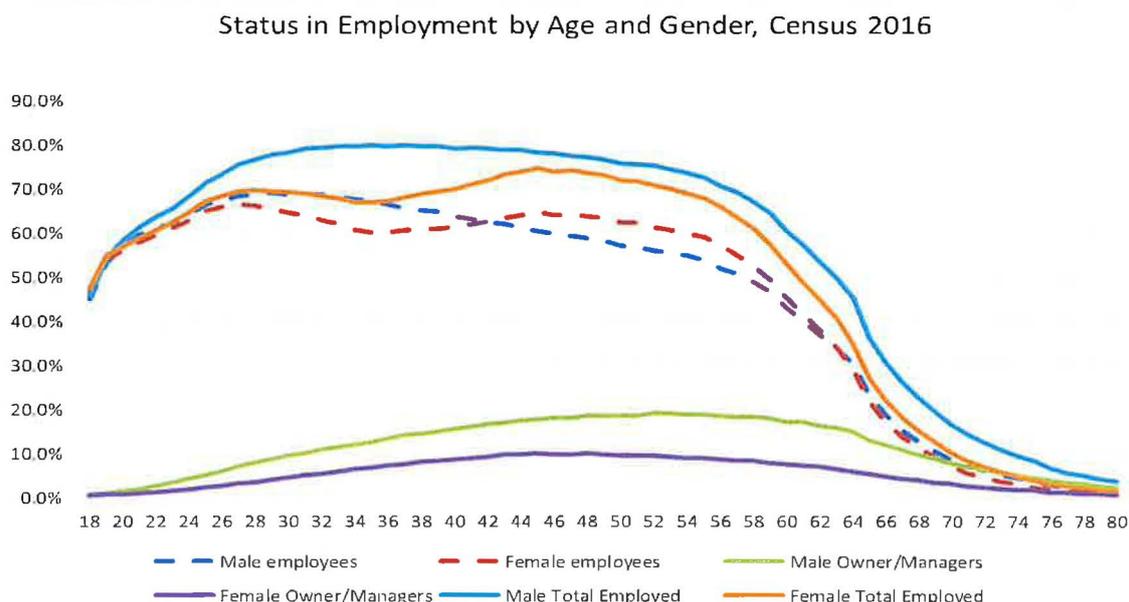
Chart 1 shows that:

- The top male employment age is 29 years when 69.2% are employees and potentially SG eligible,
- The top female employment age is age 26 years when 65.9% are employees and potentially SG eligible.

This means that less than 70% of any age group will have SG contributions. Not only is there a pronounced gap in Pillar 2 coverage but there is also a noticeable gap in workforce membership with a maximum of 80% of people aged 30 to 45 actually working.

The chart also shows that:

- For women there is a large drop in the employee ratio between ages 30 and 45 corresponding to time taken out of the workforce to care for children, parents and often grandchildren. At age 30, 64.7% of women are employees and this drops to 60.1% before recovering to 64.8% at age 45.
- For men, the employee ratio also drops from the late 20s, but this coincides with a rise in the proportion of men who are self-employed.

The employee ratio is actually higher for women than men between ages 43 and 62, but many women are working part-time.

The most important decline in the employee ratio is related to age, not gender. From age 55 there is an accelerating drop in proportion of the population who are employees and may receive the SG.

The 2016 Census data shows that of the population aged 19 to 65[5], 8.33 million are employees and 6.15 million are not employees. So, at a point in time, only a maximum of 57.5% of the population are SG eligible, and the proportions actually paid the SG rate are further reduced by underpayment of SG and by the $450 per month wages threshold.

The cameo models of the Treasury and the Grattan Institute usually assume that a person is an employee continuously from age 30 to retirement at age 67. If this kind of worker exists, they will definitely be in a small minority. These models only represent employees, and they substantially overestimate the actual accumulation of employees because there are no allowances for career interruptions.

These models represent only the minority of the population who spend most of their working years as employees. They tell us nothing about the population.

But we can look at the SG eligible population, and test whether a higher SG contribution rate might benefit them.

It is hard to represent multiple career paths in a cameo model. Longitudinal data is either based on small samples (as in HILDA) or locked behind government-imposed security walls (as in ALIFE). Early retirement also causes havoc with replacement rate calculations.

Cameo models designed to reflect the wage distribution of employees often use average wages in each age and gender group as the basis of SG contributions. Professional modellers acknowledge that actual accumulations and replacement rates will be lower than represented in their cameo model.

Professional modellers also look at the fit of their model to history.

The most accurate source of information on the SG eligible population and its financial characteristics is the ATO 2% sample file for tax filers in 2016-17. This confidentialised unit record file has both personal tax as well as superannuation contributions and balance details. Slight perturbation is rated by the ATO as not interfering with its use.

Of people aged 20 to 64 years in the SG eligible population:

- 76.6% of SG population have employer contributions under 12% with no non-concessional or non-employer concessional contributions. (**6.8 million** of 8.8 million people)

- 85.6% of SG population only have employer contributions (7.5 million of 8.8 million people)

- 95.1% of employees have employer contributions only (8.54 of 8.98 million people);[6]

More than three quarters of the population eligible for SG contributions do not have voluntary contributions. There is no good reason for modelling this population as having post-tax and salary sacrifice contributions. There is even less reason to double count salary sacrifice contributions as Daley and Coates have done by adding RESC to employer contributions which already include salary-sacrifice.

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[5] Of those 18 year-olds who work, most are part-time and not covered by the SG. Age pension age is currently 66.
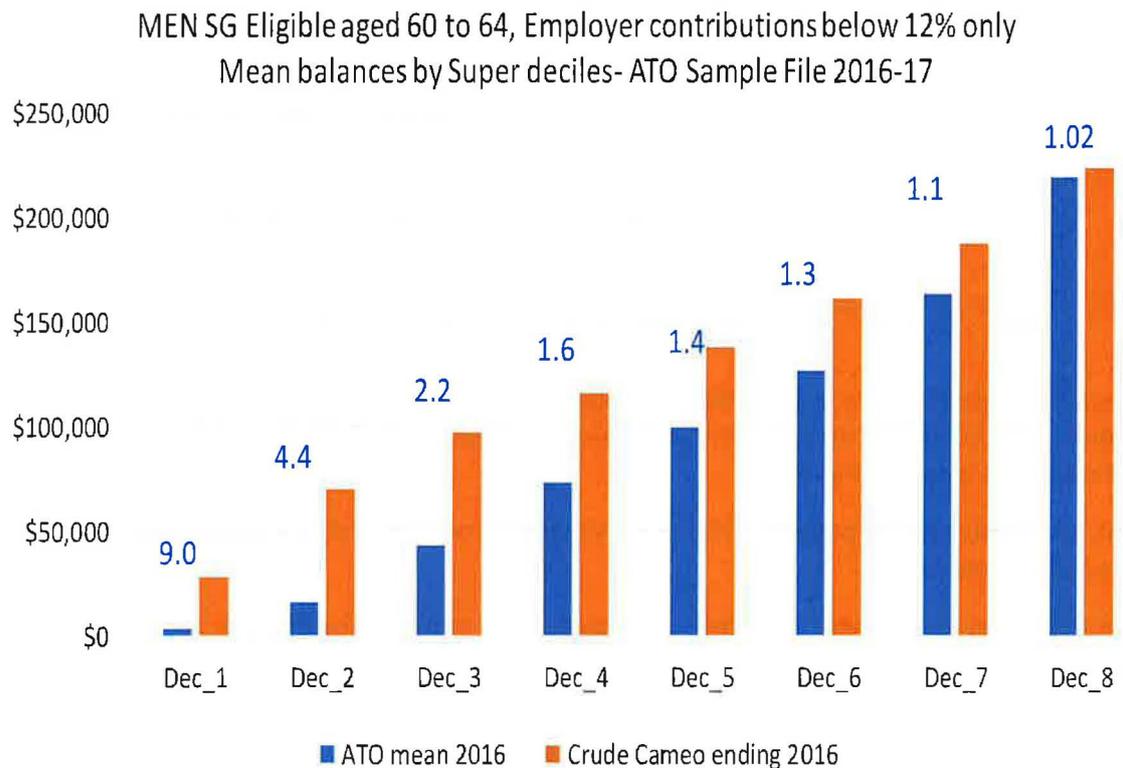[6] Employees have been defined to have wages, and to fail the former 10% rule for deductible member contributions.

There are many good reasons to test a model's fit to history before using it to analyse the future.[7]

For this analysis the ISA cameo model uses age and gender specific wage rate to produce an SG accumulation. As expected, this produces accumulations for the SG population without voluntary contributions which are higher than observed in 2016-17 for deciles 1 to 8 of balances for pre-retirement men and women. Chart 2 shows that for men the model overestimates by a factor of 9 for decile 1 and 4.4 for decile 2. Chart 3 shows overestimation of 5.0 for decile 1 women and 2.7 for decile 2 women. In large part, the overestimation is caused by portions of careers without contributions.

In the modelling presented later, wages before age 50 have been reduced in deciles 1 and 2 so that the model overestimates by respectively 5.8 and 3.4 for men, and 3.6 and 2.0 for women. Wages from age 50 have not been changed because this would distort replacement rates. Otherwise, the current test of whether the SG works uses the mean ATO wages as a percent of AWOTE for each age and gender decile.

Chart 2: Test of Fit to Actual accumulation of the main SG population - Men

MEN SG Eligible aged 60 to 64, Employer contributions below 12% only
Mean balances by Super deciles- ATO Sample File 2016-17

Legend: ATO mean 2016 | Crude Cameo ending 2016

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[7] Bruce Bastian has created a new cameo model for ISA which automates most functions in VBA. It can be run from 1992-93 or any other starting point and it includes personal tax and family tax benefit calculations on top of the normal superannuation and age pension calculations.

Chart 3: Test of Model Fit to Actual Accumulation of the main SG population - Women

WOMEN- SG Eligible aged 60 to 64, Employer Contributions up to 12% only
Mean balances by Super deciles and Ratio Model to Actual- ATO Sample File2016-17

ATO mean 2016 ■   Crude Cameo ending 2016 ■
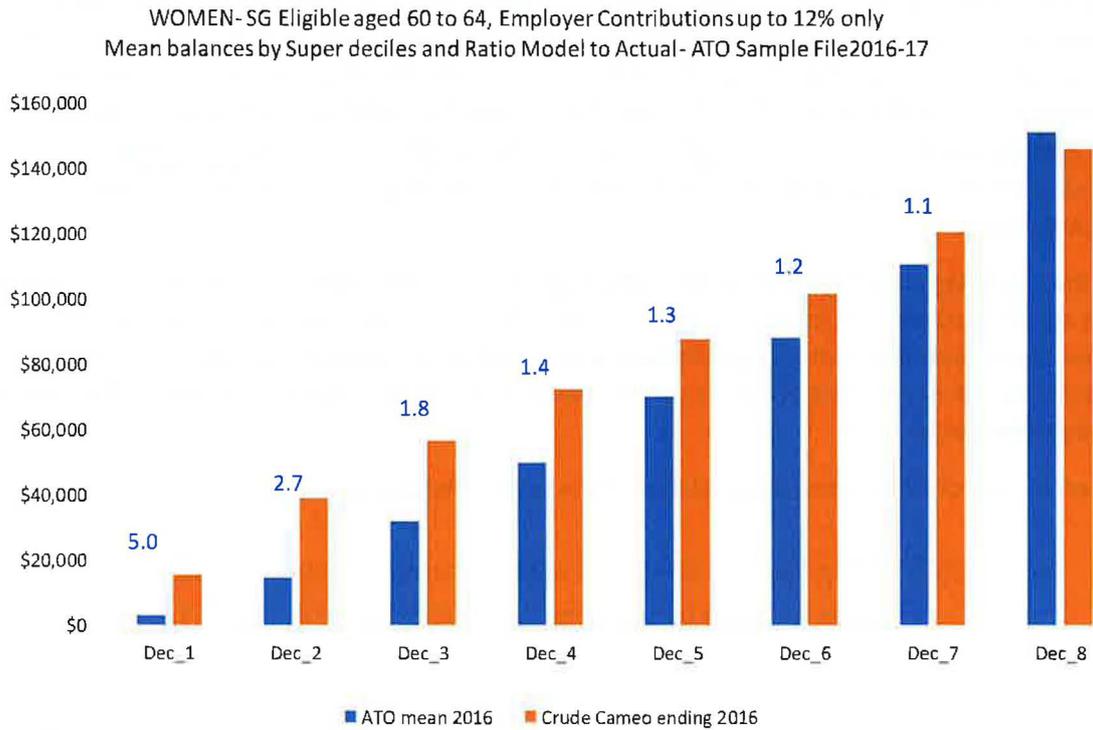
Why Retirement Adequacy Projections Should Focus on Couples

Over 70% of people retire as a member of a couple – the 2016 Census gives 70% of people partnered between age 60 and 69, the ABS Survey of Income and Housing 2015-16 gives 73.3% between 60 to 69 and 67.7% for ages 70 to 79.

The half-married rate of pension is 75% of the single rate, or alternately the single rate is 132% of the half-married rate.

For retirement replacement rates there is no equivalence concept. The personal tax system applies to individuals.

This analysis assumes assortative partnering. Males and females in the same decile form couples. Chart 4 is a Bruce Bastian heatmap analysis of the net financial asset deciles of partnered men and women in the 2017-18 ABS Survey of Income and Housing. The most common pattern is for people to have a partner in the same wealth decile. The heatmap for those aged 60 to 70 is similar, but Chart 4 makes it clear that this is due to partnering and not just due to asset reallocation before retirement.

Chart 4: Heatmap of the financial asset deciles of partners – all ages
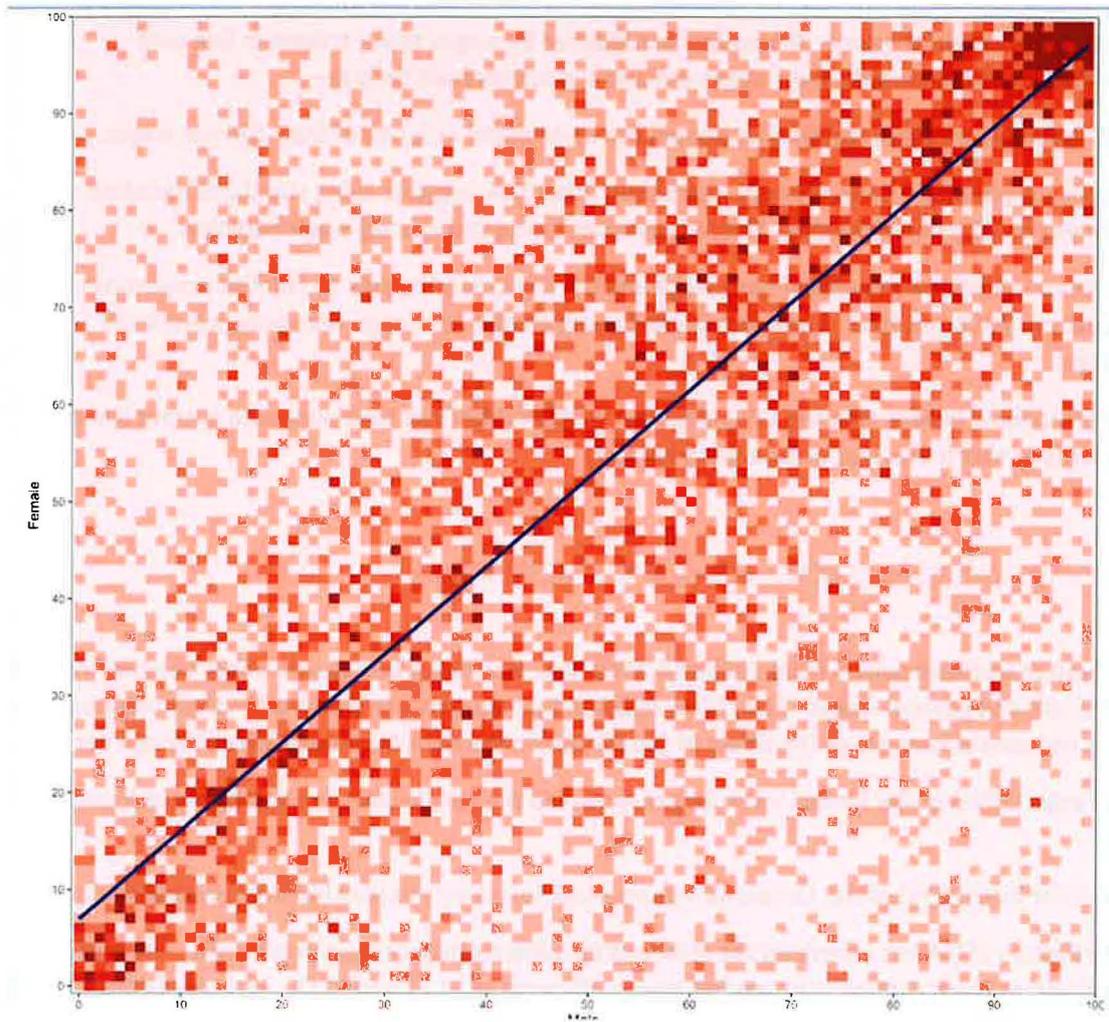
The case for WAGE DEFLATION of longer-term retirement incomes

In 2002 the *Senate Select Committee on Superannuation Inquiry into Superannuation and Standards of Living in Retirement* became concerned that Treasury projections of retirement spending overstated adequacy because the replacement rate calculations relied on real increases in the age pension across the years of retirement. ASFA and other commentators argued that the age pension had been made the driver of adequacy, not superannuation. The Senate committee commissioned the Institute of Actuaries to review the Treasury methodology and the IAA report came to this conclusion:

"The use of a CPI deflator (as has been used in the Treasury model) will produce results that are consistent with other Government projections. However, these are usually undertaken over relatively short time frames (less than five years or so). For longer-term projections, such as are required when assessing adequacy of retirement incomes, the IAA believes it is more consistent to use an AWOTE deflator to ensure comparability with living standards at the time of retirement."

The wage deflated approach recommended by the IAA is consistent with both poverty studies, poverty line indexation (such as the Henderson line in 1975), and the Australian Government's indexation of public pensions. If amounts are indexed by wages to keep them in line with community living standards, then wages are also the appropriate deflator.

Wage deflation produces results that people can understand in terms of their current wages.

The ASIC Corporations (Amendment) Instrument 2019/514 suggests living standards deflation or a statement on why not doing this. The MoneySmart Calculator is using wage deflation.

The Henry Tax Review presented both wage and CPI discounted results as did RIM presentations on adequacy in 2011 and 2013. Grattan has cited these studies as though they only present CPI deflation.

Very few people believe that the CPI indexation of NEWSTART has kept pace with current living standards or that it provides an adequate benefit.

Econometric modelling of the effect of the SG on wages

The Grattan Institute papers from 2018 and 2019 have asserted a one to one offset between rises in the SG rate and general wages. They have asserted that workers are worse off in their working lives and in retirement because of the effect of the SG rise on the MTAWE indexation of the age pension.

Kyle Taylor (2019) of the McKell Institute has modelled the relationship for Australia and found no link.

Dr Jim Stanford (2019) of the Centre for Future Work found no relationship from Australian data.

Bruce Bastian of ISA has examined the relationship using workplace agreement data. The two specifications of his econometric models give coefficients of -0.27 and -0.65. He regards this as work in progress and notes that a bit over a third of employees are covered by enterprise bargaining agreements.

To be very conservative I have used relevant international literature is on the incidence of payroll taxes and social contribution changes on wages. One of the broadest meta-analyses of 52 studies and 124 estimates is that by Ángel Melguizo and José González-Páramo, 2013. This study concluded that:

"In our preferred specification, the elasticity of wages to taxes is –0.70 in the default option . . . Moreover, the impact of taxes on wages differs in the short term. The degree of shifting is much lower in the short run: workers bear less than half of the tax burden."

In the absence of concluded Australian analysis I have simply assumed -0.70 as the elasticity of wages in response to changes in social contributions for those people affected.

Microsimulation modelling of the effect of SG rises on the MTAWE index used for the pension base rate

The base rate of Australian Government pensions is indexed to rises in Male Total Average Weekly Earnings (MTAWE) or rises in the CPI, whichever is higher. In practice, the wage measure is usually the higher. The wage indexation of base pension keeps it moving broadly in line with community living standards. Most employees will receive some government pension during retirement. There is potential for a rise in the SG rate to influence the rise in MTAWE and in the value of a maximum pension.

But the impact is smaller than many imagine because the proportion of employees impacted is smaller than usually estimated. The current estimates are based on a microsimulation model based on the ATO's 2% sample file for 2016-17.

ISA has repeatedly used the ATO sample files to estimate underpaid superannuation.[8] If the SG were to rise from 9.5% of Ordinary Time Earnings (OTE) to 10% of OTE then the group of employees impacted would be those with an effective SG rate between 7% of OTE and 10% of OTE. People below an effective SG rate of 7% seem unlikely to get an SG rise, and those over 10% would not be required to do so.

If salary sacrifice is removed from employer contributions, this impacted group is about 40% of males counted in Male Total Average Weekly Earnings and 45.5% of males and females in the Average Weekly Earnings series.

Using the ATO sample file for 2016-17 to microsimulate successive SG rises of half a per cent, I find that, with a 70% pass through to wages for those affected, Male Total Average Weekly Earnings (MTAWE) would be 0.9989 times the level without any SG offset.

So, if wages were rising 3% in the absence of an SG rise, with the SG rising by half a per cent the rise in MTAWE would be 2.89% for modelling purposes.

This is important for pension indexation which is based on MTAWE. Grattan finds that the rise in the SG from 9.5% to 12% would reduce the maximum age pension by 1.7%. The ISA estimate of the effect is 0.51% – less than a third of the Grattan estimate.

Working Life Disposable Income

The Grattan Institute has stressed the potential for lower wages from an SG rise[9]. But wages are not the only determinant of living standards and they are not used in most Australian studies of replacement rates. Personal taxes, government cash benefits and government subsidy of goods and services play a major role in determining a family's standard of living.

Replacement rate calculations should compare spending in retirement to spending (disposable income) in working life.

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[8] See Gallagher, Linden and Quinlivan (2019)

[9] In addition to the major reports, there are also press releases such as "Increasing super will take $20 billion a year from workers' wages" released on Thursday 2 May 2019

Any wage adjustment from an increase in the SG will affect tax at marginal rates and for most couples (and some singles) will also be affect family tax benefit income tests.

Both of these impacts on disposable income are included in the current modelling of couples.

Wage deflated disposable income can be used across all of working life and all of retirement, whereas CPI deflation can only be used for a few years around retirement. People understand how much income is when it is expressed in current wages.

The long period avoids using replacement rates based on the few years of low income before retirement. I am using the first 15 years of retirement and the last 15 years of working life. This avoids the impact of family tax benefit on replacement rates.

Non-Superannuation Savings

Superannuation is not the only asset which can be drawn down on in retirement. For this study I have included estimates of non-superannuation non-home median assets. The estimates are based on a new methodology which allocates property assets and loan principal liabilities from household records in the ABS Survey of Income and Housing (2015-16) back to the records for adults based on who has the income, ownership or the expense associated with the property or loan. Financial assets other than super are estimated from the person records as is customary.

Table 1 shows the resulting estimates of non-super savings for the SG population used in the study. To make these independent of year, they are expressed as a percentage of AWOTE.

Table 1 Estimates of net non-superannuation, non-housing assets for those in the SG population near Retirement.

	Age 55 to 64	
	AWOTE MULTIPLES	
DECILE	Males	Females
1	3.2%	43.3%
2	0.6%	7.7%
3	4.2%	0.6%
4	1.3%	6.4%
5	6.4%	0.8%
6	0.4%	2.6%
7	51.0%	9.5%
8	6.4%	12.8%
9	15.9%	1.3%
10	44.6%	21.7%

Source ABS SIH1516

The Retirement Income Product Used in the Cameos

The modelling uses the most popular current retirement product – an allocated pension. These can be readily bought from superannuation funds and they have legislated drawdown rules. The allocated pension has a nominal earning of 6% which is one per cent lower than the 7% used for accumulations. The accumulation return is the SuperRatings 20 year returns for a median balanced fund rounded down to the nearest percent. The allocated pension also has fees.

In order not to understate adequacy the minimum drawdowns have not been used. Instead, the maximum of a ten per cent drawdown or a minimum age-based drawdown is used to give declining (wage deflated) spending over retirement. This corresponds to more money being spent during the years of active retirement. For example, the minimum drawdown between ages 65 and 74 is five per cent.

The declining pattern of spending over retirement in this analysis is in stark contrast to the heavily escalating real spending used in the Grattan analysis. Their analysis combines a fixed real annuity with a strongly increasing age pension as the cameos age. This is Grattan prefer replacement rates based on everyone living until they are 92. The Grattan modelled escalating real spending pattern is the exact opposite of the pattern which Grattan says actually occurs.

The drawdown used increases replacement rates as does the model's over-estimation of balances when compared to history.

The high drawdown also removes spending anomalies from the 7.8% assets test taper. Spending rises monotonically by decile, rather than declining once the assets test bites.

Results for Couples

The couples in the current cameos:

- Commence work at age 20 in 2019-20;
- Retire at age 67 in 2066-67; and
- Die at age 92 in 2091-92.

Wages correspond to the age and gender specific wages of SG eligible employees without voluntary saving and with employer contribution rates below 12% of OTE.

The model calculates personal income tax and family tax benefits for 3 children between the parents ages of 30 and 51 years.

The three output measures reported here are:

- The replacement rates of the couple's wage deflated spending comparing their first fifteen years of retirement to the last 15 years of working life[10];
- The average improvement in retirement income calculated as the ratio of wage deflated retirement spending to wage deflated full rate pension; and
- The change in both working life and retirement disposable income, both wage-deflated and averaged over the full periods.

Recent Australian studies of replacement rates have tended to use 70% as the adequacy line (see Daley and Coates 2018 and 2019, Mercer 2019 and speeches by the current Prime Minister).

Table 2: Replacement rates of the couple's wage deflated spending comparing their first fifteen years of retirement to the last 15 years of working life

Decile	Frozen SG 9.5%	SG increases to 12%	Improvement in Replacement Rate
1	145%	149%	4%
2	94%	100%	6%
3	85%	89%	4%
4	75%	80%	6%
5	69%	77%	8%
6	65%	74%	9%
7	64%	75%	11%
8	60%	73%	12%
9	59%	73%	14%
10	54%	68%	14%

---

[10] This 15 years after and before retirement is far more balanced than Grattan's 25 years of retirement being compared to the 5 years prior to retirement when they give individuals their lowest wages.

Couples in all wage deciles benefit from the SG rate rising to 12%. Couples in deciles 5 through 9 improve from below 70% replacement rate to above 70%. Table 2 shows that fifty per cent of couples in the SG population move from an inadequate to adequate replacement rates. Current legislated policy (12%) also projected as being affected in the other deciles of wages.

The high replacement rates for couples in deciles 1 and 2 do not imply that their retirement incomes are more than adequate. Table 3 shows that decile 1 has spending which is only 9% above a full-rate pension, and decile 2 is 28% above.

The author's guideline for improvement in retirement income is that a substantial working life should result in an improvement of 20% over a full age pension. Table 3 shows that this is not true of decile 1 and almost not true of decile 2 at an SG contribution rate of 9.5%.

Table 3: Average improvement in retirement income calculated as the ratio of wage deflated retirement spending to wage deflated full rate pension

Decile	Frozen SG 9.5%	SG increases to 12%	Improvement in Ratio to Full Rate
1	108%	109%	1%
2	122%	128%	6%
3	144%	150%	6%
4	149%	157%	8%
5	155%	166%	11%
6	161%	175%	13%
7	173%	189%	17%
8	183%	204%	21%
9	202%	232%	30%
10	270%	327%	57%

The Grattan Institute claims that a rise in the SG will make middle income workers substantially worse off during working life and retirement. Table 4 shows exactly the opposite.

Although there is a modelled loss of working life disposable income below one per cent, this is not supported by published Australian econometric studies.

There is a significant rise in both retirement spending and spending across the whole of adult life. Retirement spending increases by 1.3% to 22.4% with spending in the middle deciles 4 to 7 rising by 5.9% to 12.2%. Adult life spending increases in every decile from 0.6% in decile 1 (who have 17 year careers) to 3.7% in decile 10 where the SG rise is not countered by a high asset test taper.

Table 4: The change in average working life and retirement disposable income (both wage-deflated)

Decile	Working Life	Retirement	Whole adult life
1	-0.3%	1.3%	0.6%
2	-0.6%	5.1%	1.5%
3	-0.7%	4.1%	0.7%
4	-0.7%	5.9%	1.1%
5	-0.7%	8.2%	1.5%
6	-0.8%	10.1%	1.8%
7	-0.8%	12.2%	2.2%
8	-0.8%	14.3%	2.5%
9	-0.9%	17.6%	3.0%
10	-0.8%	22.4%	3.7%

Conclusions

The Grattan Institute's methodology for looking at the rise in the SG to 12% is deeply flawed. It does not look at men, women, couples or the employees who are most affected by the SG rise. There is no recognition of the fact that 42.5% of the population 19 to 65 are not current employees and that contributions are heavily interrupted. Grattan makes up a full wage offset for an SG rise and does not do microsimulation analysis of the SG population to look at the MTAWE impact of the rise. Grattan uses CPI deflation of incomes across many years – an approach rejected by the Institute of Actuaries, ASIC and at least forty five years of poverty line research. Grattan does not look at couples and has retirement spending which increases rapidly across the years of retirement – a profile contradicted by their own research.

When the distributional, microsimulation and cameo analysis is done for the main SG population of 6.8 million people, all of Grattan's results are rejected. People are better off in retirement when the SG rate goes up, replacement rates move from inadequate to adequate for 5 deciles, and all deciles are better off in spending power across their adult life because of lower personal tax and the compound earnings offered by quality default funds.

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MATILDA – A dynamic flow-of-funds model for Australia

15 July 2019

Why flow-of-funds model is important

"The dominant new Keynesian model of monetary economics lacks an account of financial intermediation, so that money, credit and banks play no meaningful role…"

Mervyn King
Former Governor of the Bank of England

What is MATILDA?

MATILDA is a large-scale Australian macroeconomic model that captures the feedback loop between the **financial flow-of-funds** and the **national economy**.

The model was inspired by Bank of England (BOE) sponsored project outlined in *Burgess, S., Burrows, O., Godin, A., Kinsella, S. & Millard, S. (2016)*.
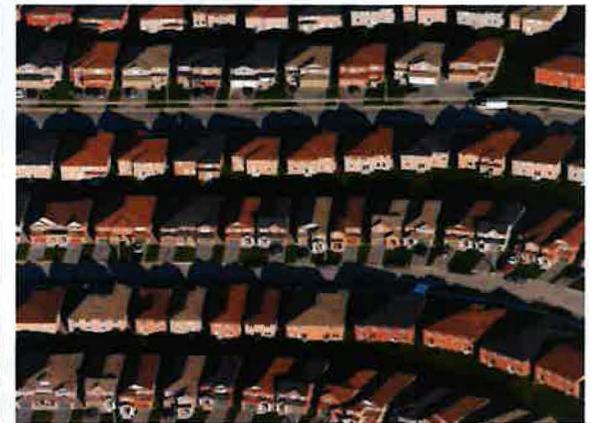
Real economy

Financial economy

Motivation

Back in 2008, mainstream macroeconomic models failed to anticipate the GFC.

The reason for this was the absence of strong linkages between finance and the real economy in orthodox modelling approaches.

Warning signs: **financial imbalances, unsustainable debt** & **financial flows**.
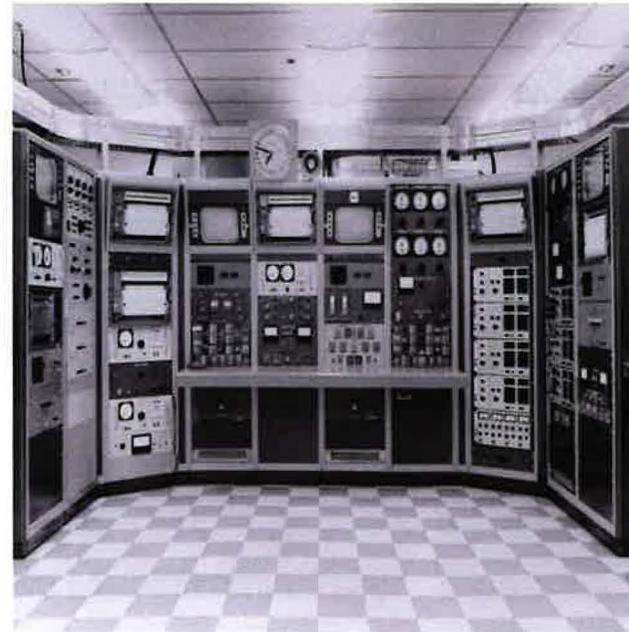
Orthodox macro-modelling approaches

Keynesian-Klein (K-K) model

Computable General Equilibrium (CGE) model

Dynamic Stochastic General Equilibrium (DSGE) model

Vector Autoregression (VAR) model

Flow-of-funds approach

The flow-of-funds approach was pioneered by James Tobin and Wynne Godley in the 1960s and 1970s. In the late 1990s, Godley created the Levy Macroeconomic Model based on the SFC concept, which was used to predict both the dot-com bubble and the GFC.

James Tobin   Wynne Godley

Flow-of-funds approach

Modelling via SFC approach applies accounting framework along with behavioural economic equations to establish transmission channels between real economic activity and financial side of the economy.

Key concepts

Flow   **Stock**

Wages, purchases, taxes, *investments*, transfers, interests   Deposits, loans, bonds, equities

Activities in the real economy   **Financial assets**
(Relevance to portfolio decision making)

The MATILDA model – a tool for analysis

MATILDA is a dynamic model of financial balances for Australia using ABS National Accounts data from 1988 to 2017.

The model is constructed to perform medium to long-term **scenario analysis** through the application of **shocks** or pre-determined paths on exogeneous variables.

We also have the ability to see the **transmission channels** and the **paths** which these shocks run through the economy and their impacts on assets and balance sheets.

Industry Super Australia

About the model

Effect of shocks on a plethora of variables

Dynamic feedback

Bond issuance	Firm deposit amount	Housing transaction	Loan amount
Bond prices	GDP	Housing wealth	Loan-to-value ratio
Capital stock	Gov transfer	Firm investments	Mortgage amount
Consumption	Gov transfers to firms	Imports	Mortgage debt
Debt-to-income ratio	Government spending	Interest bank bonds	Mortgage interest %
Deposit amount	Gross output	Interest gov bonds	Output
Dividend from Row	House prices	Interest on deposit	Pension wealth
Dividend paid by firms	Household tax rate	Interest on loans	Risk-free interest
Dividend paid by insurance	Household deposit amount	Interest on mortgage	Tax on firms
Equity prices	Houses sold	Row bond interest	Tax on households
Exports	Housing investment	Lending interest	Wages and more...

Development process
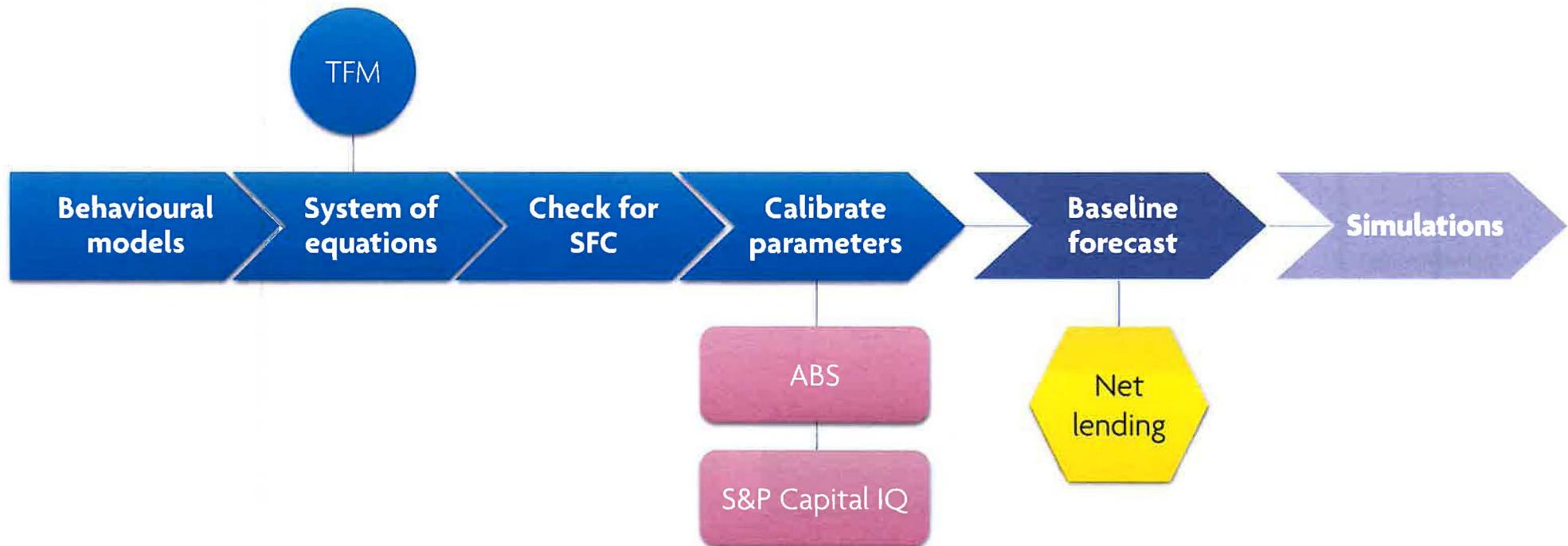
MATILDA outline – 8 major institutional sectors
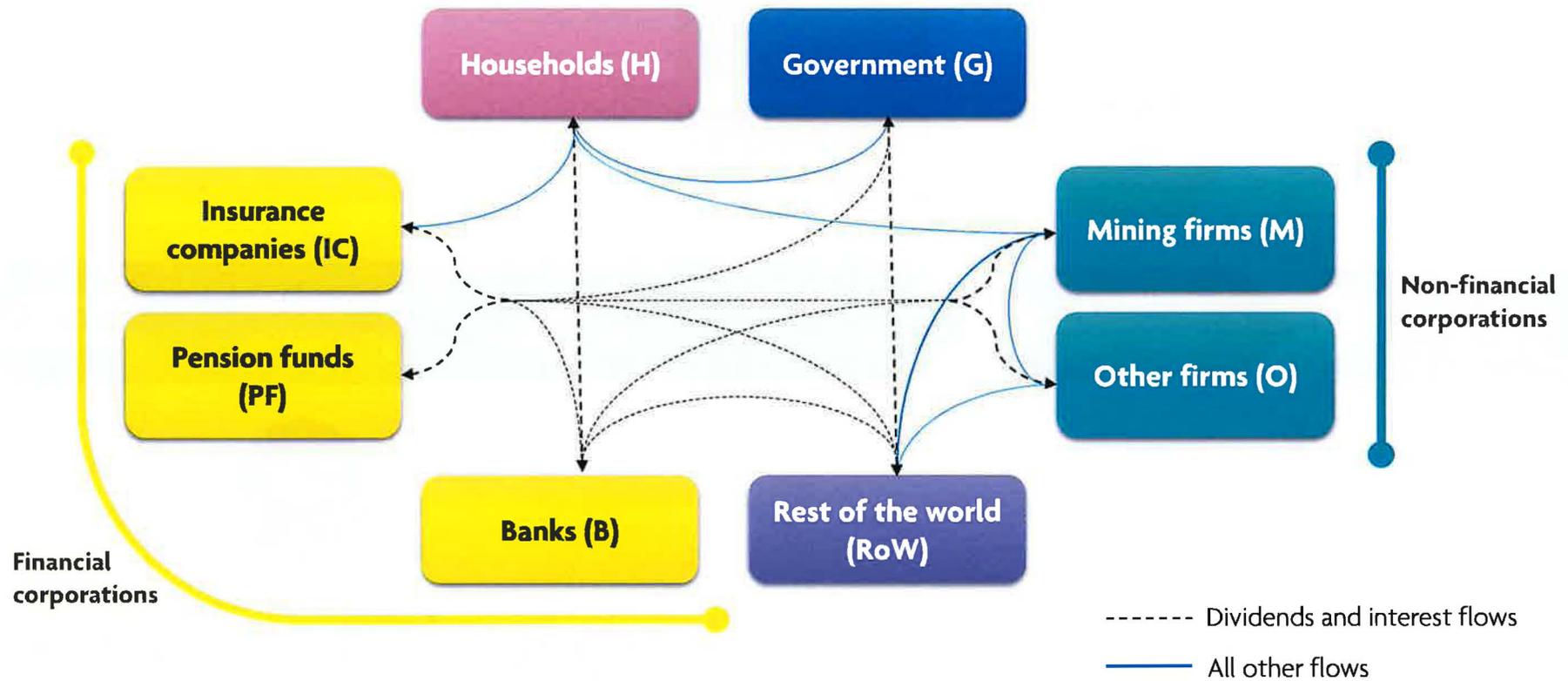
Households (H)

Government (G)

Insurance companies (IC)

Pension funds (PF)

Mining firms (M)

Other firms (O)

Non-financial corporations

Banks (B)

Rest of the world (RoW)

Financial corporations

- - - - - - - Dividends and interest flows
——— All other flows

Industry Super Australia

Modelling money flow – accounting constraints

Non-financial flows

TRANSACTION FLOW MATRIX	Households	Mining firms	Other firms	Government	Banks	Insurance companies	Pension funds	Central Bank	RoW
Consumption	-C		C						
Investment		$-I_m$	$+I_m +I_o - I_o$						
Housing investment	-Ih		Ih						
Govt expenditure			G	-G					
Exports		X_m	X_o						-X
Imports		-M_m	-M_o						M
Wages	WB	-WB_m	-WB_o						

Sum to zero

Simplified flows for modelling

MATILDA – A dynamic flow-of-funds model for Australia

Industry Super Australia

13

Modelling money flow – accounting constraints

Financial flows

TRANSACTION FLOW MATRIX		Households	Mining firms	Other firms	Government	Banks	Insurance companies	Pension funds	Central bank	RoW
Interest flows	Deposits	D_h *i_Dep_h	D_m *i_Dep_f	D_o *i_Dep_f	-D *i_Dep					
	Mortgages	-i_Mort			i_Mort					
	Govt bonds				-B_g *i_B_gov		B_g,ic *i_B_gov	B_g,pf *i_B_gov	B_g,cb *i_B_gov	B_g,row *i_B_gov
	Bank bonds					-B_b *i_B_bank	B_b,ic *i_B_bank	B_b,pf *i_B_bank		B_b,row *i_B_bank
	RoW bonds						B,r,ic *i_B_row	B_r,pf *i_B_row		-B_r *i_B_row
	NFC loans		-L_m *i_loan_f	-L_o *i_loan_f	L*i_loan_f					

Sum to zero

Simplified flows for modelling
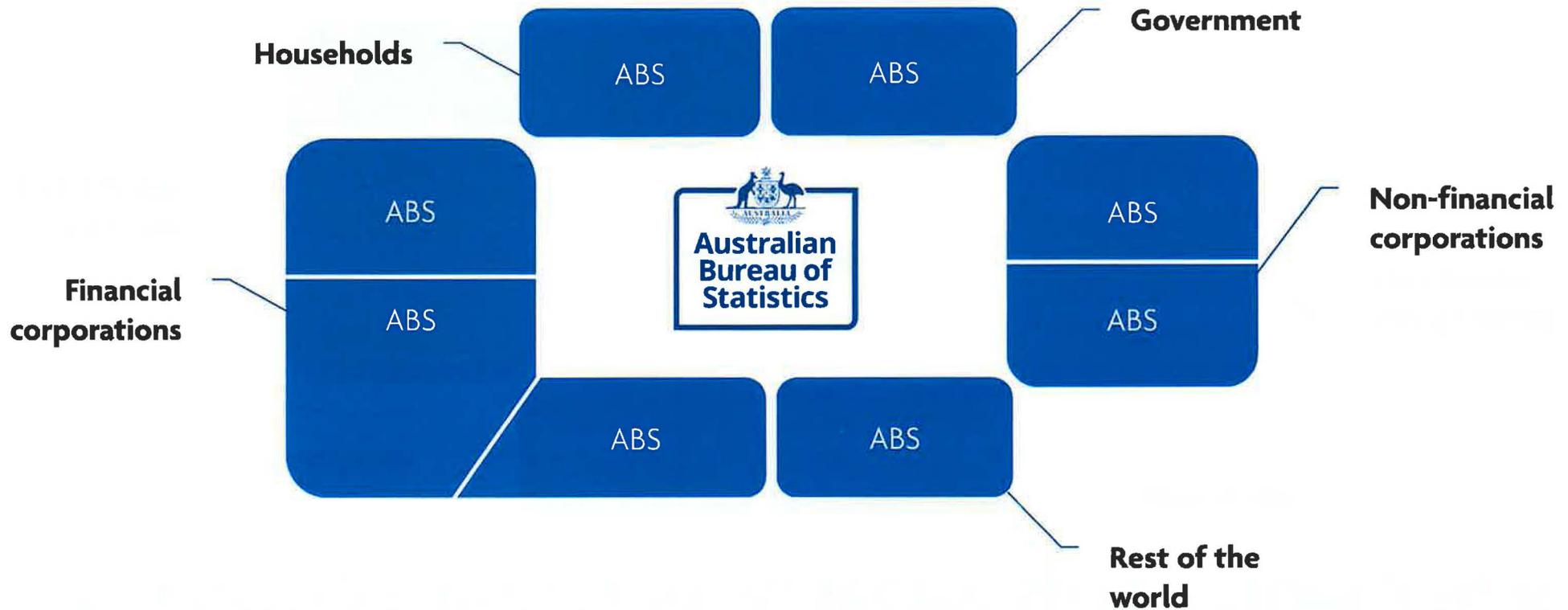
Stock-flow consistent (SFC) framework - example

Flow

Economic activity – households

- Income **+**
- Consumption **–**
- Housing investment **–**

- New mortgages **+**
- Net lending **+**
- Mortgage repayment **–**
- Pension contribution
- Insurance premiums **–**

SFC framework

Behavioural model

Decision making process on asset allocation

Change in asset allocation

Change in bank deposit

Stock

Industry Super Australia
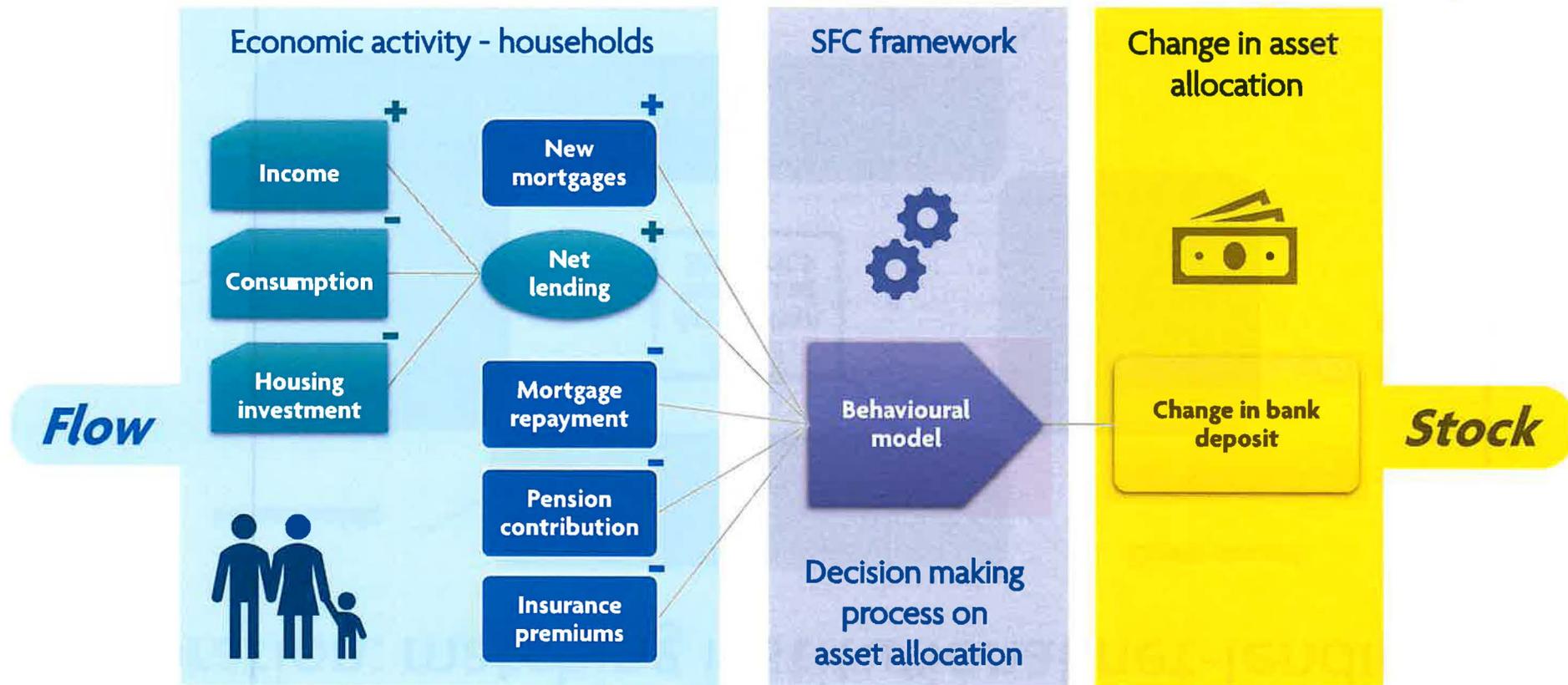
Calibration: matching institutional net-lending

Calibration: Institutional sector split – from 5 to 8
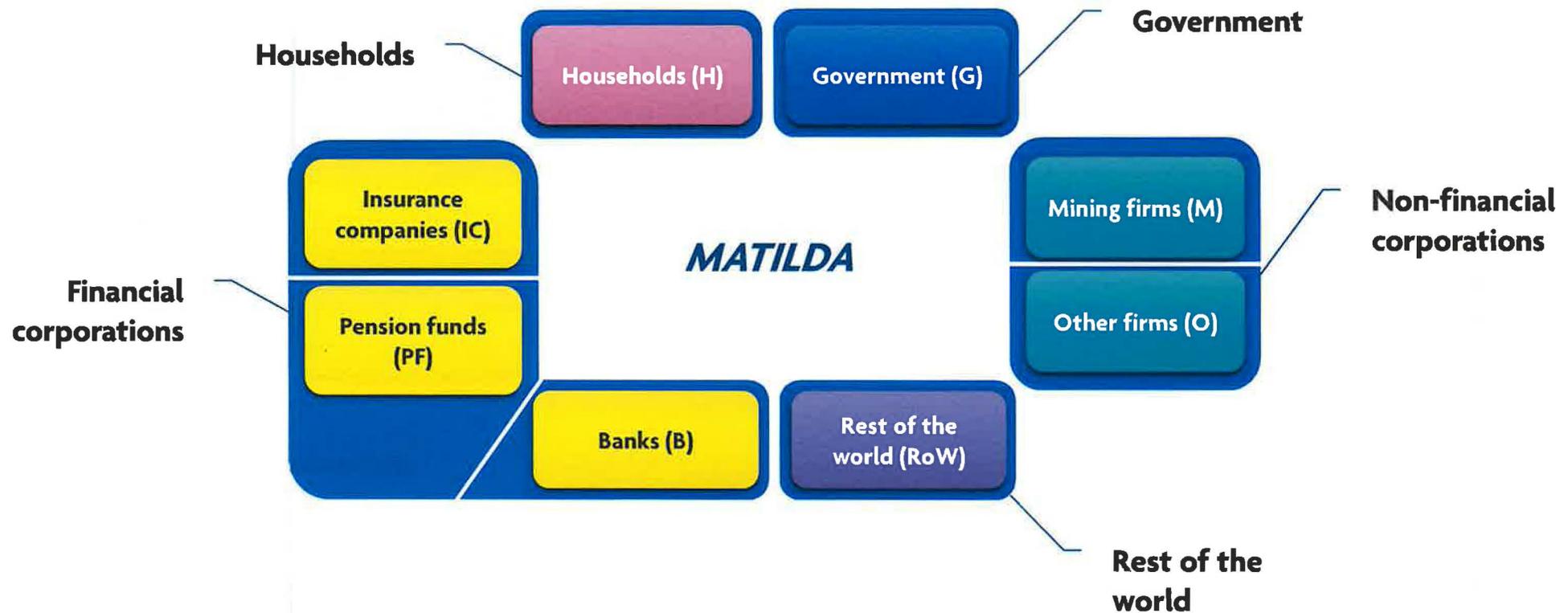
Households

Households (H)

Government (G)

Government

Financial corporations

Insurance companies (IC)

Pension funds (PF)

MATILDA

Mining firms (M)

Non-financial corporations

Other firms (O)

Banks (B)

Rest of the world (RoW)

Rest of the world

Calibration: Institutional sector split – from 5 to 8

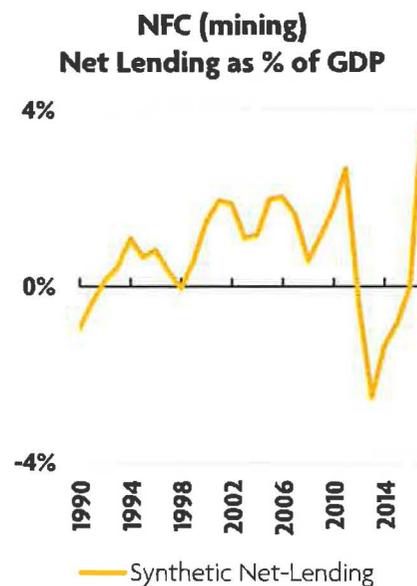# Calibration: Institutional sector split – from 5 to 8

Households

Government

Synthetic Bank

Synthetic Non-financial corporations

ABS
ABS
ABS
ABS
ABS
ABS
ABS

Australian Bureau of Statistics

Synthetic Insurance

Synthetic Non-financial corporations

Synthetic Pension

Rest of the world
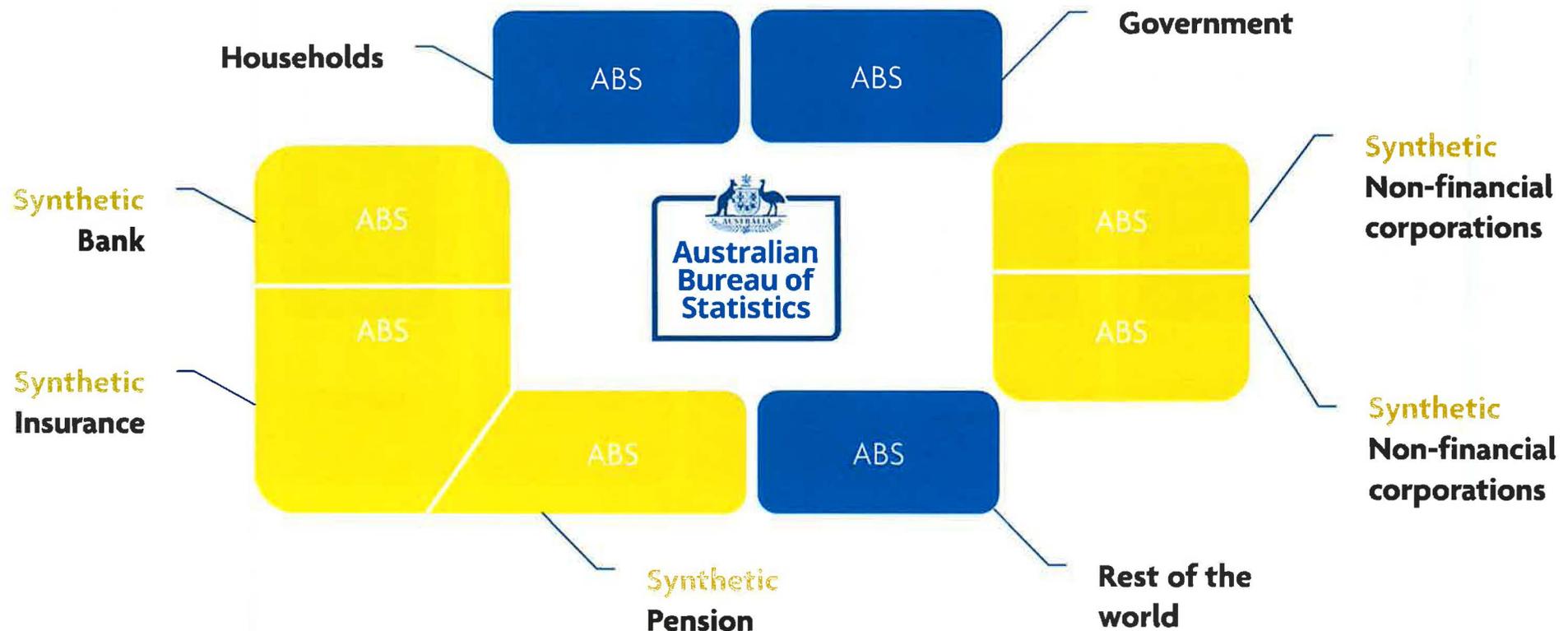
Non-financial corporations sector split

Components of net-lending

C.O.E.	Exports	Imports	Dividends	Interests on loans	Interests on deposits	Taxes
Mining	Mining	Mining	Mining	Mining	Mining	Mining
Non-mining	Non-mining	Non-mining	Non-mining	Non-mining	Non-mining	Non-mining

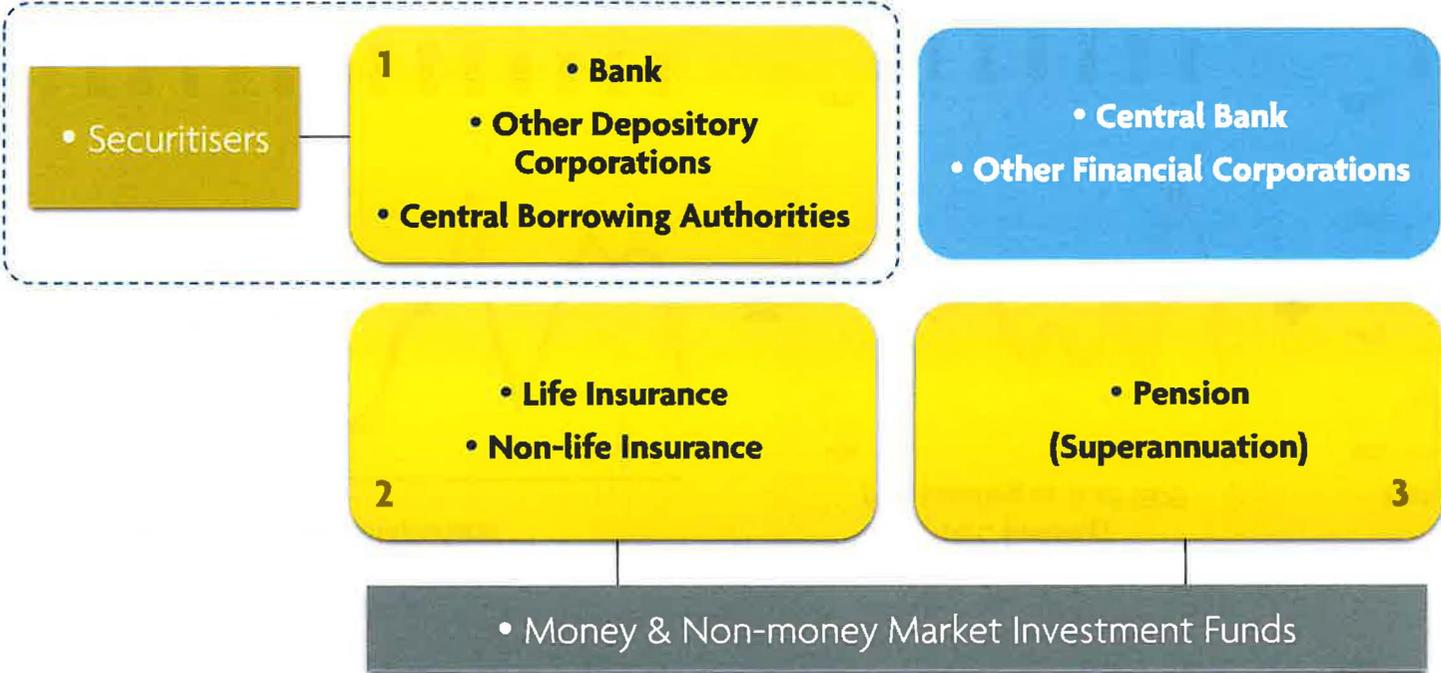# Non-financial corporations net-lending

NFC sector level comparison

Net Lending as Percentage of GDP

0%, -2%, -4%, -6%, -8%

1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016

— ABS Net Lending — Synthetic Net Lending

=

**NFC (mining)
Net Lending as % of GDP**

4%, 0%, -4%

1990, 1994, 1998, 2002, 2006, 2010, 2014

— Synthetic Net-Lending

+

**NFC (other)
Net Lending as % of GDP**
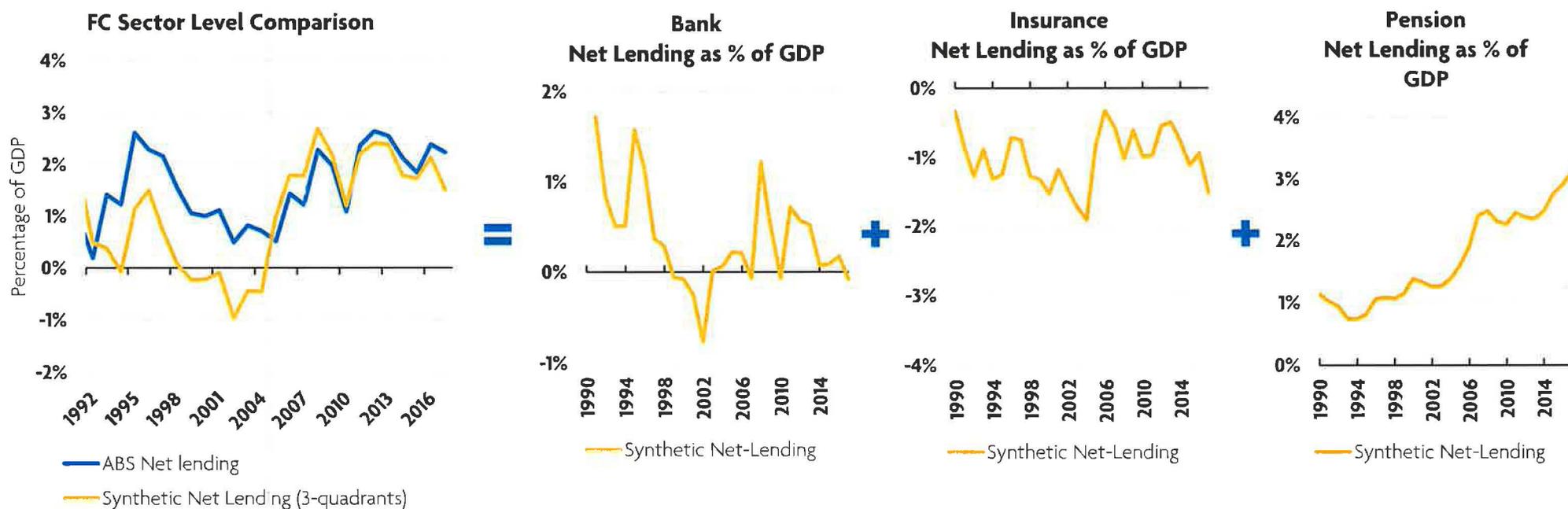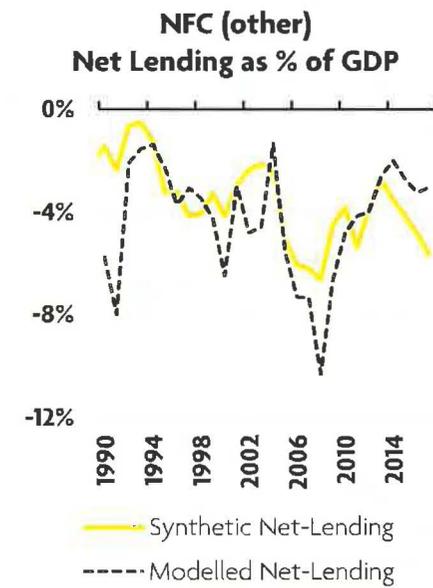

0%, -4%, -8%, -12%

1990, 1994, 1998, 2002, 2006, 2010, 2014

— Synthetic Net-Lending

Financial corporations sector split

Securitisers

1
- Bank
- Other Depository Corporations
- Central Borrowing Authorities

- Central Bank
- Other Financial Corporations

2
- Life Insurance
- Non-life Insurance
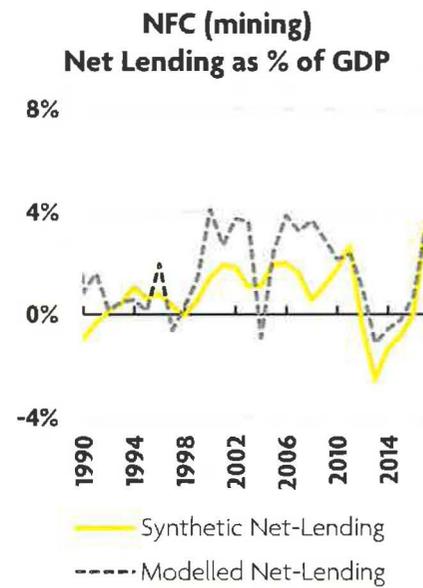
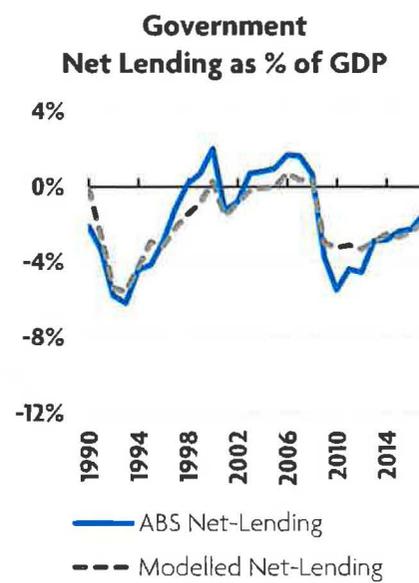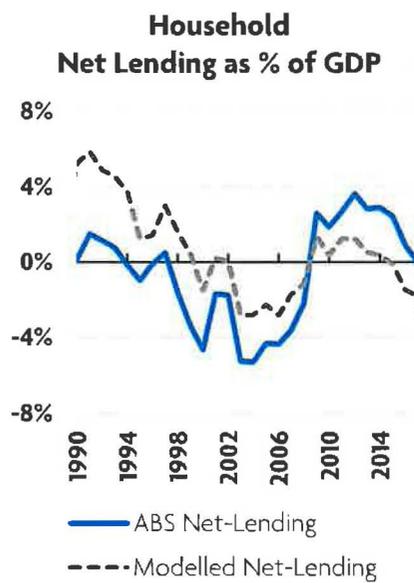**3**
- Pension (Superannuation)

- Money & Non-money Market Investment Funds

Financial corporations net-lending

FC Sector Level Comparison

ABS Net lending
Synthetic Net Lending (3-quadrants)

Bank
Net Lending as % of GDP

Synthetic Net-Lending

Insurance
Net Lending as % of GDP

Synthetic Net-Lending

Pension
Net Lending as % of GDP
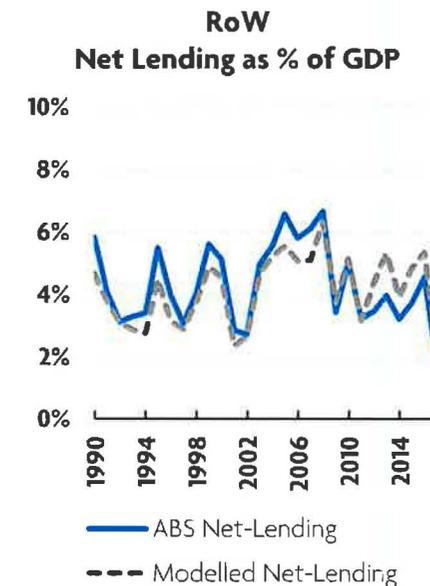

Synthetic Net-Lending
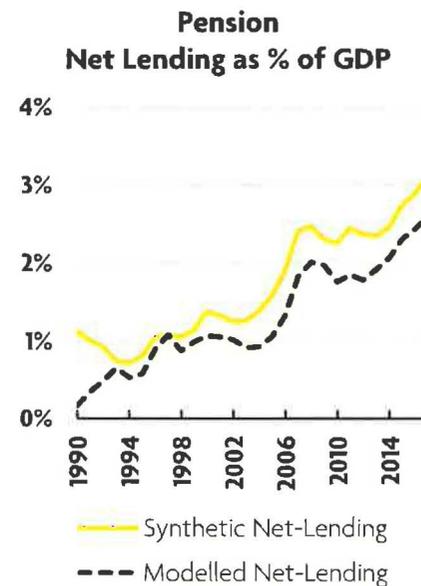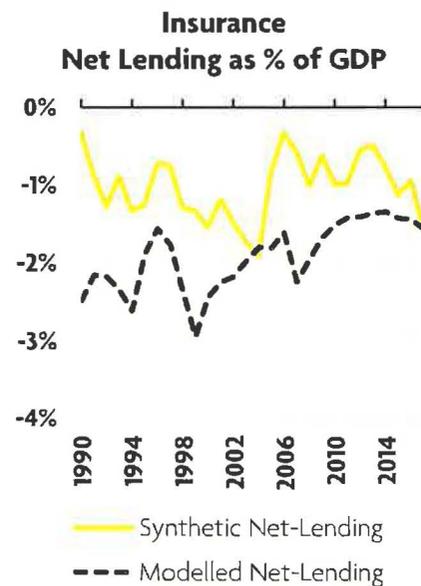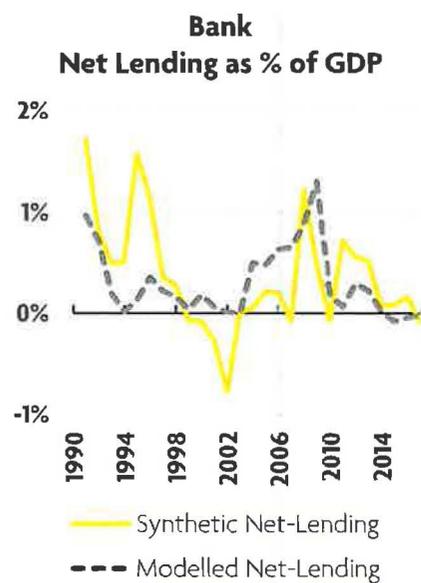
Central banks and others aren't included as these have negligible effects on sector net-lending

Modelling and fitting sectoral net-lending

Household
Net Lending as % of GDP
— ABS Net-Lending
---- Modelled Net-Lending

Government
Net Lending as % of GDP
— ABS Net-Lending
--- Modelled Net-Lending

NFC (mining)
Net Lending as % of GDP
— Synthetic Net-Lending
---- Modelled Net-Lending

NFC (other)
Net Lending as % of GDP
— Synthetic Net-Lending
----- Modelled Net-Lending

MATILDA — A dynamic flow-of-funds model for Australia

Modelling and fitting sectoral net-lending

Bank
Net Lending as % of GDP

Synthetic Net-Lending
Modelled Net-Lending

Insurance
Net Lending as % of GDP

Synthetic Net-Lending
Modelled Net-Lending

Pension
Net Lending as % of GDP

Synthetic Net-Lending
Modelled Net-Lending

RoW
Net Lending as % of GDP

ABS Net-Lending
Modelled Net-Lending

Further development of MATILDA

Alternative frameworks to consider
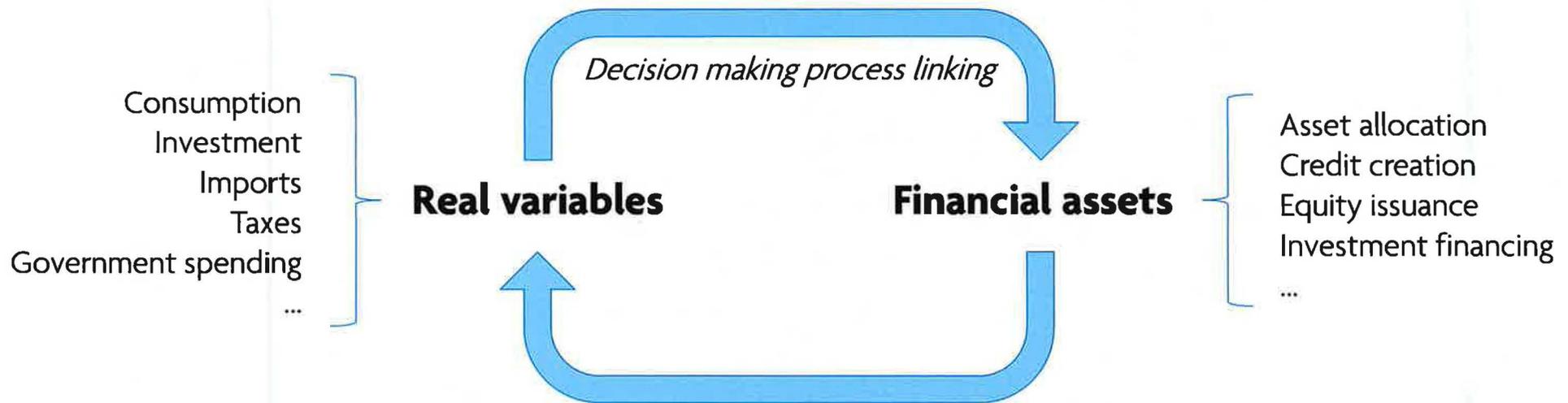
- Extension of K-K flow-of-funds model

- Tobin inspired consumption function

- 'Hurdle-rate' driven investment & dividend policy

- Asset allocation guided by 'value'

- Demographics

- Stochastics

Reader feedback received

- Adrian Pagan

- Michael Howell

- Warrick McKibbon

- Peter Johnson

- Nicholas Stoney

- Jason Nassios

Summary
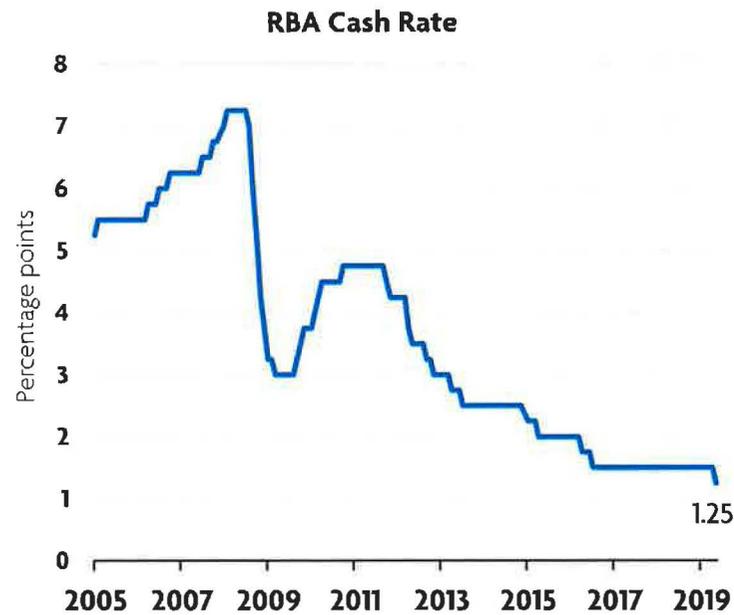

MATILDA model with Stock-Flow Consistent approach

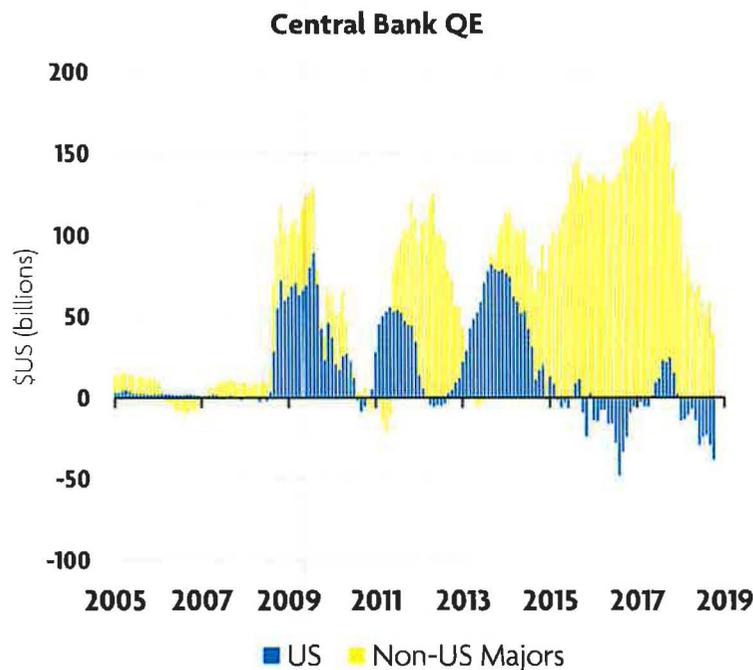Consumption
Investment
Imports
Taxes
Government spending
...

Real variables

Decision making process linking

Financial assets

Asset allocation
Credit creation
Equity issuance
Investment financing
...

Thank you

@SAnthonyMacro

A decade of loose monetary policy

Central Bank QE

$US (billions)

200
150
100
50
0
-50
-100

2005 2007 2009 2011 2013 2015 2017 2019

■ US ■ Non-US Majors

RBA Cash Rate

Percentage points

8
7
6
5
4
3
2
1
0
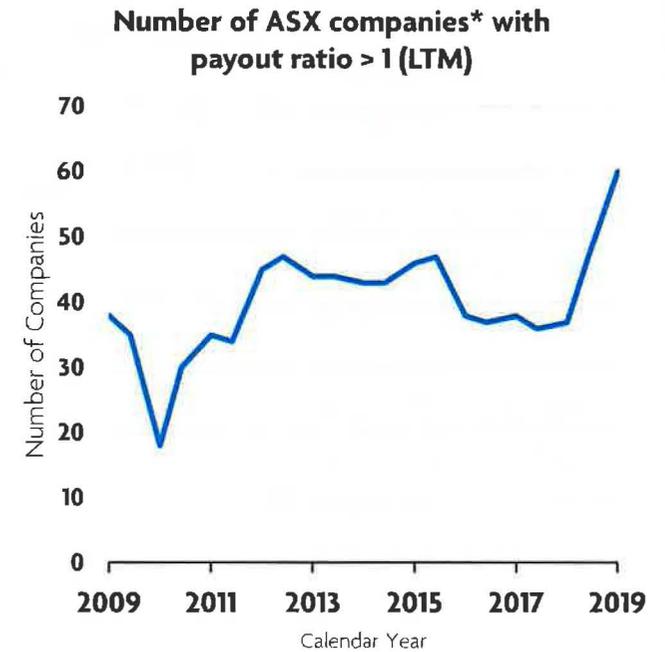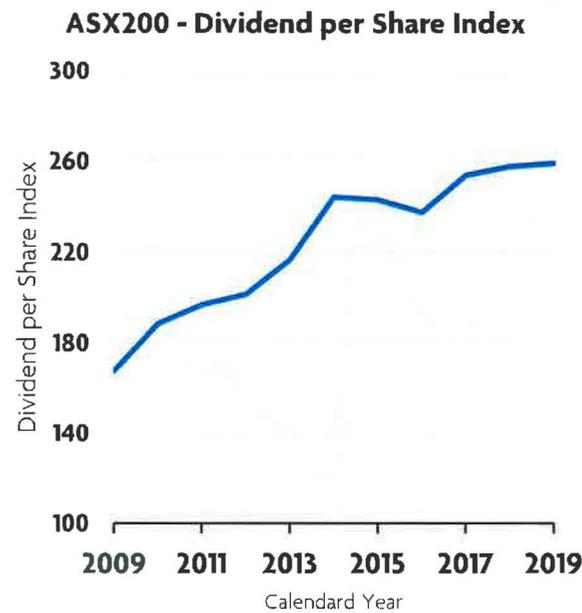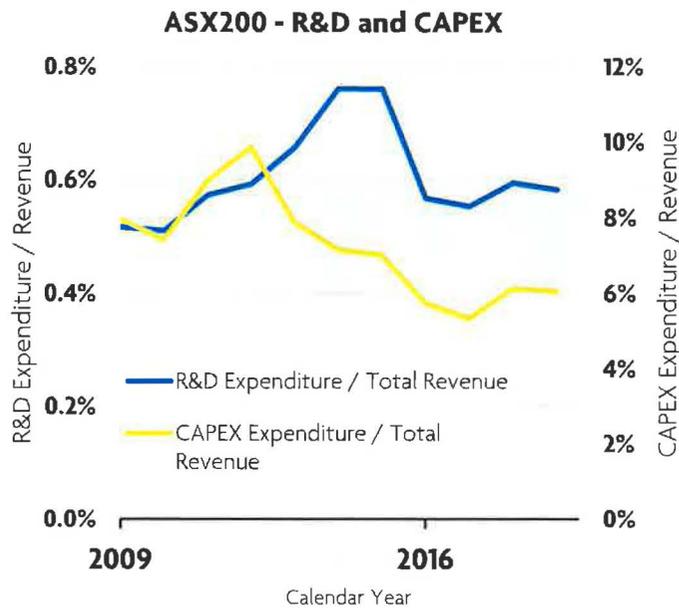
1.25

2005 2007 2009 2011 2013 2015 2017 2019

Lower interest rates has heightened yield seeking behaviour.

Since the 1990s, ASX "CAPEX-Lite" companies has outperformed "CAPEX-Heavy" companies.

Source: CrossBorder Capital, RBA

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A decade of loose monetary policy

ASX200 - R&D and CAPEX

- R&D Expenditure / Total Revenue
- CAPEX Expenditure / Total Revenue

ASX200 - Dividend per Share Index

Number of ASX companies* with payout ratio > 1 (LTM)

Source: S&P Capital IQ, *Companies listed in the All Ordinaries as of June 2019