

# **Low inflation, low interest rates, low productivity and rising inequality:**

## **Exiting the global labyrinth\***

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# Summary 1

## Low inflation and low yields in the OECD:

**Strong deflation forces (raising growth in demand for money relative to goods). Why?**

Shocks that concentrate income in the top 1%, causing

- 1) saving to rise, so long yields to fall 2% /yr
- 2) wealth portfolios to rise faster than GDP, raising demand for portfolio money
- 3) low long yields mean low opportunity cost of holding money, boosting portfolio money demand.

Other causes:

- 1) unconventional monetary policy (central bank long asset accumulation)
- 2) oligopolisation, encouraging excess demand for *existing* assets, pushing up prices and down yields.

Implications:

- 1) macro stabilisation and distributional policy are intertwined
- 2) absent major inflationary shocks, low inflation and low yields could persist.

# Summary 2

## Low productivity growth in the OECD:

Productivity slowdown began around 2005.

Cause: reduced and misallocated net investment per GDP, due to

- 1) low long bond yields arbitraging with equity return rates
- 2) low rates of population growth and urbanisation, GFC aftermath, raise perceived investment risks
- 3) declining shares of government investment in non-health public infrastructure and R&D
- 4) low real wage growth and middle class demand limits anticipated rates of return
- 5) oligopolisation limiting incentives for *aggregate* expansion
- 6) mismeasurement – screen time welfare, long life welfare.

Implications:

- 1) failures of governance: income growth concentration, oligopolisation and constrained financing
- 2) rising perceived risk and delegated portfolio management concentrate private investment on existing (oligopolistic) assets.

# Summary 3

## Good and bad exits:

### Good:

- 1) resurgence of optimism about future returns due to *sustainable tax and industrial reform*
- 2) better *redistribution of gains through the tax system* – earned income tax credits
- 3) better *anti-trust policies* that constrain rents accruing to *established* oligopolies
- 4) more *public investment in infrastructure and R&D* to attract complementary private investment
- 5) *innovations that enhance rather than displace workers* – avoiding low wage growth and the singularity
- 6) *better measurement* of welfare and government performance.

### Bad:

- 1) *transient and partial tax and industrial reforms* leading to unsustainable gains
- 2) *trade wars* – raise inflation and yields but reduce competition and welfare considerably
- 3) *new cold war*.

# Source academic papers

Zhou, Y. and R. Tiers (2018), “What’s at stake in the tariff negotiations between the US and China”, *The Conversation*, 22 05 2018, <http://theconversation.com/whats-at-stake-in-the-tariff-negotiations-between-the-us-and-china-95876>

Tiers, R. and Y. Zhou (2018), “Deflation forces and inequality”, CAMA Working Paper 15/2018, Australian National University, April, <https://cama.crawford.anu.edu.au/publication/cama-working-paper-series/12352/deflation-forces-and-inequality>

Tiers, R. and Y. Zhou (2018), ‘Lost inflation?’ Discussion Papers in Economics DP 18.01, UWA Business School, <http://www.business.uwa.edu.au/school/economics/?a=3029523>.

Tiers, R. and Y. Zhou (2017), “Automation and inequality with taxes and transfers”, CAMA Working Paper 16/2017, Australian National University, <https://cama.crawford.anu.edu.au/publication/cama-working-paper-series/9218/automation-and-inequality-taxes-and-transfers>

Taylor, G. and R. Tiers (2017), “Secular stagnation: a survey of determinants and consequences for Australia”, *The Economic Record*, 93(303): 615-650.

Tiers, R (2015), “Service oligopolies and Australia’s economy-wide performance”, *Australian Economic Review*, 48(4): 333-56.

# **1. Deflation forces and inequality**

# Taxonomy of Inflation (deflation) forces

Any force that causes  $P^C$  to rise (fall) if the central bank holds  $M^S$  constant;

$P^C$  is the exchange rate between money and goods: rises if money relatively abundant and goods relatively scarce.

## Inflation

- Inflation expectations:  $\pi^e$ , rises  $\rightarrow$  real money demand,  $m_D$ , falls  $\rightarrow$  excess money  $\rightarrow P^C$ ,  $\pi$  rise;
- Optimism: expected real disposable income,  $y_D^e$ , rises  $\rightarrow C$  rises,  $S$  falls,  $r$  rises  $\rightarrow m_D$  falls,  $\rightarrow P^C$ ,  $\pi$  rise;
- Fiscal deficit:  $G$  rises, crowds out investment via rise in  $r \rightarrow m_D$  falls,  $\rightarrow P^C$ ,  $\pi$  rise;
- Increased trade protection, raises  $P^C$  directly,  $\pi$  rises.

## Deflation

- Deflation expectations:  $\pi^e$ , falls  $\rightarrow$  real money demand,  $m_D$ , rises  $\rightarrow$  deficient money  $\rightarrow P^C$ ,  $\pi$  fall;
- Pessimism: expected real disposable income,  $y_D^e$ , falls  $\rightarrow C$  falls,  $S$  rises,  $r$  falls  $\rightarrow m_D$  falls,  $\rightarrow P^C$ ,  $\pi$  fall;
- Income concentrating shocks: the rich save so  $S$  rises,  $r$  falls  $\rightarrow m_D$  rises  $\rightarrow P^C$ ,  $\pi$  fall;

# ***Redistributive and deflationary* forces in advanced economies**

## **Recent past:**

- Globalisation – investment opportunities in rapidly growing Asia, product supply growth;
- Automation – choice of technique that favoured *skill* over low-skilled workers;
- Unconventional monetary policy (central bank asset accumulation).

## **Prospective:**

- Automation – choice of technique that favours *capital and skill* over low-skilled workers;
- Race to the bottom in capital taxation;
- Immigration, accelerated by the end of the “East Asian growth model”.



# Inflation and deflation demerits

## Inflation

- Weakens store of value role of currency and so raises transaction costs;
- Redistributes real income away from those on fixed nominal incomes;

## Deflation

- With nominal wage rigidity causes unemployment;
- Causes “hoarding of money” (Keynes), rise in portfolio money (Tobin) so reduces investment in returning assets;
- Raises real purchasing power of investor repayments and so starves investment;
- Defers consumption and so reduces current aggregate demand;

**Deflation the greater evil (Keynes) and so Central Banks seek to avoid it most.**

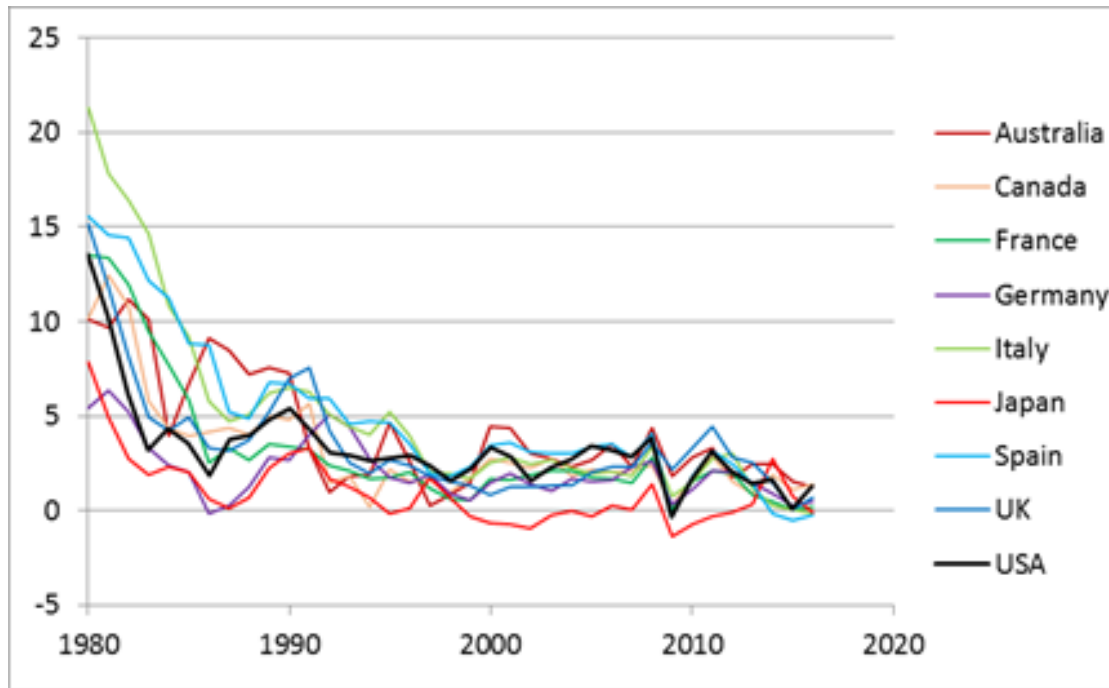
# Historical record:

## deflation forces strong and inequality is rising

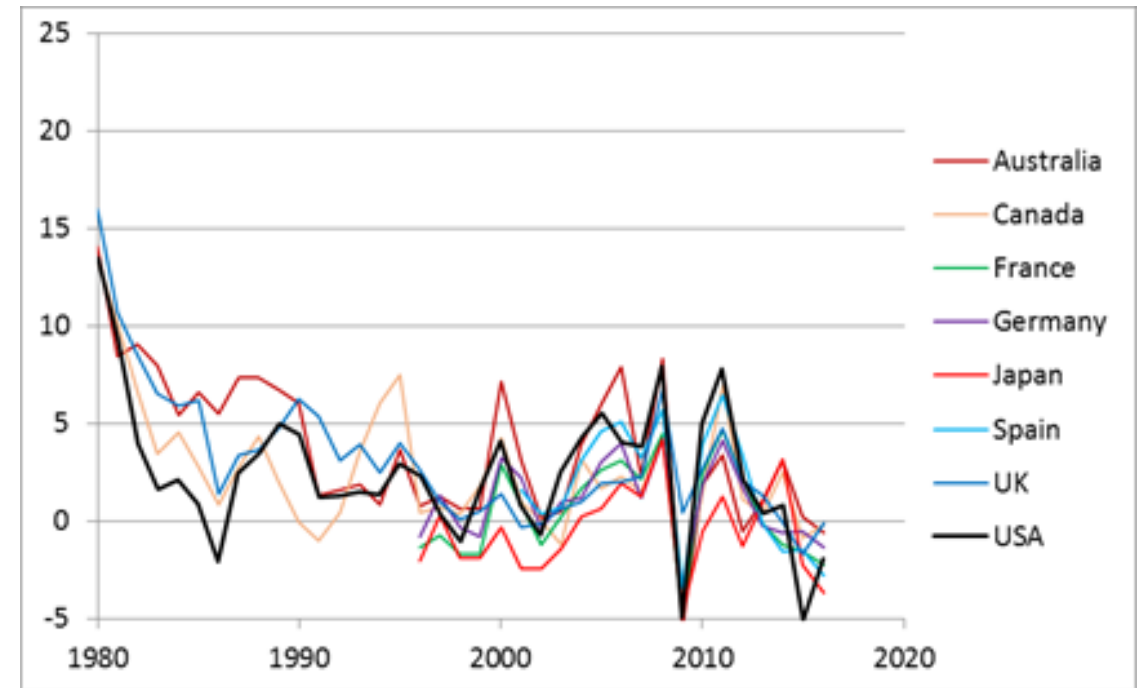
- Inflation rates in advanced economies have been declining since the 80s;
- Short maturity and real long maturity “equilibrium” yields (suggesting the have also declined in that period;
- Short nominal rates near ZLBs leave no conventional scope for defensive monetary expansion.;
- Measured inequality is on a continuously rising trend.

# Observed decline in inflation rates

Consumer price growth



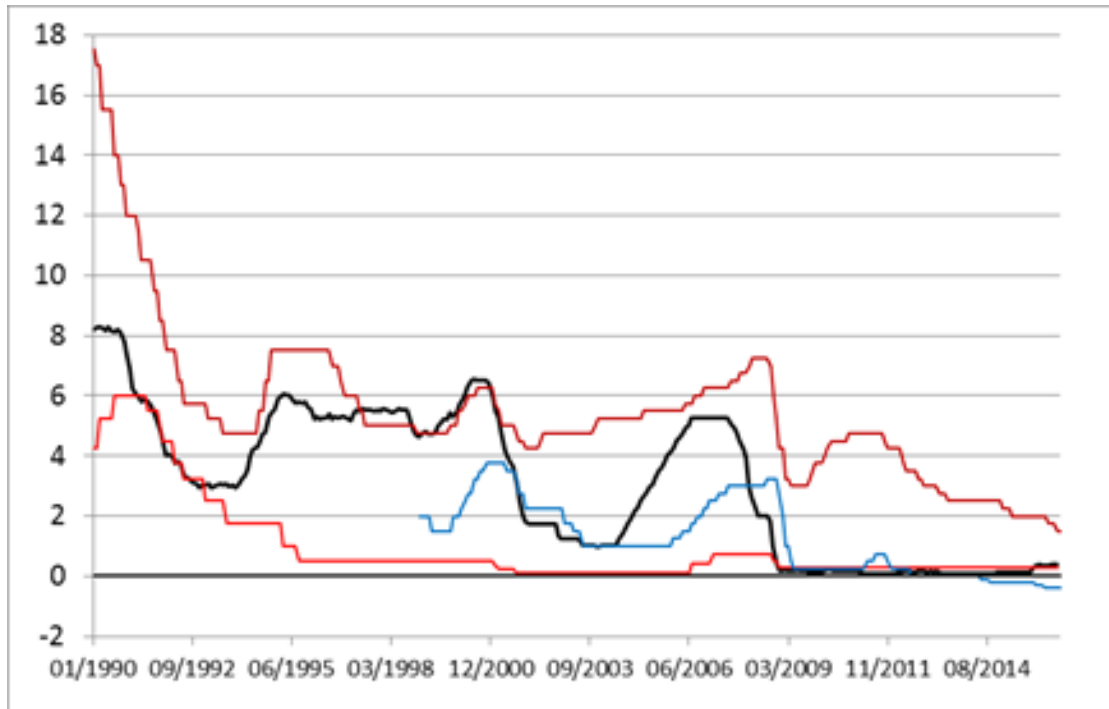
Producer price growth



Sources: Source: Federal Reserve Bank of St Louis Database (FRED), IMF [World Economic Outlook](#), October 2017.

# Declines in nominal bond yields

3 months



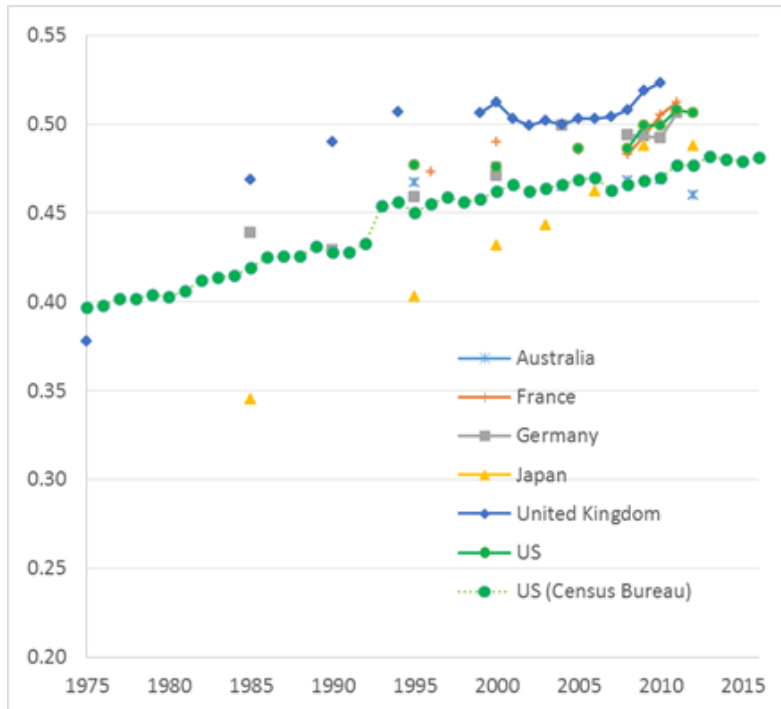
10 years



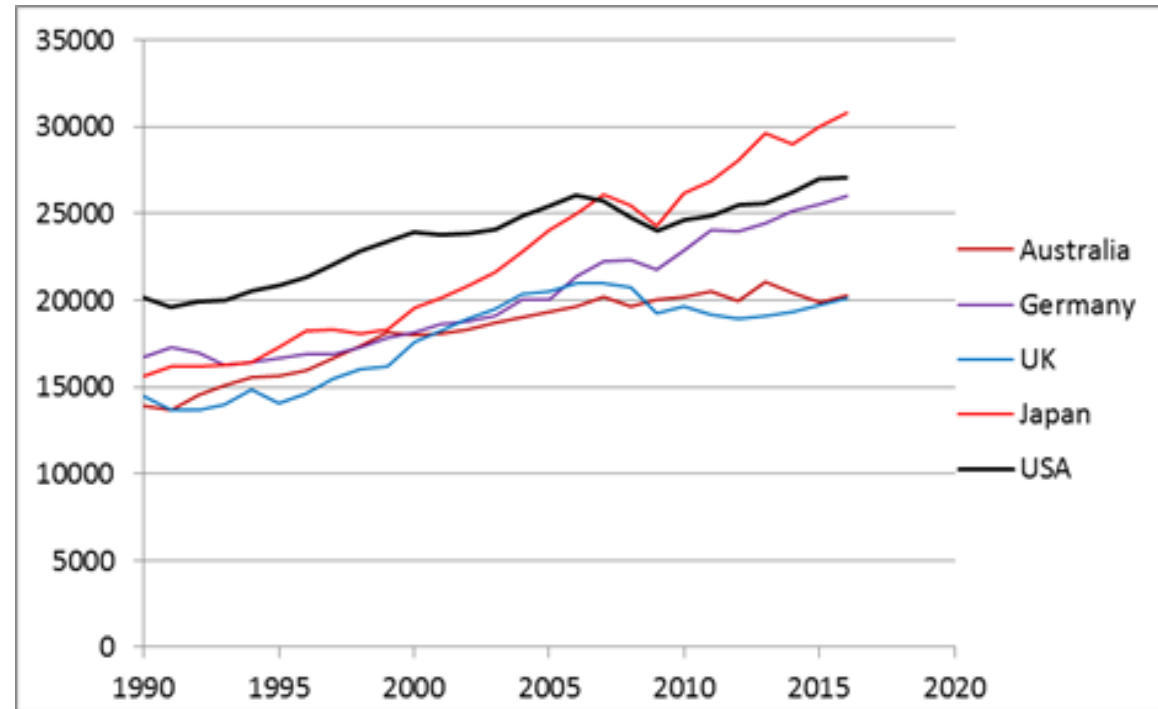
Sources: Sources: US rate from FRB of St Louis (FRED), European rate from European Central Bank ([sdw.ecb.europa.eu](http://sdw.ecb.europa.eu)), Australian rate from the RBA ([rba.gov.au/statistics](http://rba.gov.au/statistics)), Japanese rate from ECB ([sdw.ecb.europa.eu](http://sdw.ecb.europa.eu)).

# Inequality and Performance

Gini Coefficients in OECD



Real NNP per capita



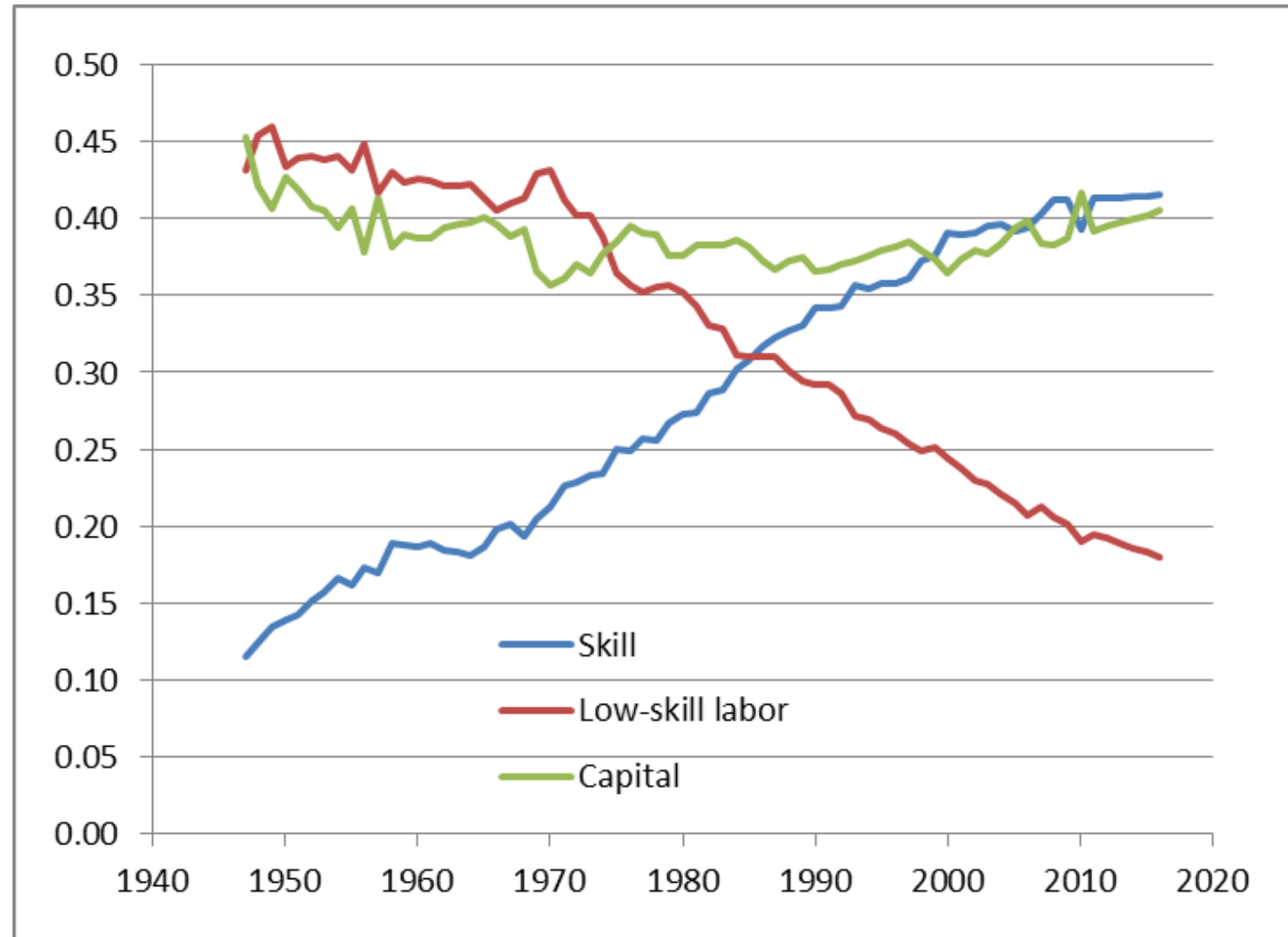
Sources: Unless otherwise stated, OECD Income Distribution Database (OECD 2015). The single continuous series is from the U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplements. Deflation of NNP is by CPI from IMF: World Economic Outlook. NNP values are from the OECD: National Accounts Statistics.

# Simulated effects of distributional shocks on deflation forces and interest rates

- Global macro and general equilibrium model on six regions ;
- Prospective deflationary and income-concentrating forces examined are:  
*automation, feasible capital tax rate declines and immigration;*
- Other distributional shocks, such as oligopolisation, are omitted here.
- These three forces, taken together, are estimated to cause:  
*worker-capital income gap to expand by 3 % per year;*  
*reduce long run real equilibrium interest rates by 2% per year;*  
*increase the growth rate of money demand by 3 % per year.*

# Factor Shares of Value Added in the US

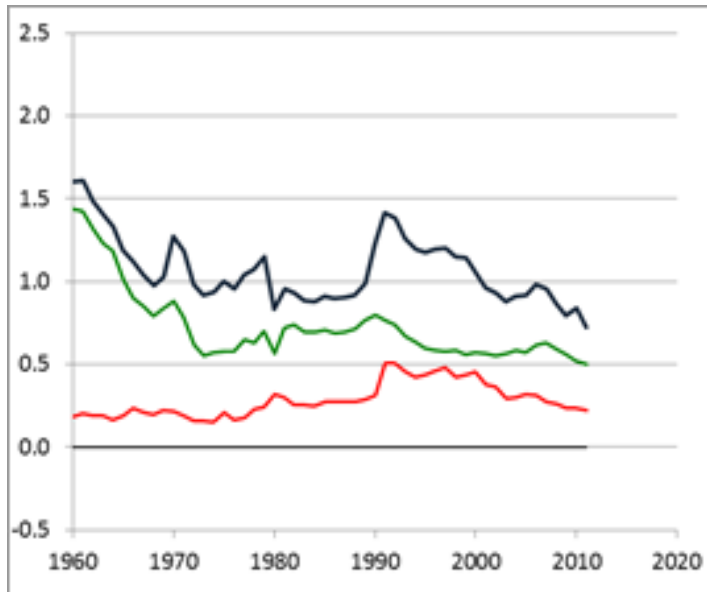
(Indices 1990=100)



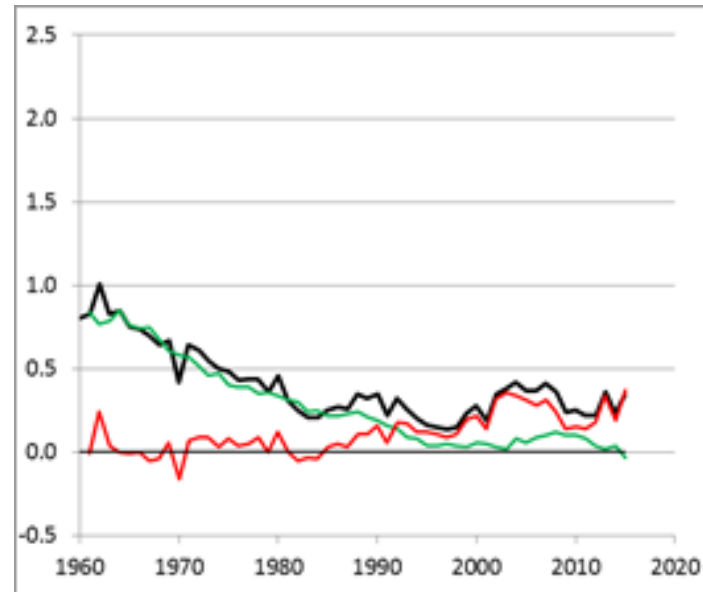
Source: World Input Output Database, extrapolated from 2010 using labour share from national accounts.

# Population Changes and Immigration Contributions

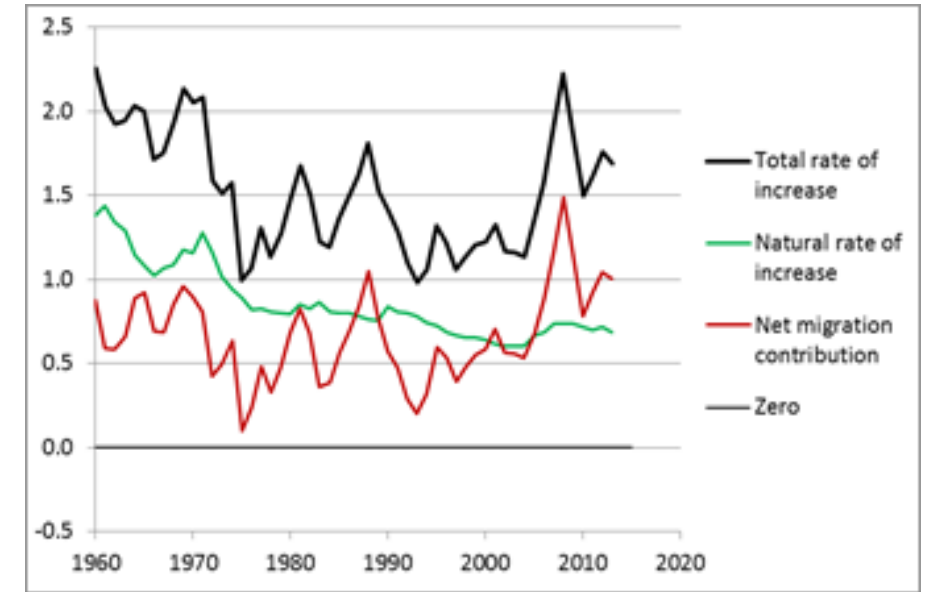
USA



Europe



Australia

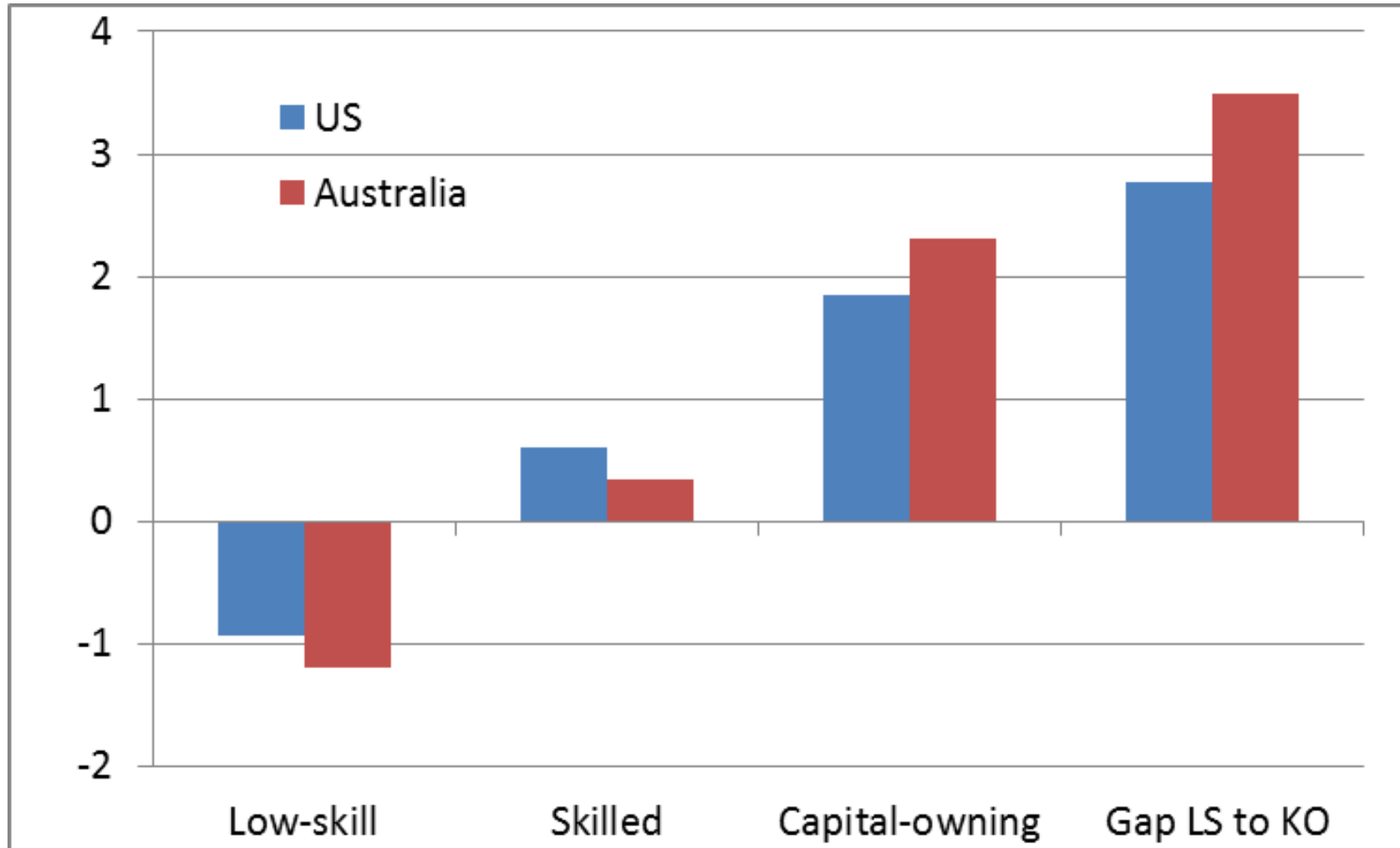


Source: European Commission, Eurostat Population and Population Change Statistics.



# Simulated future inequality: all forces combined

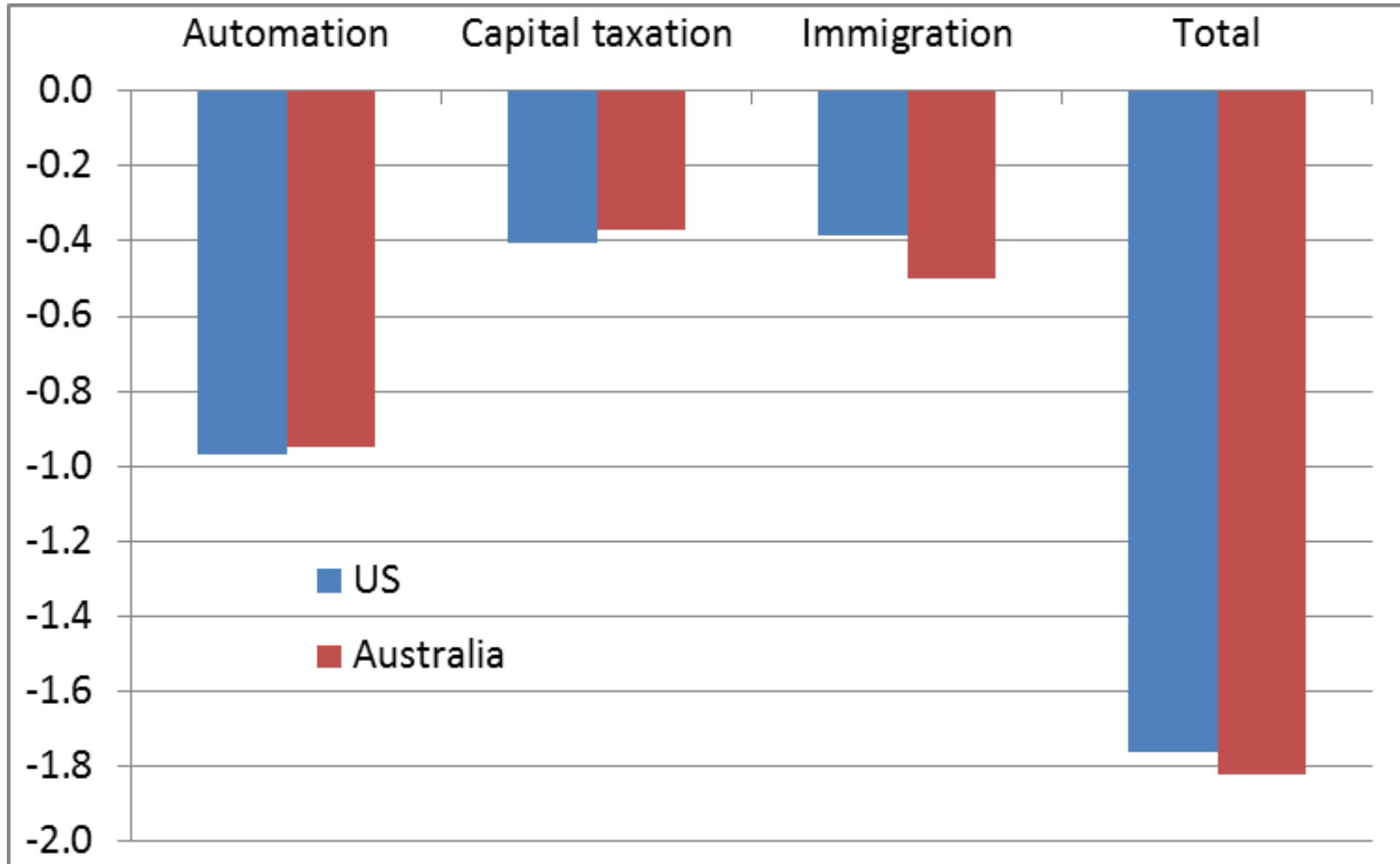
(Prospective annual % changes in real per capita disposable income, current policies)



Source: Model simulations, average annual responses to decade long run shocks.

# Long Run Equilibrium Real Interest Rate Effects

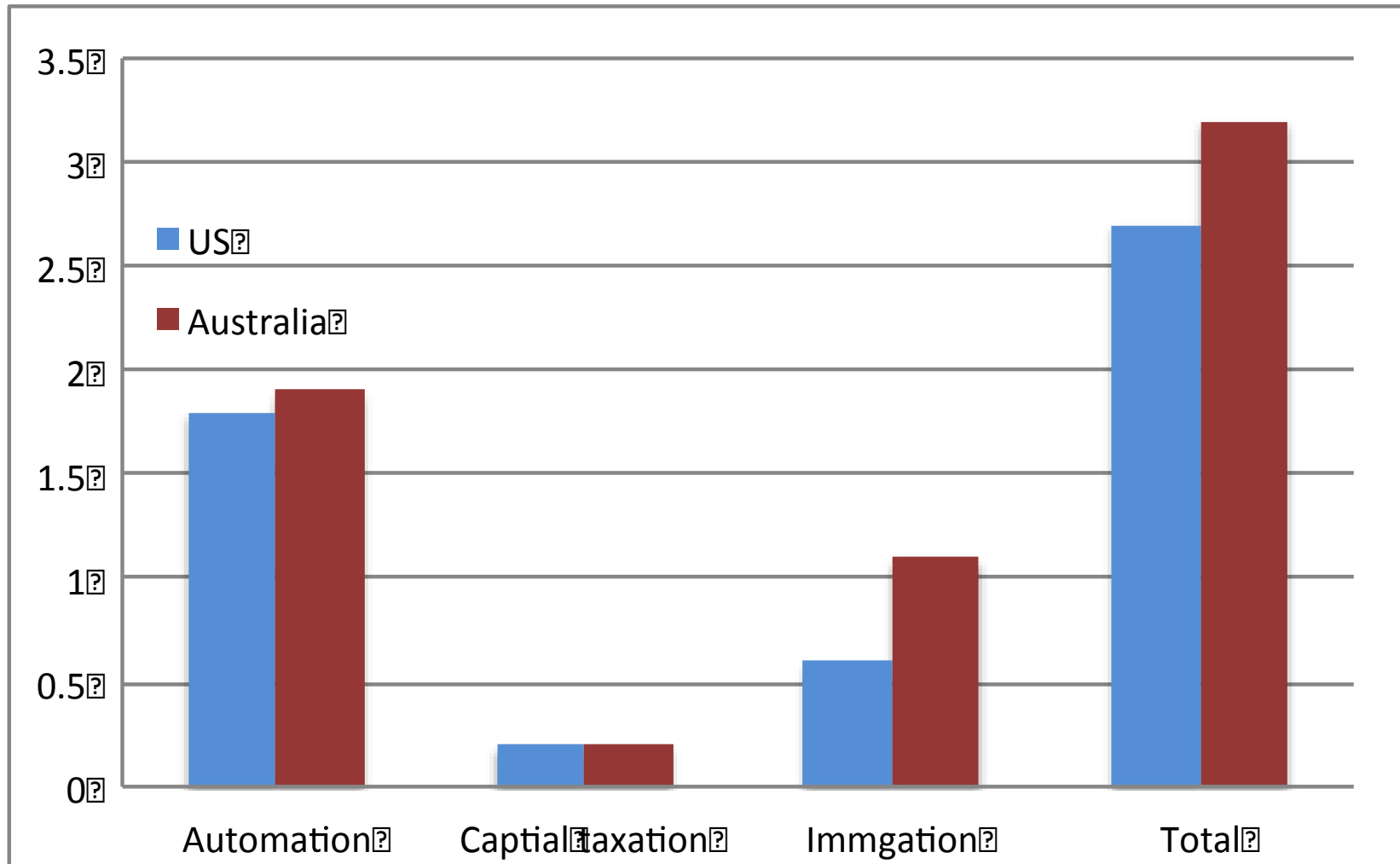
(Annual % changes, current policies)



Source: Model simulations, average annual responses to decade long run shocks.

# Changes in Money Demand

(Annual % changes, current policies)

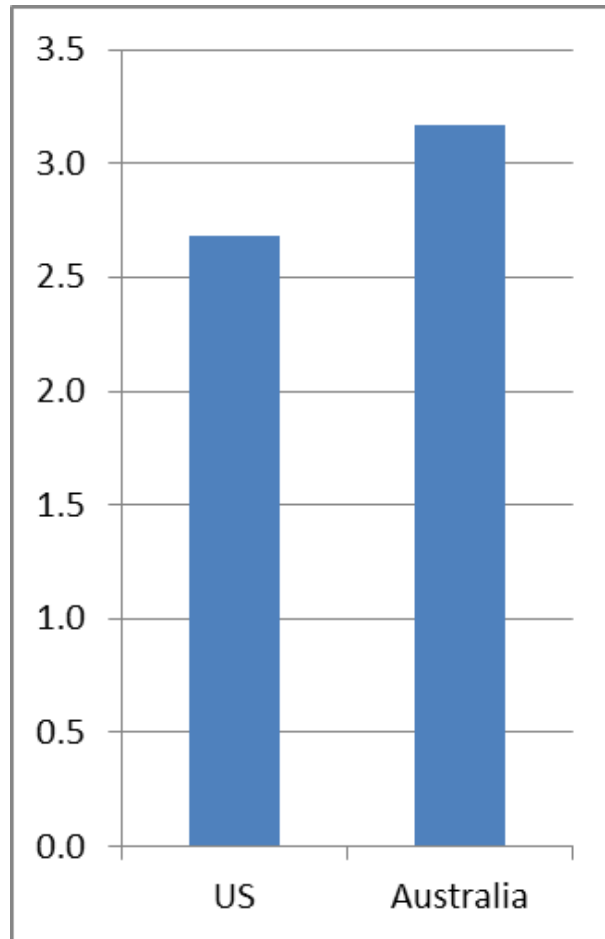


Source: Model simulations, average annual responses to decade long run shocks.

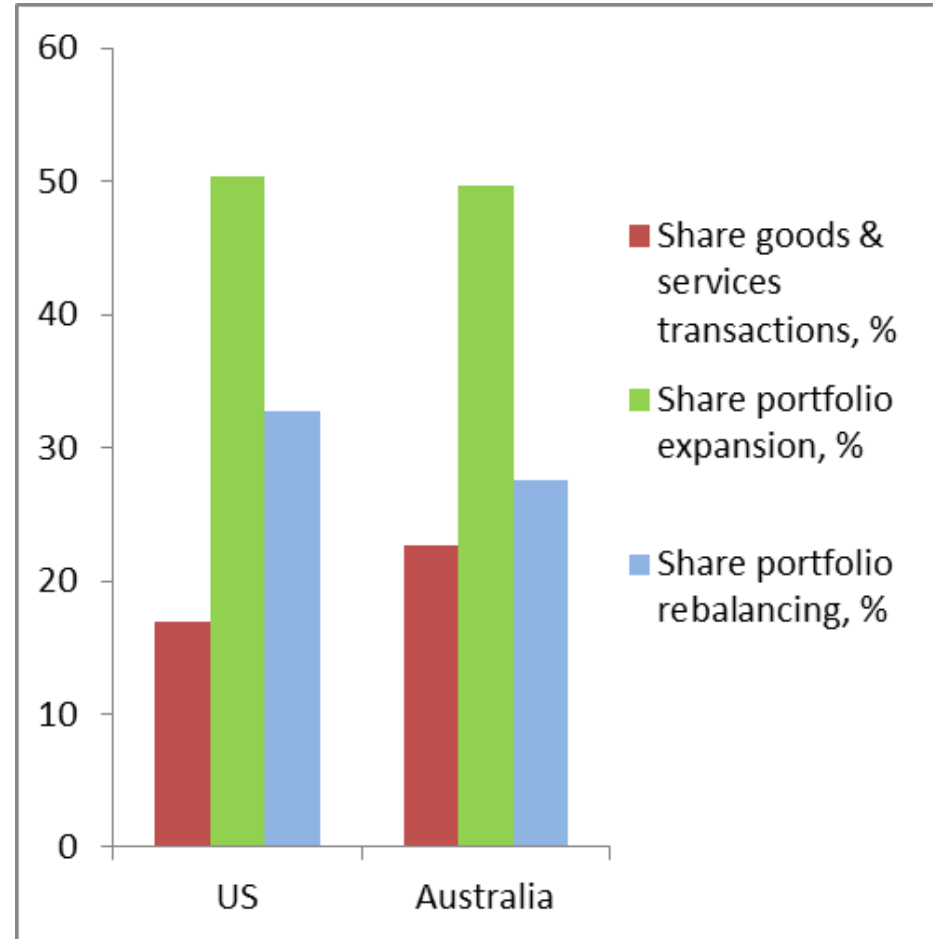
# Money Demand Growth

(Annual % changes and % shares, due to distributional shocks alone with inflation expectations anchored at zero CPI target)

Money demand growth, %/ year



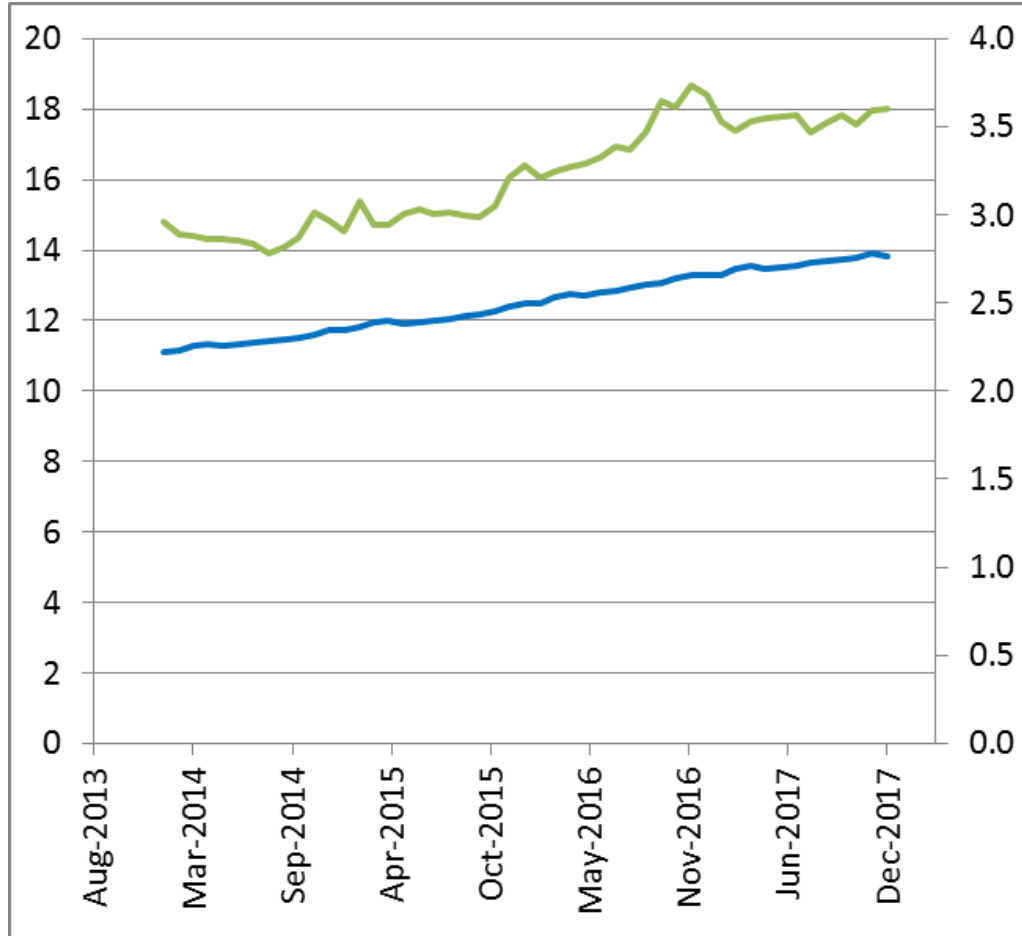
Share of growth by source, %



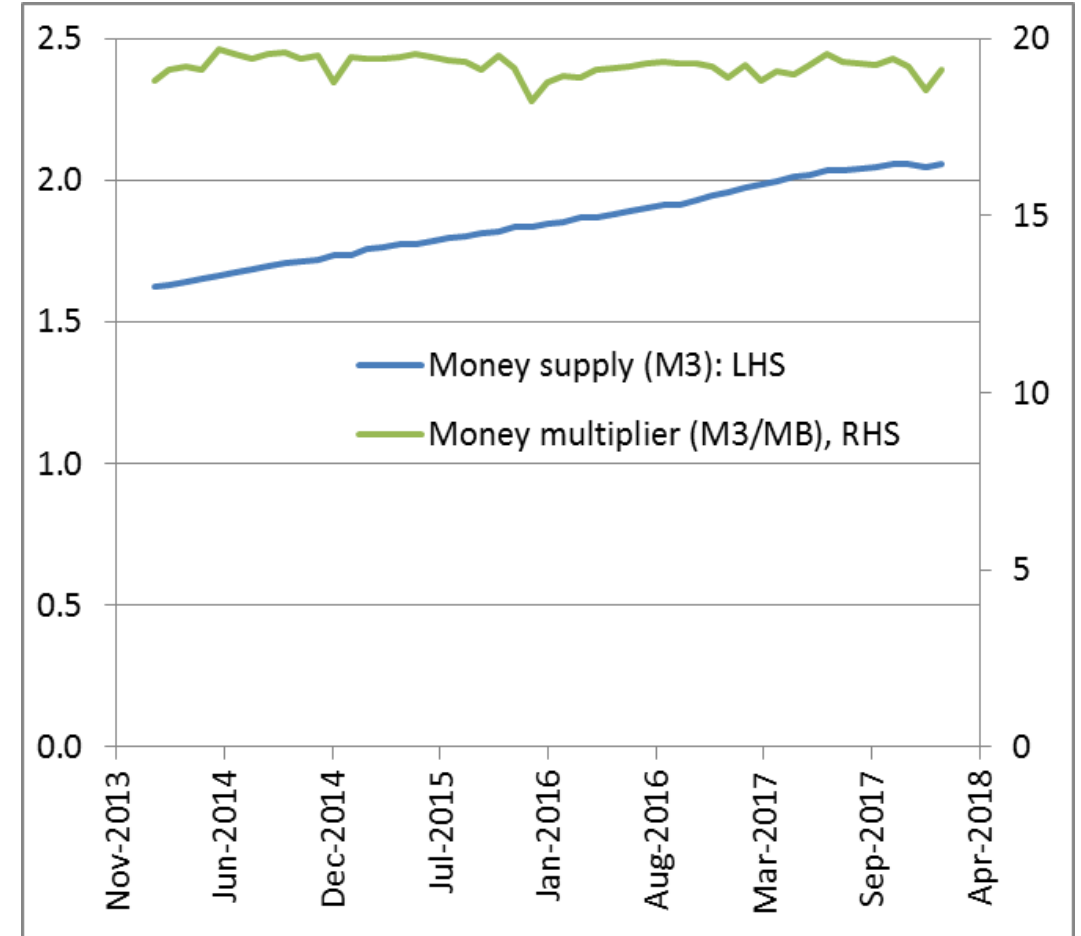
Source: Model simulations, average annual responses to decade long run shocks.

# Actual Money Growth Since 2013

US M3, 5%/yr



Australia M3, 6%/yr

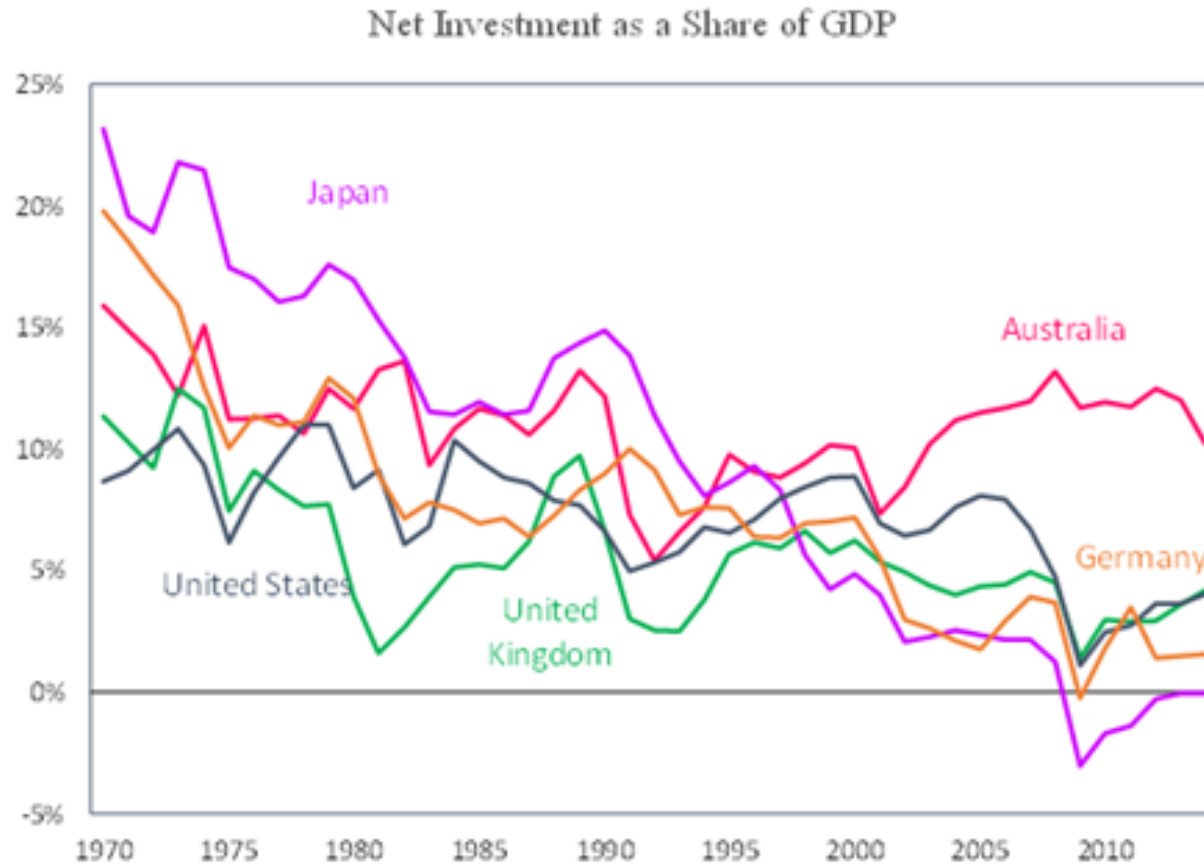


Source: FRED and RBA. Left vertical axis: \$ trillions. Right vertical axis: money multiplier %.

## **2. Low productivity growth in the OECD**

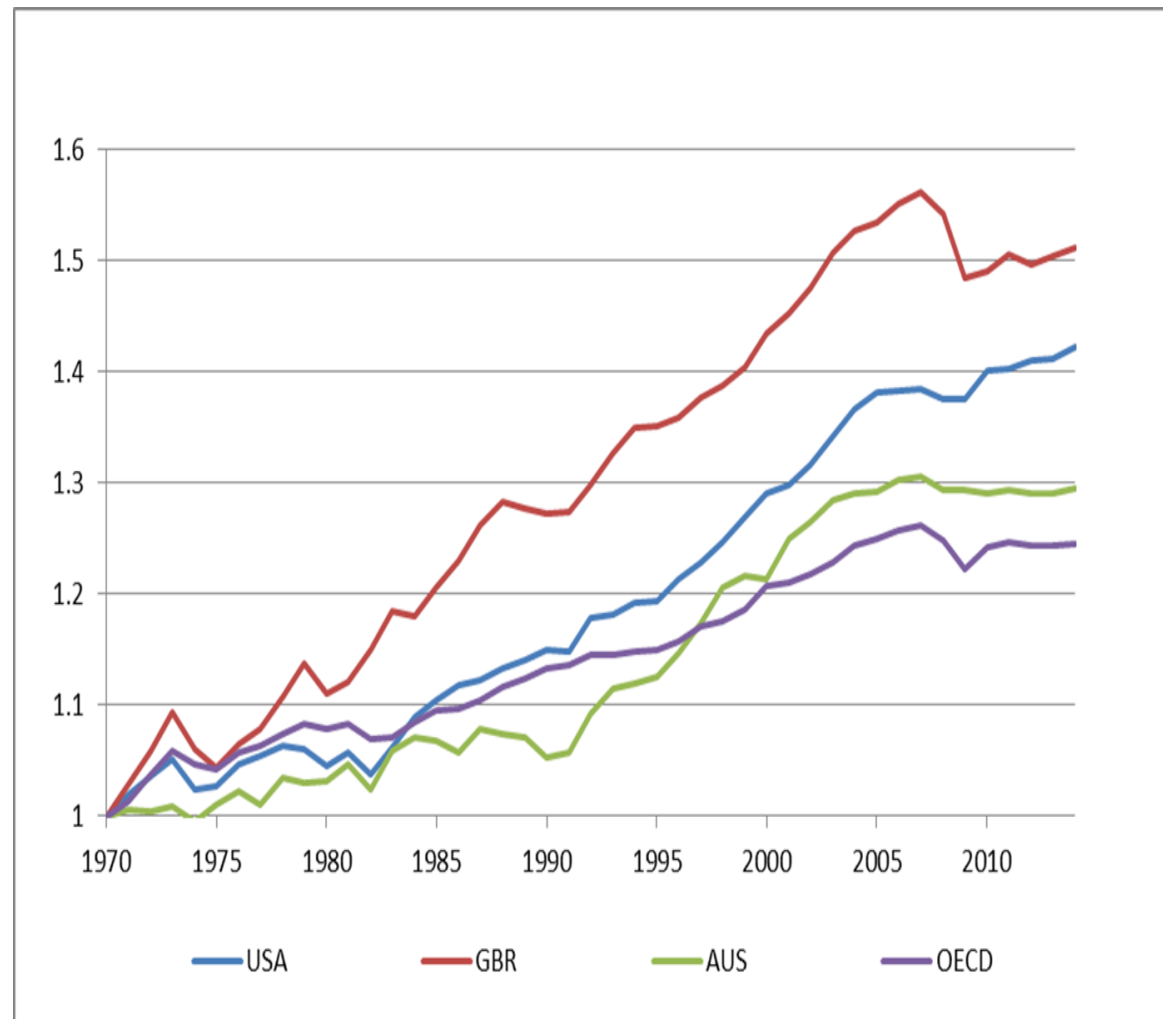
# Low net investment growth

Productivity is mostly sourced from net investment, which has been declining as %GDP  
Recent slowdown commences around 2005.



Source: World Bank World Development Indicators.

# Total factor productivity (TFP) in the OECD



Source: TFP is the portion of output change not explained by the quantities of inputs used in production and is reported at constant national prices (2011=1). We normalize the data to set TFP in 1970 at unity.

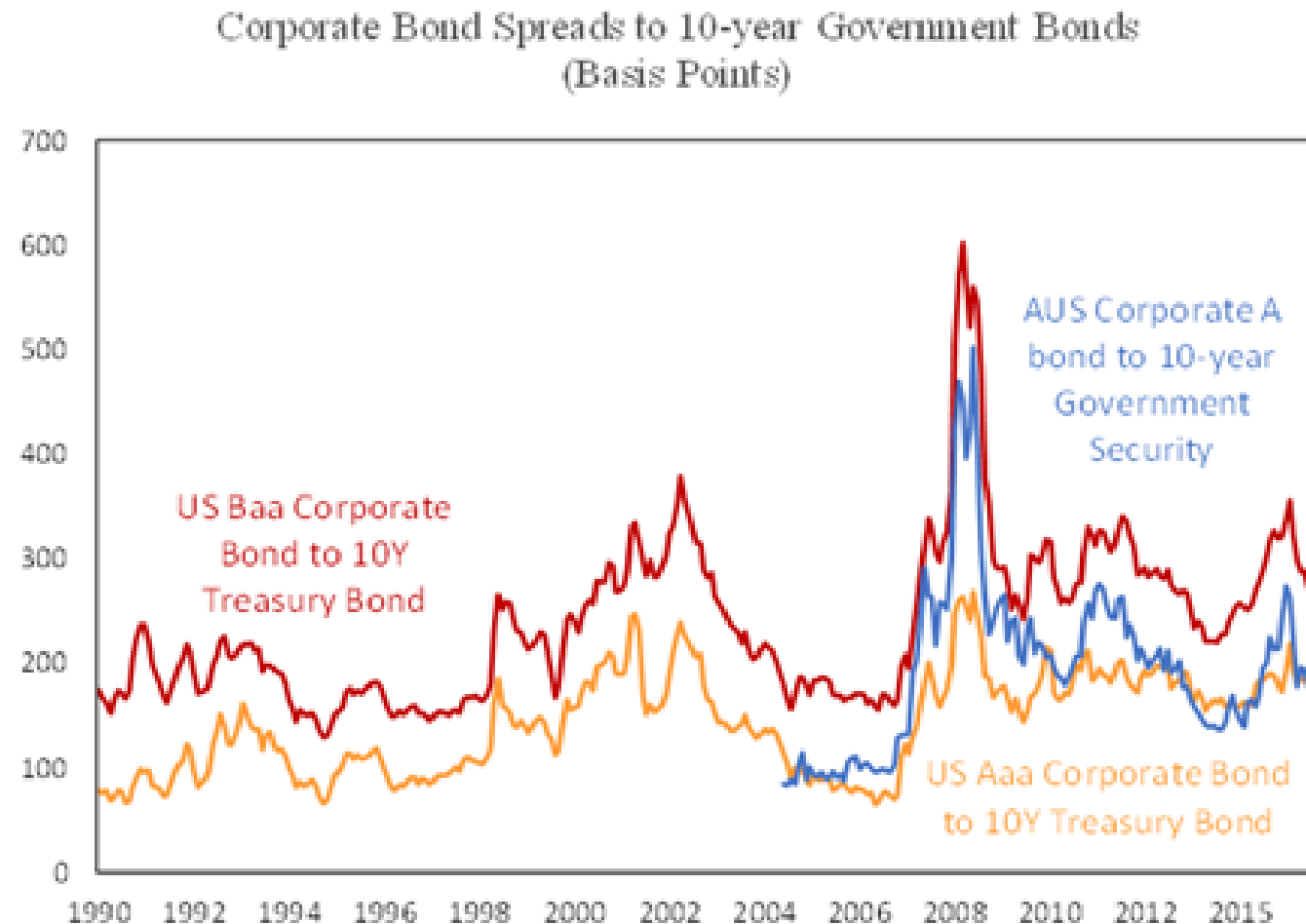


# Private rates of return



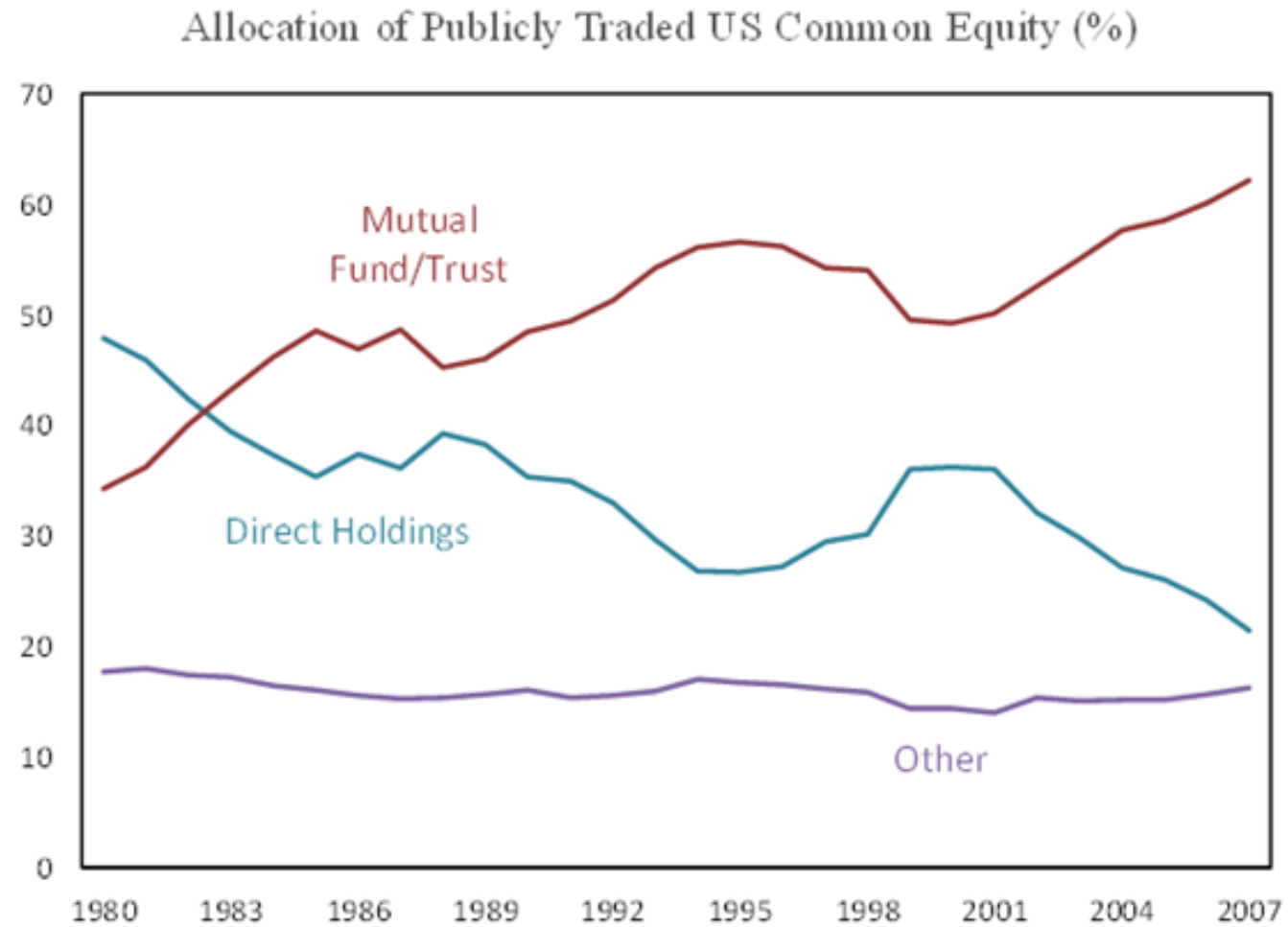
Sources: US rate from FRB of St Louis (FRED), European rate from European Central Bank ([sdw.ecb.europa.eu](http://sdw.ecb.europa.eu)), Australian rate from the RBA ([rba.gov.au/statistics](http://rba.gov.au/statistics)), UK from Bank of England ([bankofengland.co.uk/statistics](http://bankofengland.co.uk/statistics)), Japanese rate from ECB ([sdw.ecb.europa.eu](http://sdw.ecb.europa.eu)). The S&P 500 E/P ratio is based on the Shilling P/E from [www.multpl.com](http://www.multpl.com). The ASX E/P ratio is obtained from [Market Index](http://MarketIndex).

# Corporate to Treasury bond spreads



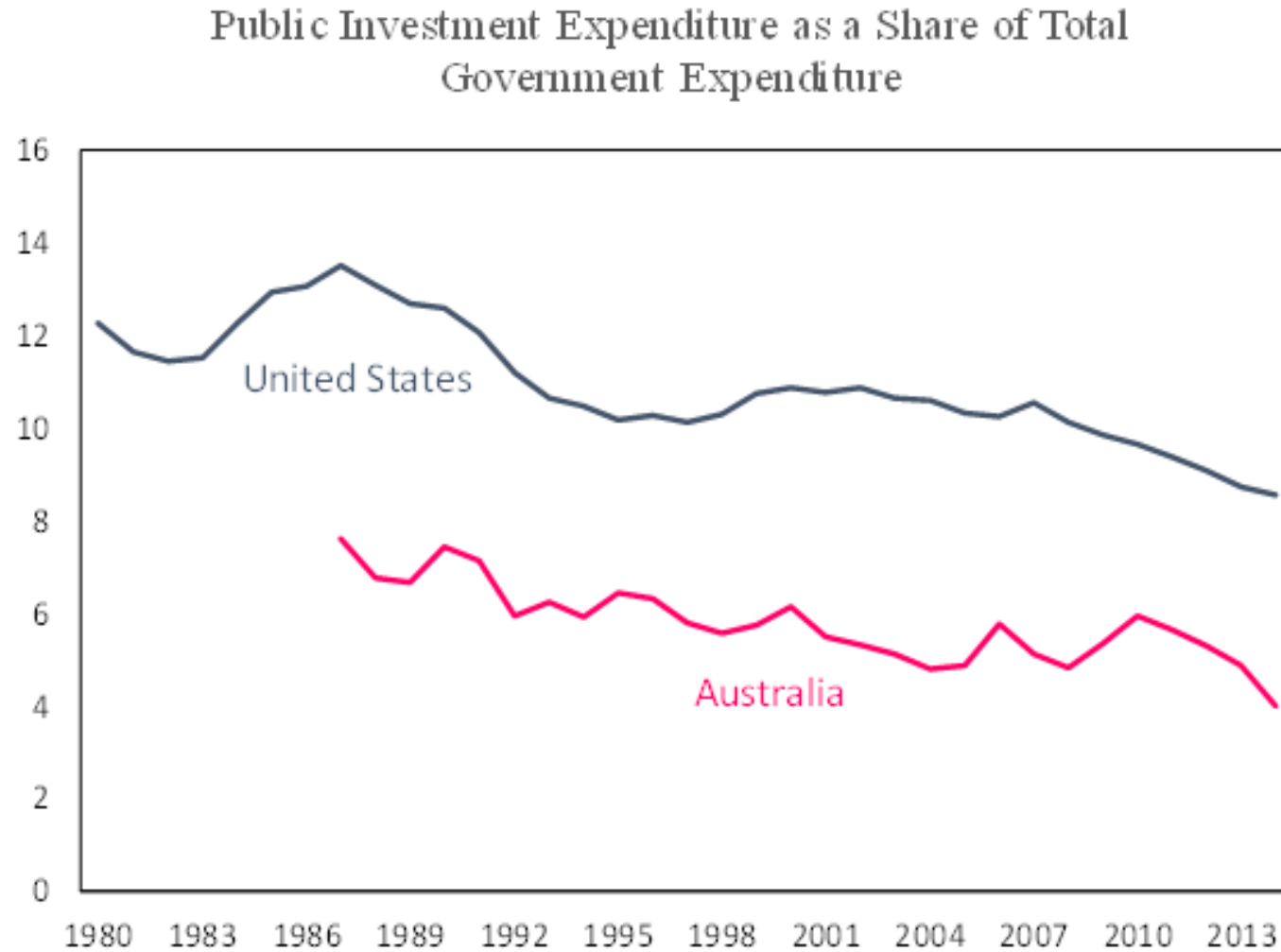
Sources: Moody's seasoned Aaa corporate bond yield relative to the yield on the 10-year Treasury constant maturity bond. Data is monthly frequency, sourced from FRED and the RBA.

# Delegated Asset Management



Source: Taylor and Tyers (2017).

# Declining public investment share of G

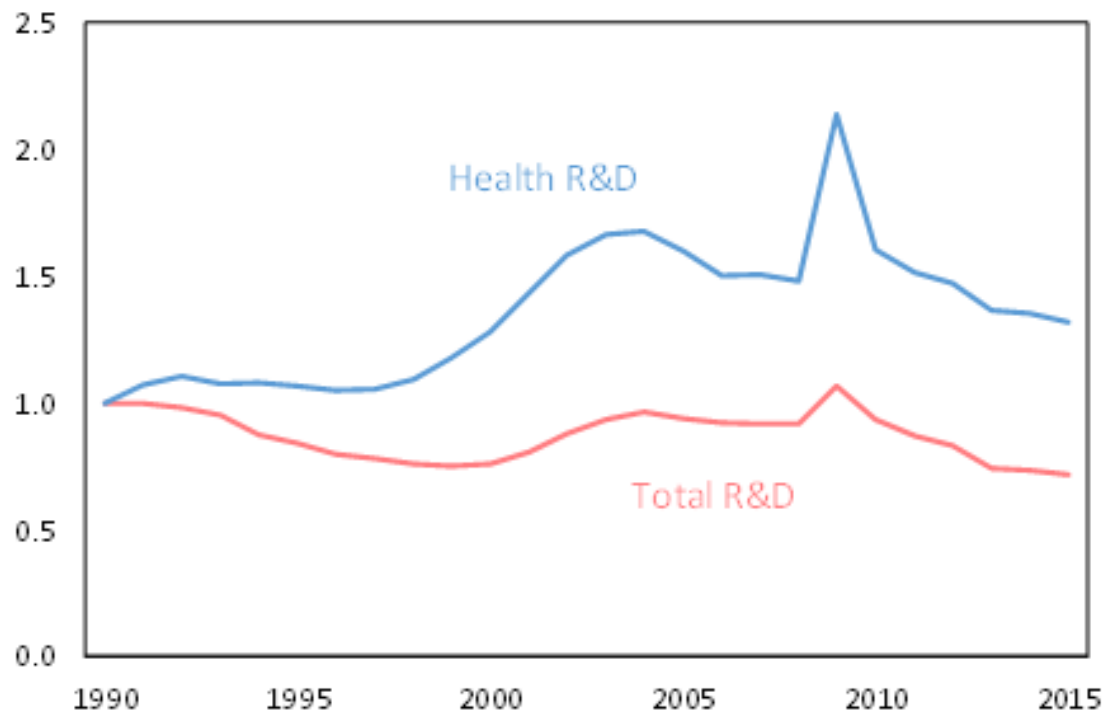


Source: Taylor and Tyers (2017).

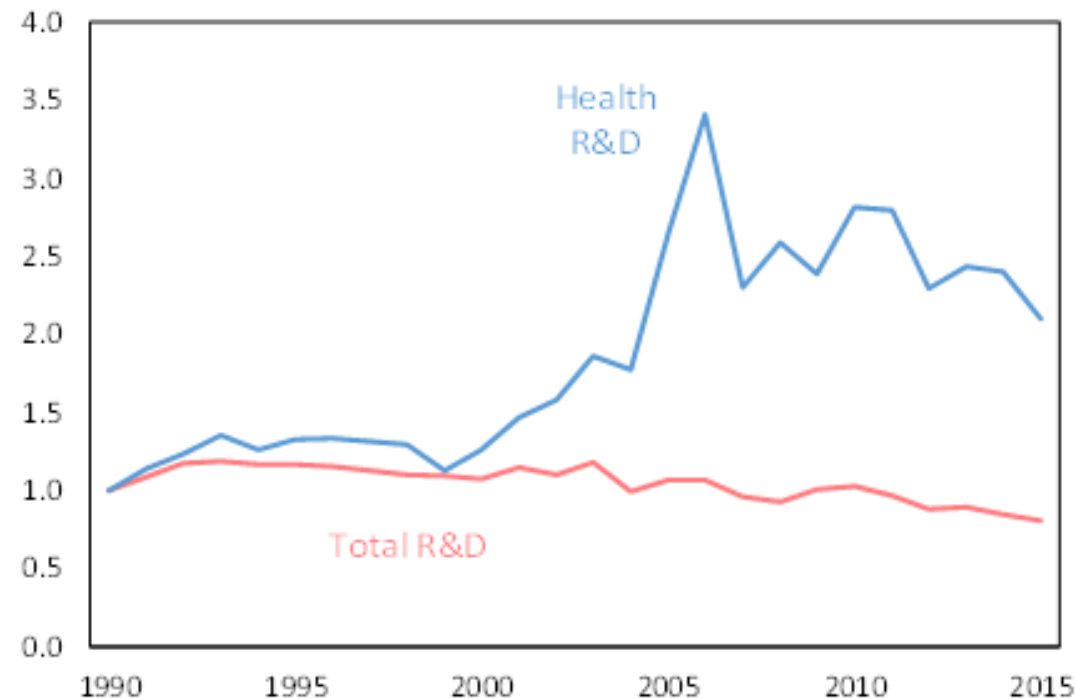
# Allocation of government R&D spending

% GDP

United States



Australia



R&D expenditure is reported as a percentage of GDP and defined as “Government budget appropriations or outlays for R&D”.

Sources: R&D data in national currency is from the OECD Database. GDP data is from the World Bank and expressed in national currency units.

# Explaining low US productivity growth

Cardarelli and Lusinyan (2018) on the US:

TFP growth began slowing in the mid-2000s, *before the GFC*

A common hypothesis is the fading impact of the 1990s IT revolution, but this is not supported.

Empirical analysis suggests a loss of efficiency over decades, which could be explained by:

declining

- net investment

- market competition

- R&D expenditure

- educational standards.

### **3. Good and bad exits**

# Good exits

**Stimulatory policy that raises expected returns and is sustainable.**

## **Tax:**

Replacement of some distortionary business taxes with less distortionary instruments  
land or wealth taxes  
broad-based consumption tax (less avoidable than income tax).

## **Competition reforms:**

Better control of oligopoly pricing, especially in services  
reduces cost of intermediate services  
raises expected returns broadly.

## **Public investment and R&D with *measurable* productivity impact:**

Raises private rates of return and stimulates investment sustainably.



# Bad exits

## **Further unconventional monetary policy**

It has stemmed deflation, but

it causes little positive inflation, *unsustainable asset price booms* and *wealth inequality*.

## **Transient and partial tax reforms:**

Reducing company tax without revenue replacement

- temporary boost to expected returns

- short run fiscal stimulus

- raises inflation, yields and investment in the short run

- raises fiscal deficits and financing costs in the long run.

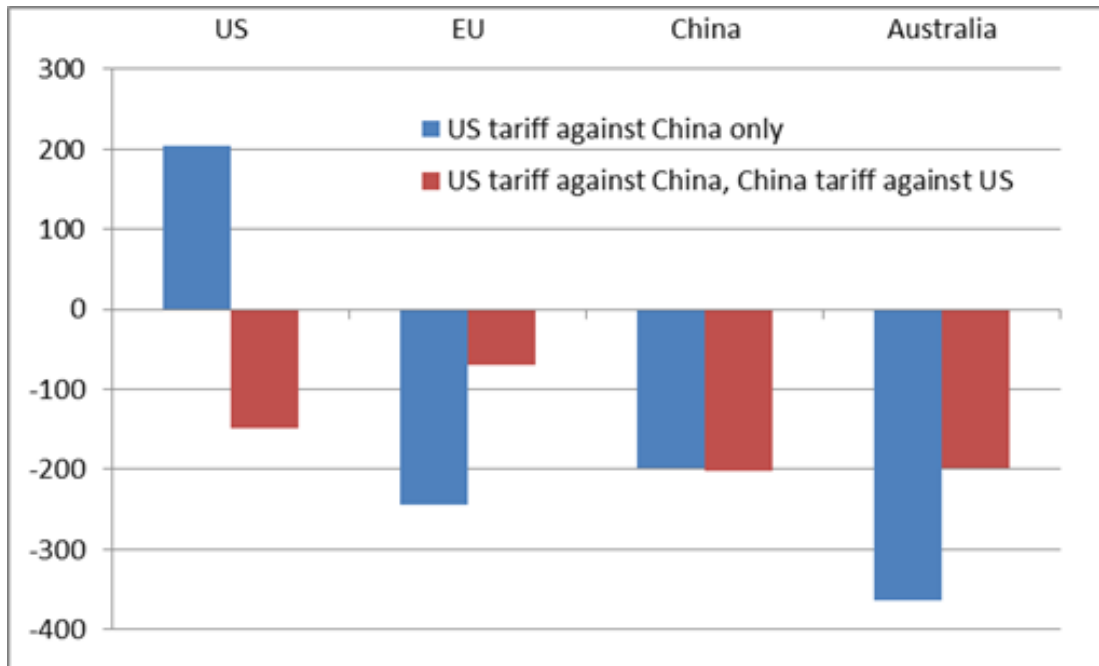
## **Trade wars:**

Protection boosts inflation and bond yields but, *with retaliation*, it reduces incomes everywhere.

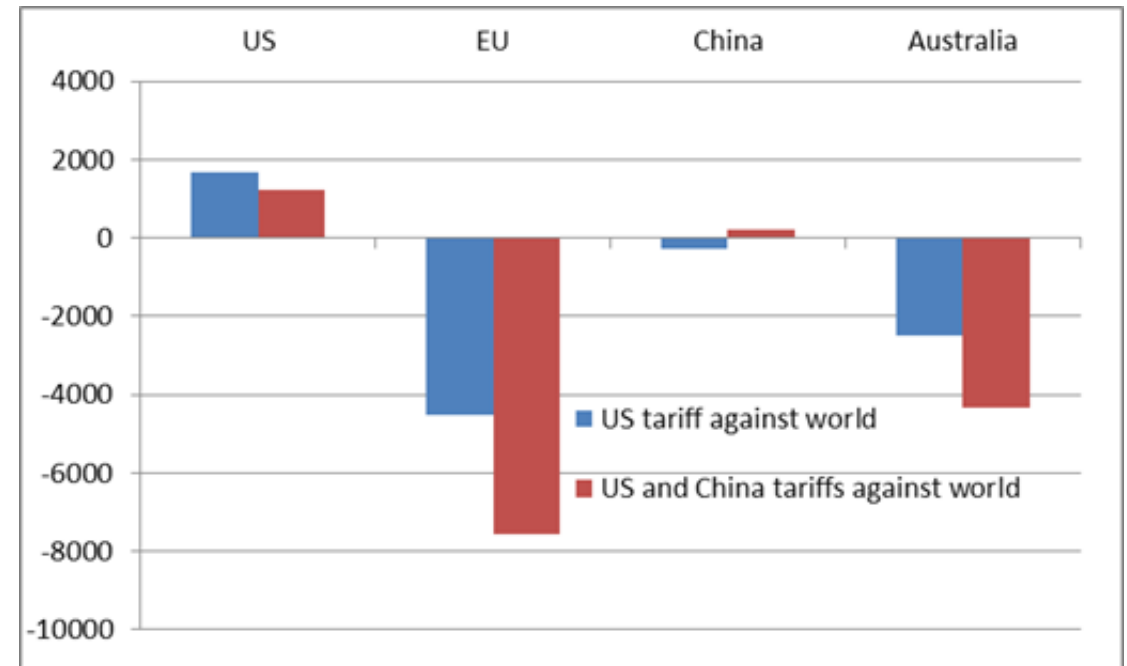
# Effects on real disposable income of 25% US tariff

US\$ per capita

## Bilateral with China



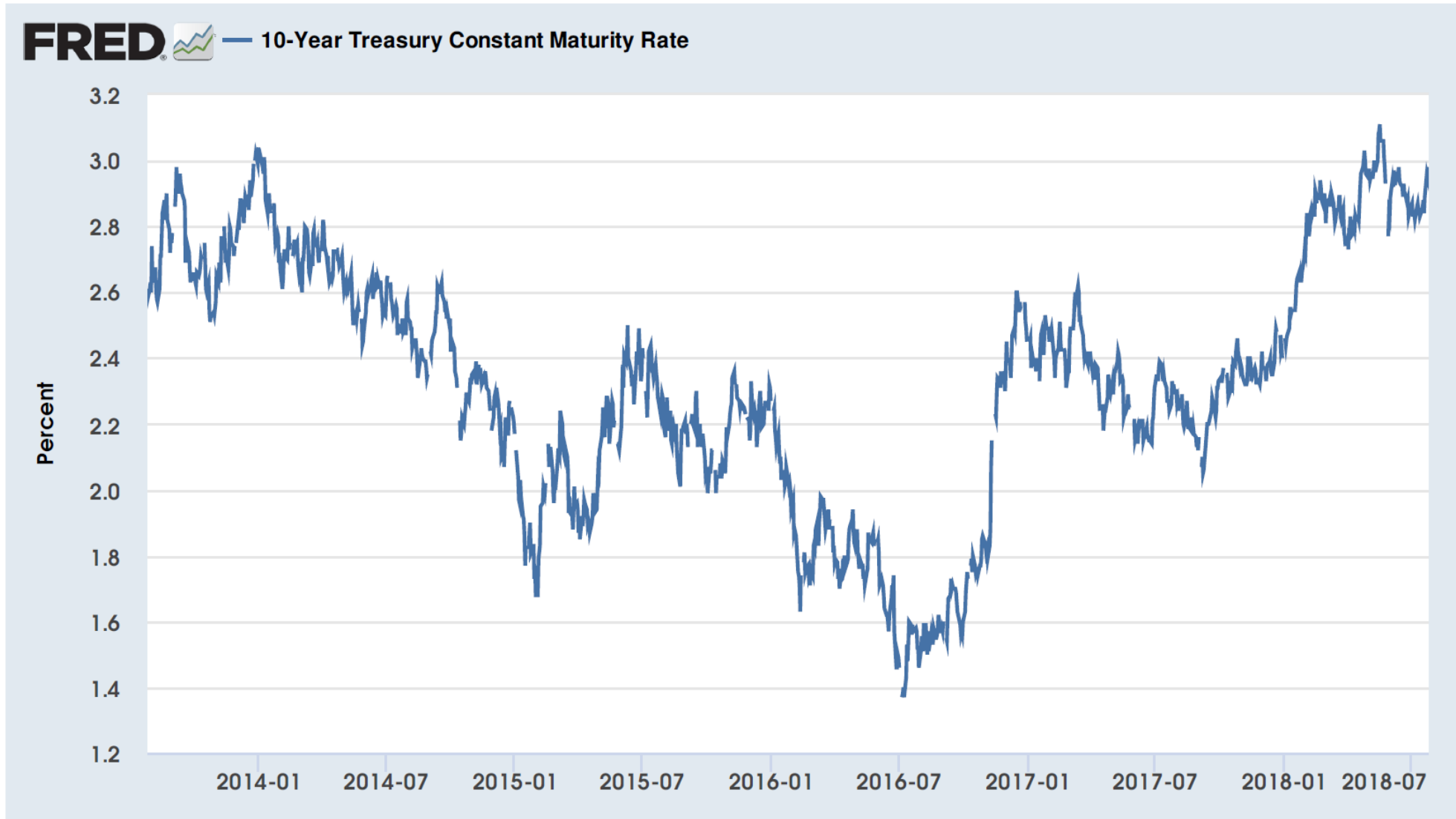
## US and China against the world



Source: model simulations.

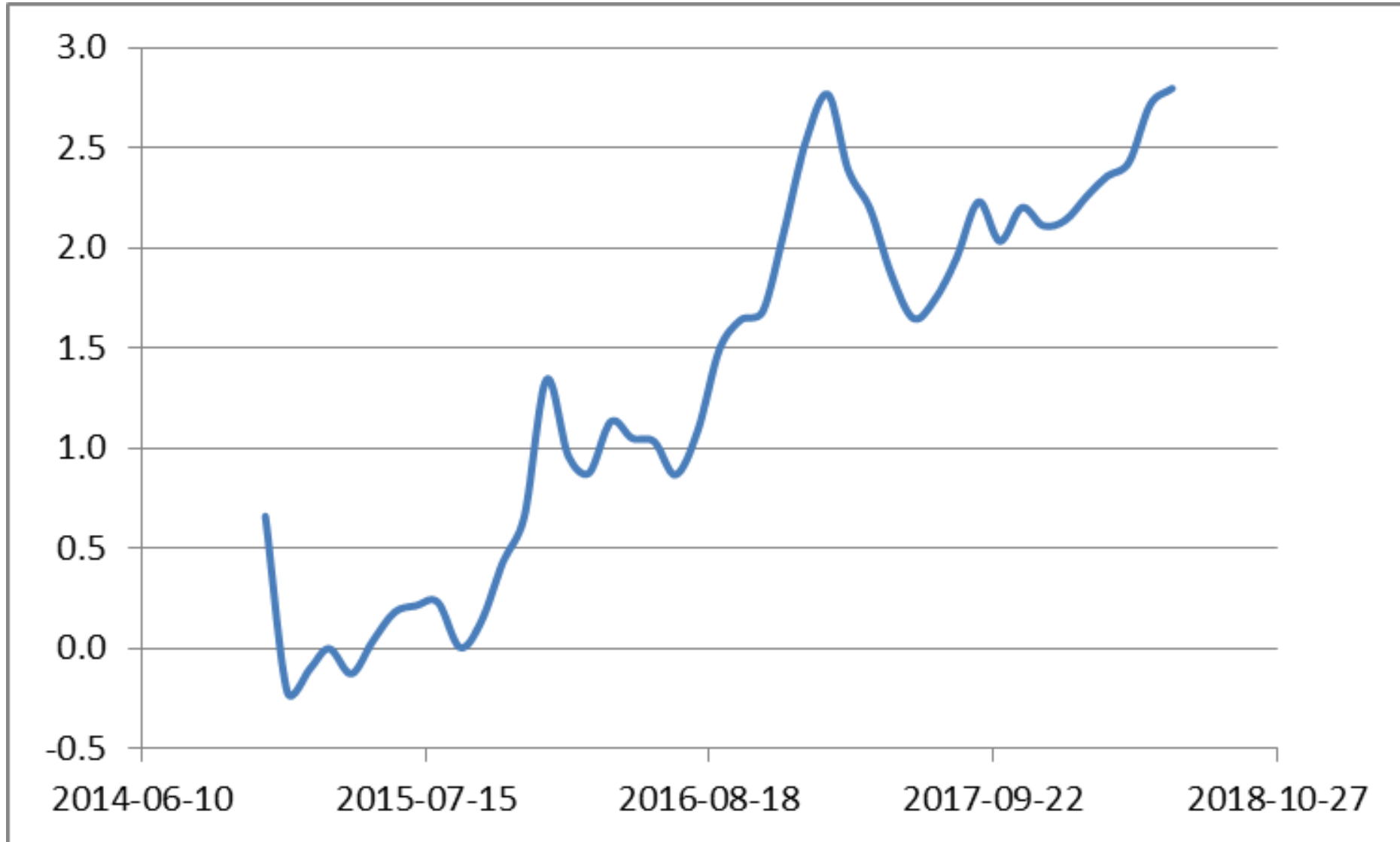
## **4. Prospects**

# Outlook: most recent US 10 year Treasury bond yields



Source: FRED.

# Outlook: most recent (monthly) annual US CPI growth



Source: FRED.

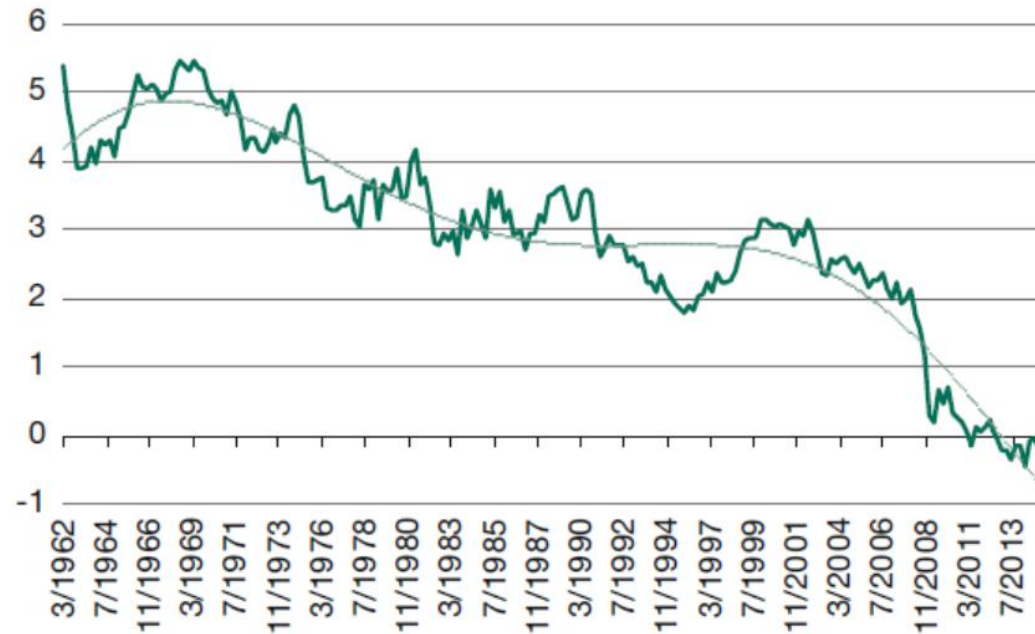
# Addenda

# Long Run Equilibrium Yield, US %/year

Demary and Huther 2015

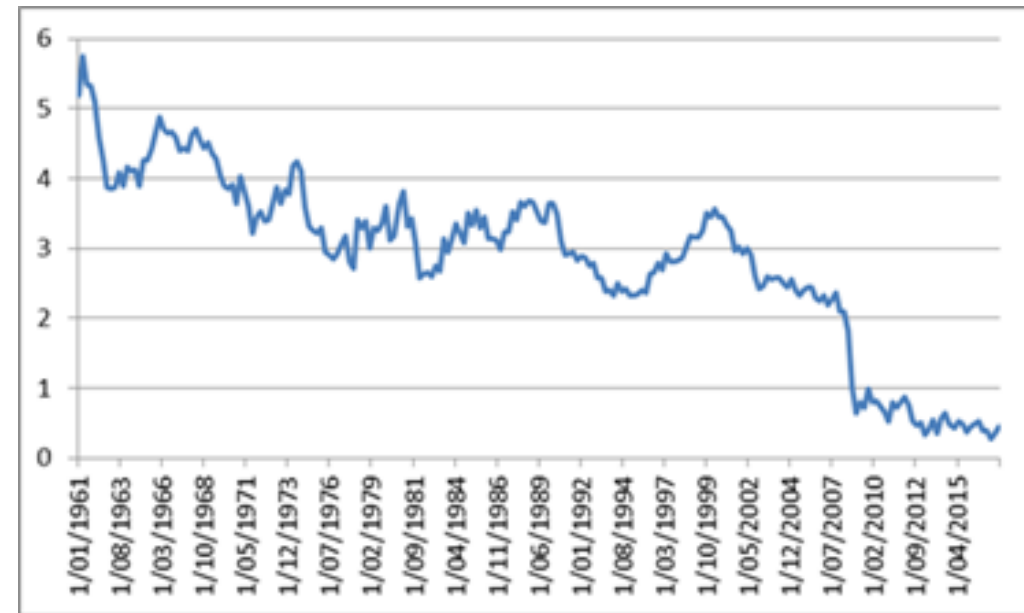
Estimated equilibrium real interest rate and its trend  
in the US

in %



Source: Federal Reserve Bank of San Francisco.

Current Fed SF Series



# The model

## Global general equilibrium with money and financial asset markets

- technology Cobb Douglas in relative quantities to separate TFP from factor share changes;
- taxation on labor, capital incomes, consumption, imports and exports;
- three household groups: low-income, professional and capital-owning
- regions: US, EU, Japan, China, Australia, Rest of World.

## Financial market structure

- Regions maintain global asset portfolios with augmentation from new saving and rebalancing to maximize portfolio rates of return;
- Savers are influenced by the market rate, current disposable income and expected future disposable income
- Government deficits are bond financed with large fiscal deficits raising an interest premium