

Lecture 1: World economic outlook

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University of Oxford - MFE - International Finance

Trinity, 2019

Disclaimer

The views expressed in this presentation, and all errors and omissions, should be regarded as those solely of the authors, and are not necessarily those of the Federal Reserve Bank of San Francisco, the Federal Reserve Board of Governors or the Federal Reserve System.

Course Admin

Lectures

- Wednesday: 13:30 - 16:45 (two 15 minute breaks, flexible end time)
- Lecture room: Edmond Safra Lecture Theatre
- Lecturer: Rhys Bidder
 - Rhys.Bidder@gmail.com
 - www.frbsf.org/economic-research/economists/rhys-bidder/
 - Office hour from 12:00-13:00 (Wednesday), contact me to arrange location

Assessment

- Written exam (75%)
 - 2 hours
 - Choose 4 questions from 7 options
- Practical group assignment (25%)
 - \approx 5 groups of 3
 - Choose a country (not G7 or China)
 - Inform me of groups and countries by 8th May
 - Submit slides by noon, Monday 17th June
 - Present during usual class time, Wednesday 19th June
 - Each group presents only to me - will be recorded

Guidance on group assignment

- Focus on...
 - Current macro/financial outlook
 - Evolution over coming 1-3 years
- Use analytical/policy models developed in class
 - Avoid journalistic chatter (or marketing!)
 - If tools from core courses are useful - feel free...
- Choose your favored slides software
 - I recommend Powerpoint or Beamer (LaTex)

Readings

- We will refer to several textbooks (see the syllabus)
- This is a 'topics' course so we will frequently draw on...
 - Research papers/publications
 - Academic blogs, NGO think-pieces
 - Financial press (read FT/Economist, maybe WSJ)

Useful Resources

Websites (hyperlinks below)

- IMF data
- IMF World Economic Outlook, Financial Stability and Fiscal reports
- St. Louis Fed's FRED database
- OECD data
- Groningen Growth and Development Center databases
- World Bank data
- U.S. Energy Information Administration
- Writings of Jim Hamilton on *OilPrice.com*

Attitude

- Be friendly, respectful and encouraging to others
- Feel free to ask questions / contribute expert knowledge

Introduction

Course Concept

- Develop an awareness of current issues in international economics
 - 'Financial' aspects derive from deep economic phenomena
 - This is not a CAPM / asset pricing course
 - Many 'current' issues have been around a long time
- Acquire a set of analytical tools to discipline our understanding
 - Simple methods and models will be emphasized
 - Note: Modeling is disputed / in flux in many areas
- Emphasize interdependence of issues in a globalized world
 - Dramatically more complicated than 'closed economy' modeling
 - Intersection of politics, economics and philosophy(?)
- Understand possible policy responses and constraints
 - Fiscal, monetary/exchange rate, regulatory...
 - Coordination vs. unilateralism
 - Note: 'Optimal' policy may be country/time dependent

Roadmap

- Week 1: World economic outlook
- Week 2: Macroeconomics and policy
- Weeks 3-4: Currency regimes, unions, debt and crises
- Week 5: Origins and legacies of GFC
- Week 6: Financial liberalization, globalization and growth
- Week 7: Commodities and sovereign wealth
- Week 8: Presentations

Growth and convergence?

Global economy - basic facts

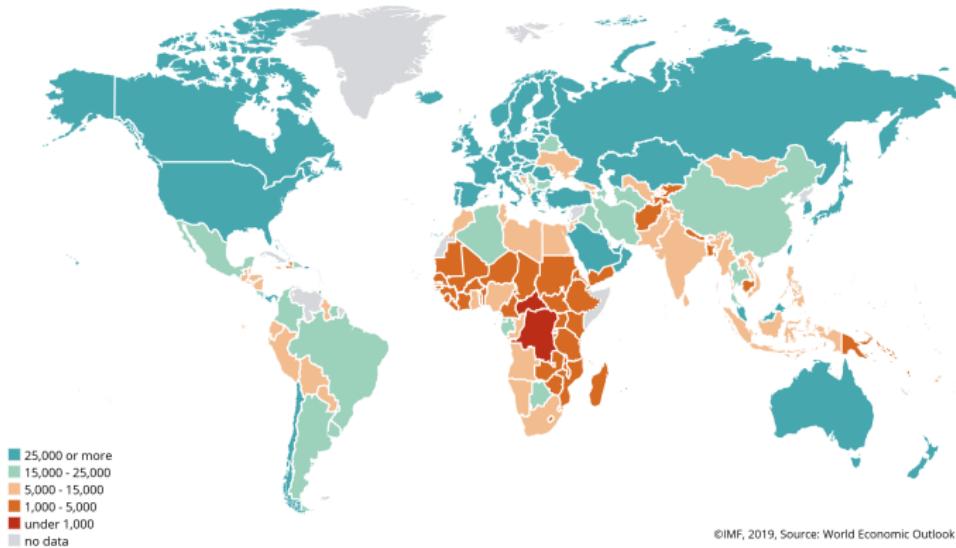
	Current \$tn			Current PPP \$tn			Population (Bn)
	GDP	% Share	GDP p.c.	GDP	% Share	GDP p.c.	
World	84.7			135.2			7.5
Advanced	51.1	60.3	47802	55.1	40.8	51573	1.1
Emerg./Dev.	33.7	39.8	5264	80.1	59.2	12521	6.4
G7	38.9	45.9	50762	40.7	30.1	53148	0.8
E.U.	18.8	22.2	36735	22.0	16.3	43148	0.5
China	13.4	15.8	9608	25.2	18.6	18110	1.4
U.S.A.	20.5	24.2	62606	20.5	15.2	62606	0.3
U.K.	2.8	3.3	42558	3.1	2.3	45705	0.1

Gross Domestic Product in 2018. Source: *IMF*

- Purchasing Power Parity (PPP) exchange rates \Rightarrow higher valuations than using market rates for developing countries
- Reflects differing price of goods baskets purchased with local currency
- See the Economist's *Big Mac Index*

Per capita income disparities across countries

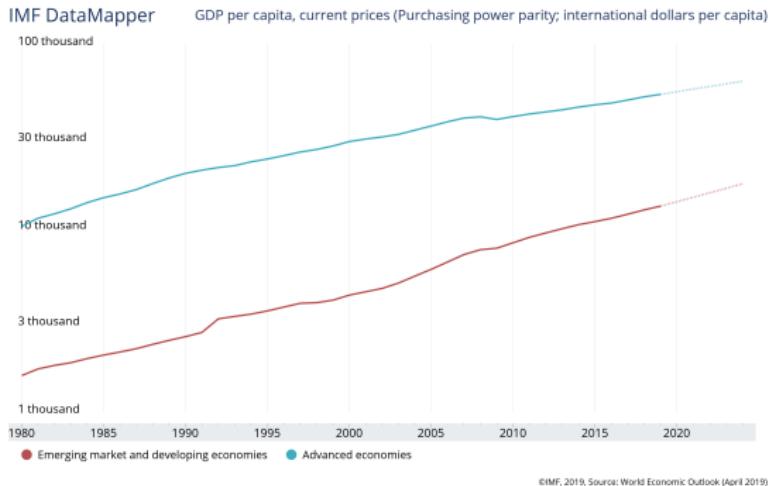
IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 2019)



©IMF, 2019, Source: World Economic Outlook (April 2019)

GDP per capita (PPP, current prices). Source: IMF

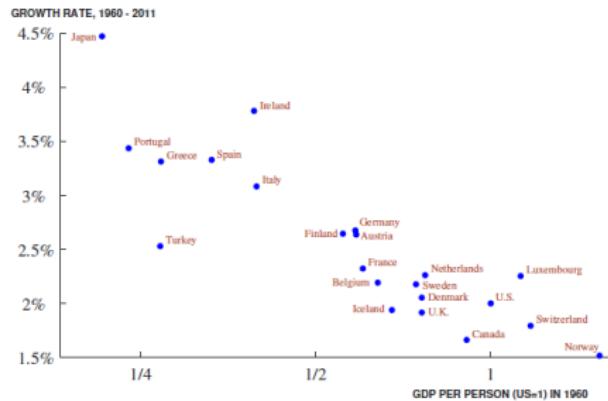
Per capita growth across countries



GDP per capita of advanced and emerging/developing countries (log scale, PPP, current prices). Source: IMF

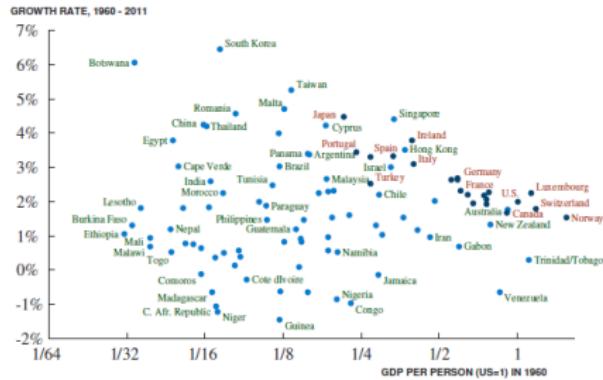
- Wide variation among (and within) countries
- Perhaps some tendency towards convergence but unclear...

Convergence?



Dependence of growth on initial level relative to the U.S.A. in 1960 -
OECD countries *circa* 1970. Source: Penn World Tables 8, Jones (2005)

Convergence?



Dependence of growth on initial level relative to the U.S.A. in 1960 - broader country sample. Source: Penn World Tables 8, Jones (2005)

- Sample selection bias may explain OECD pattern (rich in 1970)
- But could be 'conditional convergence' to common steady state
- Countries may differ in characteristics that \Rightarrow different steady state
- Barro's 'iron law of convergence' $\approx 2\%$ p.a. (also Mankiw et al 1992)

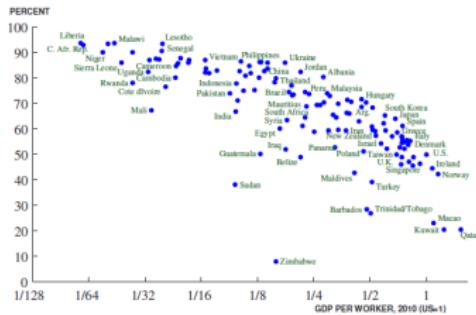
Profound economic questions

I do not see how one can look at figures like these without seeing them representing possibilities. Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia's or Egypt's? If so, what exactly? If not, what is it about the "nature of India" that makes it so? The consequences for human welfare involved in questions like these are simply staggering: once one starts to think about them, it is hard to think about anything else.

- Robert E. Lucas in *On economic growth* (1988)

Technology and Demographics

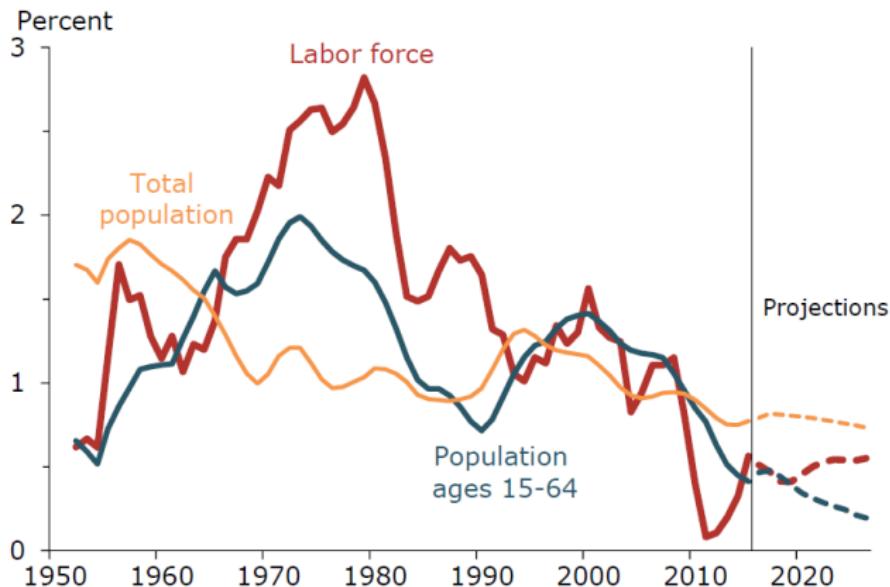
A partial but important answer - technology



Share of gap relative to U.S. accounted for by TFP differences. Source: Penn World Tables 8, Jones (2005)

- In poorest countries - vast majority of the gap in output-per-worker due to inferior 'total factor productivity'
- Not due to (independent of technology) capital-output differences
- Mexico Y/L one third of U.S. despite K/L almost 90% of U.S.
- How can technology be improved?

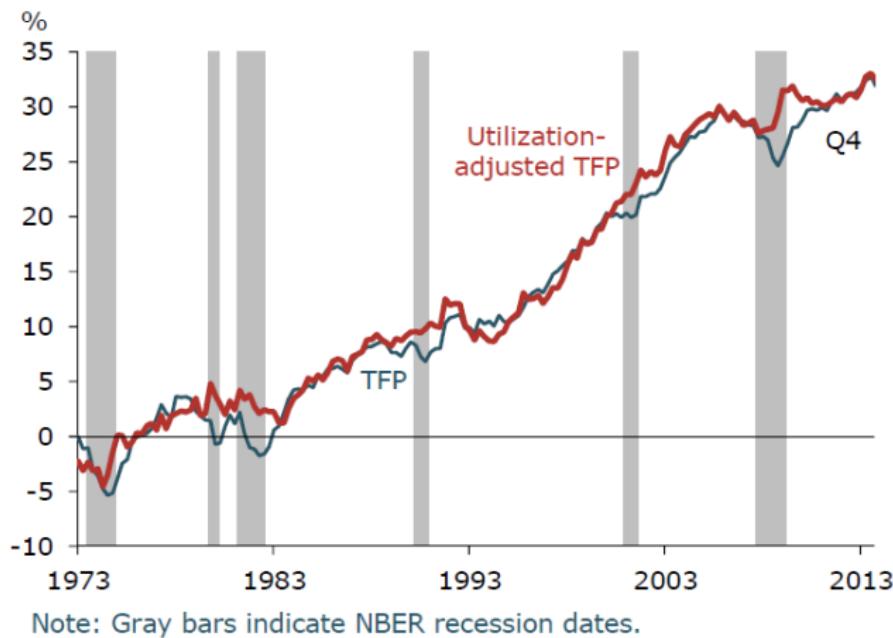
Trend growth rate slowing in advanced economies



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Census Bureau, Congressional Budget Office (labor force projections).

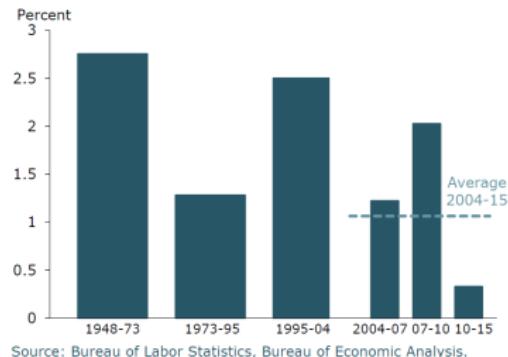
U.S. population. Source: *Fernald (2016)*

Trend growth rate slowing in advanced economies



Cumulative U.S. TFP growth. Source: *Fernald (2015)*

Trend growth rate slowing in advanced economies

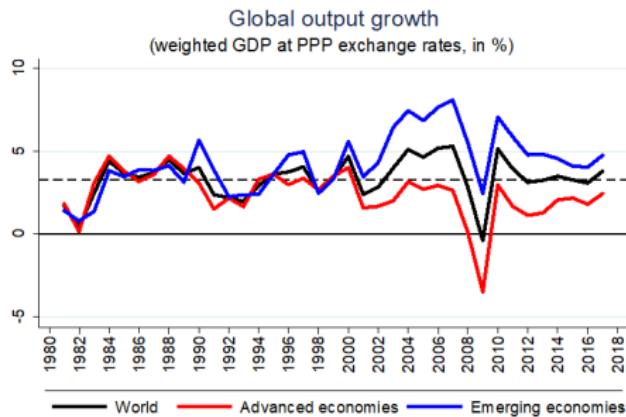


Source: Bureau of Labor Statistics, Bureau of Economic Analysis.

Regimes in U.S. productivity. Source: *Fernald (2016)*

- Fascinating debate over (difficult to predict) future of innovation
- What's the next 'general purpose technology' after the internet?
- Machine learning and A.I.?
- Where do ideas come from?

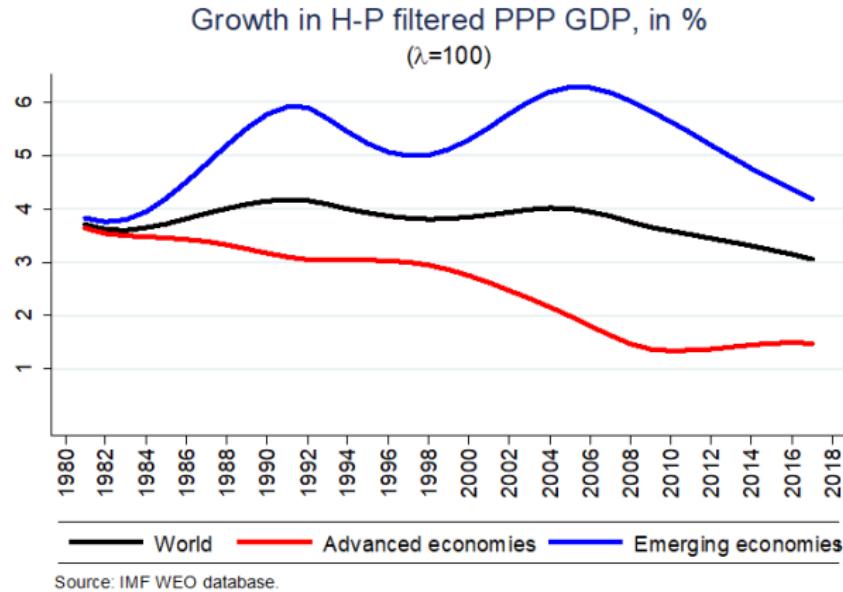
Trend growth rate slowing in advanced economies - still quick in emerging



GDP growth rates. Source: *IMF WEO Database*

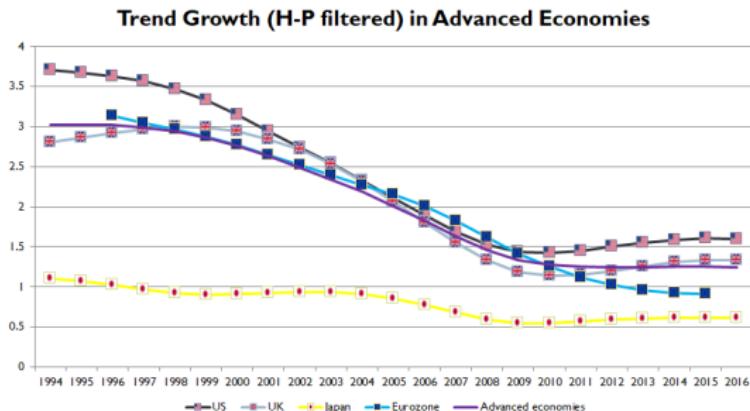
- Some suggestion of 'decoupling' prior to crisis
- Crisis nevertheless had broad effects

Trend growth rate slowing in advanced economies - still quick in emerging



HP-filtered trend GDP growth rates. Source: *IMF WEO Database*

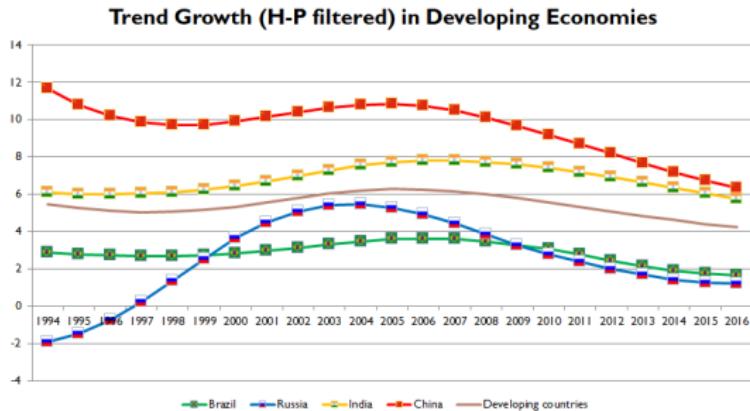
Trend growth rate slowing in advanced economies - still quick in emerging



HP-filtered trend GDP growth rates - selected advanced countries.
Source: *IMF WEO Database*

- Slow down fairly consistent across developed countries - 'secular stagnation'?
- Japan has faced it for a while

Trend growth rate slowing in advanced economies - still quick in emerging



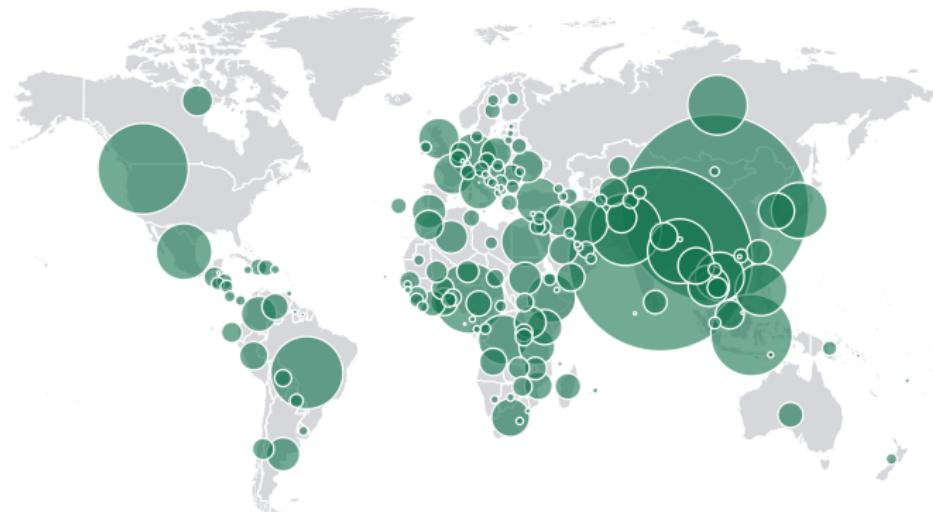
HP-filtered trend GDP growth rates - selected emerging countries.
Source: *IMF WEO Database*

- Substantial variation across emerging countries
- Enormous variation across all developing (not shown)

Population disparities - developed vs. emerging/developing

IMF DataMapper

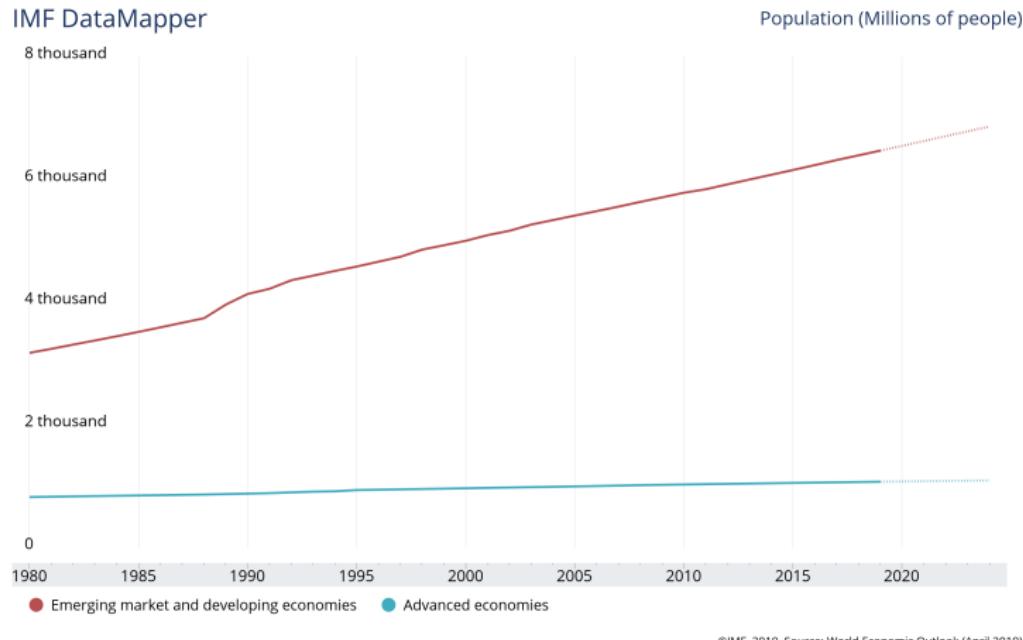
Population (Millions of people, 2019)



©IMF, 2019, Source: World Economic Outlook (April 2019)

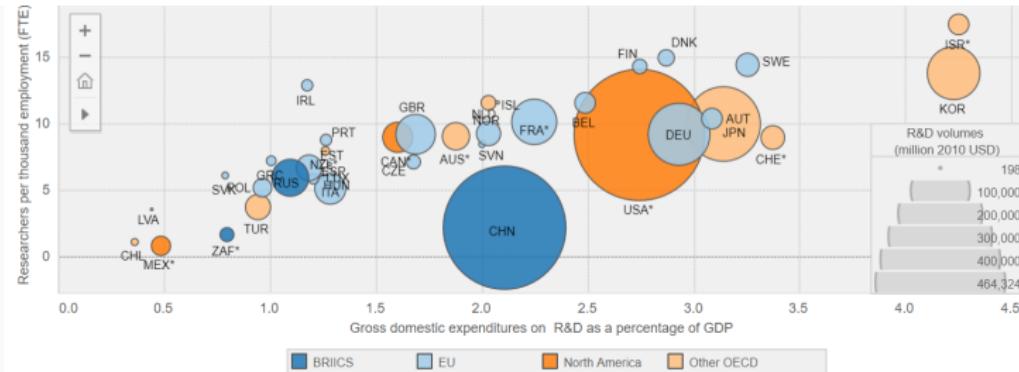
Populations (bubbles in proportion). Source: IMF

Population growth faster in emerging/developing world



Populations of advanced and emerging/developing countries. Source:
IMF

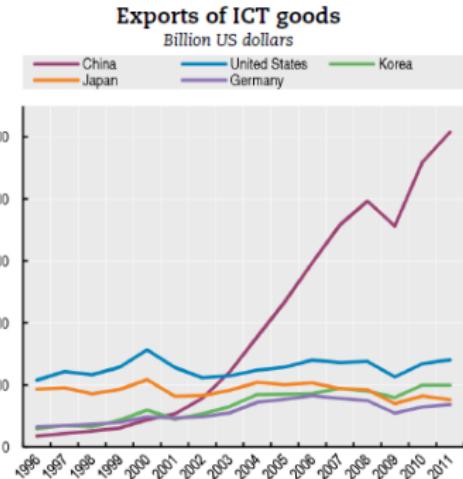
Tech adoption and innovation in developing world



Human and financial resources devoted to R&D. Source: *OECD*

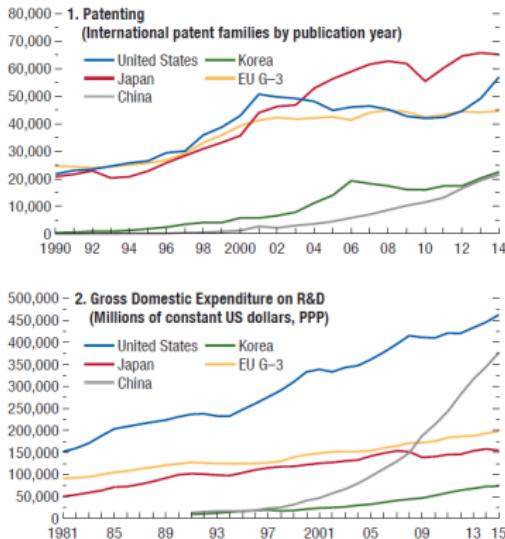
- China already has enormous scale in R&D
- Further innovation and movement to tech frontier leaves scope for emerging economies to drive growth
- Sheer *scale* of innovation, rather than 'per capita' matters. Why?

Tech adoption and innovation in developing world



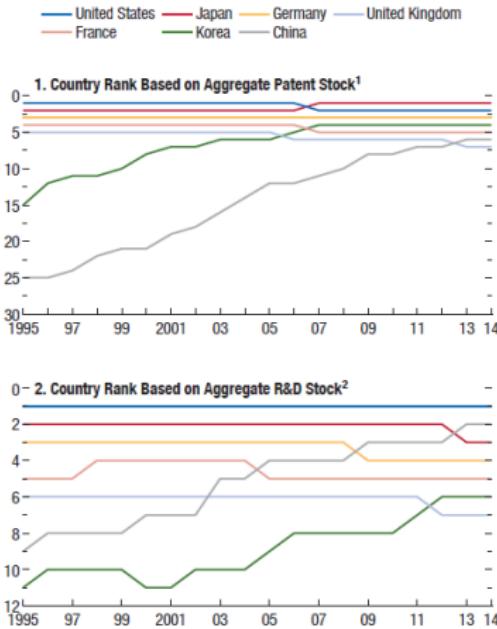
Exports of information and communication goods (\$Bn). Source: *OECD*

Tech adoption and innovation in developing world



Patents and expenditures on R&D. Source: *European Patent Office, PATSTAT database; OECD; IMF calculations*

Tech adoption and innovation in developing world

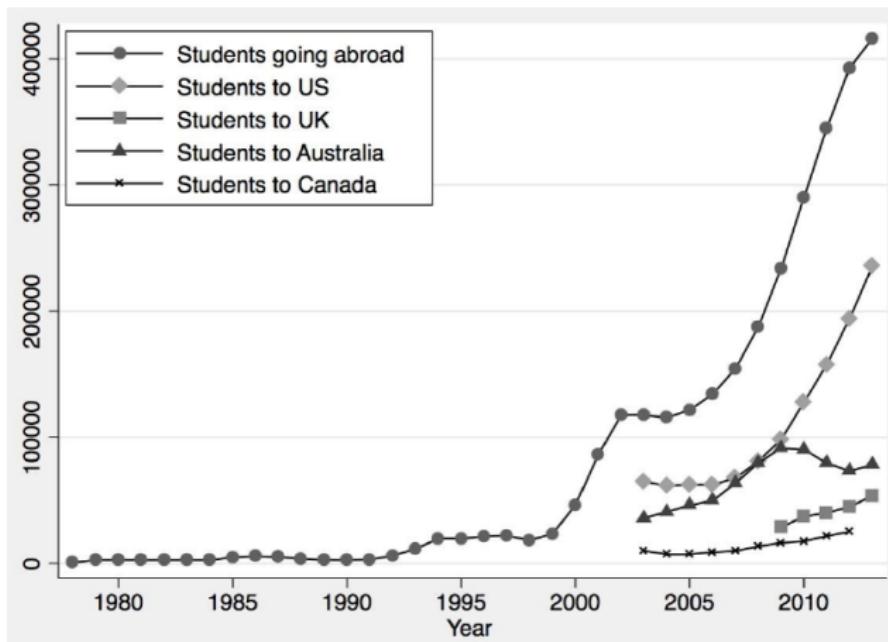


Rankings of frontier countries in terms of patent and R&D stocks.
Source: European Patent Office, PATSTAT database; OECD; IMF calculations

Tech adoption and innovation in developing world

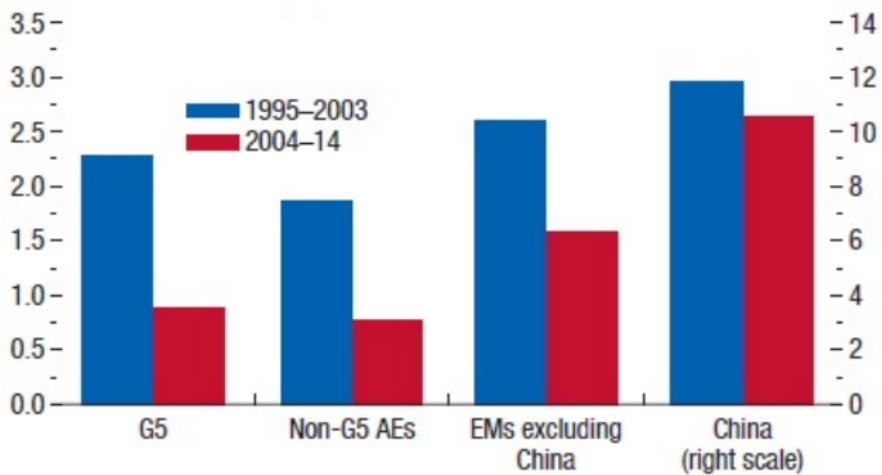
- Having barely registered two decades ago, China...
 - has the most science and engineering (S&E) graduates (as of 2015)
 - is the second largest spender on R&D
 - is the second largest producer of scientific papers.
- Improvements in human capital ⇒ greater innovation at home and easier implementation of global best practice
- Supported by government policy (e.g. tax-favored high-tech zones)

Tech adoption and innovation in developing world



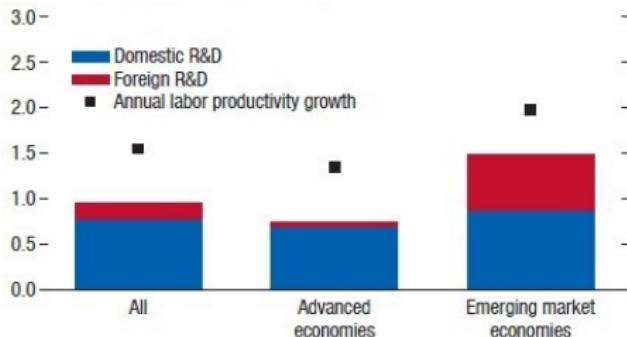
Chinese students abroad. Source: Freeman and Huang (2015)

Tech adoption and innovation in developing world



Labor productivity growth - comparing time periods (annual percent, average across country sectors). Source: *European Patent Office, PATSTAT database; KLEMS database; OECD; UN IDO; IMF calculations*

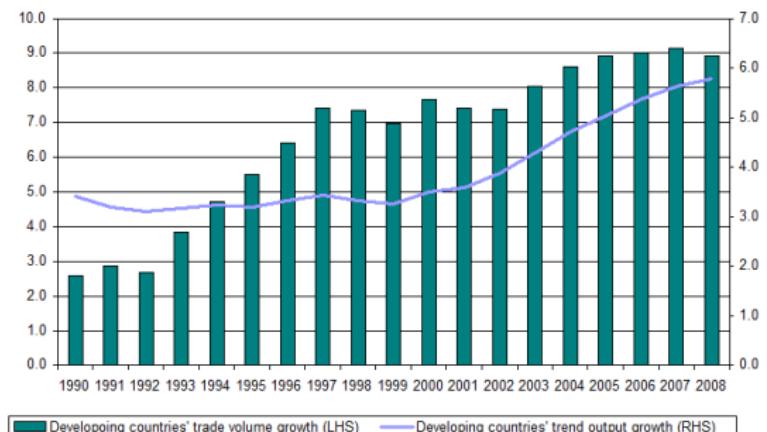
Tech adoption and innovation in developing world



Contribution of foreign knowledge to labor productivity growth, 1995-2014 (annual percent, average across country sectors). Source: European Patent Office, PATSTAT database; KLEMS database; OECD; UN IDO; IMF calculations

- Spillovers from FDI and operations by foreign MNCs
- May be a powerful way in which best practice diffuses
- Associated with 'global value chains' (GVC) divided across countries

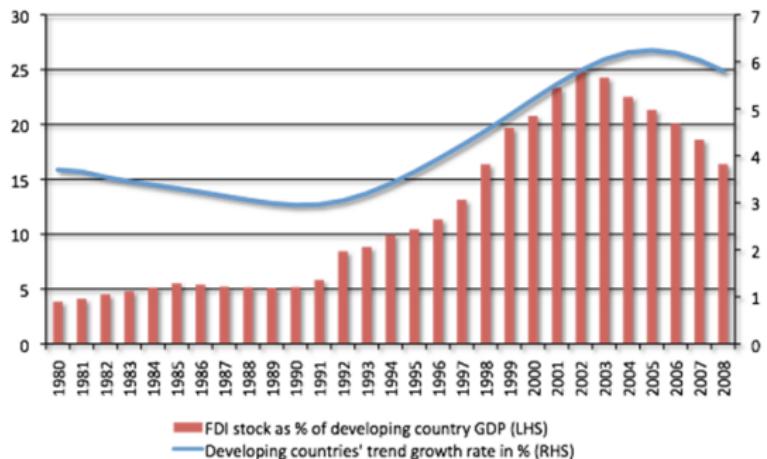
Tech adoption and innovation in developing world



Trade volumes and trend growth - developing countries. Source: *IMF WEO Database*

- Uruguay trade round completed in 1994
- Doha still to come...
- Likely some reverse causality too

Tech adoption and innovation in developing world



Foreign direct investment and trend growth - developing countries.
Source: IMF WEO Database

- FDI can be a motor of economic growth
- Again, likely some reverse causality

Tech adoption and innovation in developing world

- Enormous scope for countries to move to the ‘frontier’ (China and Korea already well on the way)
- Ample scope for developing and emerging (D&E) to drive medium-term growth as developed world slows to ‘new normal’
- Once frontier is reached - scale and type of innovation may still generate higher long-run growth
- Faster (if slowing) population growth should also contribute
- Note that this means that emerging companies will ‘move up the value chain’

Active debate over implications for other countries

Everyone knew that we would lose jobs in labor-intensive industries like textiles and apparel, but we thought we could hold our own in the capital-intensive, high-tech arena. The numbers we're seeing now put the lie to that hope — as China expands its share even in core industries such as autos and aerospace.

- Robert Scott, US Economic Policy Institute, quoted in Wang and Wei,
NBER Working Paper No. 13771 (2008)

- Nevertheless, most debate about impact relates to the labor-intensive areas...

Caveats to growth

- Note that the standard prescription to benefit from such source of growth is to open the economy and liberalize corporate and financial markets
- Likely does raise trend growth while the going is good - debate over how to prevent occasional crises
- Much more on this in later lectures...

The Great Doubling

The 'Great Doubling'

*Before the collapse of Soviet communism, China's movement toward market capitalism, and India's decision to undertake market reforms and enter the global trading system, the global economy encompassed roughly half of the world's population - the advanced OECD countries, Latin America and the Caribbean, Africa, and some parts of Asia. Workers in the US and other higher income countries and in market-oriented developing countries such as Mexico did not face competition from low wage Chinese or Indian workers nor from workers in the Soviet empire. Then, almost all at once in the 1990s, **China, India, and the ex-Soviet bloc joined the global economy and the entire world came together into a single economic world based on capitalism and markets.***

- Richard Freeman in *The Great Doubling: The Challenge of the New Global Labor Market* (2006)

The 'Great Doubling'

China

- Deng Xiaoping initiated market reforms in 1979 - pace quickened in 1990s under Jiang Zemin - China joining the WTO in 2001

India

- In 1991, Manmohan Singh initiated Indian economic liberalisation, dismantling the license raj, opening the economy to FDI and privatizing state enterprises

Russia

- Berlin wall fell in 1989 followed by the collapse of the Soviet Union in 1991

The 'Great Doubling'

- Additional 1.46 billion workers \approx doubled the global labor force
- Little usable capital among new entrants \Rightarrow dramatic decline in the ratio of capital to labor
- Slow accumulation of capital \Rightarrow persistent effect
- 'Good' for capitalists, 'bad' for labor
 - Shift in balance of power
 - Firms have option to outsource to lower cost countries
 - Also option to purchase lower cost inputs made abroad

The 'Great Doubling' - some stresses

- Rapid decline in U.S. manufacturing employment after 2001
- Various causes but much research has focused on China
- U.S. granted 'Permanent Normal Trade Relations' (PNTR) - activated after China joined WTO (Pierce and Shott, 2016)
- Eliminated (for a time!) possibility of sudden tariff spikes
 - Chinese had greater incentives to invest in entering/expanding in the US market ⇒ competition ↑ for US producers.
 - Boosted U.S. firms' investments in capital- or skill-intensive production technologies (**consistent with comparative advantage**)

The 'Great Doubling' - some stresses

But isn't specializing according to comparative advantage a **good** thing?

- Yes - on balance - for the *average* person
- Likely yes for owners of capital and 'the consumer' (through lower prices / better availability)
- But in the short run (and even longer run) can lead to greater inequality, populism and protectionism
- Largely concentrated impact on lower skilled but remember earlier technology discussion and quote

The 'Great Doubling' - some stresses

Trump won in counties that lost jobs to China and Mexico.



Source: *Washington Post* (Dec. 2, 2016)

The 'Great Doubling' - some stresses

The real reason the U.K. voted for Brexit? Jobs lost to Chinese competition.



Source: *Washington Post* (Jul. 7, 2016)

The 'Great Doubling' - some stresses

Just because the 'pie gets bigger' - doesn't mean everyone's *piece of the pie* gets bigger

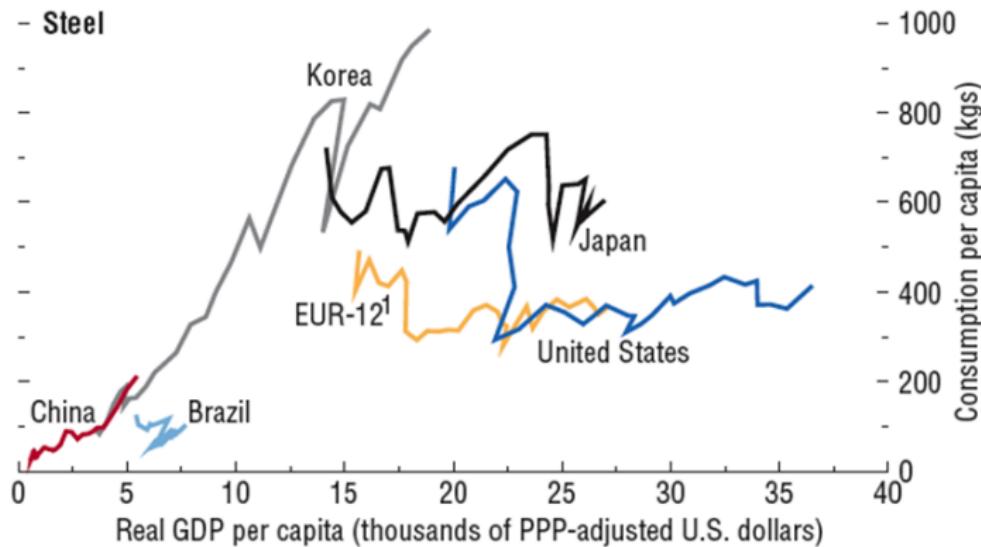
- Influential studies by Autor *et al* (2013) on U.S. labor market effects of Chinese competition
- See also work by Bloom *et al* (2015) on 'Trade-induced technical change'
- '*Washington Consensus*' somewhat out of fashion
- See also omnipresent (but somewhat perfunctory) 'inequality qualifier' in current IMF publications!

Commodities

Commodities

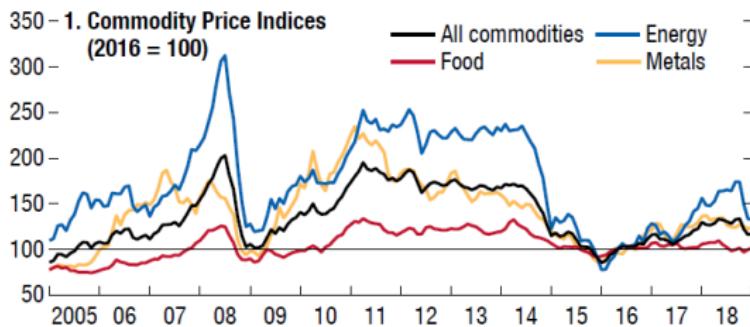
- Emerging and developing countries (esp. China) have had profound effects on various commodity markets
- Early stages of industrialization - even after increases in energy efficiency - demand (inelastic) vast amounts of energy and raw inputs
- Oil is a particularly influential commodity and the oil market(s) are especially affected by (and affect) global and financial trends
- Beyond China we must also consider OPEC, the financialization of commodities and, more recently, the shale and tight oil revolution in North America

Commodities



Economic development and steel use. Source: IMF WEO (2006)

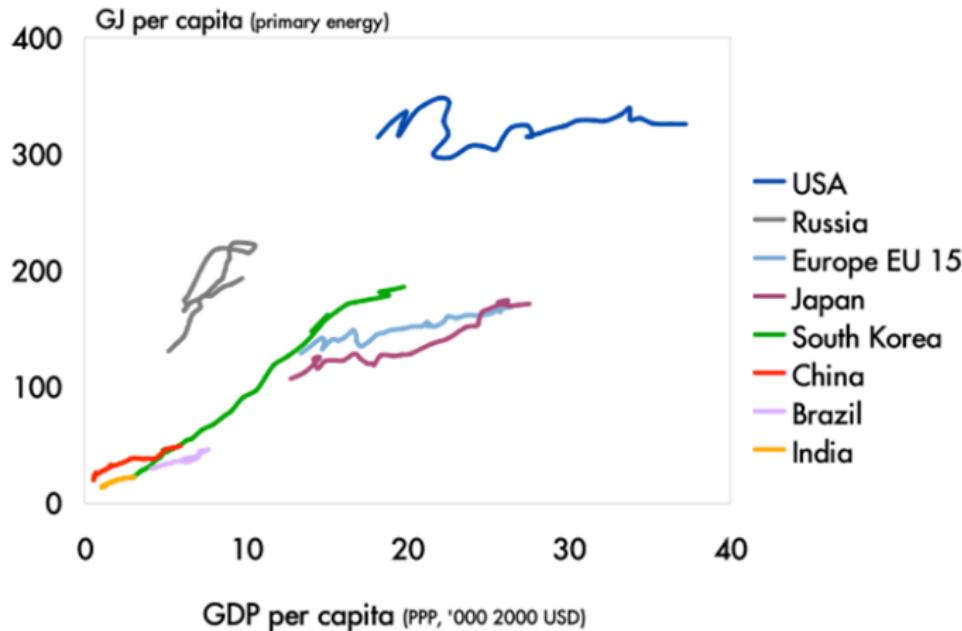
Commodities



Comovement of commodity prices. Source: IMF WEO 2018

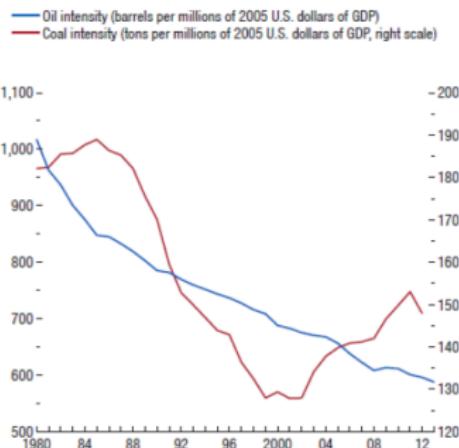
- Some independent variation (what might that be?) but clearly a strong common component (what might that be?)
- One reason: Raw sources of energy often important inputs to other (e.g. agricultural) production

Commodities



Economic development and energy use. Source: IEA; IMF

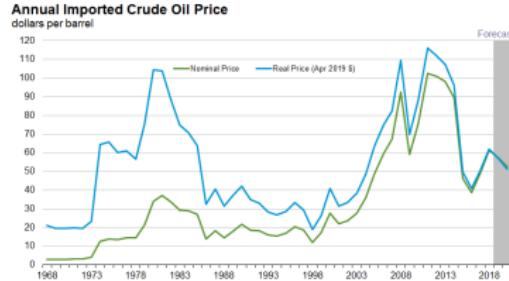
Commodities



Energy intensity - required oil and coal inputs. Source: EIA; World Bank; IMF calculations

- Even with improvements in energy efficiency (some of which come later in development cycle), the 'great doubling' and developing country growth will put pressure on prices...

Oil markets and prices



Real and nominal oil prices (imported crude oil price, \$ per barrel).
Source: EIA Short Term Oil Energy Outlook (April 2019)

- Note the 'oil shock' price run-up in 70's (traditionally attributed to OAPEC embargo)
- Note also the substantial run-up at the start of the 00's
 - Many people attribute this to 'the great doubling'/China etc.
 - But also coincides with 'financialization' of commodity markets
 - Oil futures/derivatives sometimes thought to be 'tail wagging the dog'

Oil markets and prices

Supply issues

- Short-run supply constraints (energy and metals)
 - Long lead times to expand capacity and strength of emerging market demand was not fully anticipated
 - 'Convex adjustment costs' from rapid capacity expansion (though smaller scale fracking rigs ameliorate this)
 - Closely connected to unpredictable political influences / instability
- Long-run supply constraints (energy and metals)
 - Degradation of the natural resource base means incremental supplies take more capital and skills to extract
 - Unpredictable discoveries – shale (in the US)

Oil markets and prices

'Fundamental' demand issues

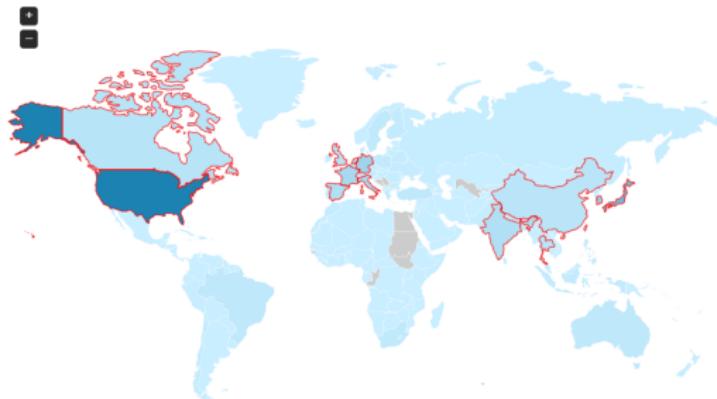
- Short run demand
 - Closely related to demand fluctuations in global business cycle
 - China and U.S. activity in particular are closely watched
 - Dollar fluctuations (why?)
- Long run demand
 - Great doubling etc.
 - Electric cars and peak oil demand?

Oil markets and prices

Imports of Crude Oil including Lease Condensate - 1999 >

Thousand Barrels Per Day

1. United States
2. Japan
3. Korea, South
4. Germany
5. France
6. Italy
7. India
8. Spain
9. Netherlands
10. Singapore
11. Canada
12. United Kingdom
13. Thailand
14. China
15. Taiwan



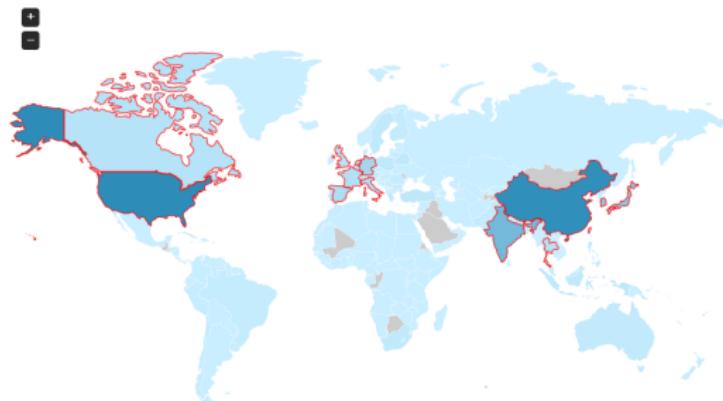
Petroleum and other liquids imports (1999). Source: *EIA*

Oil markets and prices

Imports of Crude Oil including Lease Condensate - 2016* ↗ ("most recent year with sufficient data for ranking")

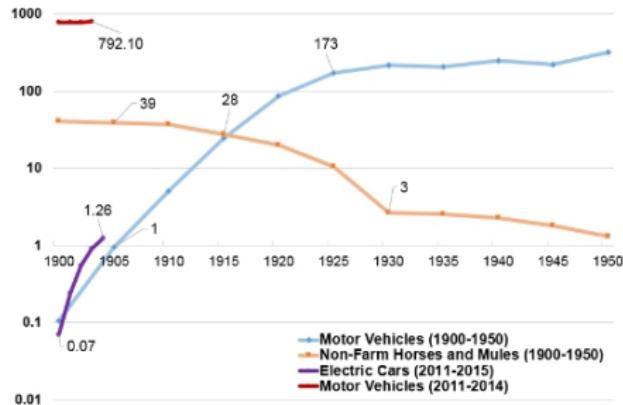
Thousand Barrels Per Day

1. United States
2. China
3. India
4. Japan
5. Korea, South
6. Germany
7. Spain
8. Italy
9. France
10. Netherlands
11. Singapore
12. Canada
13. Thailand
14. Taiwan
15. United Kingdom



Petroleum and other liquids imports (2016). Source: *EIA*

Oil markets and prices



Extrapolating (heroically) electric car implications (vehicles per thousand people, log scale). Source: *Cherif et al, 2017, IMF WP 17/120*

- Enormous uncertainty over electric cars and implications for demand
- But electricity generation is less oil-dependent and travel optimizations likely
- Renewables also dropping in price - likely to continue
- Suggests substantial ↓ for demand for oil

Oil markets and prices

2018 U.S. and other top 5, total petroleum and other liquids production

Thousand Barrels Per Day

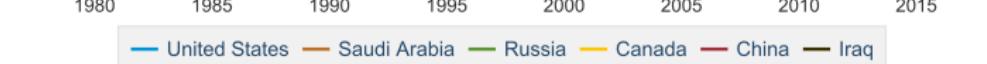
20,000

15,000

10,000

5,000

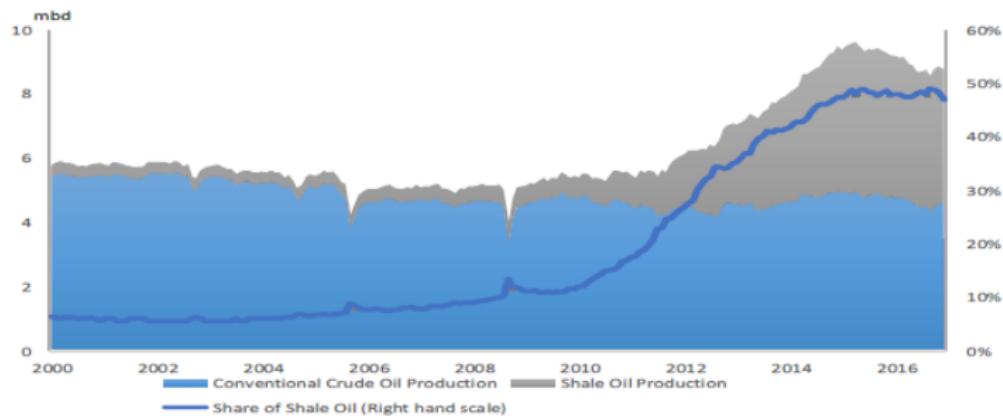
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Source: U.S. Energy Information Administration

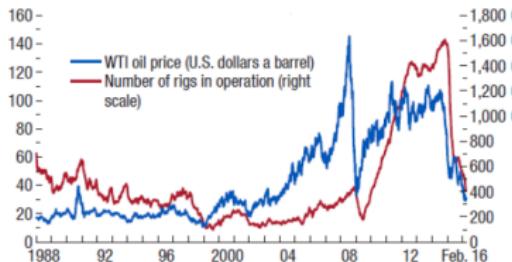
Petroleum and other liquids production - top 5. Source: EIA

Oil markets and prices



Petroleum and other liquids production - top 5. Source: Frondel et al (2018), IAEE Energy Forum, 2018Q2

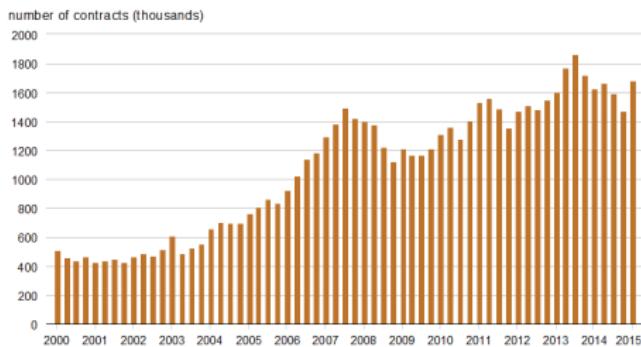
Oil markets and prices



WTI price and weekly rig count. Source: IMF WEO 2016

- High prices (prior to Great Recession) spurred research and made more expensive types of extraction viable (fracking, shale, oil sands, tight oil)
- After the methods were proved, there was a huge expansion in U.S. production
- Introduces greater supply elasticity in short to medium run
- Break even point now even lower (see my own research on losses when prices fell in 2014)

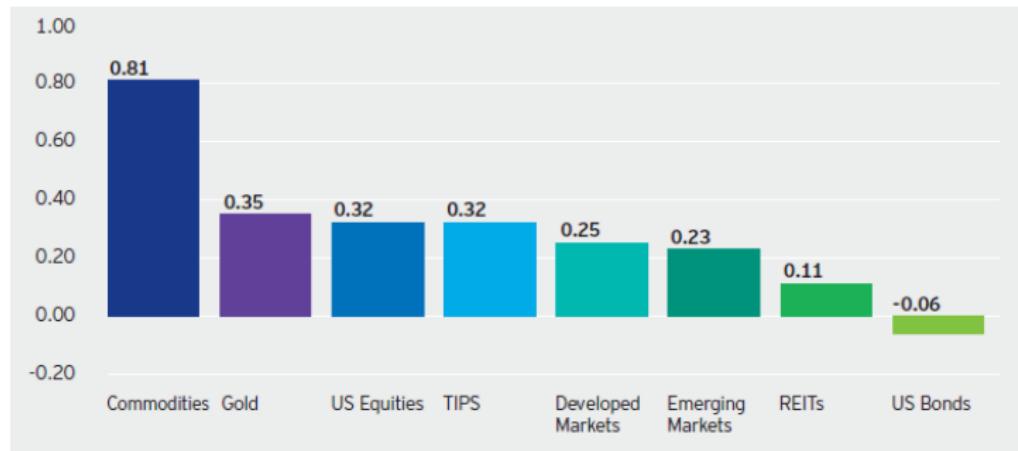
Financialization of commodities



Average daily open interest in crude oil futures on U.S. exchanges
(number of contracts, thousands). Source: NYMEX CME Group; EIA

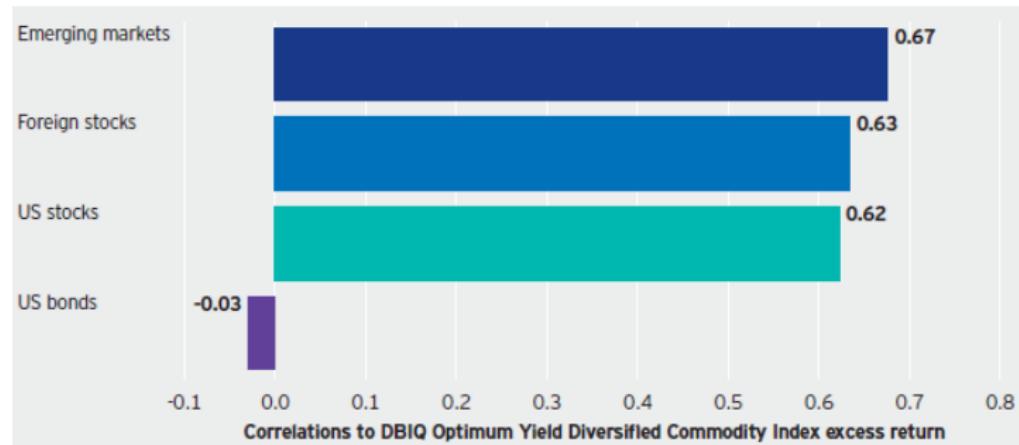
- For those not interested in **using/storing** oil (e.g. hedge funds or asset managers) exposure is obtained through - very deep and liquid - futures markets
- Not interested in delivery or delivering underlying so roll or offset positions at end of month
- Why? Oil more volatile, liberalized financial markets, search for diversification, price discovery...

Financialization of commodities



Hedging properties: 10-year correlation of with inflation. Source: Invesco WP, 'Commodities as an Asset Class'; Bloomberg LP

Financialization of commodities



Hedging properties: Correlation with other asset classes. Source: Invesco WP, 'Commodities as an Asset Class'; Bloomberg LP

Financialization of commodities



ICE Brent (\$ per barrel) and 'speculative activity' (thousands of contracts). Source: NYMEX CME Group; EIA

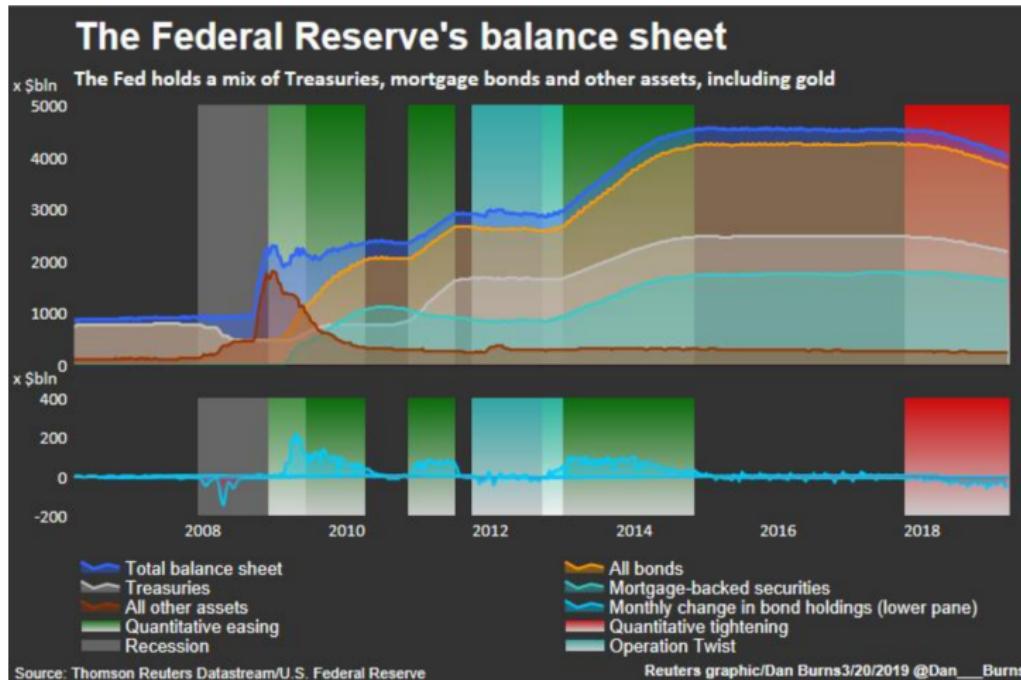
- Debate over futures market (and speculation) 'driving' spot
 - Financialization coincided with sustained price increases
 - Unclear what channel
 - Possible: segmented markets, dispersed info, learning from prices
- Consensus ≈ most of the price drivers are 'fundamental'
 - Krugman (2008) - no evidence of stockpiling (also see Killian)

Monetary Policy

Monetary Policy

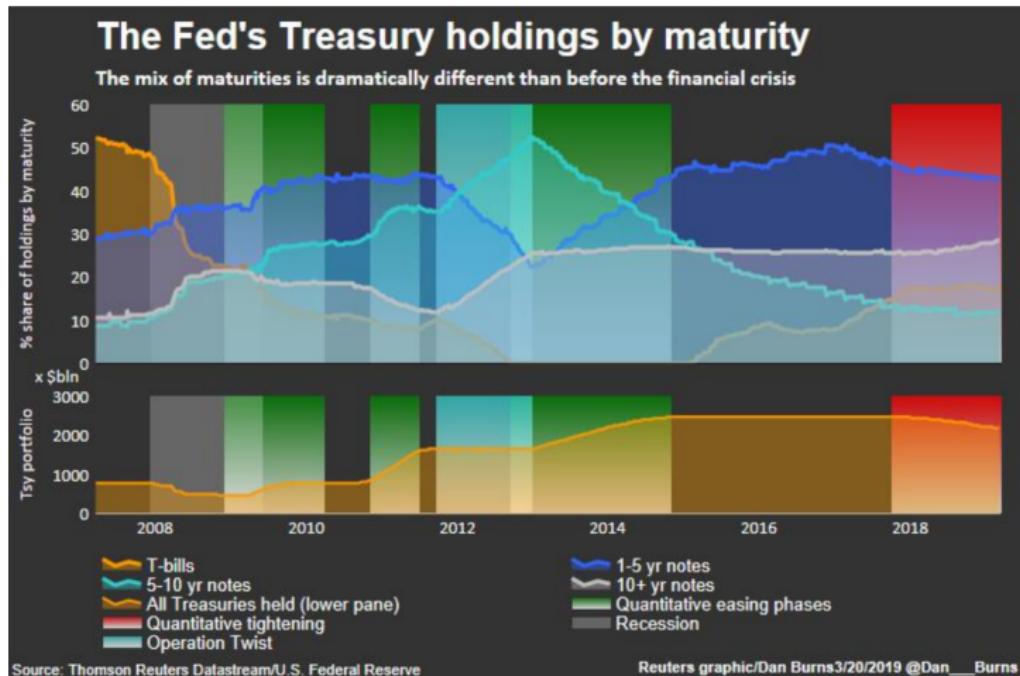
- During the 'Great Recession' policy was loosened dramatically
- Interest rates were cut to the extent they hit the 'zero lower bound'
- Unconventional monetary policy (to some extent) substituted for use of the 'short rate'
 - Lending facilities (more credit policy than monetary)
 - Forward guidance
 - Large scale asset purchases (and maturity twists) . . .
- Various possible channels
 - Signaling
 - Elicit portfolio re-balancing to riskier assets
 - Suppress long term rates - which had room to drop above zero (why?)
 - Indirectly may have weakened currency as side effect
 - Confidence?

Unconventional policy in the Great Recession



Decomposition of Fed holdings on asset side of balance sheet - by asset type (\$ billions). Source: Reuters

Unconventional policy in the Great Recession



Decomposition of Fed holdings on asset side of balance sheet - by maturity (\$ billions). Source: Reuters

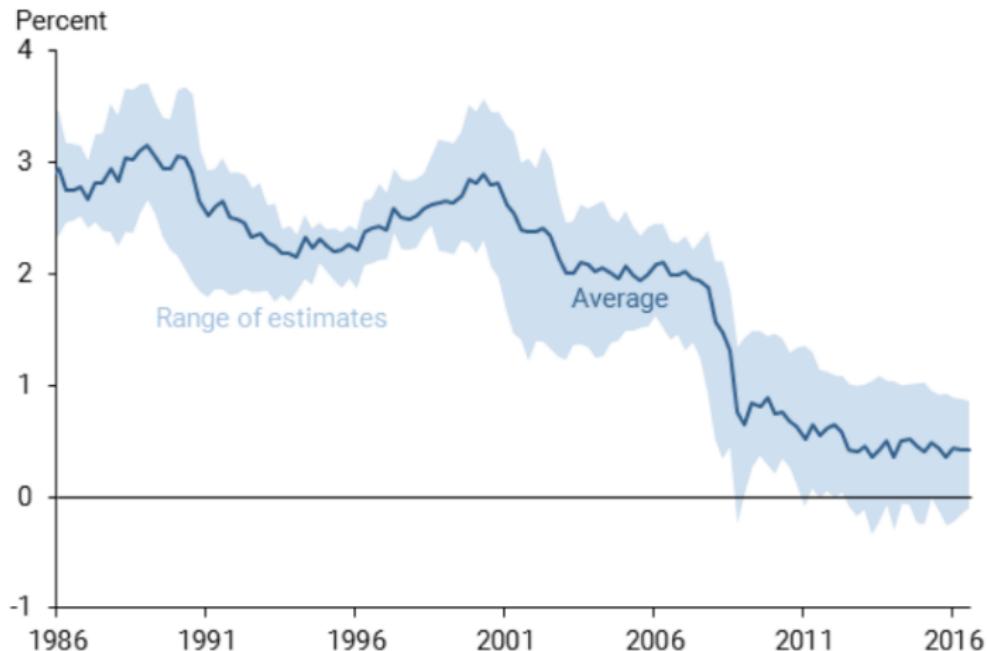
Monetary policy since the Great Recession

- Similar approaches were adopted in the U.K. and by the E.C.B.
- Since the crisis rates have begun to normalize
- But it seems that the long run level of interest rates are 'structurally' lower than before
- People refer to a 'decline in r^* '
- Fisher equation: Nominal interest rates = real + expected inflation

$$i^* = r^* + \pi^e \quad (1)$$

- People used to think $\approx 2.5\%$ but now $\approx 0.5\%$

Declining r^*

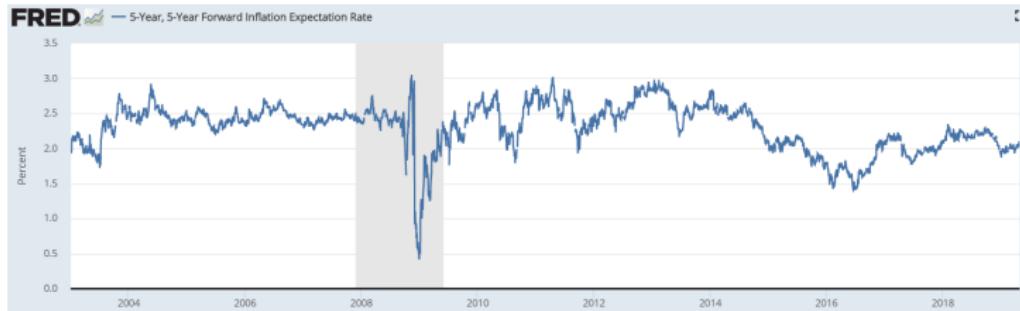


Estimates of r^* . Source: Williams (2017)

Declining inflation and inflation expectations?

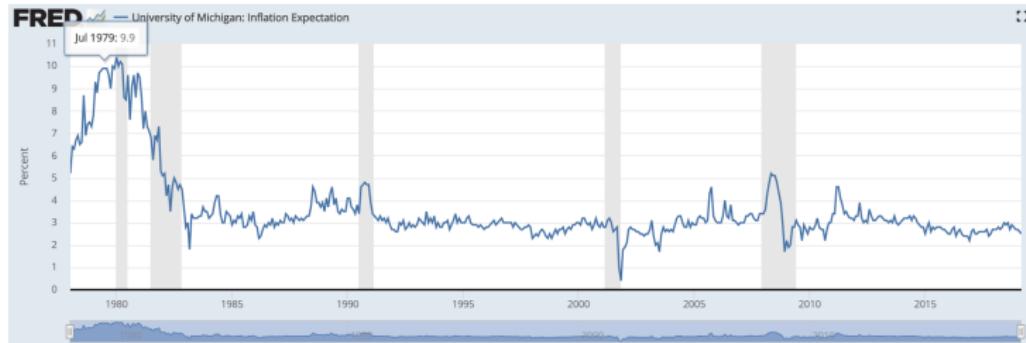
- Inflation has been brought down to \approx in many developed countries
- Implies that with lower r^* the zero lower bound may bind again - and possibly more frequently
- Some have suggested that persistently low inflation (below standard 2% targets) might deanchor inflation expectations downwards
- Matter of current debate - hints of it in the data though others argue expectations are still anchored

Declining inflation and inflation expectations?



Five-year-five-year forward measure of market implied inflation expectations. Source: FRED (St Louis Fed)

Declining inflation and inflation expectations?



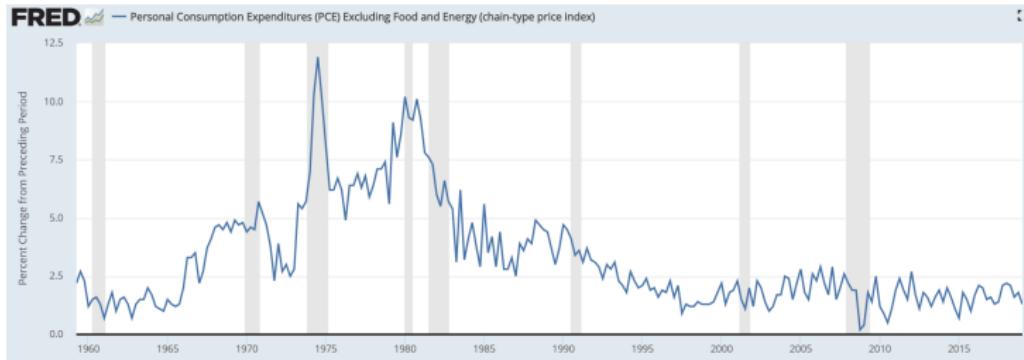
University of Michigan Survey of Inflation Expectations. Source: FRED
(St Louis Fed)

Declining inflation and inflation expectations?



PCE price inflation (percentage change, yoy). Source: FRED (St Louis Fed)

Declining inflation and inflation expectations?



PCE price inflation - excluding food and energy (percentage change, yoy). Source: FRED (St Louis Fed)

Declining inflation and inflation expectations?

Weak US inflation scrambles debate on Fed's next rates move

Policymakers have opened the door to further easing if the data warrant it



Most analysts still believe the Fed will keep interest rates unchanged for the rest of the year © AP

Sam Fleming in Washington APRIL 28, 2019

16

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Sluggish inflation numbers are persistently overshadowing firmer US growth and teeing up a debate in the Federal Reserve over whether the [next move](#) in interest rates may need to be down rather than up.

Tension between firm growth and persistently subdued inflation. Source: FT.com, April 28, 2019

Declining inflation and inflation expectations?

ECB faces stimulus pressure over falling inflation outlook

Drop in technical measure of investors' expectations fuels calls for monetary action



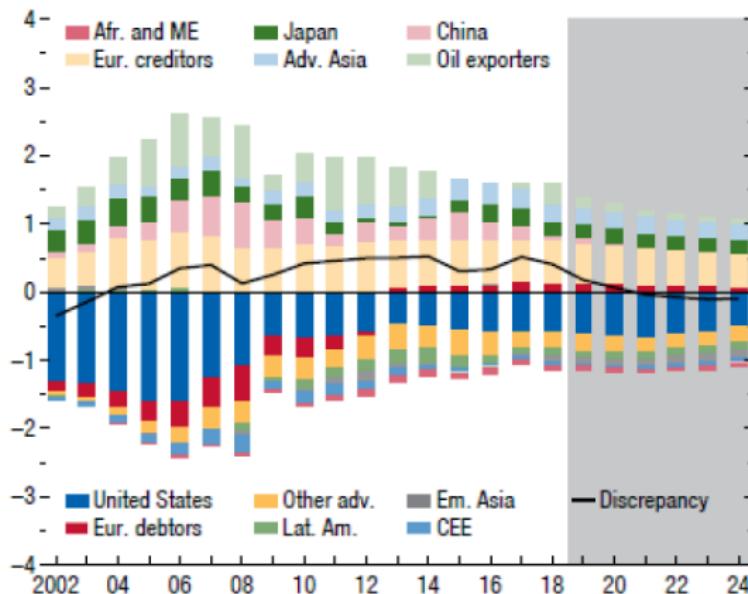
Mario Draghi has become more open to interest rate debate as the economic outlook darkens © Reuters

Not just a U.S. phenomenon. Source: FT.com, April 15, 2019

External Imbalances and Capital Flows

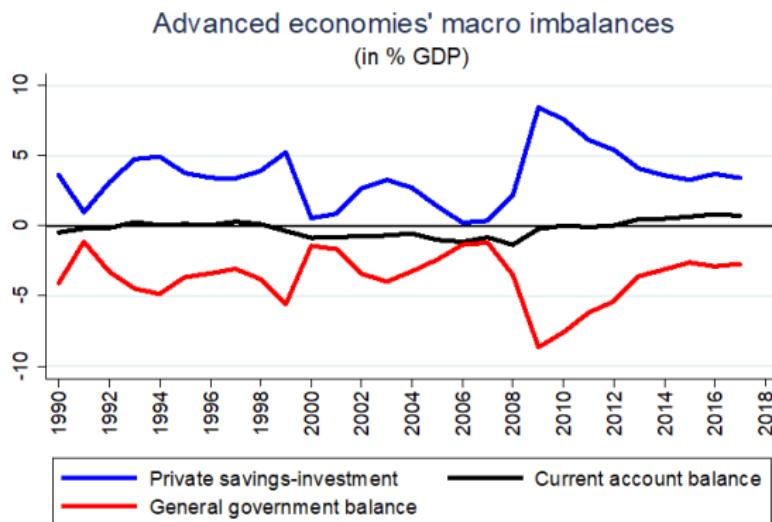
Current account imbalances across countries

Global current account deficits and surpluses are projected to gradually decline, particularly after 2020.



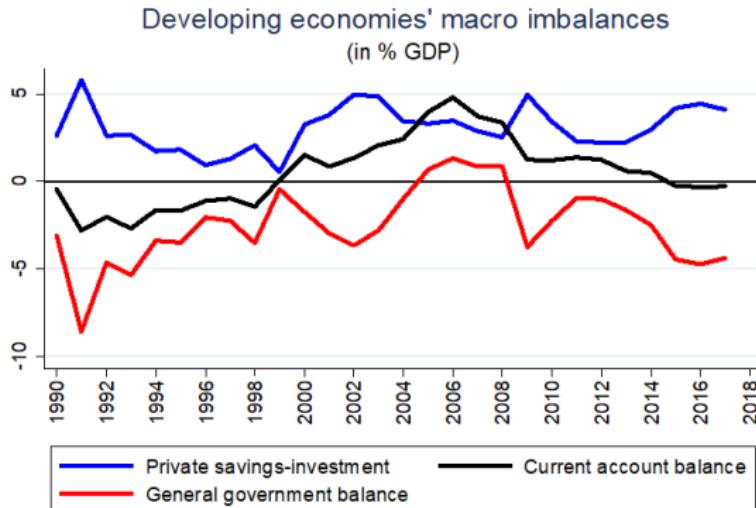
Global current account imbalances. Source: IMF WEO 2018

Current account imbalances across countries



Advanced economy macro imbalances. Source: IMF WEO 2018

Current account imbalances across countries



Developing economy macro imbalances. Source: IMF WEO 2018

Current account imbalances across countries

More on this later in the course...