New Data for New Economy:
Digital Transformation in 21st Century

Andrew Sheng

Distinguished Fellow, Asia Global Institute, The University of Hong Kong
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Key Points 1

- Structure of Global Economy and Financial System has changed dramatically in the last 15 years, due to financial innovation, deregulation, globalization and technology

- Post Crisis, further complexities and uncertainties from mega-trends in geo-politics, climate change, demographics, technology as well as unconventional monetary policy, post-crisis regulatory reforms, and market structures

- These transformative shifts require changes in mindsets, governance, new measures of inter-connected behaviour (social media) and new data-sets

- We cannot understand complexity of change unless we supplement old measurements with new data sources and factors (e.g. national balance sheets) to make better policies

Key Points 2

- Prior to 2008, Great Moderation was naïve in explaining how world operated, with view that free markets, globalization and good monetary policy would be adequate to ensure financial stability and full employment with growth
- This view ignored radical uncertainty, as well as interactive feedbacks between different parts of global system that cannot be explained by mechanical model of economy
- Financial Risks are now systemic, interactive and global but it was not just due to Real Sector Imbalances (Savings Glut theory) but more due to lack of control over leverage (Banking Glut theory). DSGE models ignored role of finance and interaction feedbacks
- Need systemic perspective of how real and financial systems interact and inter-dependent, because past models, policies were segmented into departmental and national pockets and theory was incomplete
- New Economy needs New Data and New Interpretation Tools

Key Questions Common to Global and Asian Financial Crises (1997-2007)

- Complex nexus between banks-shadow banking at national and global levels in order to understand systemic interactions and feedbacks that were under-estimated, under-measured and misunderstood
- Lack of measurement of "embedded or hidden leverage", due to off-balance sheet accounting (below the line and SIV), netting and off-shore, and under-regulated areas (shadow banking) which escaped regulatory oversight for all sectors, non-financial corporate, financial sector and governments
- Need National Balance Sheet and mapping of connectivity between key nodes (sectors) in terms of flows and stocks
- Need Big Data, including seemingly unrelated factors that enable policy makers to have at least some appreciation of known unknowns

Types of Unknowns

- Perfect information – Key assumption of free market model – in practice unattainable

- Known knowns – Information and past history available, but may not be available to decision maker at time of decision

- Known unknowns – We know that such unknowns exist - e.g. Black Holes, but we have not proven or found out how to measure

- Knowable unknowns – Using Big Data, we might be able to conjecture, estimate or paint scenario of what these unknowns may look like

- Unknown Unknowns – True radical uncertainty – something unknown that is beyond normal comprehension

Section 1 **Structure of Finance is Changing Shadow Banking-banking Nexus – Need for New Thinking**
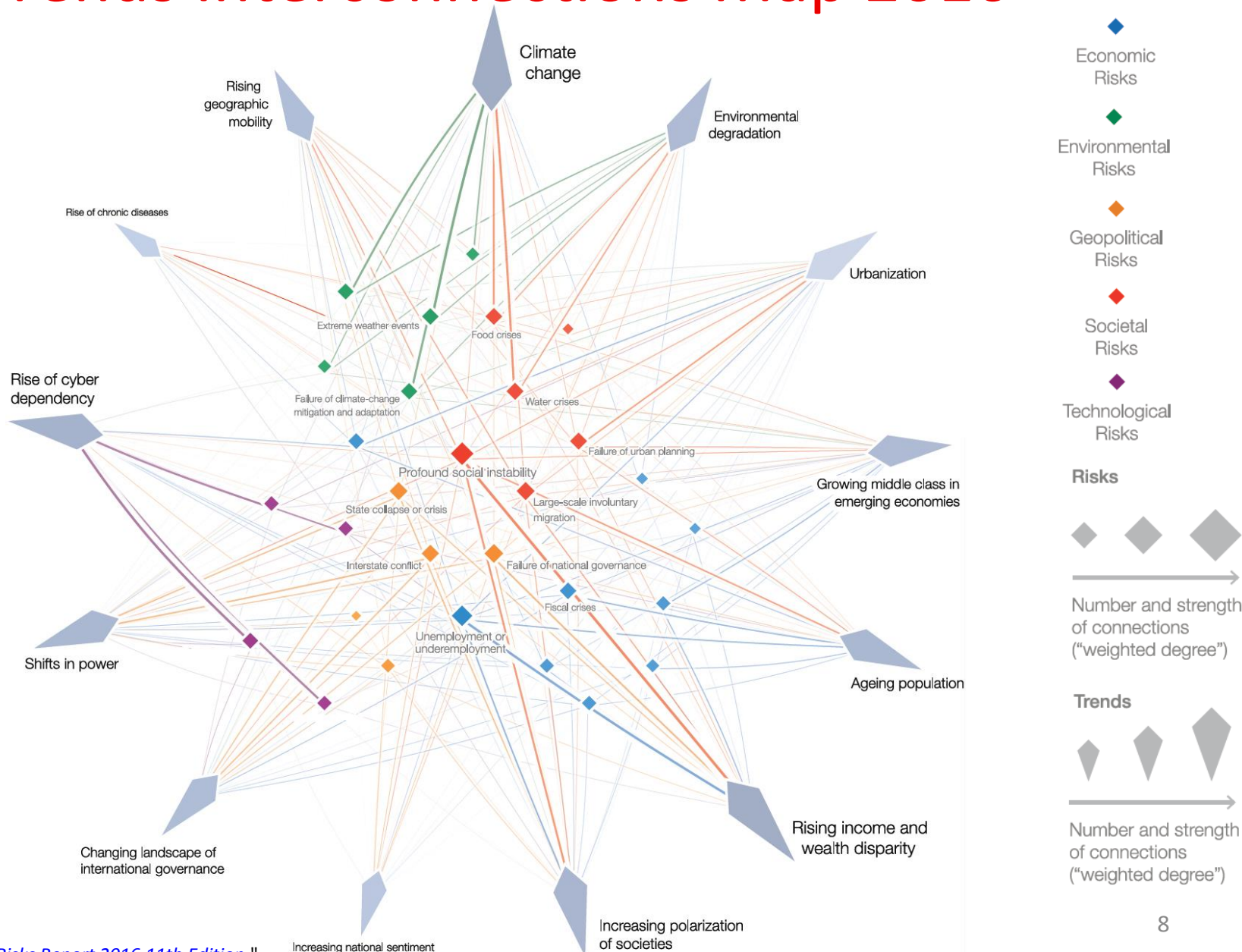
Finance now dependent on central banks, Looking both deep and wide, 'When and Where on top of How, What and For Whom?'
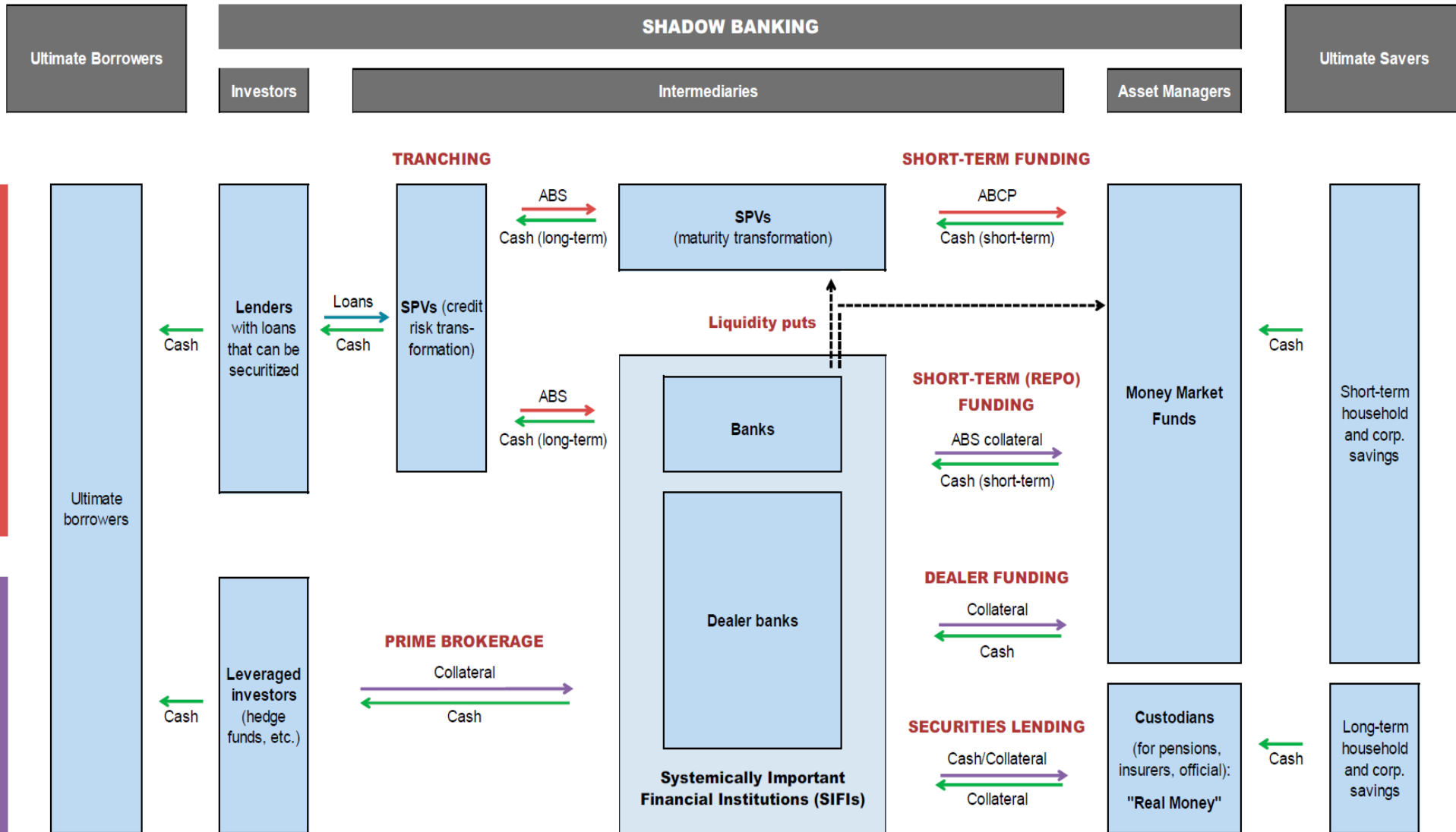
Transformative Mega-trends that Change Finance

- Global Rebalancing – Multipolar Cold War 2.0 = growing geo-political risks
- Demography – Dividends or Age burden?
- Financialization and Debt Overhang – Who pays?
- Disruptive Technology – Jobs and Creative Destruction
- Climate Change – Water, Food & Energy Stress
- Governance – Democracy, Market or State?

QE and Negative Interest Rate Policy (NIRP) is destroying business model of banks, insurance and asset management - who will pay 1-1.5% management fee if non-leveraged return is near ZERO?

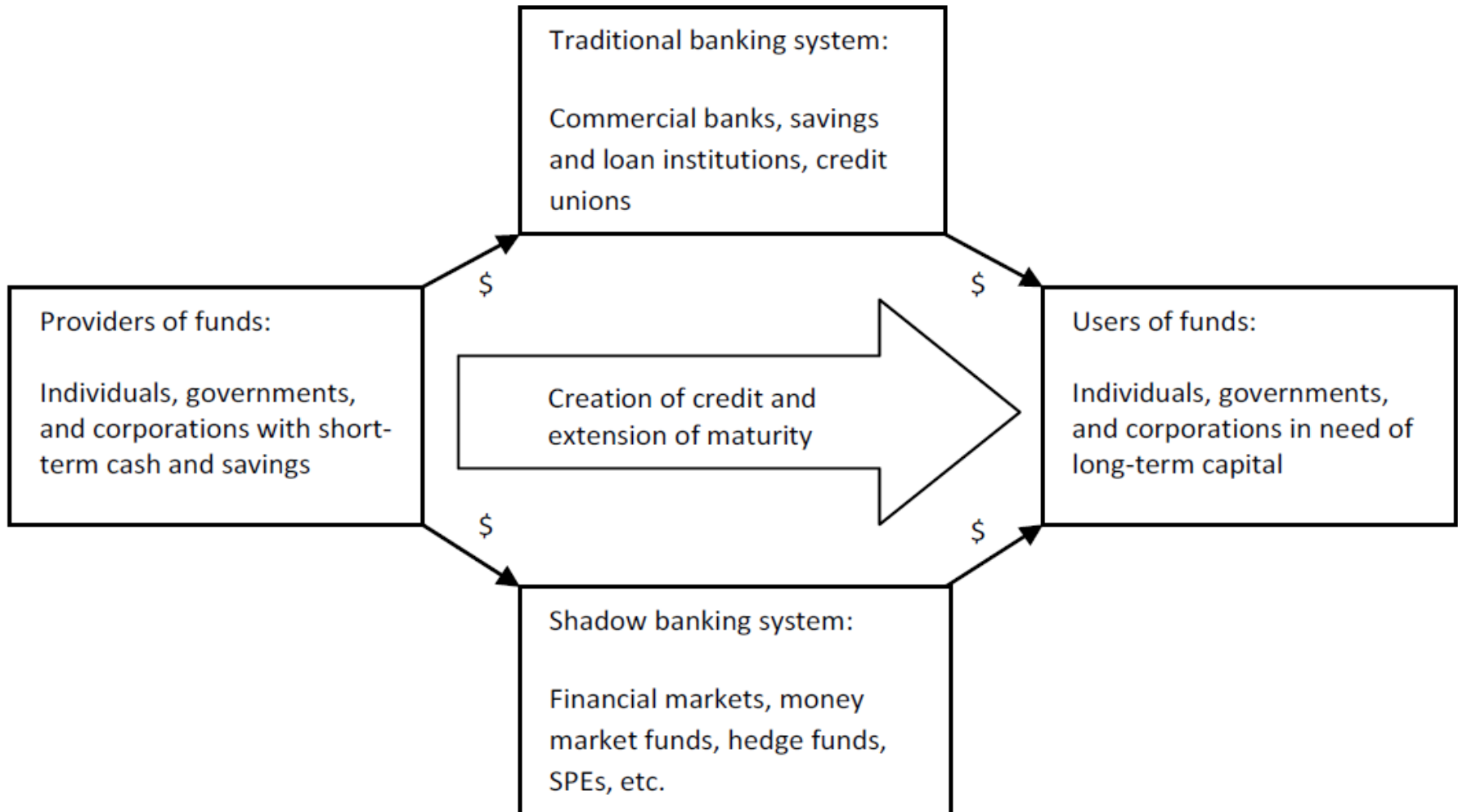# Risks-Trends Interconnections Map 2016

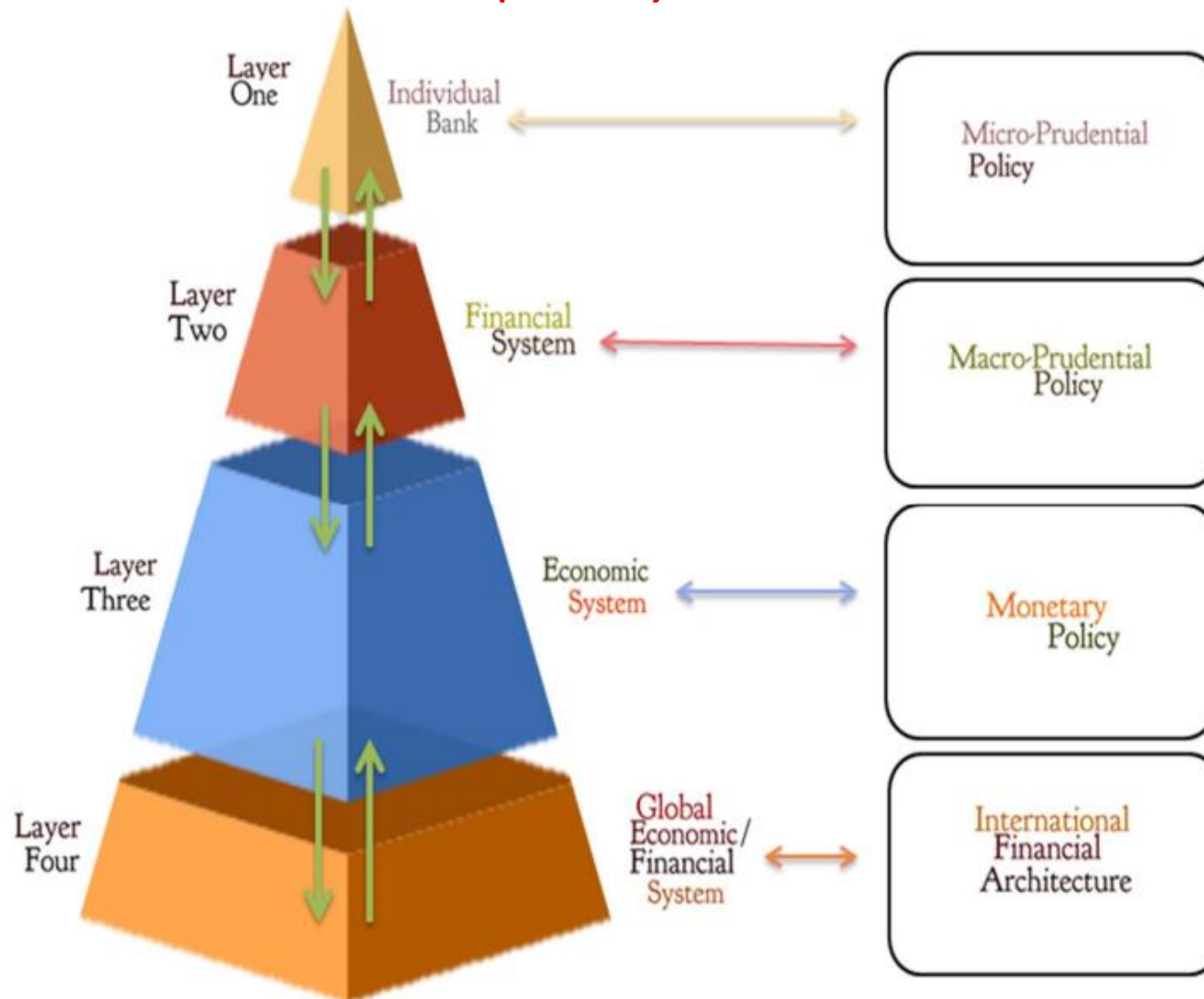# Shadow Banking Map – *Claessens (2012)*

Notes: ABS = asset-backed securities; ABCP = asset-backed commercial paper; SPV = special-purpose vehicle
Source: Claessens, Pozsar, Ratnovski & Singh. 2012. "*Shadow Banking: Economics and Policy*." IMF SDN/12/12.

Shadow Banks (NBFIs) Transform Short-term into Long-term Sources of Capital

Financial intermediation through banks and markets

Traditional banking system:

Commercial banks, savings and loan institutions, credit unions

Providers of funds:

Individuals, governments, and corporations with short-term cash and savings

Creation of credit and extension of maturity

Users of funds:

Individuals, governments, and corporations in need of long-term capital

Shadow banking system:

Financial markets, money market funds, hedge funds, SPEs, etc.

Source: FCIC. 2010. "*Shadow Banking and the Financial Crisis*." Preliminary Staff Report.

Financial Regulation Needs to be Systemic and Not "Silos" *– Haldane (2015)*

Source: Haldane, 2015. "On Microscopes and Telescopes."

We Need to Think Systemically and Learn How to Adapt to Complex Systems Within Systems

- **Macro**: Current neoclassical models "at best useless and at worst harmful" (Krugman) – reductionist based on false assumptions
- **Meso**: Institutions matter – link between Macro and Micro behaviour – must look at quality of Property Rights Infrastructure of law, judiciary etc.
- **Micro**: Specialized silos of academia and policy making miss big picture – what looks reasonable at departmental or national level, does not add up at global level
- **Meta**: Hidden connections and principles underlying economic thought
  - Macro ≠ Σ Micro
  - Pro-cyclical Feedback between state and market, banks and shadow banks, nation and global, lead to complex outcome of unintended consequences + collective action traps

New thinking – from static and stable mechanical markets to dynamic, non-linear, continuous disequilibrium – **When and Where on top of How, What and For Whom?**

Segmentation and Specialization vs. Integrative System-wide Views

- As the world become more complex, both academic disciplines and government agencies or even corporate departments became more and more specialized – we know more and more about less and less. We drill deep but not wide
- On the other hand, generalists who understand big picture (which may not be available because of inadequate statistics), know less and less about more and more. They look wide, but cannot understand detail - devil is in details, especially in implementation
- Situation is like blind men describing elephant by touching the parts
- Banking is Global in Life and National in Death – Mervyn King
- We need to look both deep and wide
- Central banks became specialized only in (national) monetary policy, and did not see the complex way financial risks were emerging at a global, systemic level, with huge system liquidity and credit implications

Macro- vs. Micro-prudential Perspectives
– *Galati and Moessner (2011) BIS Working Papers 337*

Macro- vs micro-prudential perspectives

	Macroprudential	**Microprudential**
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid macroeconomic costs linked to financial instability	consumer (investor/depositor) protection
Characterisation of Risk	"endogenous" (dependent on collective behavior)	"exogenous" (independent of individual agents' behavior)
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	in terms of system-wide risk; top-down	in terms of risks of individual institutions; bottom-up

Data source: Borio (2003).
Source: Galati & Moessner. 2011. "*Macroprudential Policy – A Literature Review*." BIS Working Papers 337.

Key Differences between "Static" Mechanical and Dynamic/Organic Perspectives

"Static" National Micro-Prudential

1. If individual institutions are sound, system is sound
2. Allowed faster trading, more leverage and regulatory arbitrage, as natural function of free markets
3. Focus on above-the-line exposure
4. Netting helps reduce risks
5. Segmented Perimeter/Jurisdiction ensure regulatory arbitrage and off-shore activities
6. Apply more new rules to fix old problems

Dynamic/Organic Macro-Prudential

1. Even if institutions are sound at point of time, dynamic feedback between them can cause instability
2. Need oversight of innovation to ensure sufficient due diligence against systemic spillovers – FDA-type reviews
3. Need to look closely at below-the-line (off-balance sheet) exposures
4. Netting shifts risks to system, as gross exposure is ignored. Focus on gross exposure
5. System perimeter covers shadow banking and global activities
6. Less is more – keep basic principles simple – economic substance over rules

Operationalizing Macro-pru Work – *CGFS (2012)*

Transmission map of raising capital or provisioning requirements
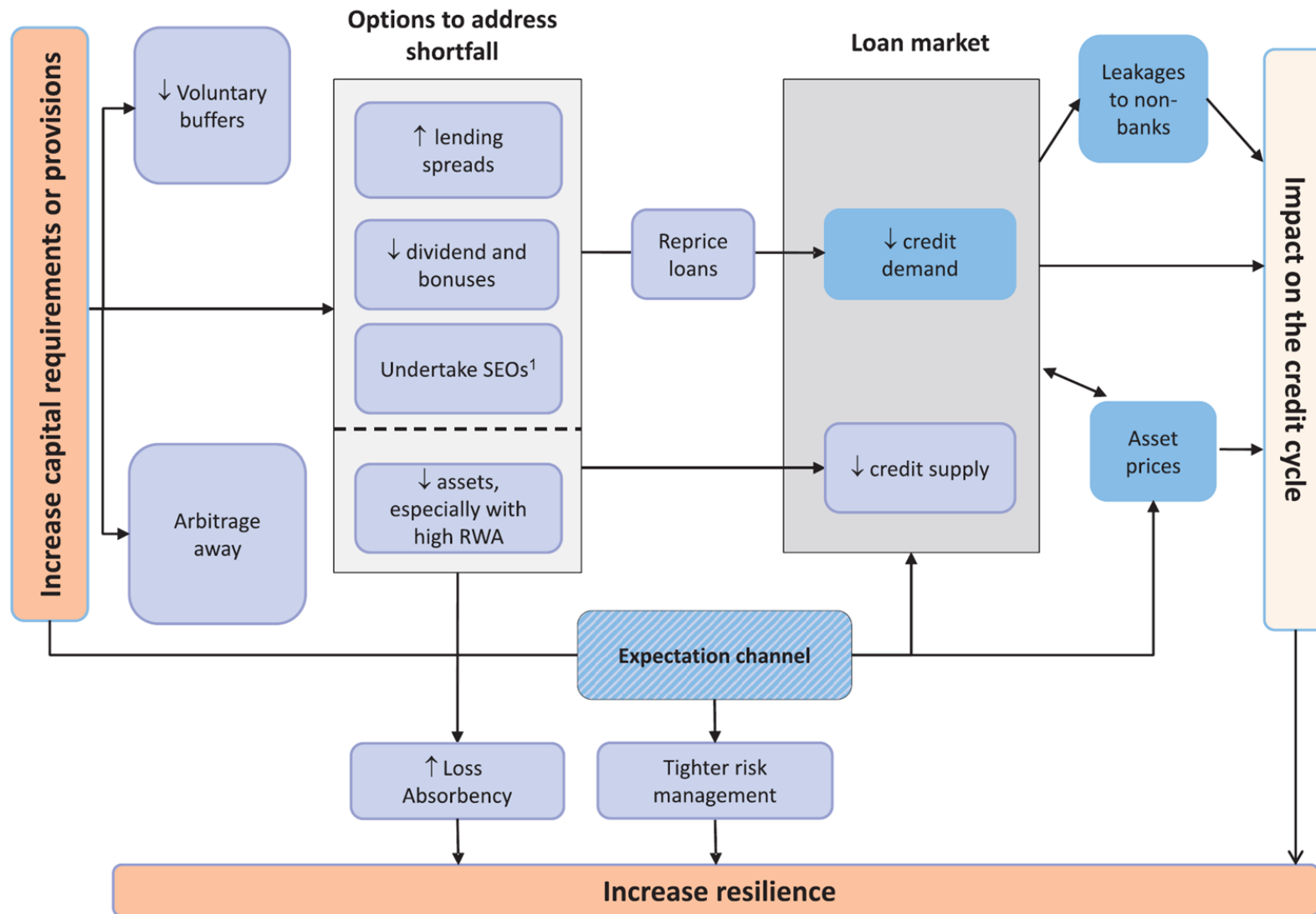
Note: Purple cells = possible bank reactions; blue cells = possible market reactions.
Source: González-Páramo. 2012. "*Operationalising The Selection And Application Of Macroprudential Instruments*." CGFS Papers 48.

Section 2 Global Finance

Interconnection and Interdependence, Nexus between Banking-Shadow Banking, Net vs. Gross

Global Finance is Interconnected, Interactive and Interdependent
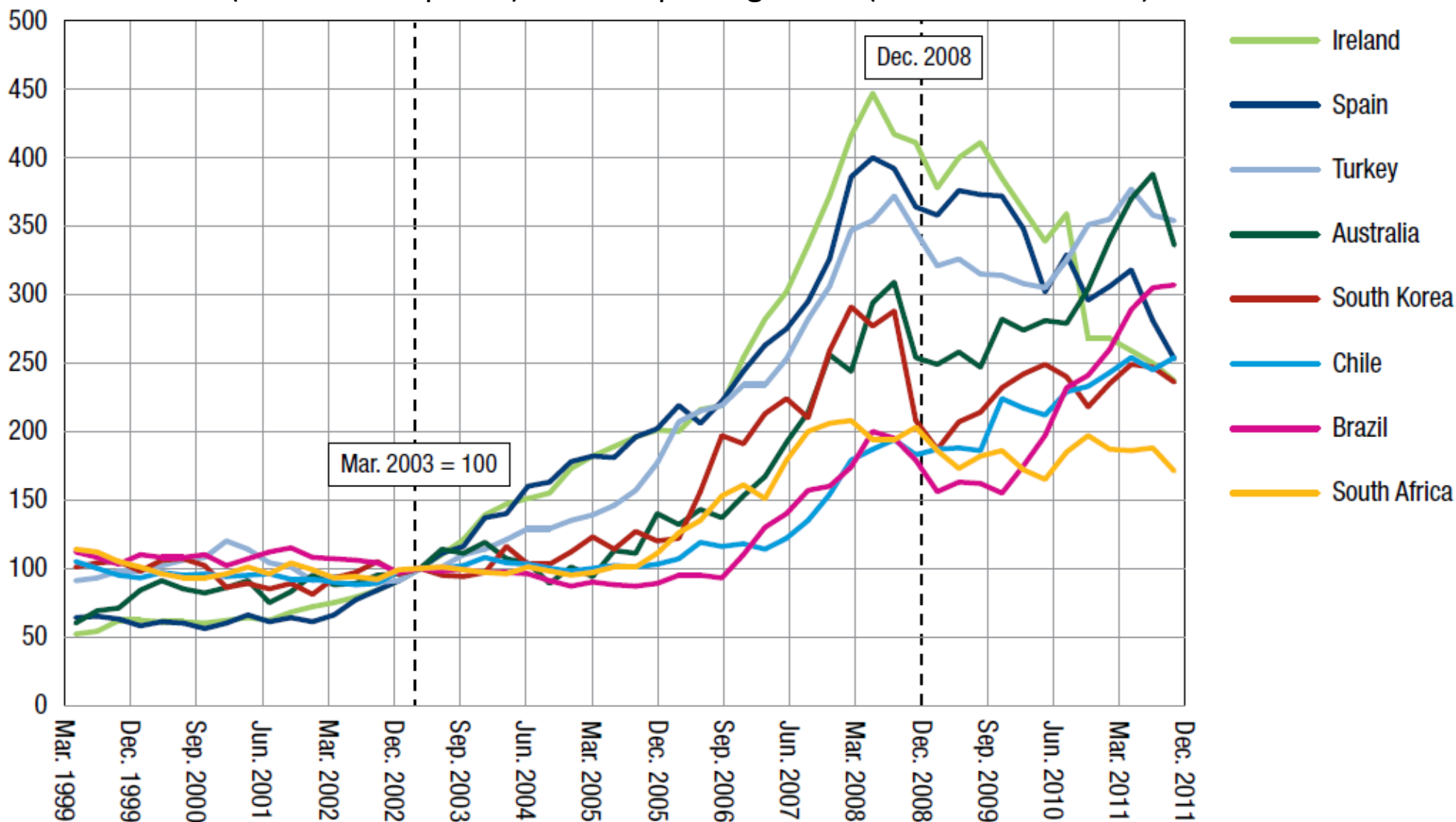
The Global Trade Network, 2009
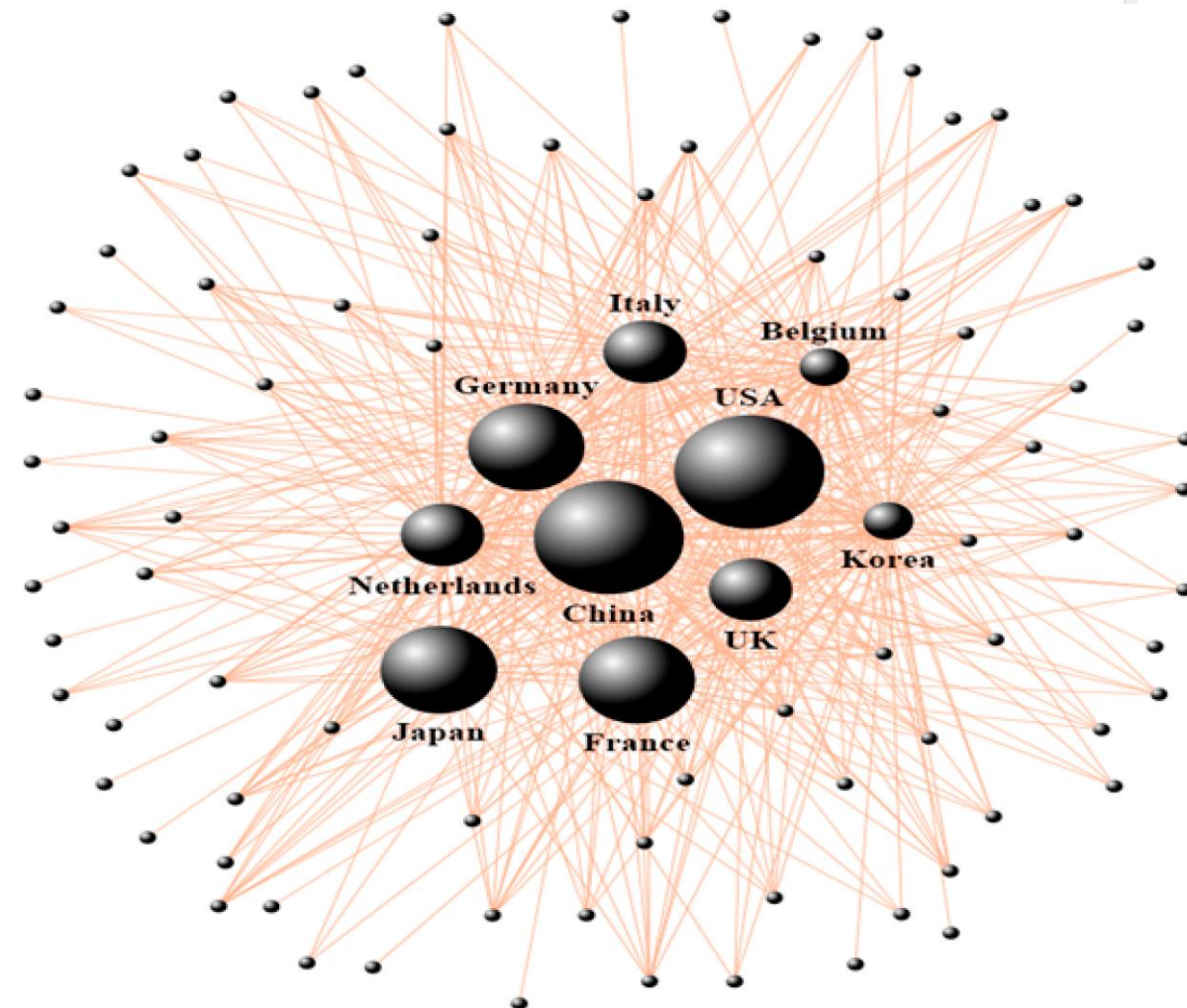
Central bank balance sheets must be seen in the context of interconnected and interactive global finance

Data sources: DOTS and Fund staff estimates.
Source: IMF. 2011. "*Changing Patterns of Global Trade*."

Banks Became More Internationally Exposed (2002-2008)

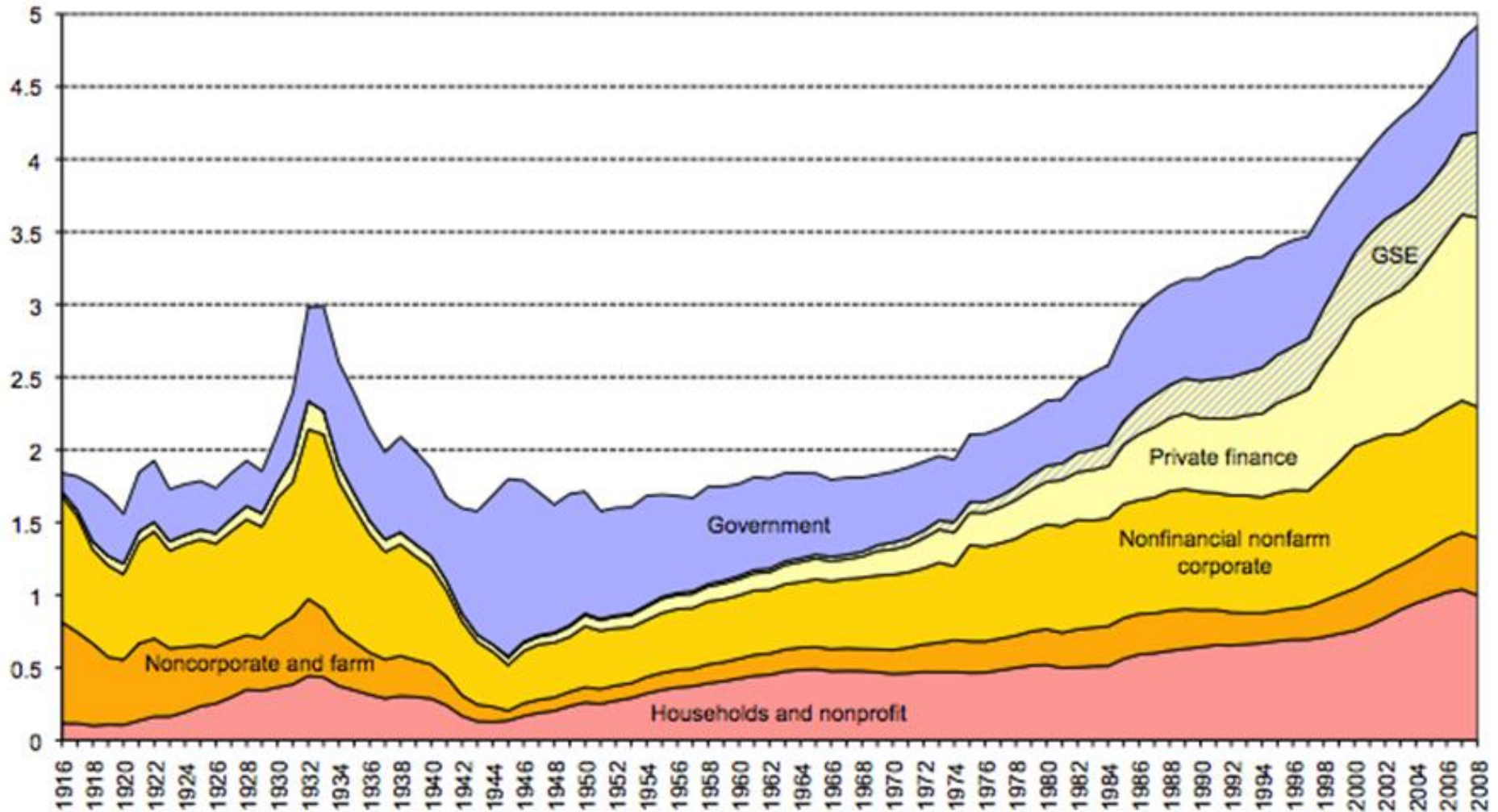External claims (loans and deposits) of BIS Reporting Banks (March 2003 = 100)

Legend: Ireland, Spain, Turkey, Australia, South Korea, Chile, Brazil, South Africa
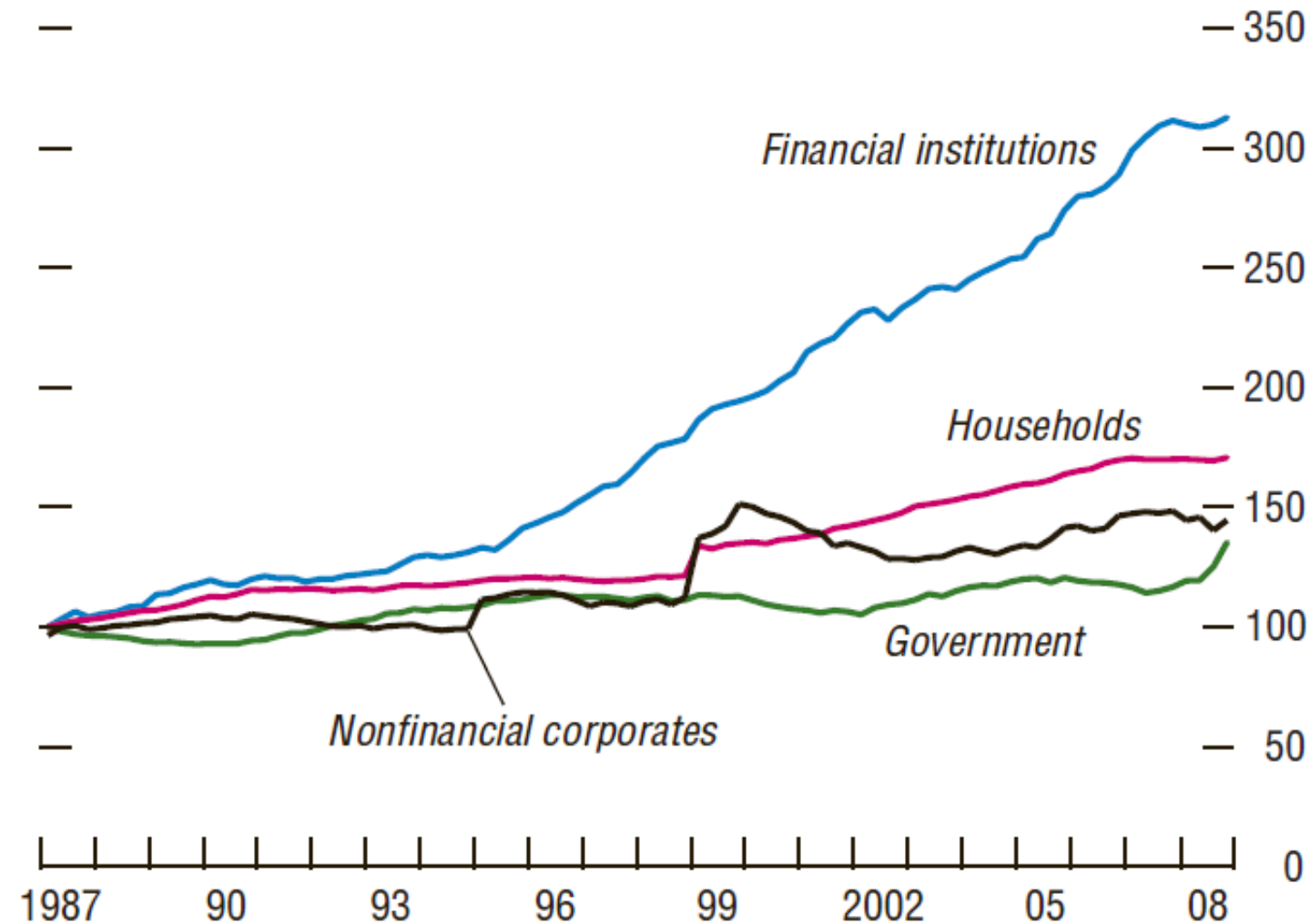
Dec. 2008

Mar. 2003 = 100

Financial Debt 5 times GDP: Finance is No Longer Agent of Real Sector but TBTF

Total financial liabilities relative to GDP

Overall Financial System Became Over-leveraged

Ratio of Debt to GDP Among Selected Advanced Economies
(In %, GDP-weighted, 1987 = 100)

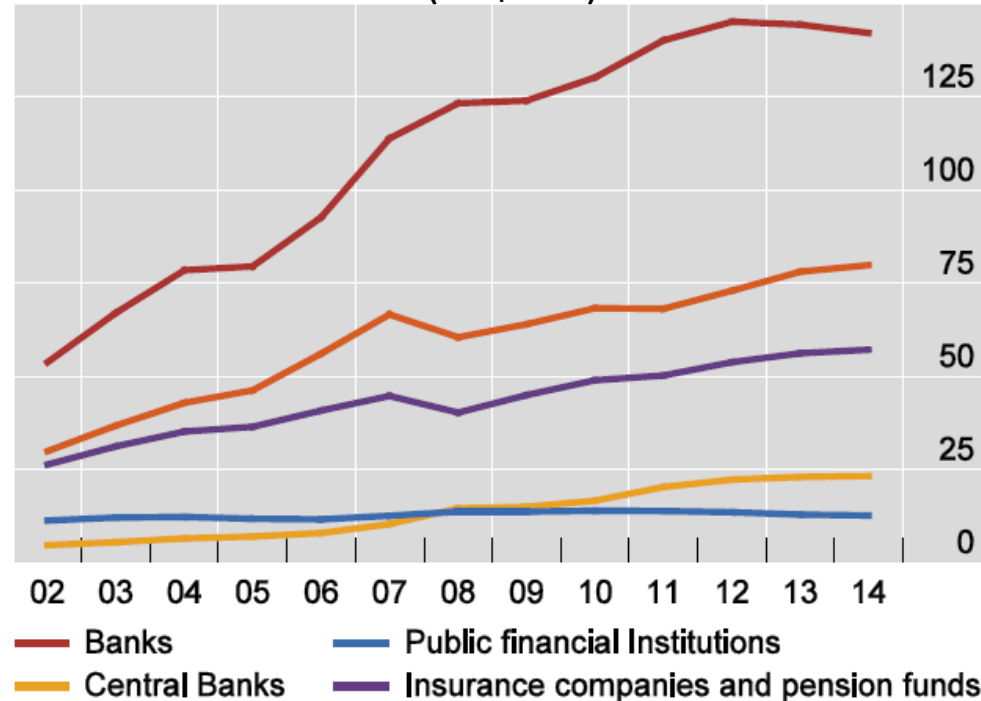The fundamental problem is overconsumption through over-leveraging of finance

Data sources: Bank of Japan; Bureau of Economic Analysis; Federal Reserve; Office of National Statistics; and IMF staff estimates.
Source: IMF. 2009. "*GFSR April 2009: Responding to the Financial Crisis and Measuring Systemic Risk*."
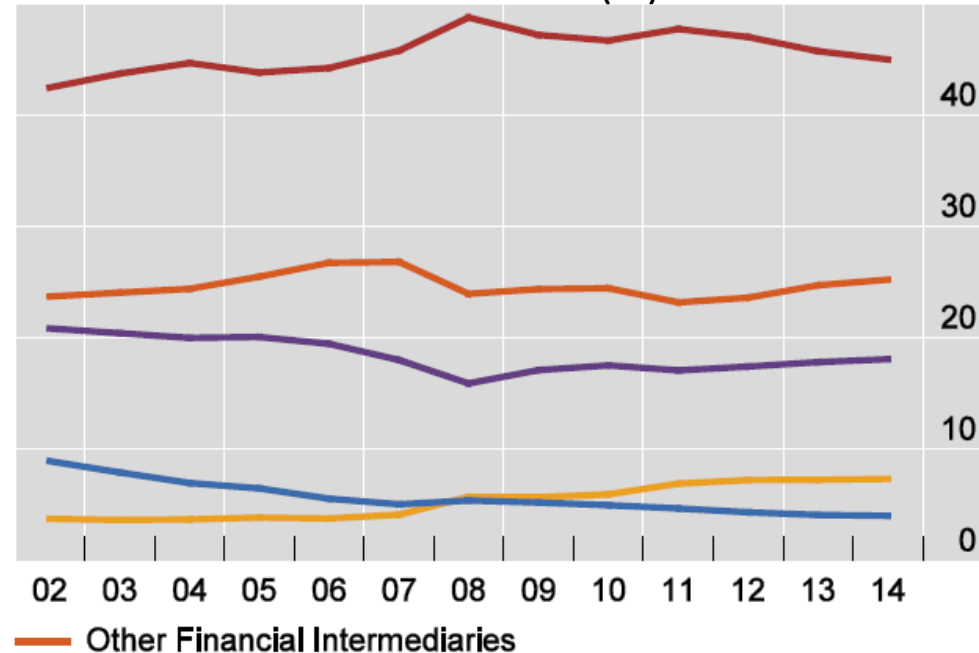
Banking Assets Account for Half of Global Financial Assets, Shadow Banking One Quarter and Central Banks One-eighth

Banking + Shadow + Central Banking = 83% of system – short-term bias with maturity mismatch
(Assets of financial intermediaries: 20 jurisdictions and euro area)

Total financial assets (US$ trn)

Share of total financial assets (%)

Banks — Public financial Institutions — Other Financial Intermediaries
Central Banks — Insurance companies and pension funds

Note: Banks = deposit-taking institutions; OFIs = Other financial intermediaries.
Data sources: National flow of funds data; other national sources; FSB calculations.
Source: FSB. 2015. "*Global Shadow Banking Monitoring Report 2015*."

Basic Problem: Global Shadow Banking Private Credit/Monetary Creation, Not Monitored for Monetary or Financial Stability Risks

- Competition in Global markets allowed regulatory arbitrage into leveraged, pro-cyclical Shadow Banking
  - Bank-Shadow Banking Nexus created highly leveraged and opaque system
  - Funding and accounting is off-balance sheet and off-shore and disguised size of Overall Leverage until it was too late
  - Concentrated Prime Brokers become Too Big to Fail – Too Big to Manage
- Supervision failed to ameliorate procyclical risks
  - Insufficient understanding of financial engineering
  - Insufficient attention to build-up of systemic risks
  - No understanding that market had globalized losses through network leverage
- Basically, the system became too fragile and dependent on short-term funding

Financial Transactions Grew Faster than Real Trade

FX turnover = 23 times world GDP in 2010 (13 times in 1992)

US$ Tn

Legend:
- Stocks Traded, Total Value (Current US$ Tn)
- World Total Merchandise, Imports and Exports (Current US$ Tn)
- World GDP (Current US$ Tn)
- FX Turnover (US$ Tn)

Year	Stocks Traded	World Total Merchandise	World GDP	FX Turnover
1992	4.5	7.6	24.3	321.2
2001	41.5	12.7	31.8	452.6
2010	64.1	30.8	62.8	1453.0

Sources: World Bank, Bank for International Settlements, World Trade Organization.

G-SIFIs: Still Concentrating with Large Off-balance Sheet Liabilities

US$ bn

No	Country	Total Assets	Off-Balance Commitment& Contingency	Home Country GDP	Total Assets/GDP (%)	Off-Balance Commitment& Contingency/ GDP (%)
1	United States	10159	7417	15685	65	47
2	UK	7882	5653	2441	323	232
3	Japan	5950	NA	5964	100	NA
4	France	8112	721	2609	311	28
5	Switzerland	2388	763	632	378	121
6	Spain	2518	487	1352	186	36
7	Germany	2656	268	3401	78	8
8	Netherlands	1542	169	773	200	22
9	Norway	894	NA	501	178	NA
10	Italy	1223	230	2014	61	11
11	China	2034	849	8227	25	10
	Total	45358	16557			
	World GDP	71707	71707			
	G-SIBs/World GDP (%)	63.3	23.1	2002:	47.7%	

Measures of Shadow Banking Differ due to Different Definitions

U.S. shadow banking size estimates in 2010
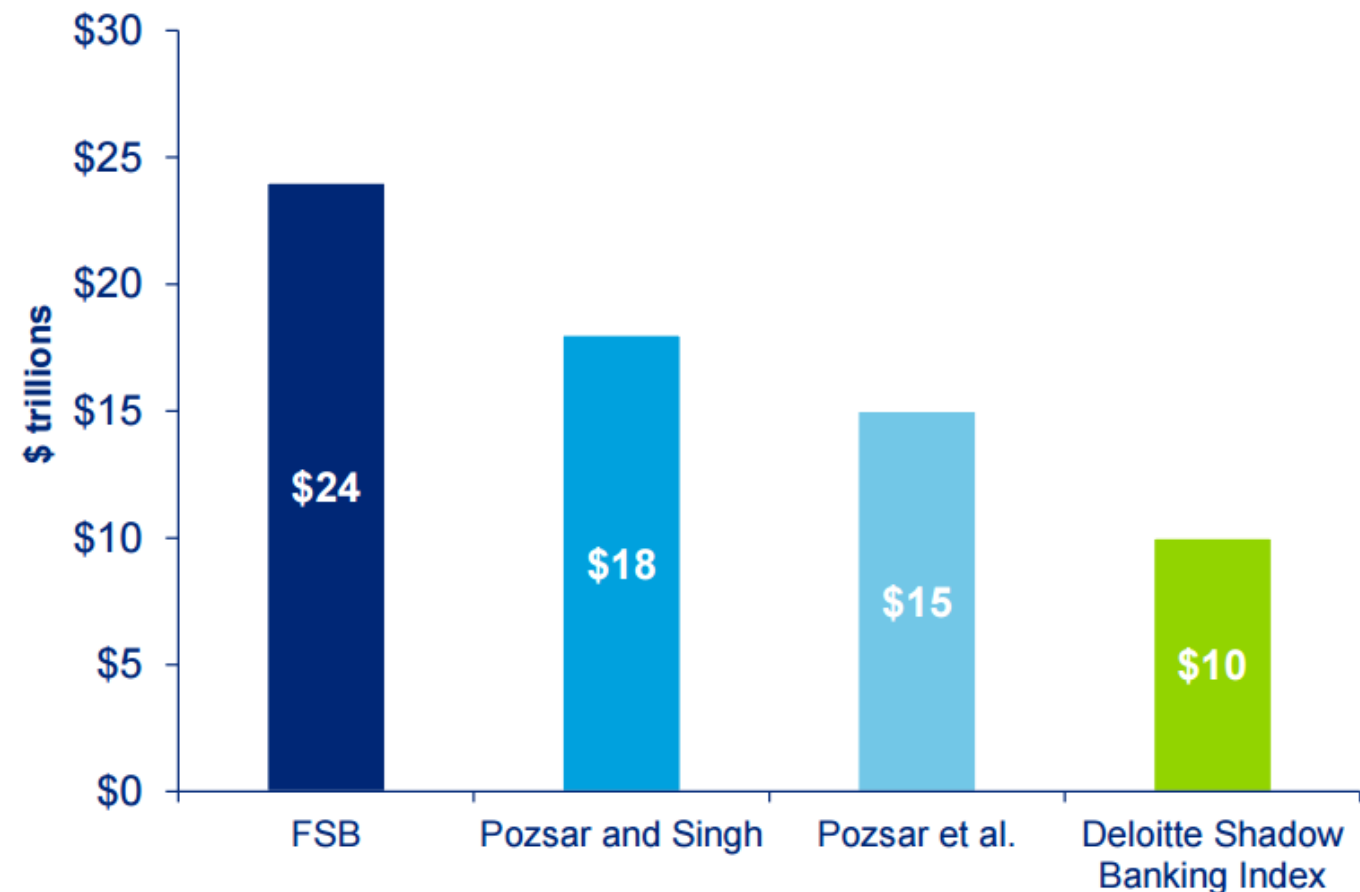
Difference between FSB and Deloitte estimates mainly due to inclusion of investment funds, finance companies, and "others" in FSB estimate

Source: Schneider. 2013. "*Growth and Evolution of the U.S. Shadow Banking System*." Deloitte.

China: Gap between Official and Shadow Interest Rates

Official and shadow market interest rates

Data sources: CEIC and Deutsche Bank.
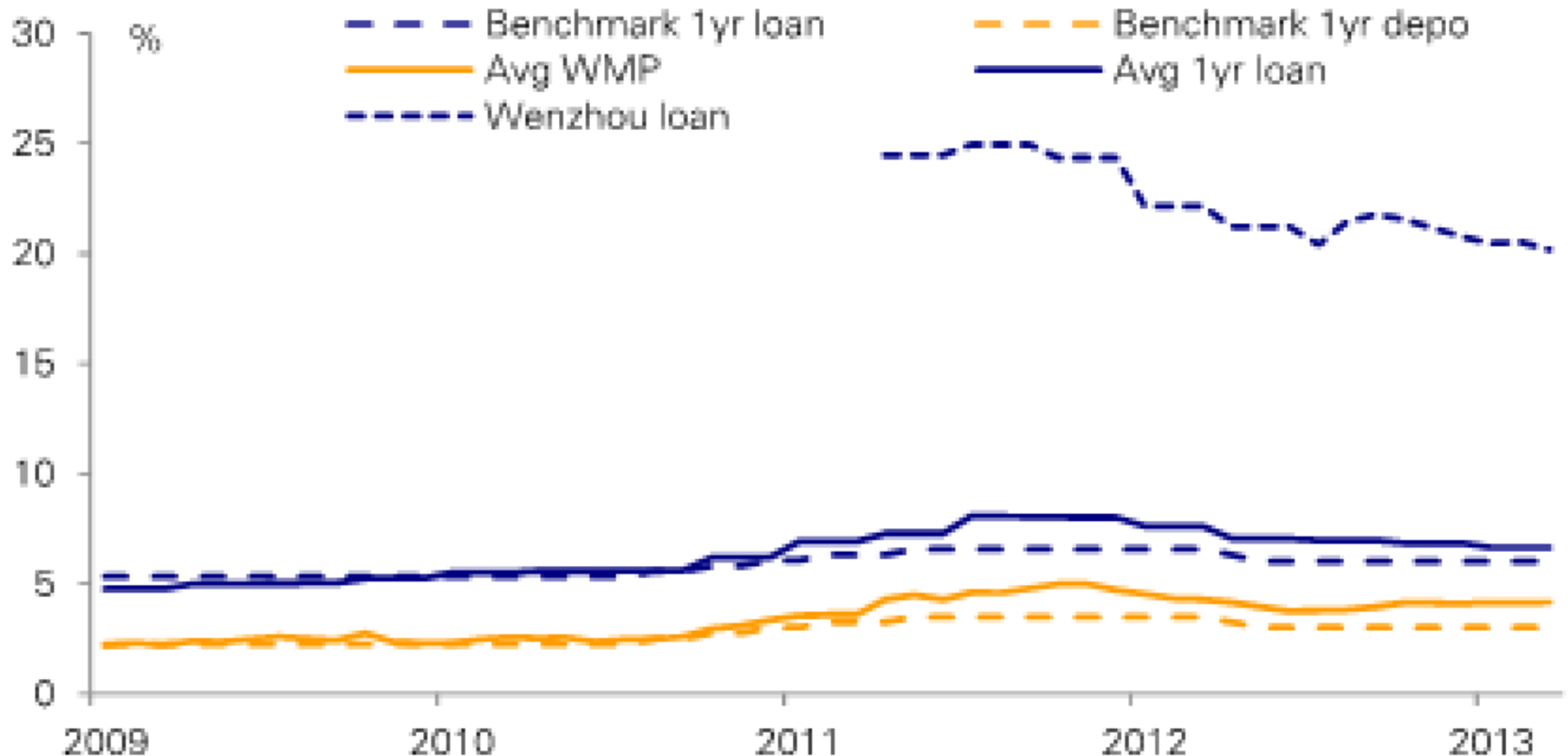
Net vs. Gross: Net Leverage May Look Small, but if One Player does not Pay, Gross Failure Can Kill Liquidity

- Off-balance sheet, SIVs, Netting and Offshoring all create image that gross leverage is smaller, because of creative accounting and regulatory arbitrage

- Moving OTC transactions to centralized clearing platform (CCP) only concentrates risk, as CCP becomes G-SIFI

- Because Financial Sector was treated as intermediary and netted off, Finance was never core part of DSGE models to forecast economic behaviour

- Thus global imbalances were explained in terms of Savings Glut (Current Account Imbalance), rather than Global Credit Glut (which financed over-consumption)

We Need Different Measuring and Statistical Systems to Monitor Dynamic Systems

- Need balance sheet data for real estate values to capture possible bubbles

- Need better sectoral leverage ratios and debt service capacity

- Need to understand interconnections between different sectors through transactions or reputations

- For example, carry trade due to low interest rates is major component of capital flows, and these are highly leveraged. But they are not monitored for systemic risk purposes, as they are reported off-balance sheet and offshore

Impact Factor of Gross Savings in Real Sector vs. Financial Sector – *Sheng, Kwek & Cho (2013)*

Impact factor of real sector vs financial sector on gross savings

Data source: Authors' calculations.
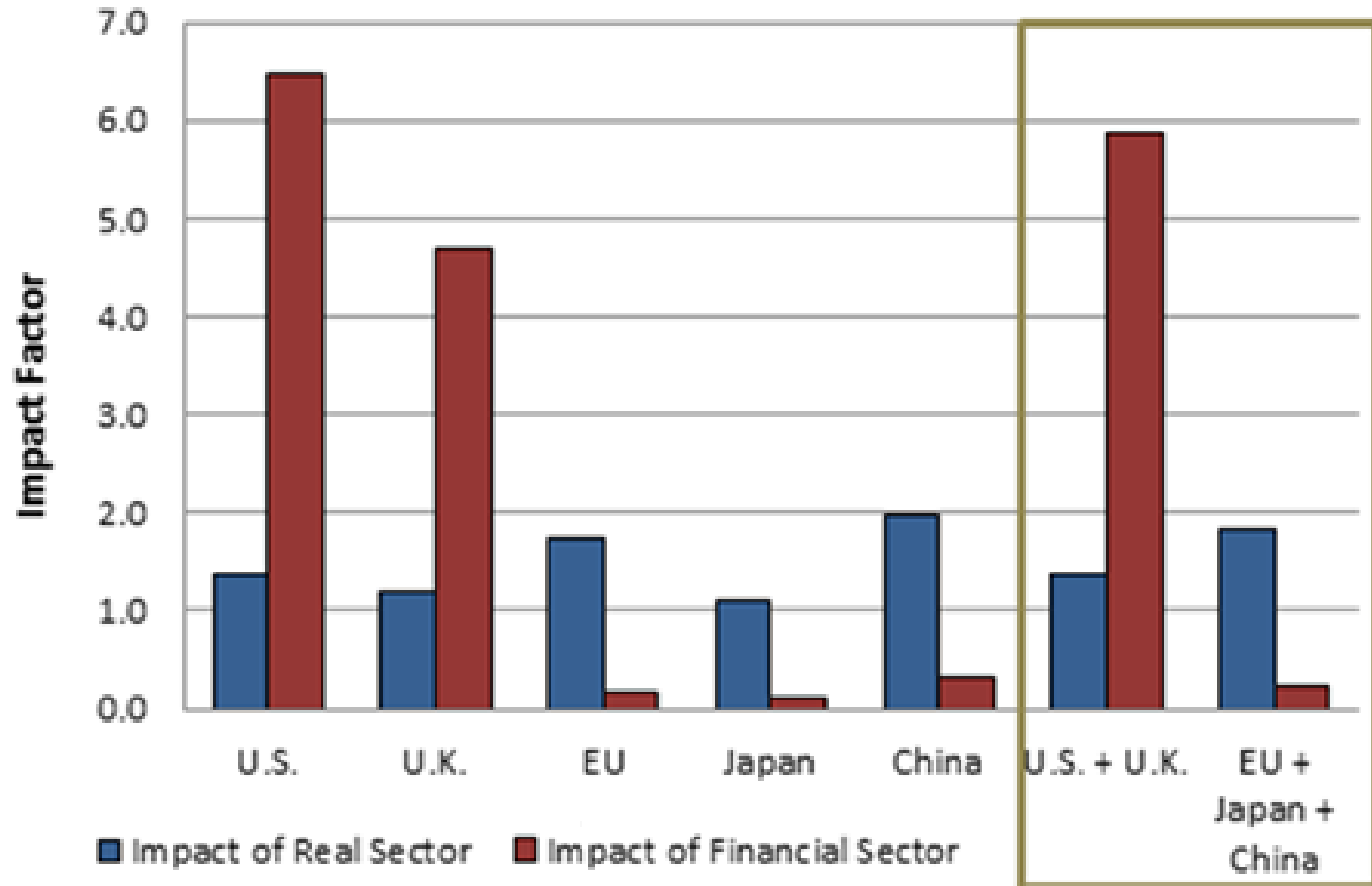
Section 3 Central Banking and Unconventional Monetary Policy

Loss-allocation function, Flawed analysis led to imbalanced policies

Changing Role of Central Banks

- Operating in hugely distorted environment
- Need to deal with global shadow banking and reduce financial repression, especially impact on long-term pension rights
- Dealing with systemic risks – not clear how to monitor and measure liquidity and liquidity shocks
- Deleveraging and impact on capital markets – how to deal with global concentration
- How to finance SMEs, trade, long-term infrastructure and environmental change?
- How to handle financial inclusion (inequity in financial access)?
- *How has Financial Environment changed Central Bank functions?*

Channels of Central Bank Balance Sheet Changes

- Changes in central bank balance sheet affect the real economy through three channels
  - Inflation
  - Credit creation that may impact trade and employment
  - Recapitalization of Banking system through interest rate subsidy, but lower interest rates create losses in long-term holders of debt (e.g. pension funds and insurance funds) particularly if they have "guaranteed" returns to stakeholders
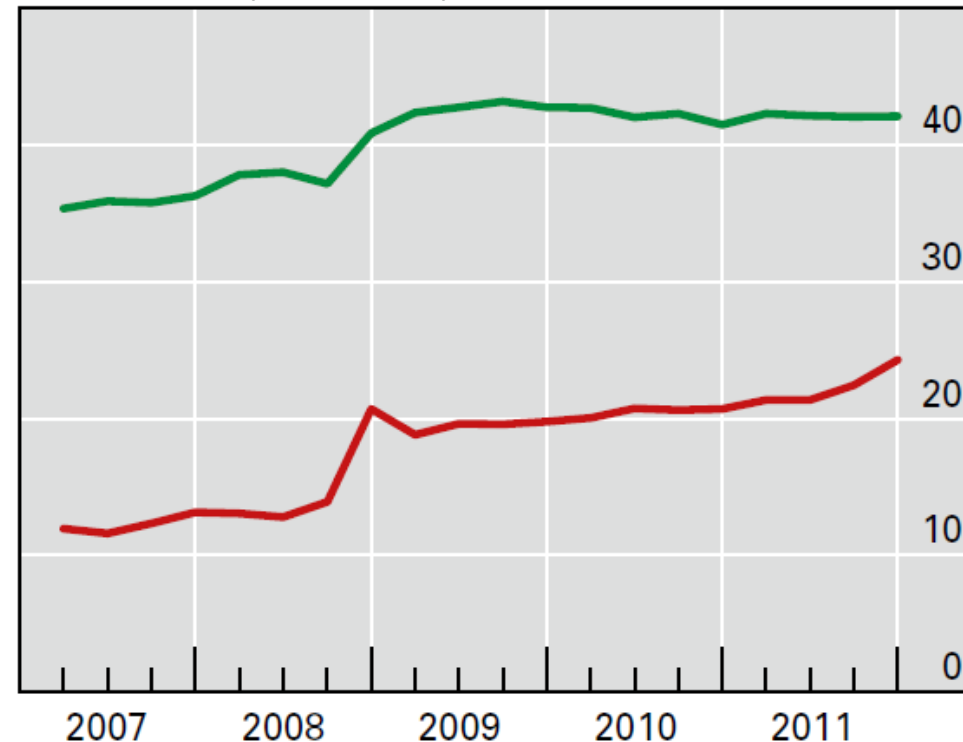
Expanded Central Bank Balance Sheet: AEs vs. EMEs

Central bank assets

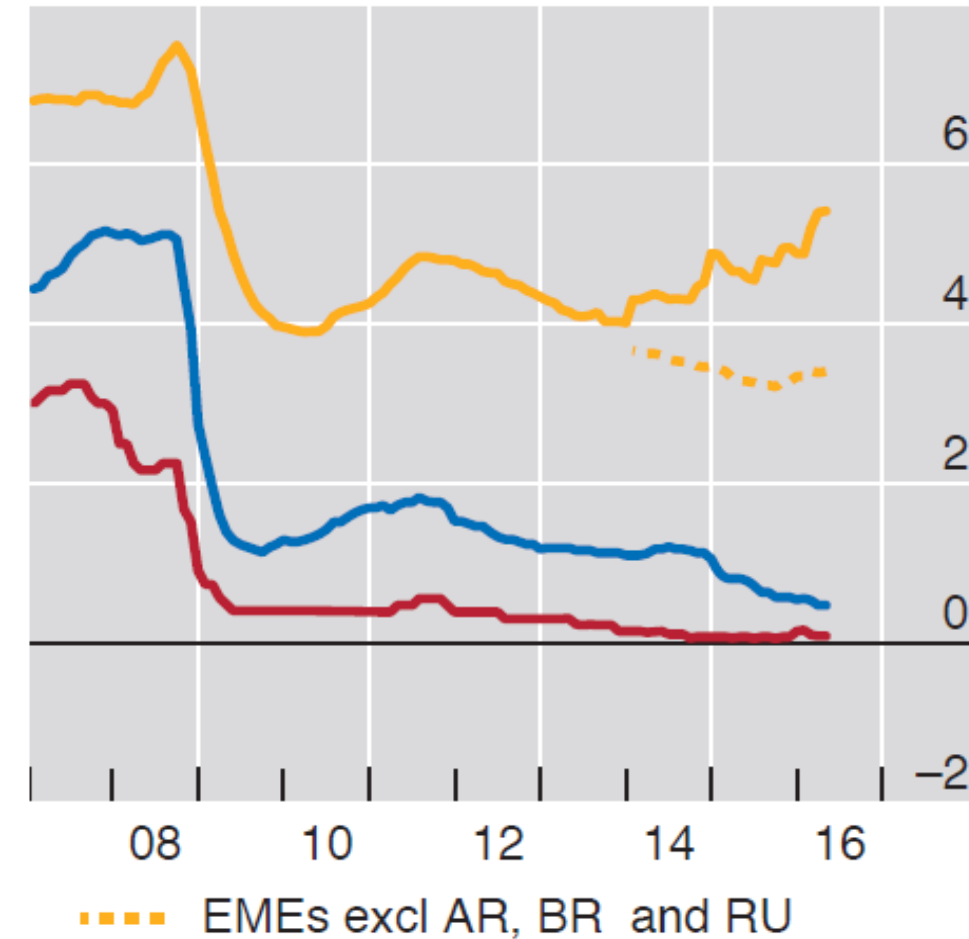Total assets (current US$ trn)
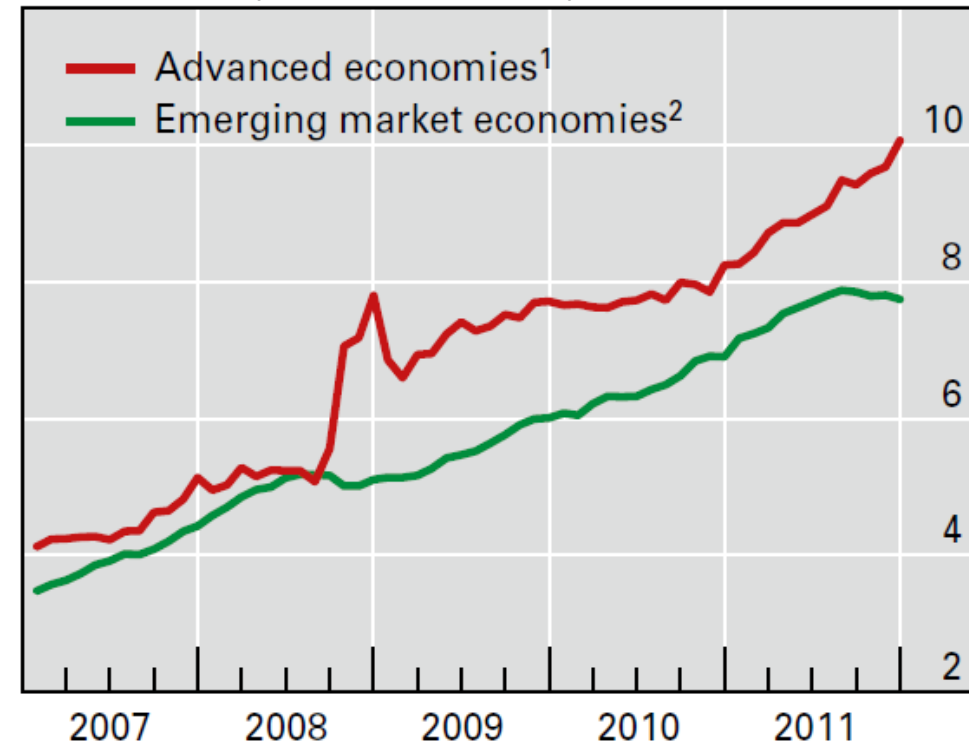
Total assets (% of GDP)

Note: 1 Total of major advanced economies (see Graph IV.6). 2 Total of major emerging market economies.
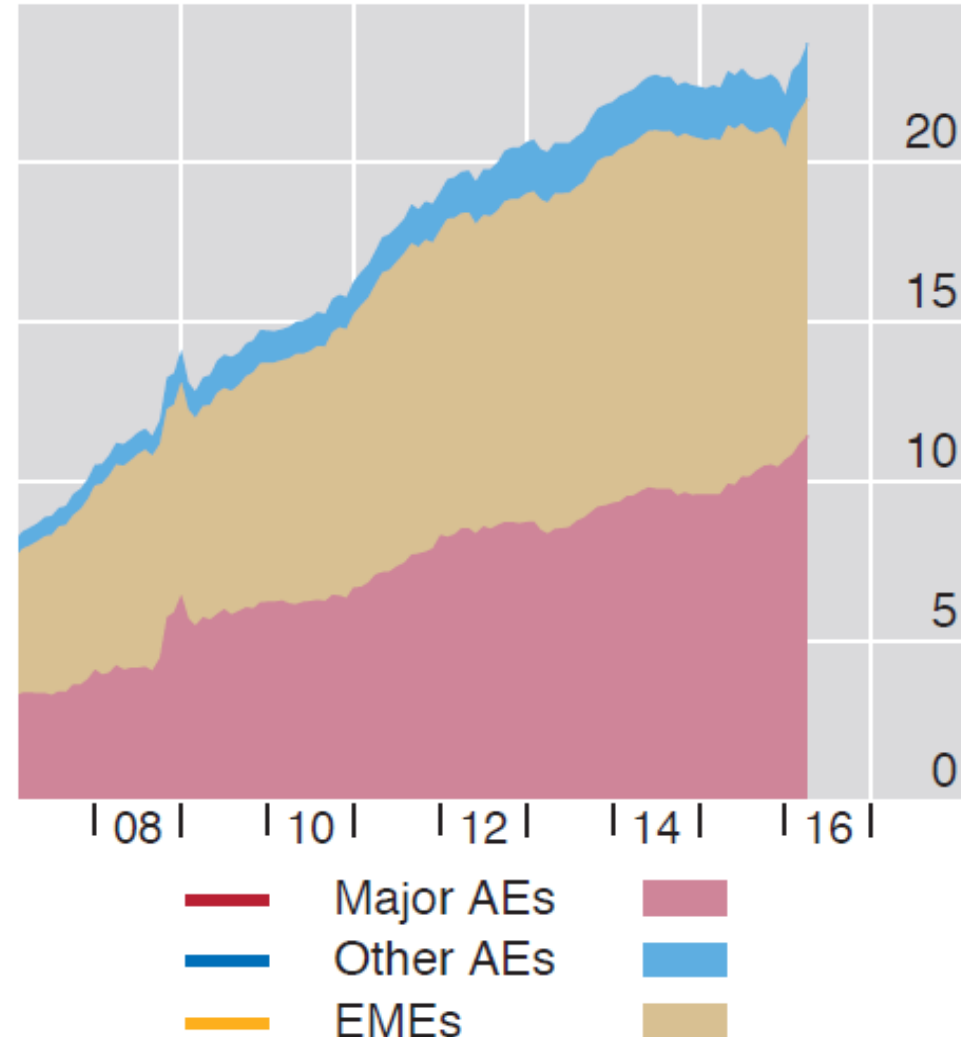Data sources: IMF, International Financial Statistics; Datastream; national data.
Source: BIS. 2012. "*BIS 82nd Annual Report*."

Central Bank Assets Rising, Interest Rates Staying Low

Nominal policy rate[1] (%)

Total central bank assets (US$ trn)

EMEs excl AR, BR and RU

Major AEs

Other AEs

EMEs

Note: 1 Policy rate or closest alternative, simple averages.
Data sources: IMF, International Financial Statistics and World Economic Outlook; Datastream; national data; BIS calculations.
Source: BIS. 2016. "*BIS 86th Annual Report*."

# U.S. Crisis: Balance Sheet Sectoral Net Worth Showed Finance Won, Others Paid

Selected Aggregates for Total Economy and Sectors (US$ bn)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Change in net worth										
Households and nonprofit institutions serving households	5912.3	4340.0	481.9	-10363.0	1880.1	4221.8	1228.3	6053.7	9785.2	4817.1
Nonfinancial noncorporate business	1107.5	430.5	91.0	-1436.5	-1241.4	638.3	629.6	784.3	1200.2	660.6
Nonfinancial corporate business	781.1	-215.1	763.4	3900.4	-4625.6	-320.9	1002.6	-1065.5	-2859.9	-886.5
Financial business	184.5	-358.6	1204.6	1704.6	-345.5	-501.1	402.0	-367.9	-961.9	-512.4
Federal government	-296.8	-123.3	-216.0	-663.6	-1461.9	-1467.5	-1269.8	-1087.3	-609.3	-535.6
State and local government	647.7	917.6	660.2	-698.1	58.9	81.6	186.0	347.0	748.4	370.0
Rest of the world	-13.0	95.6	-581.7	1910.8	-857.9	73.9	1288.7	106.1	666.1	1327.1
Aggregate change in net worth / GDP (%)	**64%**	**36%**	**21%**	**-51%**	**-40%**	**18%**	**14%**	**29%**	**44%**	**23%**

By Sectors	Households	Nonfinancial business	Financial business	Federal, state & local government	RoW
Aggregate of all losses since 2008/GDP in 2008 (%)	**70.4% of 2008 GDP**	**84.5%**	**18.3%**	**52.9%**	**5.8%**

U.S. Net Worth Back to Pre-crisis Levels

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nonfinancial assets	**471.0%**	**432.9%**	**407.0%**	**402.8%**	**402.4%**	**409.5%**	**431.8%**	**437.9%**	**444.9%**
Real estate	365.8%	326.1%	298.6%	295.3%	294.3%	302.3%	324.8%	332.0%	340.3%
Financial assets	**993.9%**	**926.9%**	**978.8%**	**990.1%**	**976.6%**	**997.3%**	**1061.5%**	**1072.7%**	**1056.6%**
Total assets	**1464.9%**	**1359.8%**	**1385.8%**	**1392.9%**	**1379.0%**	**1406.8%**	**1493.2%**	**1510.6%**	**1501.5%**
Total liabilities	**804.8%**	**801.6%**	**837.7%**	**835.2%**	**827.8%**	**838.1%**	**867.9%**	**875.1%**	**861.7%**
Net financial assets	**189.1%**	**125.3%**	**141.1%**	**154.9%**	**148.8%**	**159.3%**	**193.6%**	**197.6%**	**194.8%**
Net assets	**660.1%**	**558.2%**	**548.1%**	**557.7%**	**551.2%**	**568.8%**	**625.4%**	**635.5%**	**639.7%**
Net assets excl real estate	294.3%	232.0%	249.5%	262.5%	256.9%	266.5%	300.5%	303.5%	299.4%

U.S. National Balance Sheet, 2007-2015 (% GDP), (all sectors including central bank)
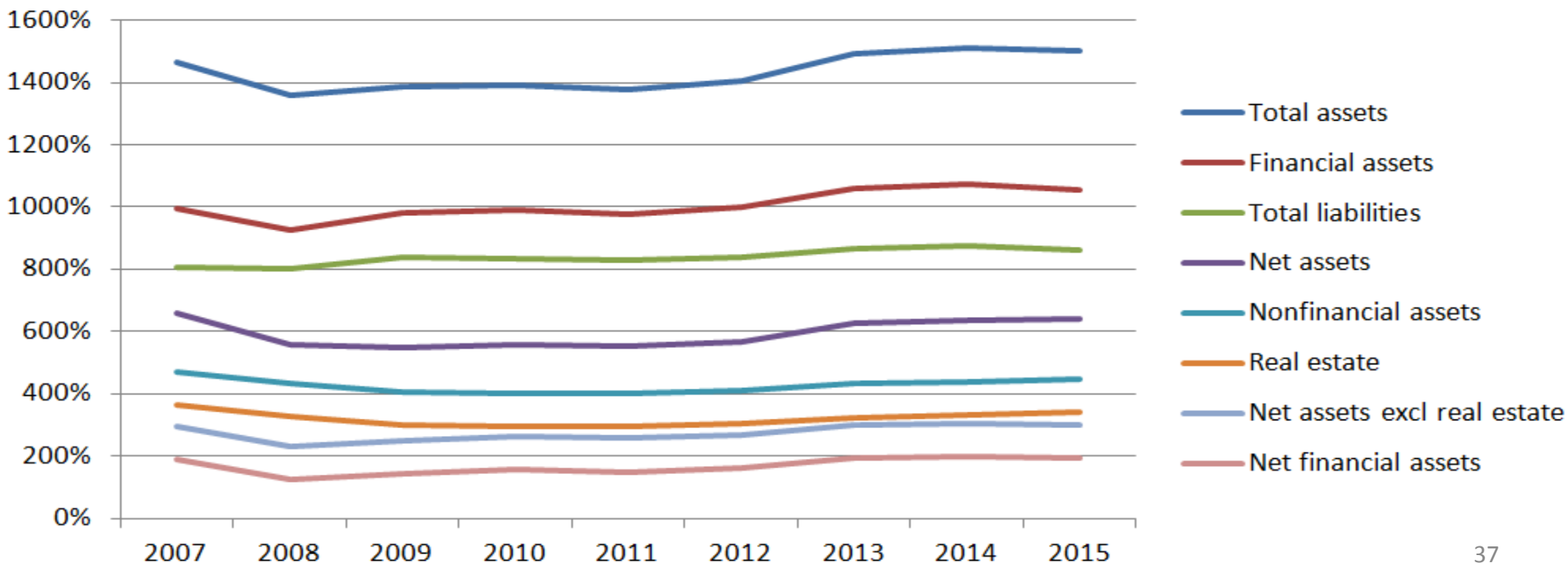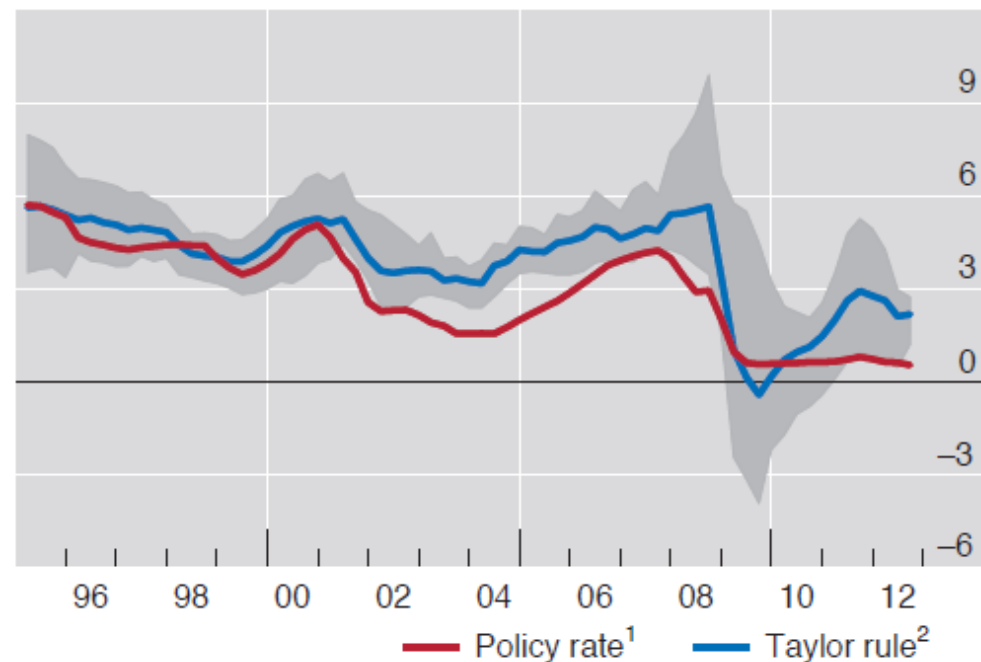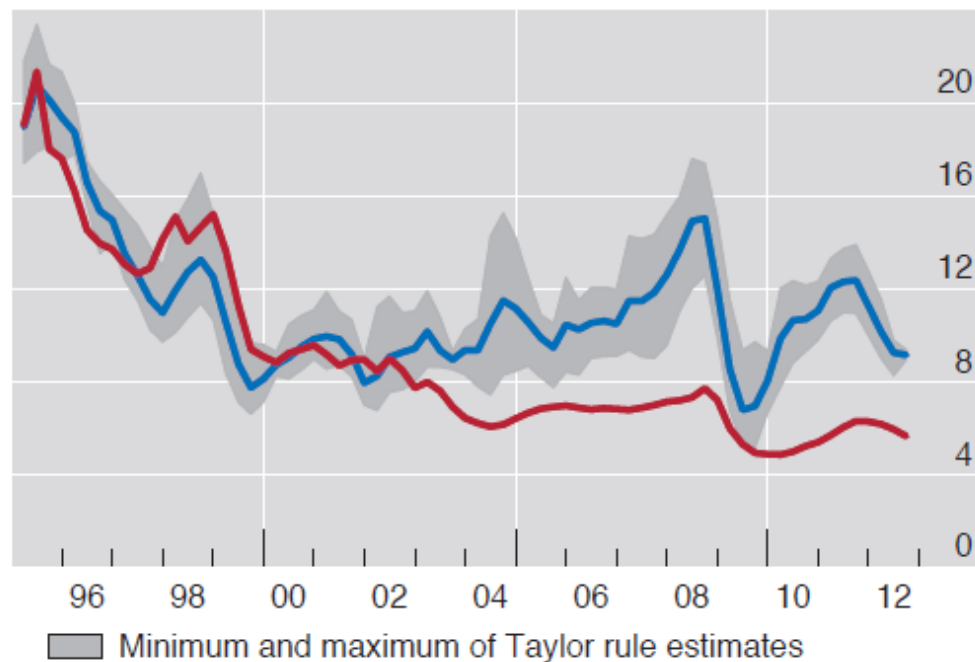
Section 4 Implications for Asia

Where are we heading?

Taylor Rule: Higher Interest Rates Warranted

The Taylor rule and policy rates (%)

Advanced economies

Emerging market economies

Legend: Policy rate[1] (red) — Taylor rule[2] (blue) — Minimum and maximum of Taylor rule estimates (grey)

Note: 1 Weighted average based on 2005 GDP and PPP exchange rates. Advanced economies: Australia, Canada, Denmark, the euro area, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. Emerging market economies: Argentina, Brazil, China, Chinese Taipei, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Poland, Singapore, South Africa and Thailand. 2 See B Hofmann and B Bogdanova, "Taylor rules and monetary policy: a global 'Great Deviation'?", BIS Quarterly Review, September 2012, pp 37–49. Data sources: IMF, International Financial Statistics and World Economic Outlook; Bloomberg; CEIC; Consensus Economics; Datastream; national data; BIS calculations.
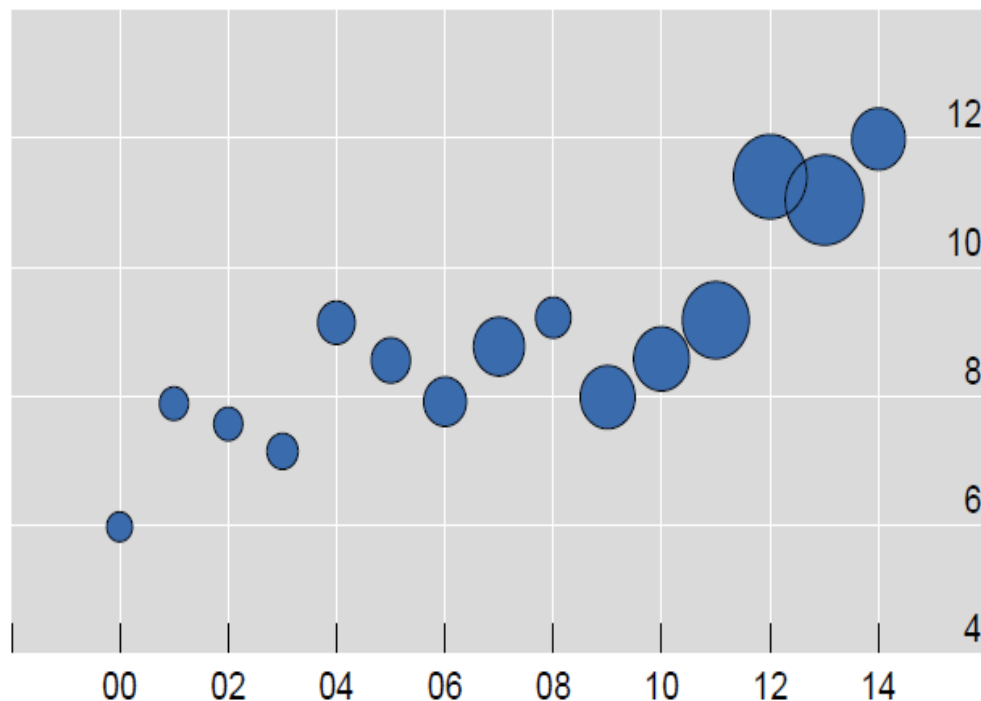Source: BIS. 2013. "*BIS 83rd Annual Report*."

Rising Volumes and Lengthening Maturities (Weighted Averages)

Gross issuance by emerging market non-bank corporations, in years
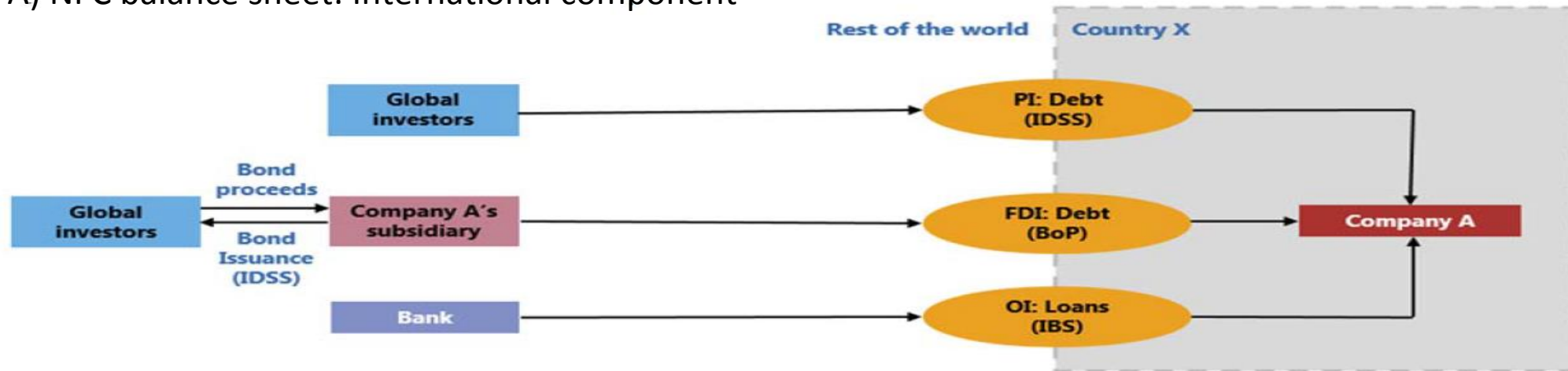
Nationality basis
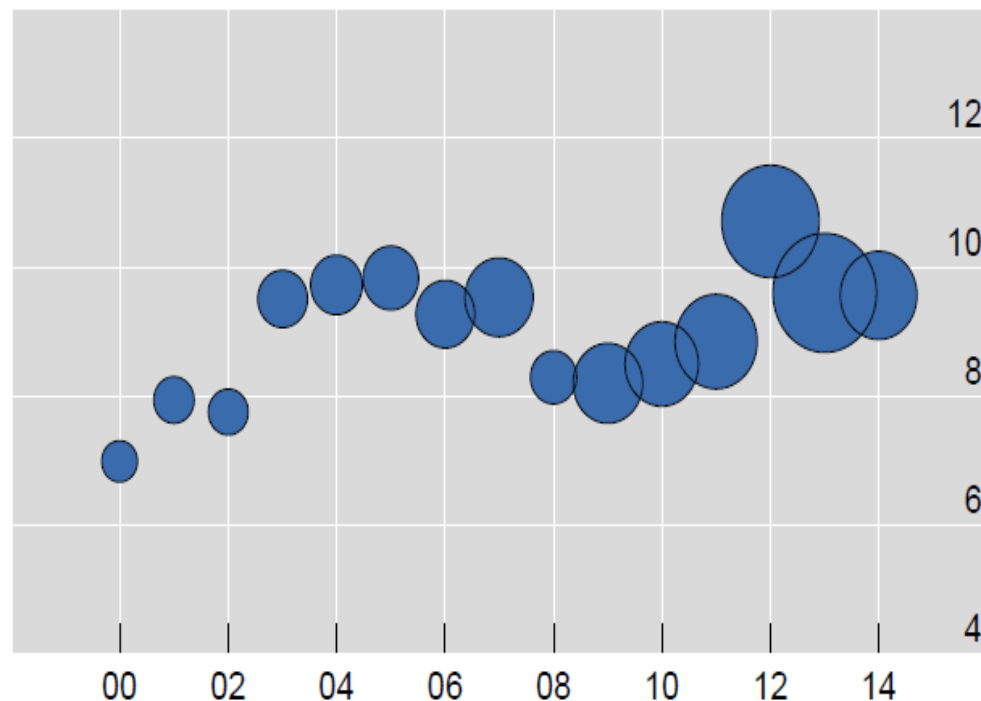
Residence basis

Note: Non-banks from Bulgaria, Brazil, Chile, China, Colombia, Czech Republic, Estonia, Hong Kong SAR, Hungary, Indonesia, India, Iceland, Korea, Lithuania, Latvia, Mexico, Malaysia, Peru, Philippines, Poland, Romania, Russia, Singapore, Slovenia, Thailand, Turkey, Venezuela and South Africa. Nationality basis refers to firms with headquarters in the selected countries. Residence basis refers to firms resident in the selected countries. The size of balloons reflects relative volume of annual gross issuance of long-term securities. Gross issuance for 2013 were 265 billion dollars (nationality basis) and 152 billion dollars (residence basis). The data for 2014 is up to June. Data sources: Gruić, B, M Hattori and H Shin (2014): "Recent changes in global credit intermediation and potential risks", BIS Quarterly Review, September, pp 17–18.

Source: Tarashev, Avdjiev & Cohen. 2016. "*International Capital Flows and Financial Vulnerabilities in Emerging Market Economies: Analysis and Data Gaps*." BIS.

Non-Financial Corporations as Drivers of Capital Flows

A) NFC balance sheet: International component

B) Impact on credit conditions

Data source: BIS.
Source: Tarashev, Avdjiev & Cohen. 2016. "*International Capital Flows and Financial Vulnerabilities in Emerging Market Economies: Analysis and Data Gaps*." BIS.
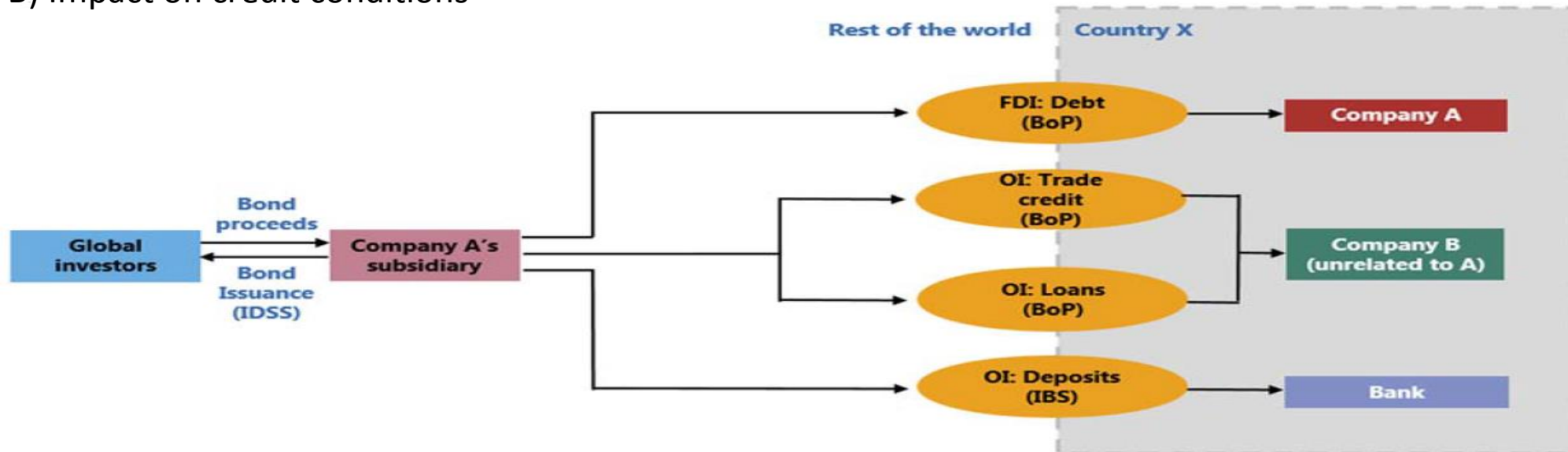
EMEs Need Different Approaches

- Given no "One Size Fit All", must segregate Global Principles from National (Legal) approaches
- Simpler EME financial systems do not require too complex regulatory rules
- Easy to learn, easy to comply, easier to regulate and accountable
- Need to re-write simpler set of rules for EMEs, e.g. IFRS for SMEs – Simplified Core Principles (BCBS, IOSCO, IAIS) for EMEs
- National regulators have scope to interpret incomplete global standards and ensure that they "fit" local conditions
- There should be global body to check global consistency and ensure that national systems do not encourage regulatory arbitrage

Dealing with Systemic Risks

- Systemic crisis will take time to resolve – banks are IT systems – can't implement continuous complex rule changes and risk management in time without operational risks
- No one has calculated how the total impact of new rules (+ unformulated rules on shadow banking), cross-jurisdiction powers on tax and regulation, balkanization, etc will have on business model, profits, and costs to real economy
- Complex prescriptive rules are micro-managing and increasing moral hazard
- GSIBs, national funding and asset markets becoming more reliant on central bank balance sheet expansion itself a major policy (reversal) risk
- Too much "fighting last war" tone

Constructive Reforms Forward

- Real economy will only heal when banks, regulators and politicians are all on same page to get growth going
- Time to prioritize reforms on what is growth enhancing and what is crucial for systemic stability (e.g. capital)
- System stability needs recognition that anti-fragility comes from deepening the capital for borrowers, i.e. deleveraging through capital growth and growing long-term funding from pension, insurance and fund managers, rather than just "squeezing banks"
- Not just regulation and supervision – but "organic system strengthening"

# Are Supervisors Game Keepers or Gardeners/Organic System Builders?

- Supervising banks only is like searching for lost keys under street-light and not looking in dark – with oncoming train?
- System-wide view recognizes that past crisis was systemic, and therefore requires systemic solution – growing diversity of intermediaries (long-term funding); deepening equity of debtors, reviving growth through innovation
- Focusing on minimizing risk is necessary but not sufficient – you need to generate sufficient income and capital to deal with unknown unknowns (anti-fragility)
- Over-regulation raises barriers to entry, shut out profit opportunities and increases system fragility and vulnerability to mono-culture/ concentration risks. Example of IT platforms (Alibaba) eating into payment/credit lunch
- One-size fit all and mono-view of risk reduction reduces diversity and increases system fragility and concentration

We Need New Way to Measure Economies

U.S. GDP data subject to frequent revisions
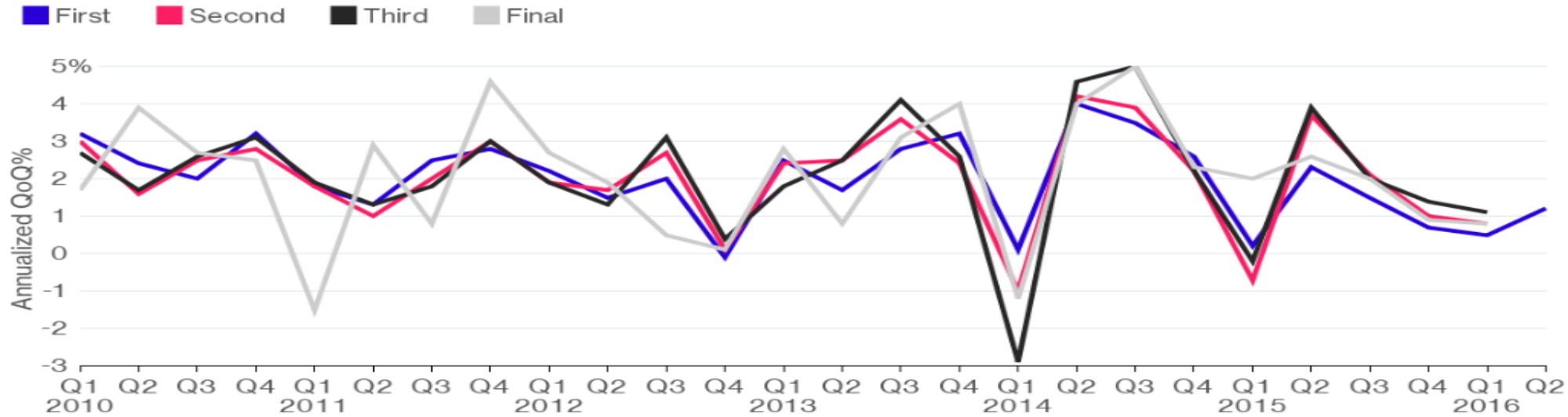
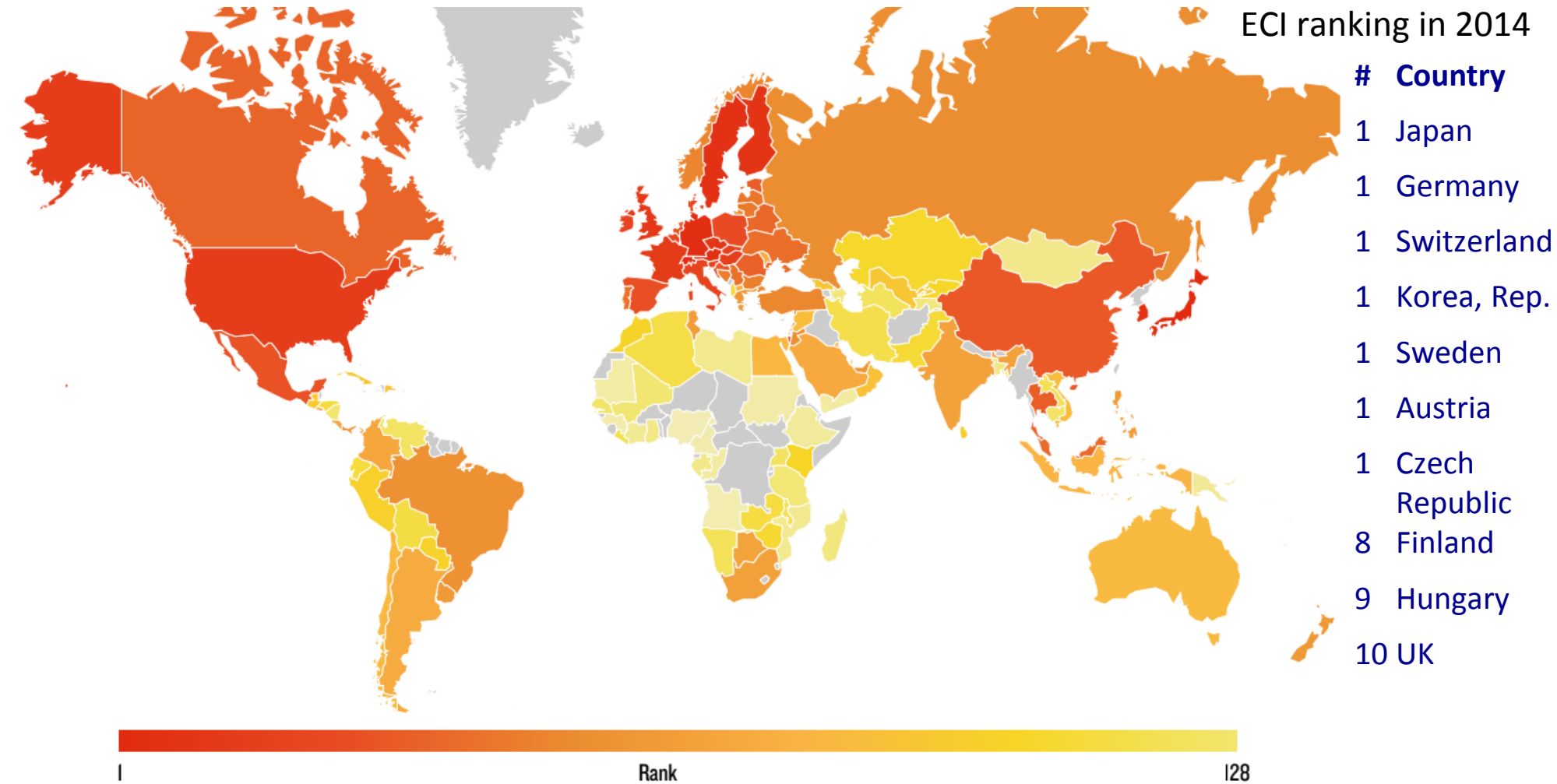Percentage change in Japan's real GDP
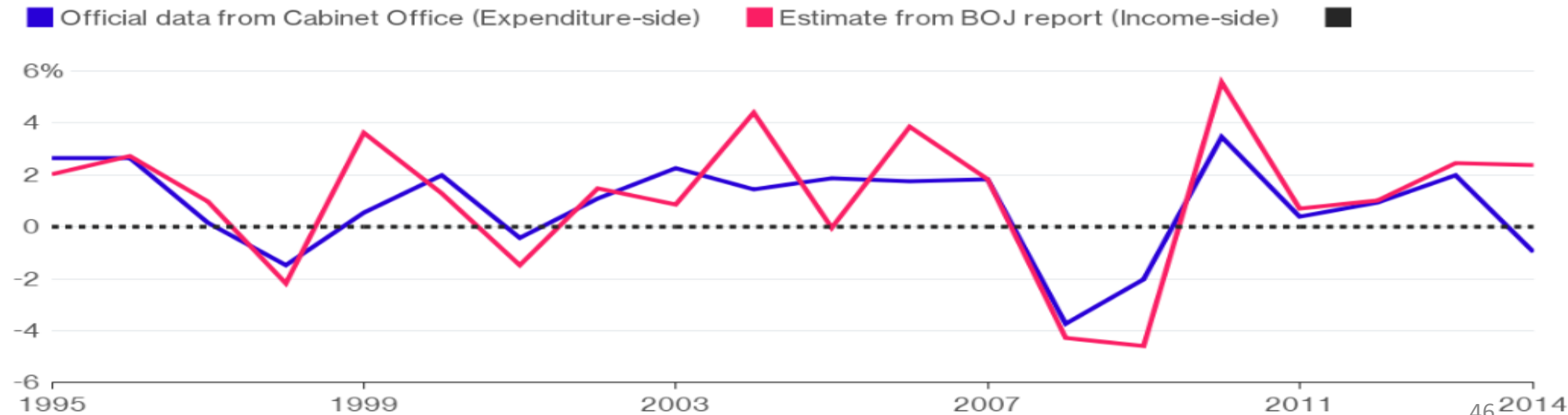
Geography of Complexity: Most Advanced Countries have Developed Knowledge Economies

Economic complexity index by country in 2013 (128 countries)

Top 10 countries by ECI ranking in 2014

#	Country
1	Japan
1	Germany
1	Switzerland
1	Korea, Rep.
1	Sweden
1	Austria
1	Czech Republic
8	Finland
9	Hungary
10	UK

Rank

I   I28

Product Space: Indicators of Complexity –
Hausmann (2014)

ELECTRONICS		MEAT & EGGS	
MACHINERY		FISH & SEAFOOD	
AIRCRAFT		TROPICAL AGRIC.	
BOILERS		CEREALS & VEG. OILS	
SHIPS		COTTON/RICE/SOY & OTHERS	
METAL PRODUCTS		TOBACCO	
CONSTR. MATL. & EQPT.		FRUIT	
HOME & OFFICE		MISC. AGRICULTURE	
PULP & PAPER		NOT CLASSIFIED	
CHEMICALS & HEALTH		TEXTILE & FABRICS	
AGROCHEMICALS		GARMENTS	
OTHER CHEMICALS		FOOD PROCESSING	
INOR. SALTS & ACIDS		BEER/SPIRITS & CIGS.	
PETROCHEMICALS		PRECIOUS STONES	
LEATHER		COAL	
MILK & CHEESE		OIL	
ANIMAL FIBERS		MINING	

Thailand Ranked 26th (out of 124) in Economic Complexity, 2014

Thailand's exports in 2014 (Total exports: US$237 bn)

Source: Hausmann, Hidalgo, et al. 2016. "*What did Thailand export in 2014*?" The Atlas of Economic Complexity.
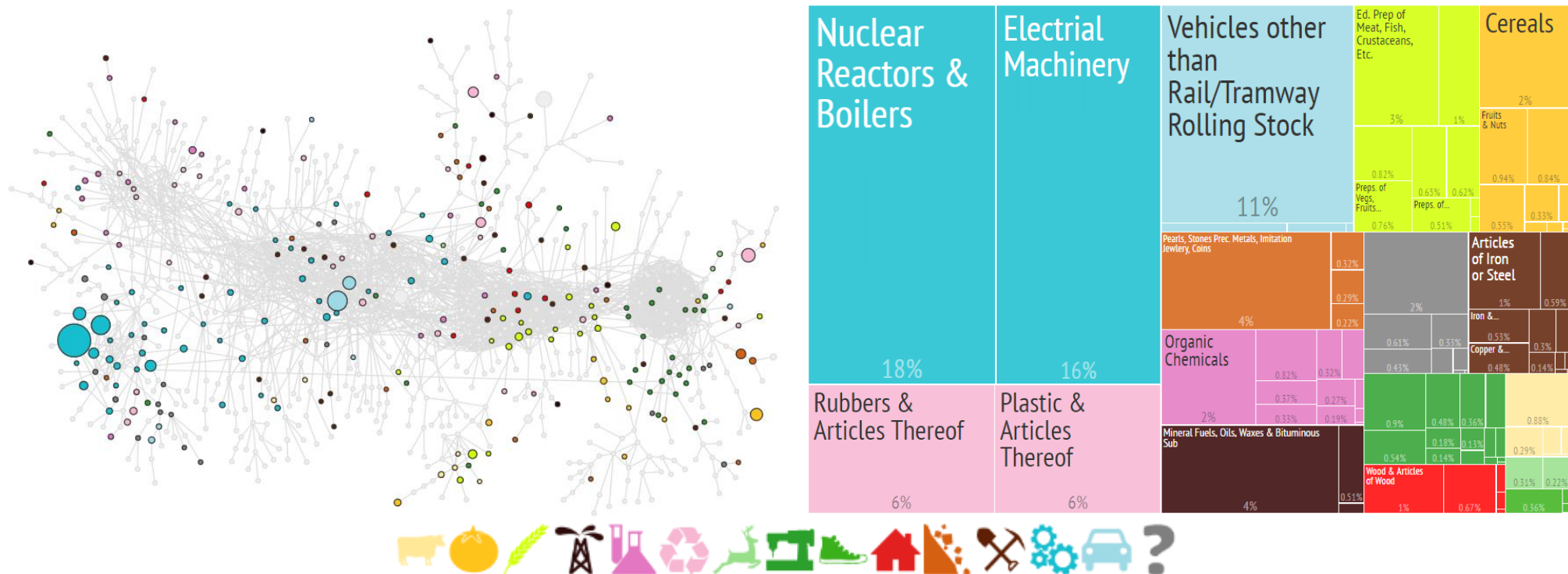
Food for Thought

- We have a global financial architecture that lacks Global Public Goods, which current Westphalian system (national authority) has difficulty agreeing on how to contribute to global stability
- Central banks may be able to influence short-term "risk-free" rates through monetary easing, but risk spreads are now widening, as market begins to price in credit risks in the changing environment
- Change is happening at the interaction between different actors – it is the feedback mechanism that shows the change
- We need to look not only at the flows, but also the stock and also the interaction between different players, especially the incentives
- Central banks cannot do everything – there are limits to monetary policy. But, exit from QE will not be easy, because monetary policy already captured by politics, which is not just local but global. Central bankers need to be reminded to maintain integrity, professionalism and objectivity (autonomous within government)

Thank you

Q&A to
altsheng8@gmail.com
and www.andrewsheng.net