

SEACEN Directors of Research
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**Financial Crisis, Networks and Central
Banks**

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Opinions are personal to author

Outline

- **Problems raised by Current Global Financial Crisis**
- **Network Analysis**
- **Macroprudential regulation and implications for central banks**
- **Need for major fiscal reform to restore sustainable balance [cf spending imbalance, BoP imbalance and fiscal imbalance]**
- **System-wide Governance - a question of Collective Action**

Crisis is Event; Crisis Management is a Process

1. **Diagnosis** - this is a Network Crisis!
2. **Damage Control** - Replaced lost private sector liquidity with public sector liquidity, but ZIRP creates its own set of distortions
3. **Loss Allocation** - who bears the losses?
4. **Changing the Incentives** - Bad incentives + moral hazard led to excessive leveraged financial system. Has this changed?

Financial Crisis: Four Failures

1. **Failure to remember History** - we have a history of increasing volatility and financial crises
2. **Failure to see Macro-Systemic Issues** - Unsustainability of Global Imbalance, Low interest rates, Implications of Asset Bubbles and Excess
3. **Failure to understand systemic implications of micro-behaviour** - Embedded leverage in Financial Engineering, bad incentive schemes,
4. **Failure of Economic Thought** - Specialization of academic disciplines and Fragmentation of Bureaucracies had huge blindspots that ignored the really important political economy issues of our times: social inequities, political capture by vested interests, global warming and complex factors that affect financial stability

Richard Posner: Critique on US Reforming Blueprint

-- *Lombard Street, July and August 2009, finreg21.com.*

- **Premature** – advocates a specific course of treatment for a disease the cause or causes of which have not been determined.
- **Emphasis on the folly of private-sector actors—investors, consumers, credit-rating agencies, above all bankers and and defects in the regulatory structure, leaving out:**
 - 1) Errors of monetary policy;**
 - 2) Large budget deficits;**
 - 3) Deregulation in banking;**
 - 4) lax enforcement of existing regulations;**
 - 5) the complacency of and errors by the economics profession**

Financial Crisis is Governance Crisis

- **Markets are networks, in which institutions are formal institutions**
- **Crisis are breakdowns of institutional behaviour, resulting in loss, therefore a governance failure.**
- **Failure is at levels of individuals, institutions and government**
 - **1980s was Latin American fiscal imbalance ⇒ sovereign debt crisis**
 - **1990s Asian corporate overleverage ⇒ currency and banking crisis**
 - **2007-9 Financial Sector overleverage ⇒ Derivative network crisis**

Public/Private Governance

How to deal with Moral Hazard/Capture

	Private	Public
Private	1 - Greed for self-interest	2 - Civil Society – NGO
Public	3 - Public for Bureaucratic or small group interests	4 - Public for Public Interests

Types 1 + 4 = Adam Smith ideal
 Types 1 + 3 = regulatory capture

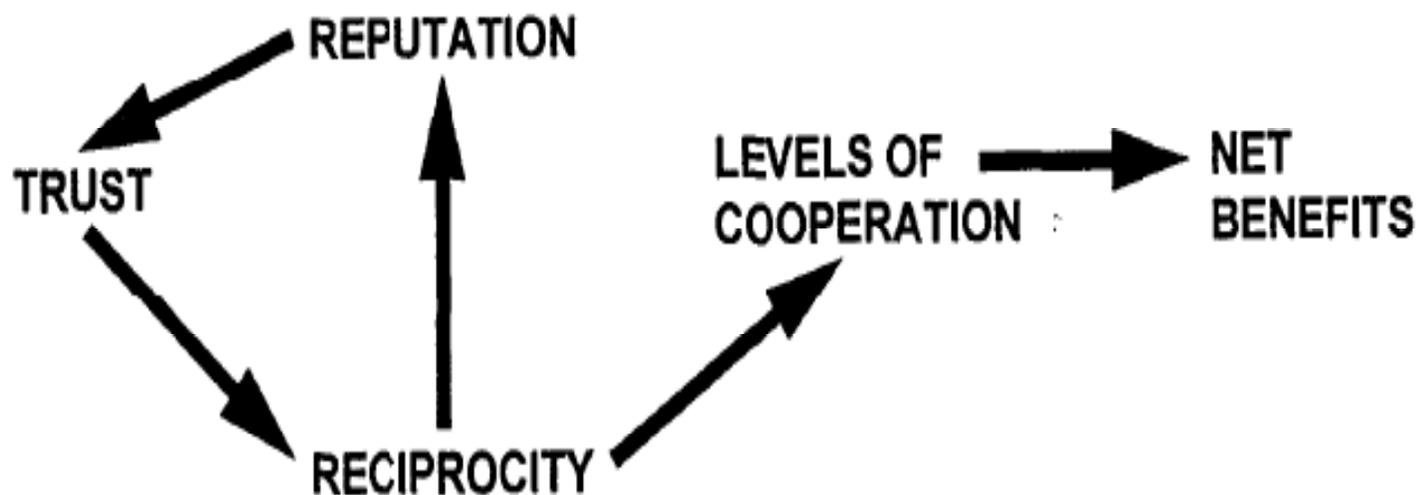
***A Behavioral Approach to the Rational
Choice Theory of Collective Action***

***Presidential Address, American Political
Science Association***

**Elinor Ostrom (Nobel
Laureate 2009)**

1998

The Core Relationships: Reciprocity, Reputation, and Trust (e.g. central bank relationship with banks and public)



Fritjof Capra: The Turning Point (1982):

1. **Current problems are “systemic problems, which means that they are closely interconnected and interdependent. They cannot be understood within the fragmented methodology characteristic of our academic disciplines and government agencies**
- **Basically, Capra argues that the present Cartesian, logical, linear, Newtonian approach to analysis leads to a “mechanistic conception of the world” that “has led to the well-known fragmentation in our academic disciplines and government agencies and has served as a rationale for treating the natural environment as if it consisted of separate parts, to be exploited by different interest groups.”**

Fragmentation vs. System-wide view at Academic and Government Levels – it does not add up

1. Fragmentation of Academic Disciplines –

Economics wants to be a science, but uses unrealistic assumptions that may be false. Example, the assumption that default risk and liquidity risk are distinct when they become one during crisis

In reality, institutions and behavioural characteristics are interdependent, inter-connected and interact in non-linear manner.

2. Fragmentation of Governance

We have One Global Market, but financial institutions are regulated under National laws [Fragmentation of enforcement]

At national level, different agencies are in charge of different institutions, so that there are overlaps, gaps, turf-fighting and non-cooperation to solve complex social issues

Mervyn King - Banking is Global in Life and National in Death [but regulated in parts] - real issue is not theory or policy but Collective Action at National and Global level

All partial solutions are by definition not first best.

Current crisis should be viewed as a Network Crisis.

- **Highly Concentrated** hubs (20-25 large complex financial institutions) accounting for over half of global turnover, particularly in derivatives, concentrated in London, New York.
- **Too Interconnected to Fail** – LCFIs are larger than countries
- **Highly interdependent** – LCFIs trade with hedge funds and key clients, dependent on AIG, government deposit guarantee and central bank liquidity provision;
- **Inter-Active** – Markets become pro-cyclical through momentum trading, but reversal becomes vicious circle – lower liquidity, lower prices, insolvency
- **Simultaneous** – failure of Lehmans led to almost instantaneous stoppage of global credit, which affected real economy
- **Complex** – no one understood complexity of financial derivatives

The Global Network Economy

"The value of a network goes up as the square of the number of users"

(Metcalfe's Law)



1934 New Deal invented four simple but crucial “coarse” rules that limited network crisis:

- **Guaranteed deposits (FDIC)**
 - **Net Capital Rule - risk limits**
 - **Glass-Steagall - firewalls**
 - **Disclosure - greater transparency through SEC as conduct regulator.**
- **Unfortunately, since 1990s, these rules were eroded through exemptions, use of models or abolished (Glass Steagall). The global network was then vulnerable to inter-connected and interactive shocks that collapsed through failure of hubs like Lehmans. China and India were shielded from direct impact by exchange controls and lag in financial development.**

Implications of Network Analysis on Political Economy of Growth, Equity and Stability

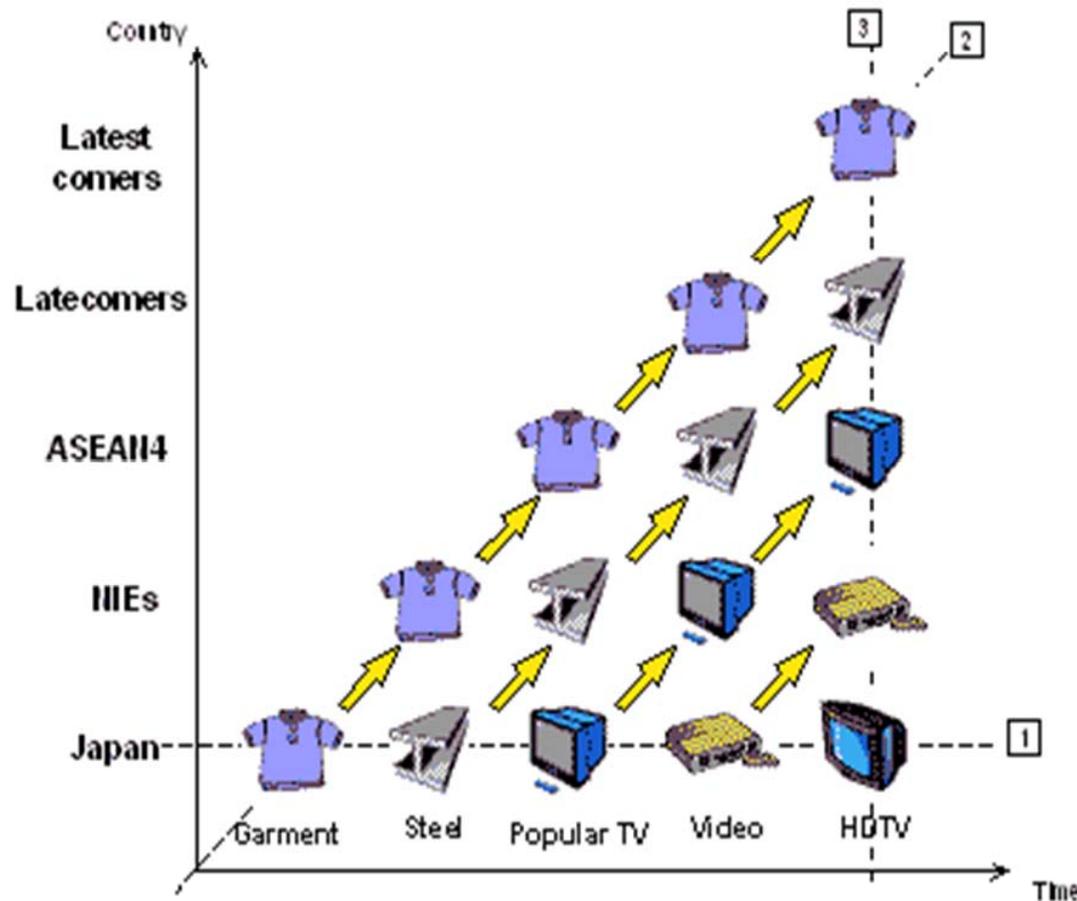
1. You need *system-wide view* of whole network, weak links, major players and network architecture
2. Systems must have *standards and risk tolerance limits*
3. You need to understand the *incentive structures* that are driving behaviour, including flows and stocks [balance sheets]
4. Regulation of system stability requires you to *enforce rules, maintain high transparency* and note that market behaviour is human behaviour [crowd behaviour is interactive, different from individual behaviour]
5. Hence, one must create *firewalls between modules* which can easily be cut off without damaging system as a whole
6. System stability is maintained through *Collective Action*

Global Four Mega-trends

1. **Wage Arbitrage** - cheap labour created low inflation and boosted global trade
2. **Interest Rate Arbitrage** - Low interest rates e.g. in Yen, gave rise to Carry trade,
3. **Knowledge Arbitrage** - Financial Engineering permitted faster trading and higher leverage
4. **Regulatory Arbitrage** - Accounting, Tax and liberal regulation allowed higher disguised leverage through SIV, OTC markets etc.

Asia was networked into a Global Supply Chain

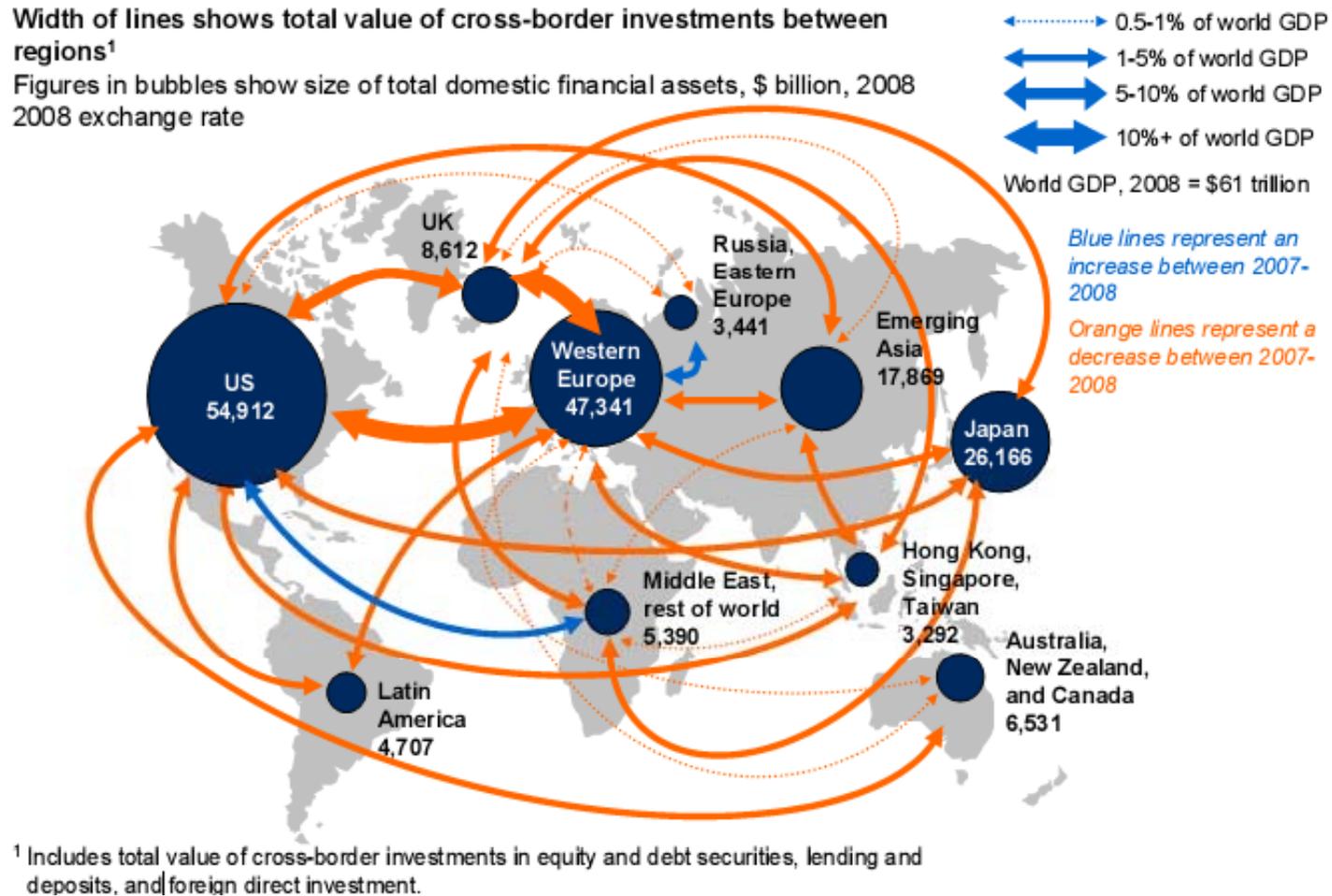
Asian Economies moved in V-formation, following Japan through copying, production and exports, eventually forming Global Supply Chain



Key customer was
USA, so key
currency was Yen-
Dollar

Source:

A Networked Globalized Finance



The Asian Network Economy

One Supply-Chain; Two Financial Standards

The Asian
Network Economy

The Asian
Supply Chain Network

The Asian
Financial Network

Yen Standard

Dollar
Standard

2. Damage Control: Zero Interest Rate Policies (ZIRP) have serious distortive impact on Global real economy

- **The rescue plans guarantee and replace private debt by public debt, sustainable only with ZIRP.**
- **ZIRP will create even more Carry Trade/Capital Flow Volatility that distort resource allocation**
- **Exit strategy is hostage to Collective Action to exit together.**
- **Financial system profitability will be challenged by lower real sector profits, affected by problems of de-leveraging, massive excess capacity and risks due to Global Warming and re-engineering to Quality of Life environment.**

3. Loss Allocation: Who is winner in financial crisis?

- **Subprime losses of \$150 bn in 2007 required US Government aid of \$13.2 trn as of 19 June 2009**
- **In crisis year 2008, salaries of top 10 banks rose from \$31 bn in 1999 to \$75 bn, but cash dividends to shareholders was only \$17.5 bn.**
- **Management took 4.3 times more than shareholders, when shareholders had to inject capital and government guaranteed the deposits.**
- **Critical principal-agent fiduciary problem**
- **Essentially, financial sector losses will be paid for by future taxation (large fiscal debt) or inflation.**

Implications For Reforming Regulatory Architecture

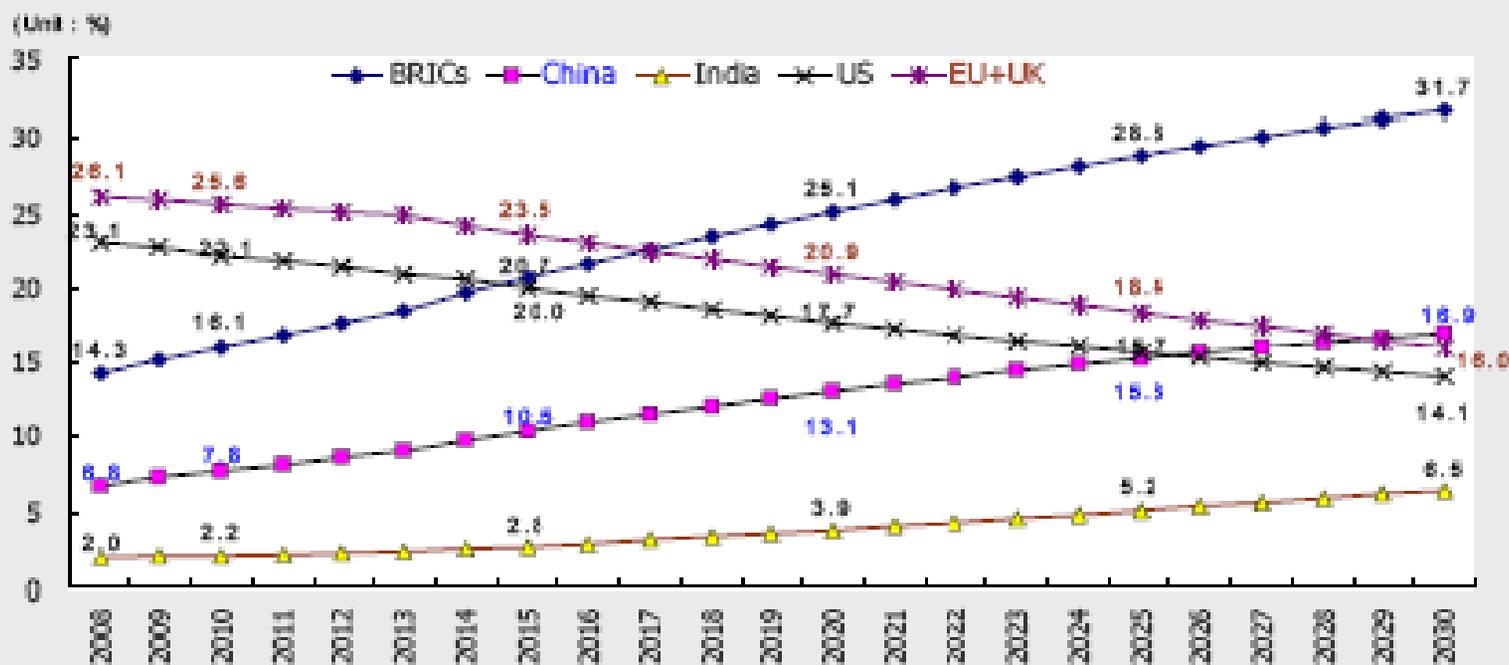
1. **Simple Playbook** requires a few clear and simple rules, firmly enforced, rather than multiple complex rules, lightly or under-enforced.
2. If regulation limits the level of leverage, the bonuses will be capped.
3. Asia is more rudimentary, bank-based, and “Bulge Bracket” banking systems require simpler regulatory standards. Suggest that:-
 - *We should have simpler form of Basle and IFRS for Emerging Markets, with clear priorities for implementation*
 - *FSAPs to be focused on Systemic Risks and whether domestic systems are robust relative to global systemic risks.*

World Economic Forum Global Redesign Initiative – April 2009

- **Traditional Bureaucracies not equipped to deal with inter-civilizational and interdisciplinary processes under rapidly changing contemporary circumstances:-**
 - 1. Power shift from North to South, West to East**
 - 2. World that is more complex and bottom-up**
 - 3. Nation states and government structures still play major role but needs interdisciplinary and multi-stakeholder input**
 - 4. World needs more systemic approach to decision-making**
 - 5. Traditional concepts of global governance need re-thinking**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Outlook for the Change in Economic Weight of Major Countries from Mid- to Long-Term Perspectives



Simplicity - more Implementability, Enforceability, Greater Accountability

- 1. Complexity reduces Accountability and enables Arbitrage. Complex regulatory rules are impediments to Emerging market capacity to reform themselves to more efficient levels.**
- 2. Simplicity helps Understanding and getting Collective Action consensus**
- 3. Reform and Regulation is a process over time - cannot achieve everything overnight.**
- 4. Better that we begin the process of:-**
 - *Putting in place global tax regime for financing of global public goods***
 - *IFIs to concentrate on global public goods***
 - *National governments to concentrate on implementation and enforcement.***

FSAP as Overview of Financial Stability

Integrated Analysis of Stability and Development issues

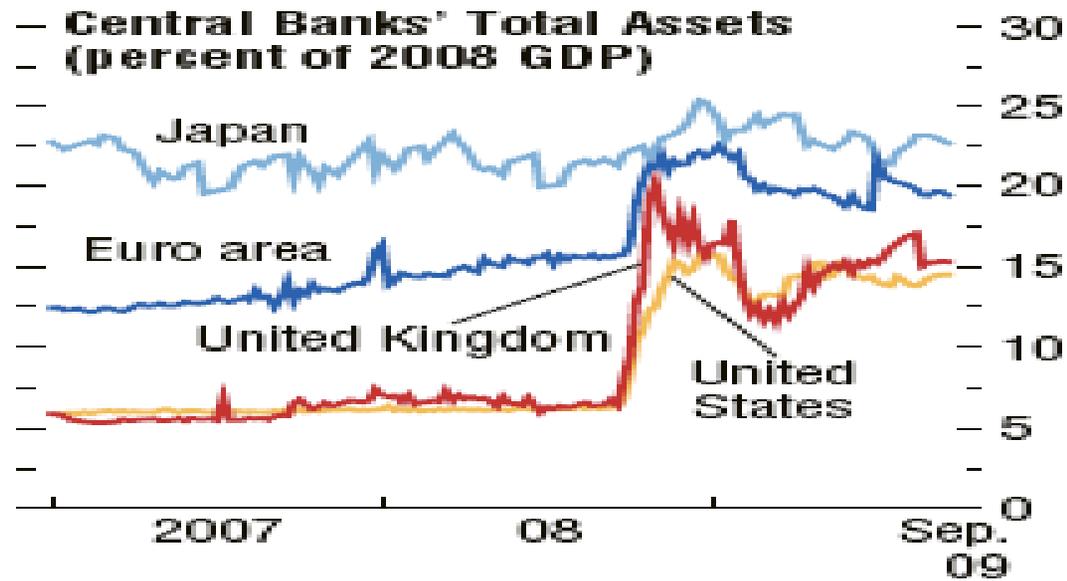
- **Macroprudential Analysis**
- **Analysis of Financial Sector Structure**
- **Assessment of observance and Implementation of Standards and Codes**
- **Assessment of specific Stability and Development issues.**

Pillars of Financial System

- 1. Macro Prudential Surveillance and Financial Stability Analysis**
- 2. Financial System Supervision and Regulation to manage risks**
- 3. Financial System Infrastructure**
 - Legal infrastructure**
 - Systemic Liquidity Infrastructure, including monetary and exchange operations, payment systems and exchange clearing and settlement systems**
 - Transparency and Governance**

Implications for Central Bank Research

- **What does Macro-prudential Oversight mean?**
- **How does macroprudential work affect monetary policy?**
- **How do you deal with interactive, interconnected networks in order to maintain financial stability?**
- **How do you deal with capital flows?**



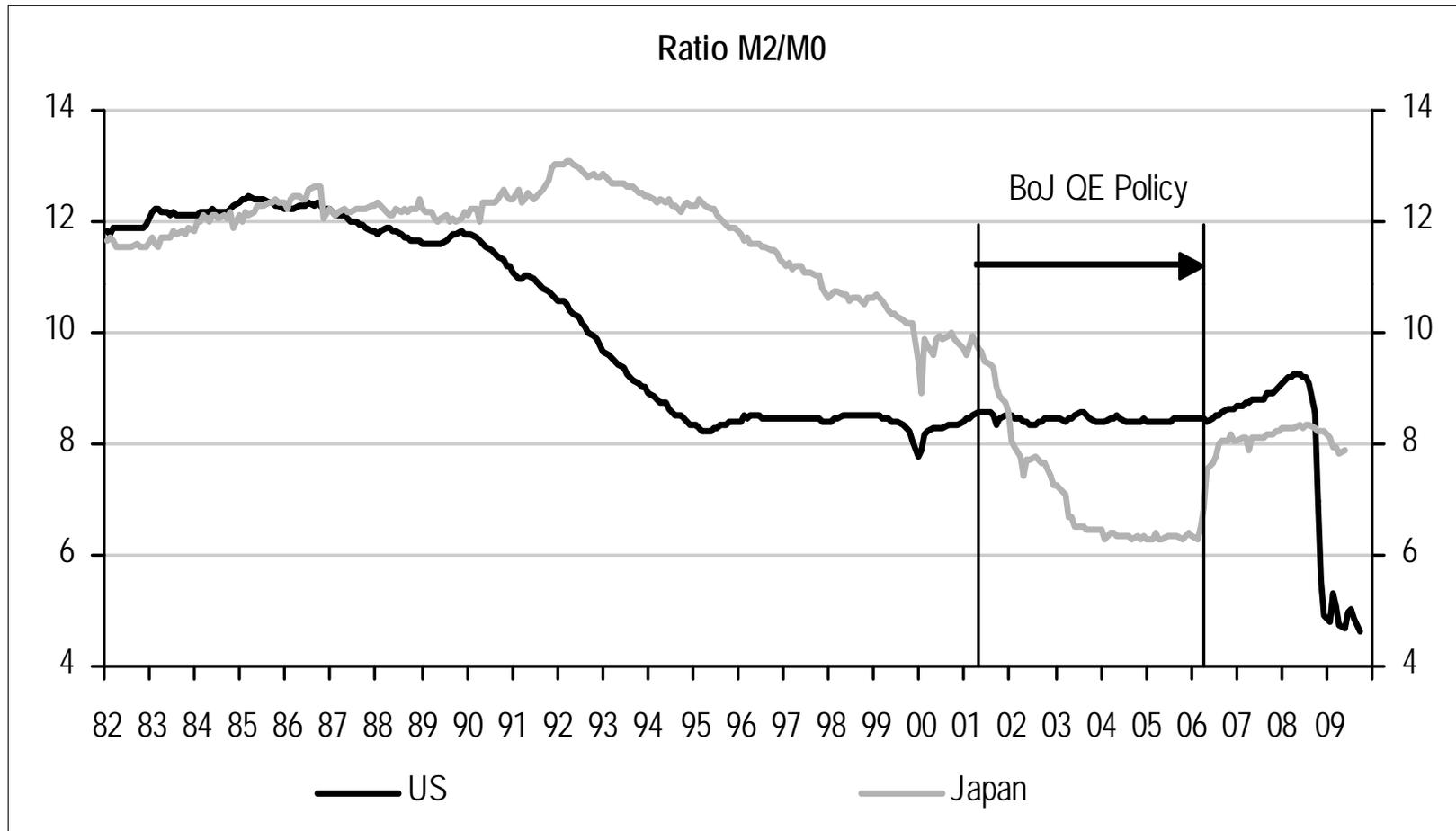
Advanced Markets replicating Japan in 1990s

Are they trying to inflate their way out of problems?

Monetary policy issues

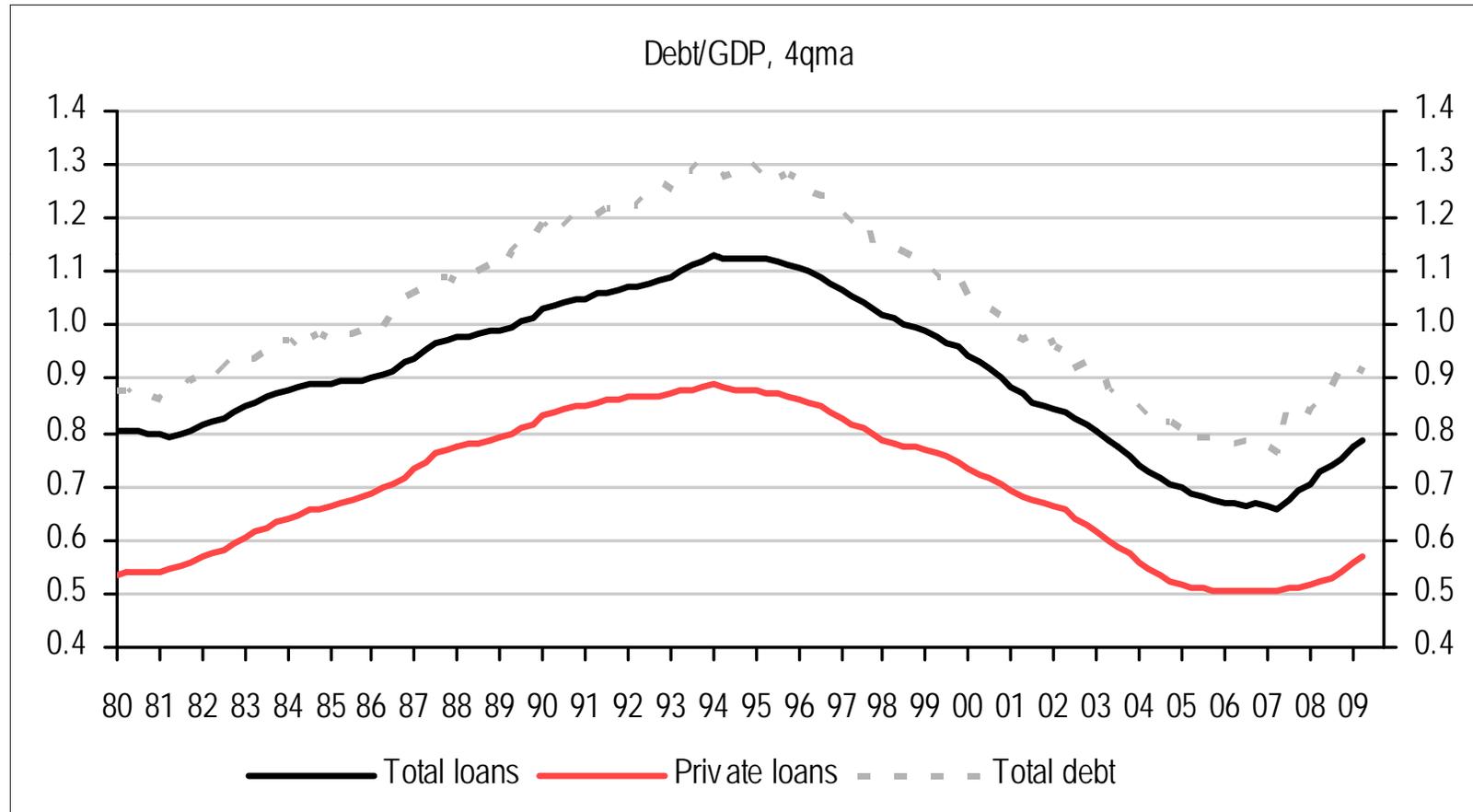
- **Monetary Targeting focused on CPI and ignored asset prices**
- **Current dilemma post-bubble collapse is liquidity trap, with zero interest rate, deleveraging and no investment**
- **Fiscal pump priming with inadequate taxation leads to unsustainable fiscal position**
- **Central bank can intervene to replace faulty commercial bank intermediation, but assumes quasi-fiscal credit of last resort role**
- **Deleveraging can take long time to unwind**

Breakdown of the money multiplier



Source: US Federal Reserve, CEIC

Japanese corporate debt—the long adjustment path



Source: BoJ Flow of Funds (CEIC), ADBI estimates

Capital Flows and Exchange Rate Management

- Importance of FX reserves relative to FX liabilities and understanding nature of short-term capital flows
- Carry trade using ZIRP drives large leveraged capital inflows that create asset bubbles.
- Banks then lend to finance bubbles and their collapse lead to large wealth losses and bank insolvency
- No easy solution - under free capital account and flexible exchange rate, carry trade creates volatile asset bubbles. The more you revalue, the more capital flows

Balance Sheet Crisis is Contagion between sectoral networks

- National economy [flow of funds data] omprises 5 key sectors –
 - Household
 - Corporate
 - Government
 - Foreign
 - Financial
- Accumulated Flows (consumption, investment, savings) become stocks.
- Imbalances are unsustainable, so it is important to understand sectoral and global imbalances, sources and vulnerabilities.
- Hence, we need holistic system-wide view of real and financial sectors together in order to diagnose and solve problems
- However, central banks cannot do it alone, you must cooperate with other agencies (MoF, financial regulators, IFIs and regulated entities in order to identify and solve problems.
- Crises occur because of non-cooperative, free-riding and conflict situations.
- Crisis prevention and resolution is a Collective Action Problem.

1996 Negative Net Investment Position (NIP) and Exchange Devaluation explains a lot about Crisis

	NIP 1996 (USD bn)	NIP as % of GDP 1996	Fall in GDP 1997/98 (%)	Change in exchange rate (+/-) 98/97	Remarks
Japan	+890.0	+19.0	-8.5%	-10.7%	
China	-122.9	-15.1%	+5.3%	+0.2%	Protected by exchange control
Indonesia	-129.4	-56.1%	-55.8%	-51.4%	
Korea	-50.2	- 9.0%	-33.1%	-50.2%	Bank run causing exchange overshoot
Malaysia	-55.9	-55.4%	-27.9%	-35.0%	
Philippines	-41.6	-49.2%	-20.5%	-34.2%	Already under IMF Program in 1997
Singapore	+80.2	+87.0%	-14.2%	-14.9%	Contagion effect
Thailand	-101.8	-55.9%	-25.9%	-45.8%	

Source: calculations from Lane and Milesi-Ferretti, 2006

Wealth Losses as Real Estate and Stock Prices deflate overwhelming financial institutions capital:

Fed Flows of Funds data

- **Real estate is 225% of GDP and stock market 100% of GDP. If real estate market declined by more than 20% and stock market 50%, then private sector wealth loss in 2008 was as much as 95% of GDP [45% + 50%]. US bank capital was estimated at \$1.35 trillion (10% of GDP). Banks clearly insufficient capital to meet such losses.**
- **Clearly, investment banks with above-the-line leverage of 30 and below-the-line leverage of 20 would only be able to sustain 2% swings in market or credit risks.**

Acknowledged Regulatory Weaknesses

- **Need for System-wide Supervision [silo oversight does not work]**
- **Insufficient attention to Liquidity issues**
- **Lack of understanding of risks in derivatives and their leverage**
- **IFRS + Basel II both pro-cyclical**
- **Rating Agencies weaknesses**
- **International Financial Architecture still not representative of world reality**
- **Huge coordination machinery needed for all forms of cross jurisdictional regulation**
- **Incentive structures drive risk-taking/excess leverage**

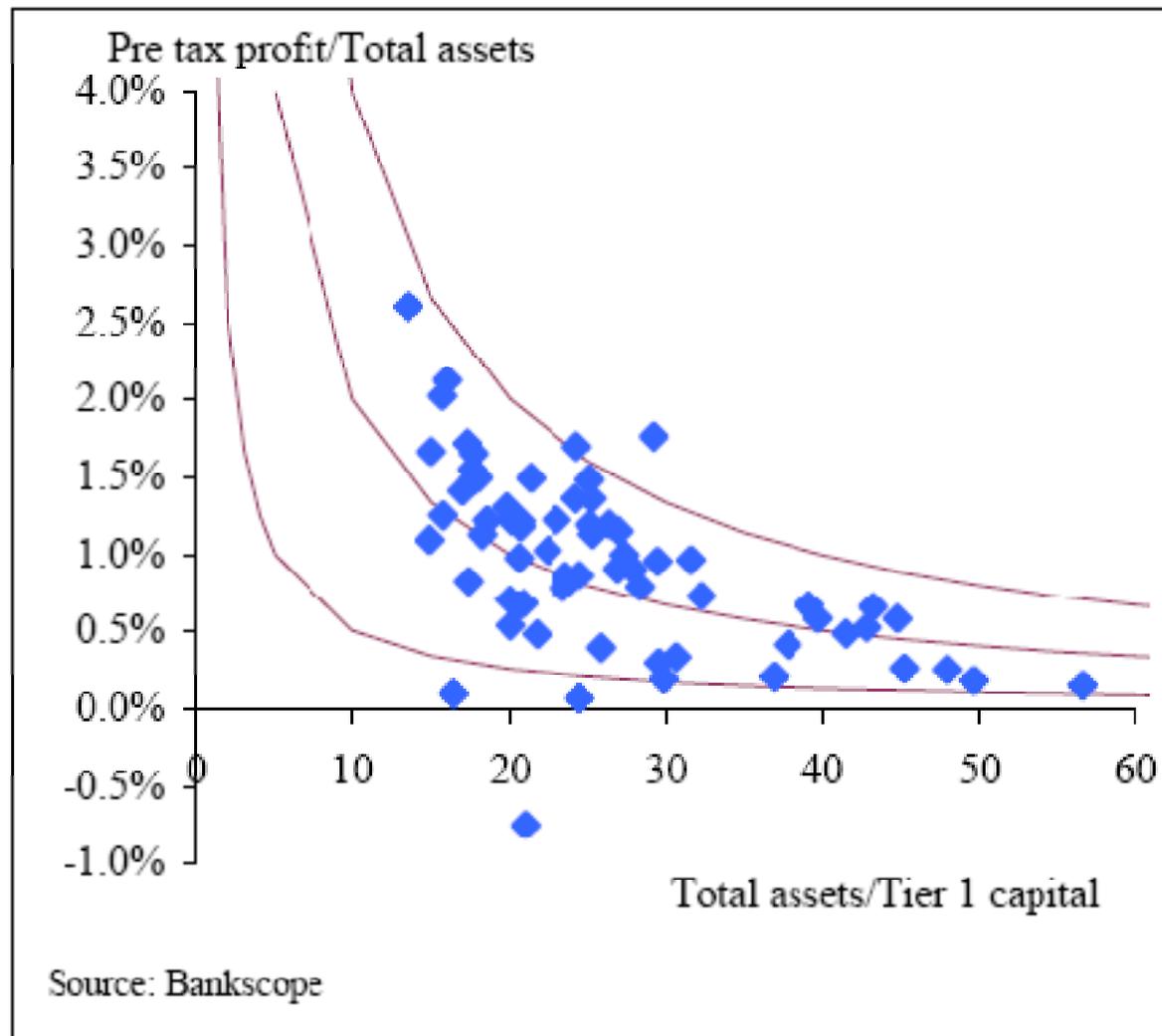
US Investment bank Off-Balance Liabilities = US\$17.8 trillion, additional leverage of 88.8 times

Company		Bear S	Lehman B	Merrill L	Morgan S	Goldman S
Commitments	Lending related	7,219	38,059	78,232	73,958	82,747
	Investing in Conduit, etc	729	11,694	n	1,311	17,758
	Underwriting	652	19,979	n	11,620	88
	Commercial and Residential	2,828	7,449	8,132	5,680	n
	Letters of Credit	2,749	1,690	45,177	16,049	8,747
	Other	170	125,859	66,434	988	43,528
Guarantees	Derivatives	2,515,965	737,937	4,562,883	7,120,380	2,045,341
	Other	4,452	6,902	44,670	36,799	29,525
Total	17,784,380	2,534,764	949,569	4,805,528	7,266,785	2,227,734

Present Spending Increase/Tax decrease model is Leverage Machine

- **Leverage enabled funding of current consumption through future taxation**
- **Ponzi Financial Engineering based on complexity, “frictionless” markets, moral hazard + lower and lower interest rates**
- **ZIRP puts huge volatility on other asset prices, capital flows and exchange rates and underprice risks**
- **ZIRP creates huge Collective Action Dilemma - no country can increase interest rates, tax rates and regulation without huge capital flows and arbitrage.**

Chart 3: Return on assets and leverage for global banks, end-2007



Excessive Consumption drove Global Resource Depletion

- **Challenge of Medium term financial regulation is how to shift our financial structure to a more “deleveraged” model, consistent with a real sector sustainable consumption that does not add to Global Warming.**
 - **Completeness of Globalization requires - global tax mechanism, global monetary policy, global financial regulation and global court and bankruptcy laws**
- **Global Network Collective Action problem of -**
 - **How to coordinate monetary policy**
 - **How to prevent regulatory “race to the bottom”**
 - **How to raise fiscal resources to deal with need for Global Public Goods**

Global Climate Change will change Global Real Sector and Governance Model, including financial regulation

- **Financial losses are say \$2-3 trillion during this crisis; global biodiversity losses are around \$2-5 trillion annually (EC-sponsored TEEB interim study, 2008)**
- **Japan “solved” asset bubble deflation by ZIRP and fiscal debt to 200% GDP. Solution replicated in this crisis.**
- **Problem therefore is that we have no fiscal resources to cushion economy against “bubble-thy-neighbour” policy.**
- **We therefore need to change “Leverage Machine” model with fiscal system that balances consumption with sustainable resources and balances fiscal sustainability.**
- **Many of our problems are going to be global collective action problems**

4. Changing Incentives: Excessive Leverage = Moral Hazard

- Financial Sector is subsidized by under-priced Deposit Insurance
- Central Bank Investor of Last Resort = Quasi-fiscal Action
- You cannot solve Excess Leverage with more Leverage
- Excess Liquidity Hides Insolvency
- To get collective action agreement, you need to have proper incentive structure - reward plus taxation!
- **Global turnover tax would fund Global Public Goods and would be an additional tool to deal with excess leverage, excess consumption and excess carry trade volatility.**

Turnover Tax to solve Fiscal Gap for Global Public Goods

1. Less regressive, voluntary “user-pay” tax that is easy to collect
2. Can be counter-cyclical, increased as turnover increases to risky levels and reduce when market is slow - complements Capital Adequacy rules
3. **Used to equalize taxation between subsidized financial sector and real sector**
4. Reduced profits means reduced risk-taking
5. Add Sand in Wheels, because Frictionless Financial System enables infinite derivation and Runaway Windmill
6. Tax collection mechanism means that financial markets can be monitored against money laundering, insider trading, market manipulation etc that is currently impossible in global markets

COLLECTIVE ACTION CORE PROBLEMS

- **Collective action occurs when more than one individual is required to contribute to an effort in order to achieve an outcome.**
- **if all individuals pursue short-term, self-centered benefits [free riding, crime and moral-hazard], not only there are no collective benefits, there could be huge negative externalities [crisis or disasters].**

Ostrom 1990:

Three influential models to discuss

- 1. The Tragedy of the Commons**
- 2. The Prisoners' Dilemma; and**
- 3. The logic of collective action**

How do we work together for growth and stability, without free riding and moral hazard?

- Some recommend **the state**
Some recommend **privatisation or market self-interest**

Ostrom - history has shown that some communities have successfully managed scarce resources for a long time without either a state or private ownership, relying on other types of institutions: **self-governance**

Fragmentation of governance means that we cannot cooperate to deal with free riding and moral hazard effectively

Two possible approaches:

- **Horizontal fragmentation** (*the joint provision of action by different departments, MoF, central banks and regulators*),
- **Vertical centralization** (*one authority to coordinate and direct everything - the central bank + systemic regulator*) - *but this requires full independence, including legislative interference.*
- **Trust, reciprocity requires high transparency**

- **Centralization** can be efficient, decisive, but imposes large costs, can be authoritarian and wrong or even bureaucratic because of monopoly of power.
- **Privatization** can reduce coordination problems in situations where markets can be created, but raises further problems of control and coordination.

Game theory and **network analysis** are two of the most important tools of such micro-level analysis.

- ***Game theory*** provides tools to model how preferences, beliefs, and constraints affect choices in strategic (or interactive) decision-making situations.
- ***Network analysis***, on the other hand, looks at the way multiple interactions of a certain kind are connected to each other and studies how the configuration of the interactions affect the outcomes for individuals and the group as a whole.

Monetary Policy and Systemic Regulation are about *networked-games between different market participants and the state agencies*

- The games are interdependent and interactive, hence behaviour is pro-cyclical.
- Central banks need to concentrate less on research into theory, but more on practice, market behaviour, arbitrage, incentives, leads and lags, institutional weaknesses or gaps and capacity and ability to act.
- Cooperation can be effected more easily through informal policy networks, than formal institution-to-institutional relationships.

Strong-ties [Clusters] vs Weak ties [dispersed market]

- **Strong-tie networks are best at enhancing credibility and trust required to resolve cooperation problem**
- **Weak-tie bridging networks are best at obtaining and distributing information (use education)**

Stakeholders denser networks seem to be more effective in implementation, development of joint undertakings.

Modern Collective Action Theory realizes importance of Institutional Path Dependence, Context and Evolution

- **No “one-size fits all” solution. Central banks need to have good understanding of local culture, history and behaviour in order to implement monetary and financial stability policies**
- **Central banks should therefore be much more flexible and open to informal communication with market participants to encourage self-regulation through better corporate governance and sustainable development, because the state cannot regulate everything.**
- **Without system-wide understanding and also feed-back from market stakeholders on where the problems are, central banks will not have the information to apply the right policies.**
- **Central banks are not independent of the market, nor the market and are also human [cf Goodhart’s Law].**