Rethinking Economics after the Crisis

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HAS MACROECONOMICS CHANGED?

- I taught macroeconomics long ago. I taught IS-LM, Phillips curve and the FRB-MIT-Penn model.
- This lead to VAR and impulse response functions.
- Then we had the energy crisis and supply side macro
- Then we had rational expectations with its policy impotence, the Lucas critique and DSGE.
- Then came globalization and international macro.
- Now we have the financial crises and macro finance.

NEW ECONOMIC GOALS

- Understand the causes of the financial crisis
- Develop policies to prevent future crises
- Understand the channels from the financial sector to the real economy
- Forecast the arrival of the next financial crisis with as much lead time as possible
- Understand how to minimize the effects once a financial crisis begins and then to restore normality

MACRO-FINANCE

- The field of study we now call Macro-Finance has taken up these challenges.
- It changes macroeconomics to incorporate financial markets and frictions
- It changes finance to include banking institutions and externalities
- It focuses on regulation and risk management-topics that were previously minor components of a finance education.

IS THE NEW MACRO-FINANCE A SUCCESS?

- By the standards of the goals– probably not.
- Most macro-finance models are "toy models" designed to rigorously illustrate how some friction could work.
- At best, these models are "calibrated" but not estimated.
- Empirical models are more "reduced form" such as the regime switching VAR models we saw yesterday.

HOW TO MEASURE SUCCESS???

1. Able to fit this financial crisis without using too many dummy variables
2. Also fit previous financial crises or other countries financial crises. (but are the underlying dynamics the same?)
3. Have useful and theoretically plausible predictions for the causes and channels.
4. Have plausible prescriptions for regulation
5. Have plausible policy recommendations

WHAT SHOULD WE EXPECT TO LEARN FROM A GOOD MACRO-FINANCE MODEL?

- How to identify and regulate SIFIs.
- How to implement counter-cyclical regulations
- How to improve monetary policy
- How to foresee crisis preconditions
- How to mitigate and ameliorate a crisis
- How to coordinate with fiscal policy

- None of the models answer most of these questions.

QUESTIONS on SIFIs

- How to identify SIFIs? A good model that identifies channels should answer these questions.
- Should asset managers be SIFIs?
- Should insurance companies be SIFIs?
- Should foreign subsidiaries be SIFIs?
- Could non-financials be SIFIs?
- What about firms that pose a risk to the real economy if they fail vs. firms that *could* pose a risk to the real economy but are safe?

WHAT IS THE DIFFERENCE BETWEEN SYSTEMATIC RISK AND SYSTEMIC RISK?

- In Finance, systematic risk is the common risk that impacts all assets. It may be an equity market aggregate or a measure of aggregate wealth possibly even including human capital. This is a feature of all general equilibrium models with uncertainty. It can be catastrophic but is it systemic?

- I prefer to use systemic risk for risks that result from market failures, particularly financial market failures that seriously impact the real economy.

PET PEEVES

- Is it systemic when agents hold the same portfolio?
- In classical general equilibrium models, all well informed agents hold the same portfolio but in different proportions. Hence it is not inherently systemic.
- Is high volatility systemic? No as the news may be extremely informative about changes in the economy. Is low volatility a policy objective? No.

ANOTHER PET PEEVE – DOMINO THEORY

- Any domino will trigger a complete meltdown.
- In reality, bank failures are not generally systemic. They are only systemic when the sector is so undercapitalized that it cannot absorb the losses.
- Interconnectedness is also called risk sharing
- What we saw was a *tsunami* not a domino. Many banks held the same assets which fell in value.
- Firesale or just overvalued because of risk myopia and regulatory risk weights?

DEMAND OR SUPPLY?

- Is the key channel the withdrawal of financial intermediation services or the lack of demand?

- Conversations in Iseo

- Mian and Sufi "House of Debt" is an interesting challenge
- Is there a bigger role for fiscal policy?

VAR MODELS

- Switching regimes seem necessary because dynamics from 1990-2006 appear to be from a different regime!
- Is there a specification that doesn't have to switch?
- In many of my VARs, bank credit is a negative predictor of IP suggesting reverse causality.

THE FINANCIAL CRISIS: WERE WE PREPARED?

FORECASTING VOLATILITY in V-LAB

- VLAB.STERN.NYU.EDU

- VLAB forecasts volatilities of a thousand assets every day with a variety of models

- Assets include equity indices, individual equities, bonds, FX, international equities, commodities, and even volatilities themselves.

V-Lab
BETA

Documentation »   Analysis List »

NYU STERN
THE VOLATILITY INSTITUTE

| Systemic Risk Analysis ▼ | GMES ▼ | Click 'Go' for GMES SRISK Analysis | Go |

V-LAB ANALYSIS OVERVIEW

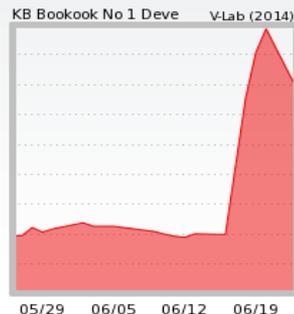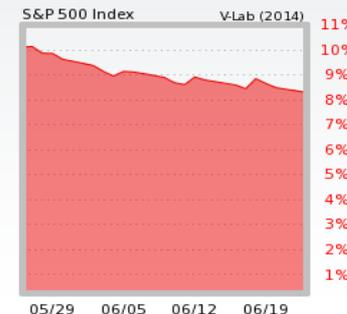**VOLATILITY** | CORRELATIONS | SYSTEMIC RISK | LONG RUN VALUE AT RISK | LIQUIDITY | ⓘ

HOT	Volatility	Change
149130:KS	137.49	-39.90
NIHD:US	136.70	-2.72
SIR:AU	127.38	-0.38
084680:KS	122.43	-26.93

HEATING	Volatility	Change
TEG:US	40.61	+23.69
104120:KS	58.05	+16.16
123690:KS	53.90	+13.71
FMC:US	31.59	+13.66

KB Bookook No 1 Deve — V-Lab (2014)
05/29 06/05 06/12 06/19

MARKET SUMMARY		
	Volatility	Change
SPX	8.30	-0.19
UKX	8.60	+0.41
DAX	11.53	+0.73
CAC	11.88	+0.27
EUR	4.83	-0.04
JPY	6.41	+0.03
MXWD	6.57	-0.11
EEM	13.56	-0.26

S&P 500 Index — V-Lab (2014)
05/29 06/05 06/12 06/19

The Volatility Laboratory (V-Lab) provides real time measurement, modeling and forecasting of financial volatility, correlations and risk for a wide spectrum of assets. V-Lab blends together both classic models as well as some of the latest advances proposed in the financial econometrics literature. The aim of the website is to provide real time evidence on market dynamics for researchers, regulators, and practitioners.

The V-Lab is currently running 28897 analyses on 6052 datasets producing a total of 63777 series each day!

Monitoring Risk with V-Lab: Professor Rob Engle's video lecture on using V-Lab to monitor risk at the Becker Friedman Institute
An Introduction to Financial Volatility: Professor Rob Engle's video lectures on the Financial Times

V-Lab Related Documents

- Prof. Rob Engle is interviewed about the financial services industry
- Dynamic Conditional Beta
  Engle (2014)
- AEA Paper - Capital Shortfall: A New Approach to Ranking and Regulating Systemic Risks
  Acharya, Engle, and Richardson (2012)

What's in V-Lab?

Asset Class	Number of Assets
International Equities	2633
Equities	770
Credit Default Swaps	292
Equity Indices	174
Currencies	103
Commodities	59
Volatility Indices	14
Equity Sectors	9
Treasuries	8
Corporate Bonds	6
Real Estate	3

Share your insights:

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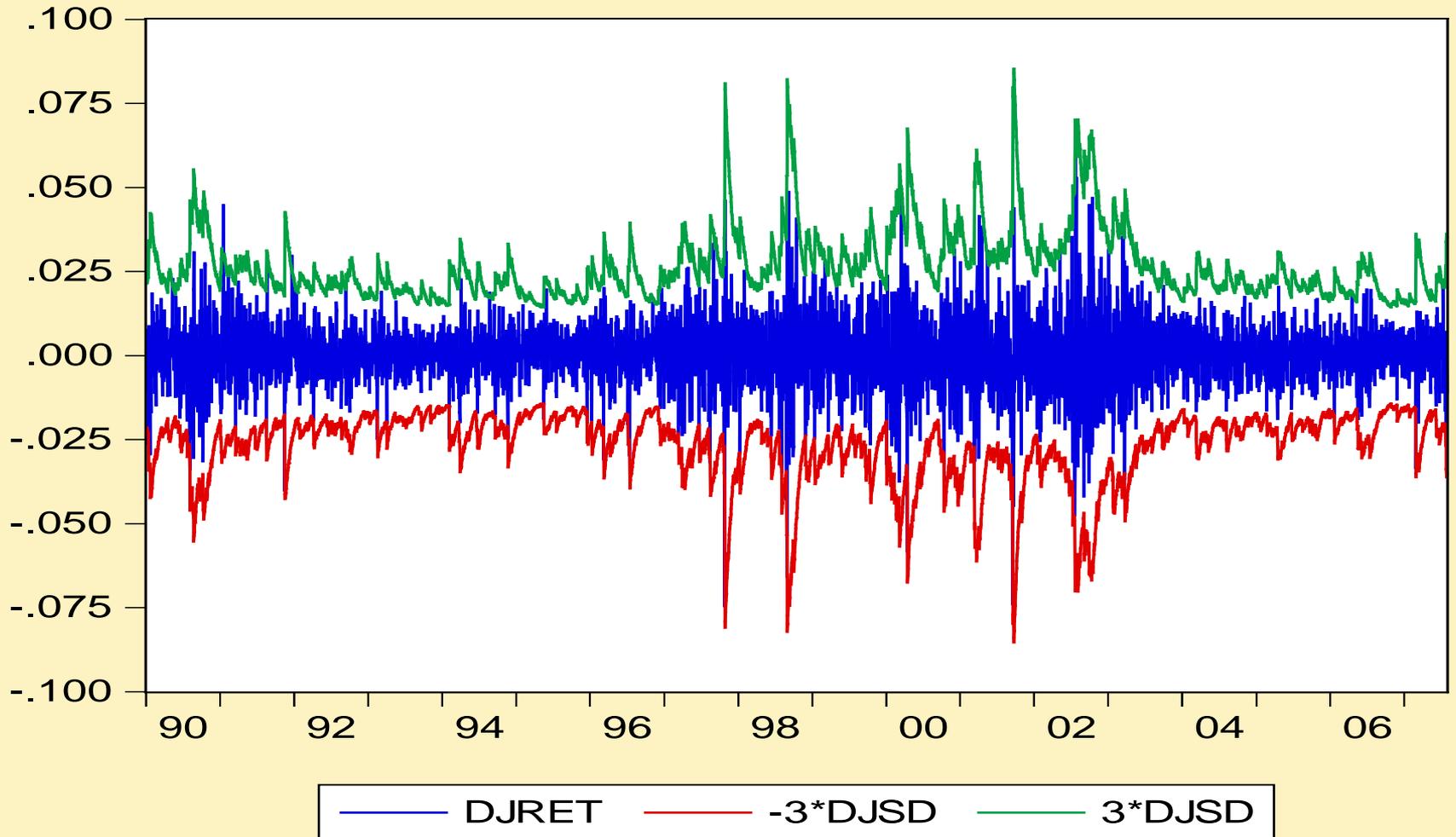
Send Comments to V-Lab

CAN YOU PREDICT A CRISIS?

- **V-LAB experience**
  - Risk measures during the financial crisis
  - SRISK agrees with most of the SIFI designations made at the same time
  - SRISK has similar rankings and better predictability compared with most stress tests when capital ratios are measured relative to total assets. See forthcoming paper in JME.
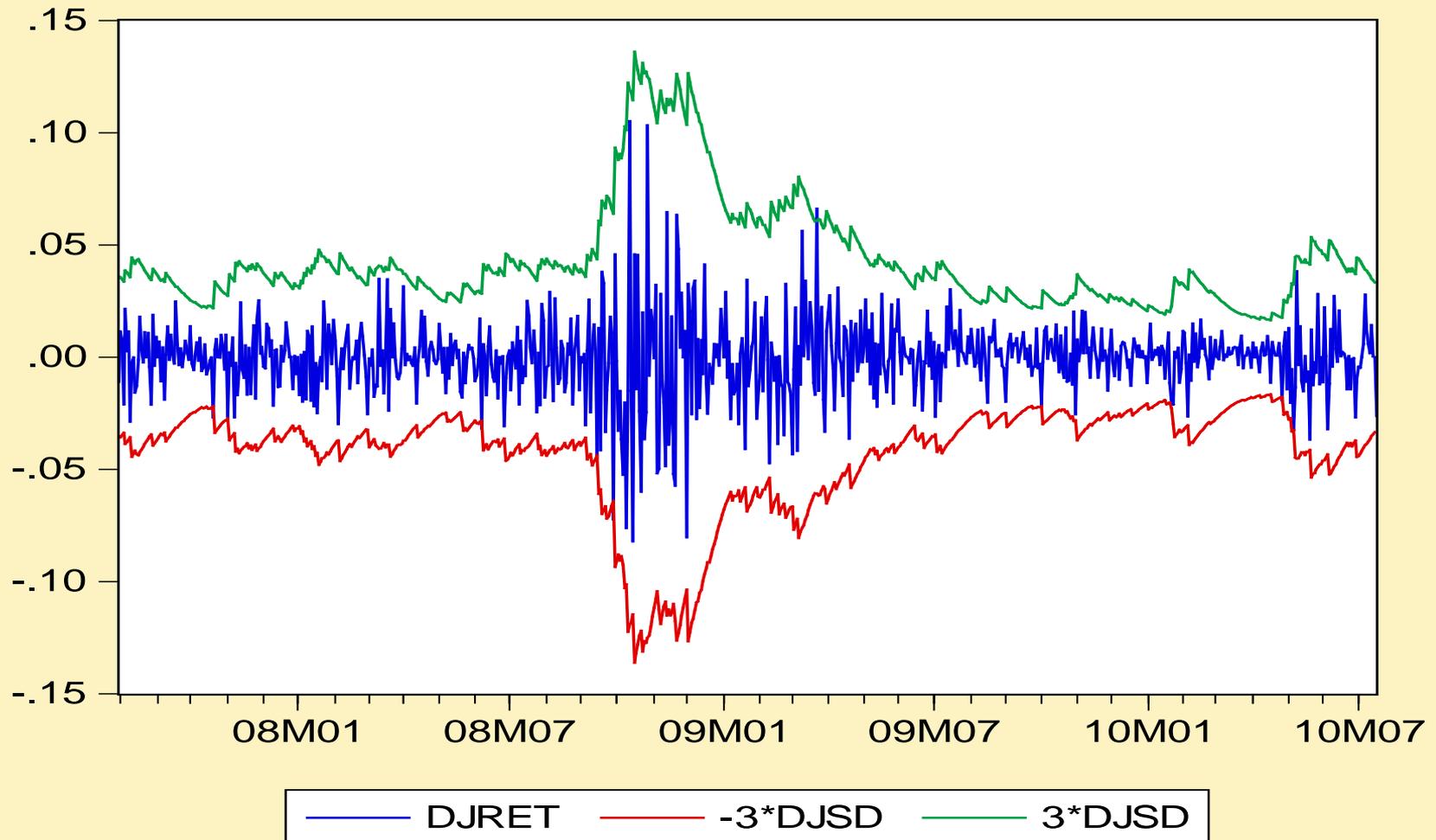
CONTINUE

▫ Six months before the crisis, the most systemically risky US financial firms were ones that failed in the crisis. The order in Jan 2007 was MS, FNMA, FMAC, GS, LEH, ML, BSC, MET, C, HIG

▫ But the list does not include BAC, AIG, JPM, WMU,WB and other big commercial banks.

▫ Remember that BAC bought Countrywide in 2007 and Wachovia (WB) bought Golden West in 2006. These institutions rose rapidly in their systemic riskiness and forecasting this a year in advance would require corporate strategy notes.

3 Sigma Bands before Aug 2007

Out-of-Sample 3 Sigma Bands after Aug 2007

FORECAST PERFORMANCE IN VLAB

- During the financial crisis, the short run forecasts were just as accurate as during the low volatility period.
- One month ahead forecasts were less accurate during the crisis but were still within the 1% confidence interval of historical and theoretical experience.
- See Brownlees, Engle, Kelly,"A Practical Guide to Forecasting in Calm and Storm" *Journal of Risk, 2011*
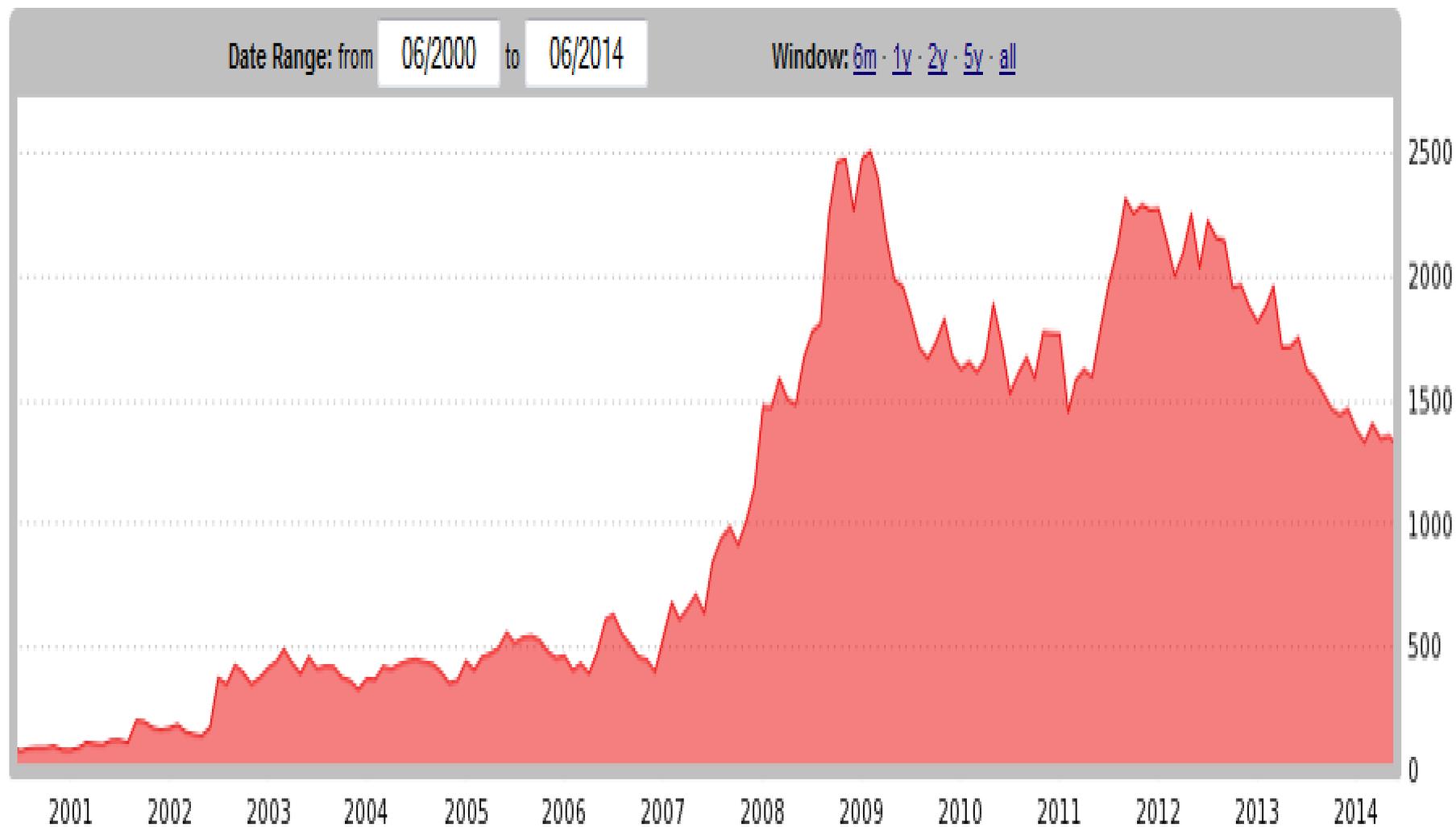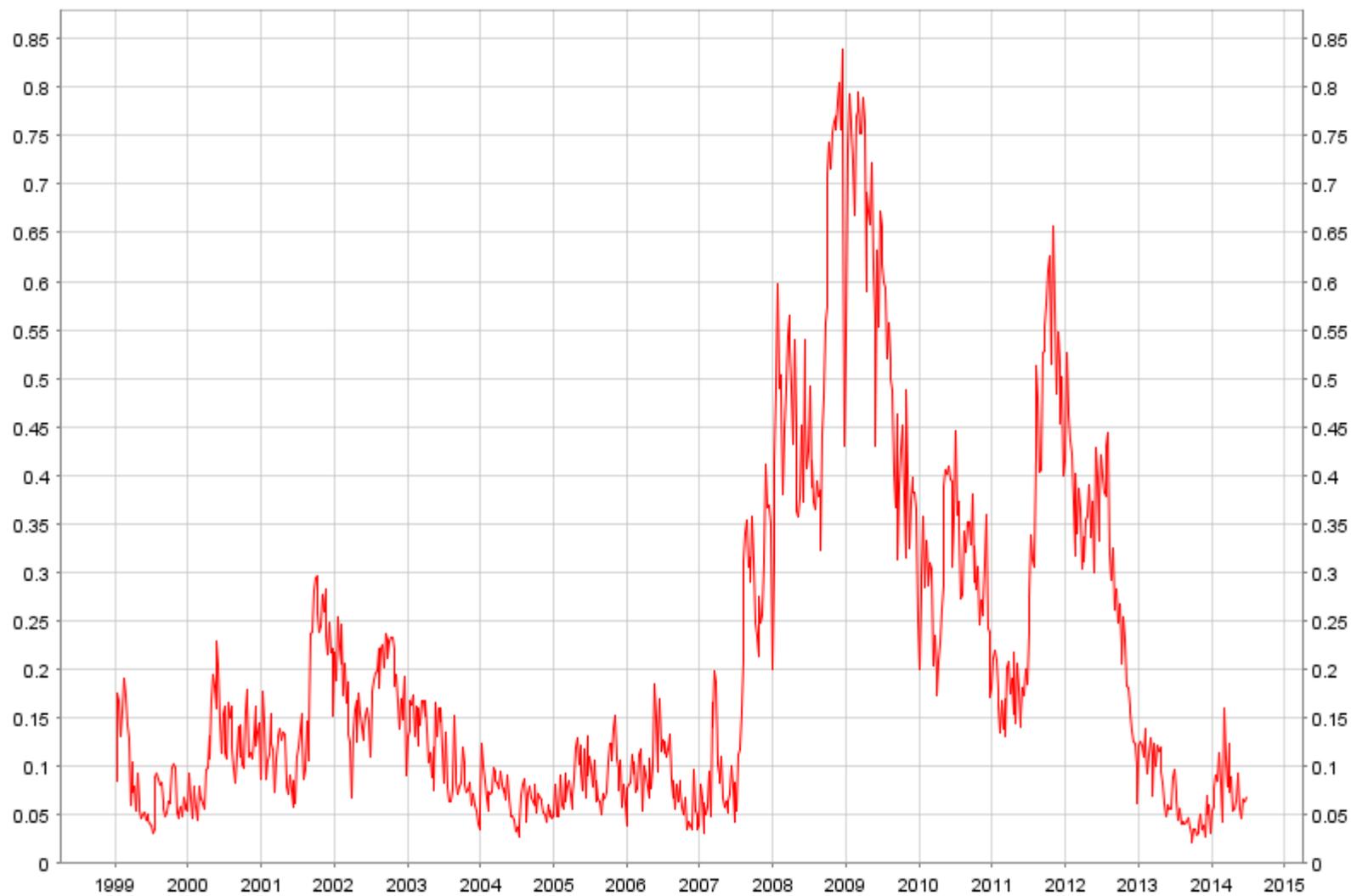
RISK MYOPIA

- If agents use short run risk measures to make decisions about illiquid assets, then low volatility will lead to excessive buildup of leverage.
- This can be household borrowing or bank holdings of illiquid assets or ratings agency valuation of complex CDOs.

- There is a risk that the risk will change
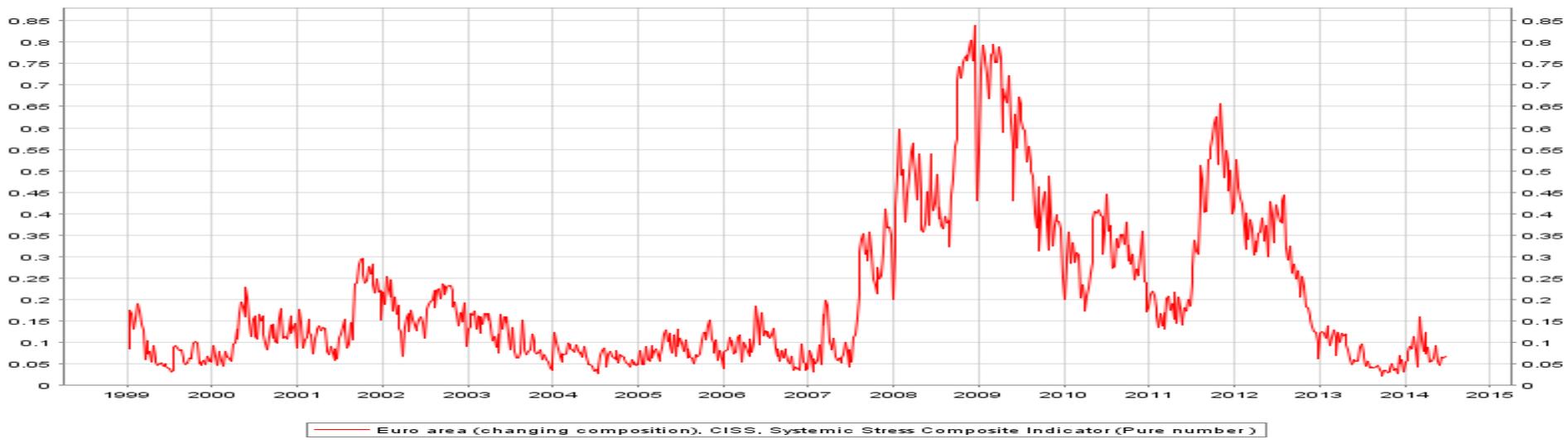
MEASURES OF SYSTEMIC RISK

- SRISK is a capital shortfall measure.
- How much capital would a firm need to raise in order to function normally if we have another financial crisis?
- Measure is based on size, leverage and risk. Inputs are equity valuation and book liabilities.

- Estimate this econometrically and update weekly for 70 countries and 1200 firms.
- What do we see in Europe?

Risk Analysis Overview - Europe Financials Total SRISK (US$ billion)

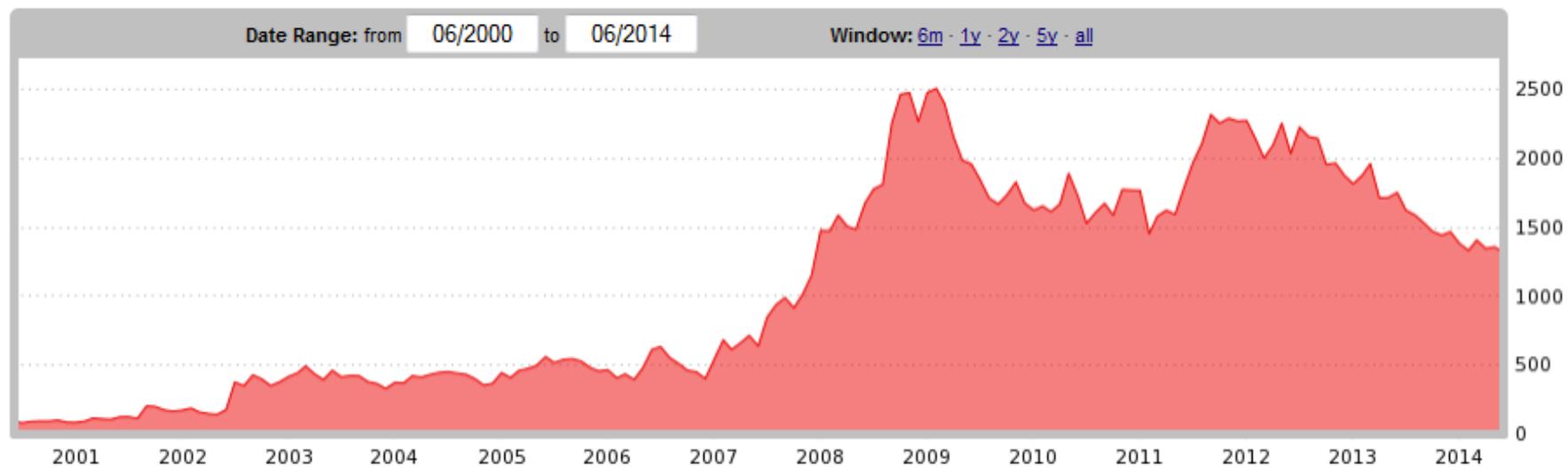Euro area (changing composition), CISS, Systemic Stress Composite Indicator (Pure number)

Euro area (changing composition), CISS, Systemic Stress Composite Indicator (Pure number)

Risk Analysis Overview - Europe Financials Total SRISK (US$ billion)

Date Range: from 06/2000 to 06/2014   Window: 6m · 1y · 2y · 5y · all

Systemic Risk Rankings for `2014-06-20 ▾` ☐ View changes

Institution	SRISK%	RNK▲	SRISK ($ m)	MES	Beta	Cor	Vol	Lvg
Credit Agricole SA *	8.15	1	96,853	4.14	1.71	0.49	24.5	55.65
Deutsche Bank AG	7.97	2	94,677	3.60	1.50	0.53	20.6	43.93
BNP Paribas SA	7.20	3	85,558	3.44	1.44	0.48	20.2	28.22
Barclays PLC	7.16	4	85,031	3.33	1.39	0.38	21.2	34.06
Societe Generale SA	6.15	5	73,073	4.49	1.87	0.51	25.8	38.57
Royal Bank of Scotland Group PLC	4.19	6	49,761	2.61	1.09	0.35	19.6	25.62
ING Groep NV	3.59	7	42,603	3.91	1.63	0.51	20.8	23.59
London Stock Exchange Group PLC	3.47	8	41,202	2.71	1.21	0.37	24.6	95.23
UniCredit SpA	2.89	9	34,367	3.71	1.55	0.47	24.9	21.66
Commerzbank AG	2.77	10	32,932	4.01	1.68	0.47	27.5	41.61
Schweizerische Nationalbank	2.57	11	30,487	0.79	0.33	0.09	28.1	4574.50
Credit Suisse Group AG	2.40	12	28,500	3.64	1.52	0.47	19.2	20.81
Natixis *	2.35	13	27,972	4.10	1.69	0.42	27.7	33.79
AXA SA	2.31	14	27,439	4.29	1.77	0.56	20.6	17.37
Lloyds Banking Group PLC	2.02	15	23,964	3.20	1.34	0.38	24.5	15.32
UBS AG	1.88	16	22,381	3.71	1.55	0.47	21.0	15.37
Legal & General Group PLC	1.69	17	20,060	3.02	1.26	0.46	18.9	26.97
CNP Assurances	1.62	18	19,246	3.44	1.42	0.51	18.6	34.65
Intesa Sanpaolo SpA	1.60	19	19,030	3.84	1.60	0.43	28.2	16.19
Banco Santander SA	1.54	20	18,320	3.43	1.43	0.55	19.0	12.92

Global Systemic Risk Rankings

"A Look Back"

Systemic Risk Rankings for 2010-01-29 ☐ View changes

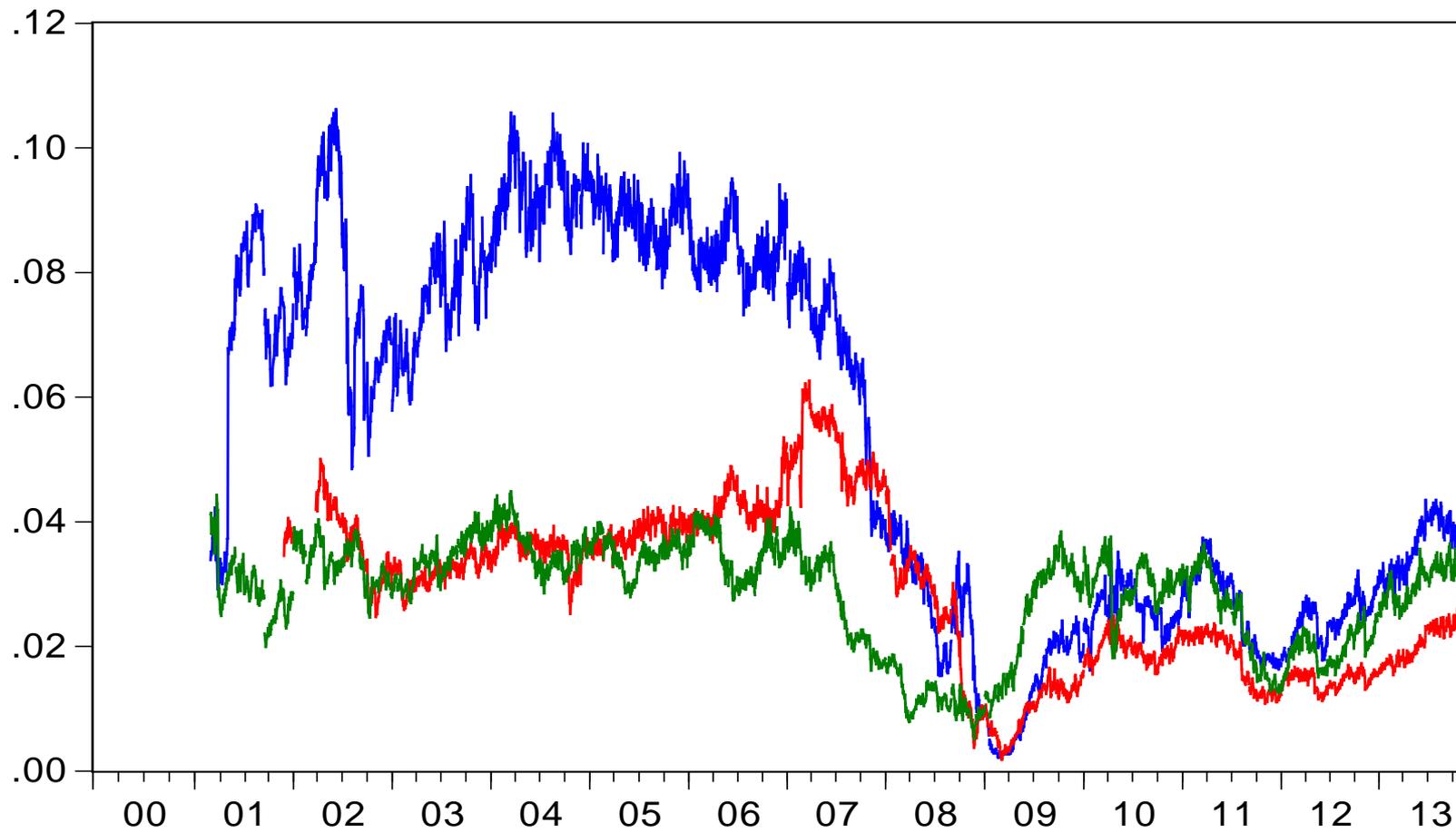| Institution	SRISK%	RNK ▲	SRISK ($ m)	MES	Beta	Cor	Vol	Lvg
Royal Bank of Scotland Group PLC	7.86	1	117,517	4.17	1.47	0.47	61.1	47.58
BNP Paribas SA	7.53	2	112,619	3.50	1.24	0.57	37.5	34.01
Credit Agricole SA *	6.78	3	101,368	3.89	1.37	0.57	40.0	59.53
Deutsche Bank AG	6.63	4	99,161	4.48	1.59	0.68	42.2	55.81
Barclays PLC	6.47	5	96,823	4.59	1.62	0.54	53.0	44.13
ING Groep NV	4.82	6	72,135	4.12	1.46	0.55	40.9	45.09
Commerzbank AG	4.02	7	60,088	3.89	1.38	0.56	44.1	127.40
Lloyds Banking Group PLC	3.92	8	58,576	3.02	1.07	0.40	45.4	31.33
Societe Generale SA	3.87	9	57,850	4.23	1.50	0.57	45.9	33.28
UBS AG	3.06	10	45,787	3.69	1.31	0.54	38.4	27.53
Dexia SA	2.58	11	38,658	3.12	1.10	0.50	37.2	74.65
UniCredit SpA	2.56	12	38,317	2.98	1.05	0.57	45.6	23.91
AXA SA	2.05	13	30,692	4.19	1.48	0.62	33.4	20.78
Credit Suisse Group AG	1.94	14	28,994	4.18	1.47	0.55	43.9	19.23
Natixis *	1.82	15	27,181	3.76	1.25	0.44	39.8	46.04
Banco Santander SA	1.76	16	26,323	3.82	1.35	0.62	42.0	13.71
Legal & General Group PLC	1.48	17	22,082	3.00	1.06	0.44	39.8	67.38
Danske Bank A/S	1.44	18	21,515	2.46	0.87	0.42	30.9	35.21
Aviva PLC	1.38	19	20,565	2.95	1.04	0.46	29.0	32.84
Intesa Sanpaolo SpA	1.37	20	20,556	3.16	1.12	0.56	39.2	18.90

REGULATION

HOW EFFECTIVE WAS PAST REGULATION?

- This is important in understanding how much of financial outcome was due to regulation and how much to economic incentives.

- Suppose that regulation was effective and that it had time varying capital requirements. Using the V-LAB measure of 40% decline in aggregate equities as a stress scenario, what was the implicit stressed capital ratio used by regulators? What k makes SRISK=0?

$$k_t^{implicit} = \frac{1 - LRMES}{Leverage - LRMES}$$

CONCLUSIONS

- There is lots of excellent research being done. Much of the best appears to be in central banks.
- There are many important questions left to solve.
- As with all new fields, it takes time to sort out the findings and strategies but this is happening.
- We are in an exciting time.