



THE PROSPECTS FOR GLOBAL FINANCIAL STABILITY

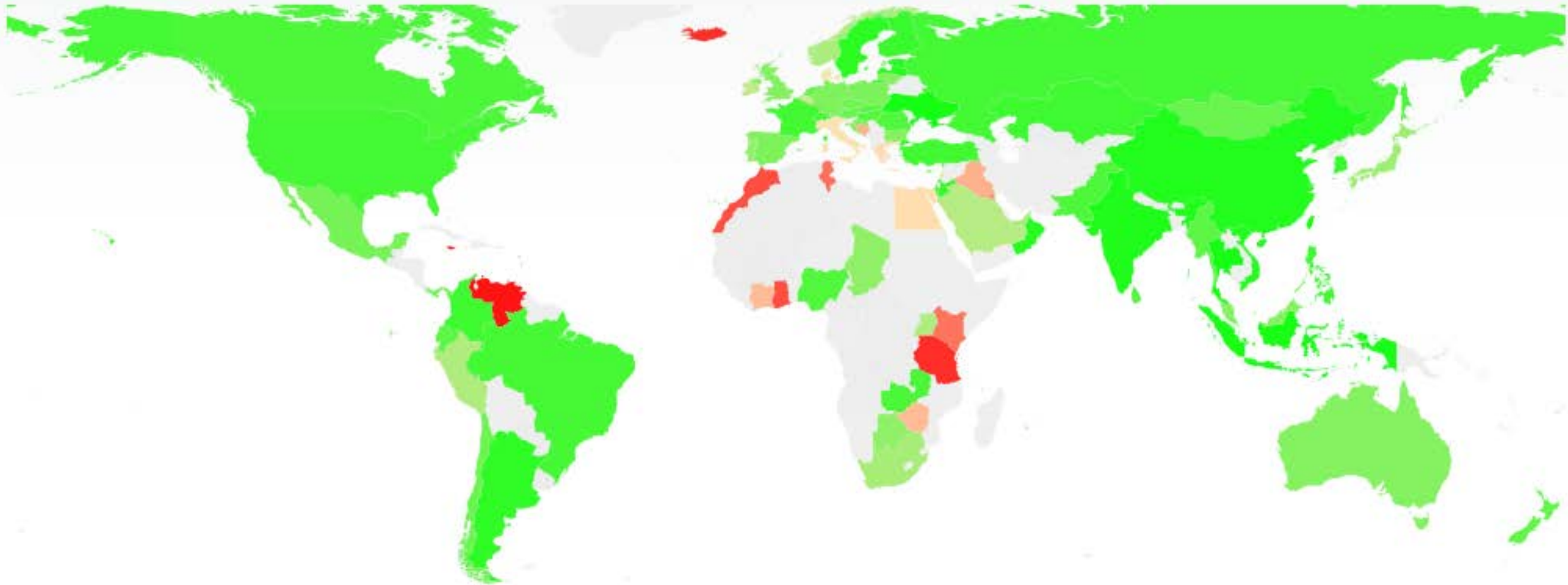
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Volatility Institute of NYU Stern
ASEAN BRIDGES FOR PEACE
February, 2017

VOLATILITY TODAY FEB 13, 2017

VLAB.STERN.NYU.EDU

Region: World

Now



RISK IN FINANCIAL MARKETS

- ▣ Should we hope to eliminate financial risk?
- ▣ No! Financial markets will not work if there is no risk!
- ▣ Investors will know the future price of stocks and other financial assets if there is no risk. Everyone will own the same stock!!
- ▣ Firms will have no incentive to improve performance
- ▣ Capital will not be allocated to the best companies

RISK AND RETURN





WHAT IS SYSTEMIC RISK?

SYSTEMIC RISK



SYSTEMIC RISK

- ▣ WHEN THE FAILURE OF AN INSTITUTION TO MEET ITS OBLIGATIONS HAS SERIOUS CONSEQUENCES FOR THE REAL ECONOMY
- ▣ FAILURE OF ONE INSTITUTION WILL BE MUCH MORE DANGEROUS IF THE WHOLE FINANCIAL SECTOR IS WEAK.

REGULATORY CHALLENGE

- ▣ ENSURE THAT FINANCIAL INSTITUTIONS HAVE SUFFICIENT CAPITAL SO THAT THEY CAN NOT ONLY SURVIVE A FINANCIAL CRISIS, BUT CONTINUE TO INTERMEDIATE AND PROVIDE FINANCIAL SERVICES TO THE REAL ECONOMY.
- ▣ GOOD REGULATION IS PREVENTION – NOT RESCUE



WHY DO PEOPLE AND BANKS NEED A CAPITAL CUSHION?

- ▣ If you lose your job or have a big expense, will you have enough savings to get by?
- ▣ Banks have this problem too. They borrow money (from us and from capital markets) and invest it typically in loans. If these go bad they won't have enough capital to pay back the money they borrowed.
- ▣ We will measure this by considering a stress event to see if there is enough capital.

DEFINITION of SRISK

- ▣ *How much capital would a financial institution need to raise in order to function normally if we have another financial crisis?*
- ▣ Principle investigators: Viral Acharya, Matt Richardson and me at the Volatility Institute at NYU's Stern School. Collaboration with HEC Lausanne and the Institute for Global Finance at University of New South Wales. Contributions by Christian Brownlees, Rob Capellini, Diane Perriet, Emil Siriwardane.
- ▣ References: Acharya, Pedersen, Phillipon, Richardson "Measuring Systemic Risk (2010); Acharya, Engle, Richardson "Capital Shortfall, A New Approach to Ranking and Regulating Systemic Risks, AEAPP (2012), Brownlees and Engle, "Volatilities, Correlations and Tails for Systemic Risk Measurement", 2010

SRISK

$$\begin{aligned} SRISK_{i,t} &= \text{Median}_t \left(\text{Capital Shortfall}_i \mid \text{Crisis} \right) \\ &= \text{Median}_t \left(k \left(\text{Debt}_{t+n} + \text{Equity}_{t+n} \right) - \text{Equity}_{t+n} \mid \text{Crisis}_{t+n} \right) \\ &= k \text{Debt}_{t+n} - (1-k) \text{Median}_t \left(\text{Equity}_{t+n} \mid \text{Crisis}_{t+n} \right) \end{aligned}$$

▣ *And equity in a crisis is expected to fall by beta*market decline*

$$\log \left(\text{Equity}_{t+n} / \text{Equity}_t \right) = \beta_t \log \left(\text{WEquity}_{t+n} / \text{WEquity}_t \right) + u_{t+n}$$

$$\text{Median}_t \left(\text{Equity}_{t+n} \mid \frac{\text{WEquity}_{t+n}}{\text{WEquity}_t} = 1 - \theta \right) = \text{Equity}_t \exp \left(\beta_t \log (1 - \theta) \right)$$

SRISK IS A STRESS TEST

$$SRISK_t = kDebt_t - (1 - k) Equity_t \exp(\beta_t \log(1 - \theta))$$

- ▣ *SRISK depends upon size, leverage and risk OR INTERCONNECTEDNESS.*
- ▣ where k is the capital ratio under stress. we take this as 8% : it is adjustable
- ▣ and θ is the stress which we take as 40% decline in global equity markets over six months : this is also now adjustable.

HOW TO ESTIMATE THIS BETA?

- ▣ We use a global ETF and equity prices and accounting data from more than 1000 financial firms.
- ▣ We estimate volatility and correlation models for all of these every week using techniques derived from the ARCH model that was honored by the nobel prize.
- ▣ We call this a Dynamic Conditional Beta
- ▣ We adjust for time zones and post it on VLAB.
- ▣ See VLAB.STERN.NYU.EDU
- ▣ Or Google VLAB

THE BASIC IDEA of DCB

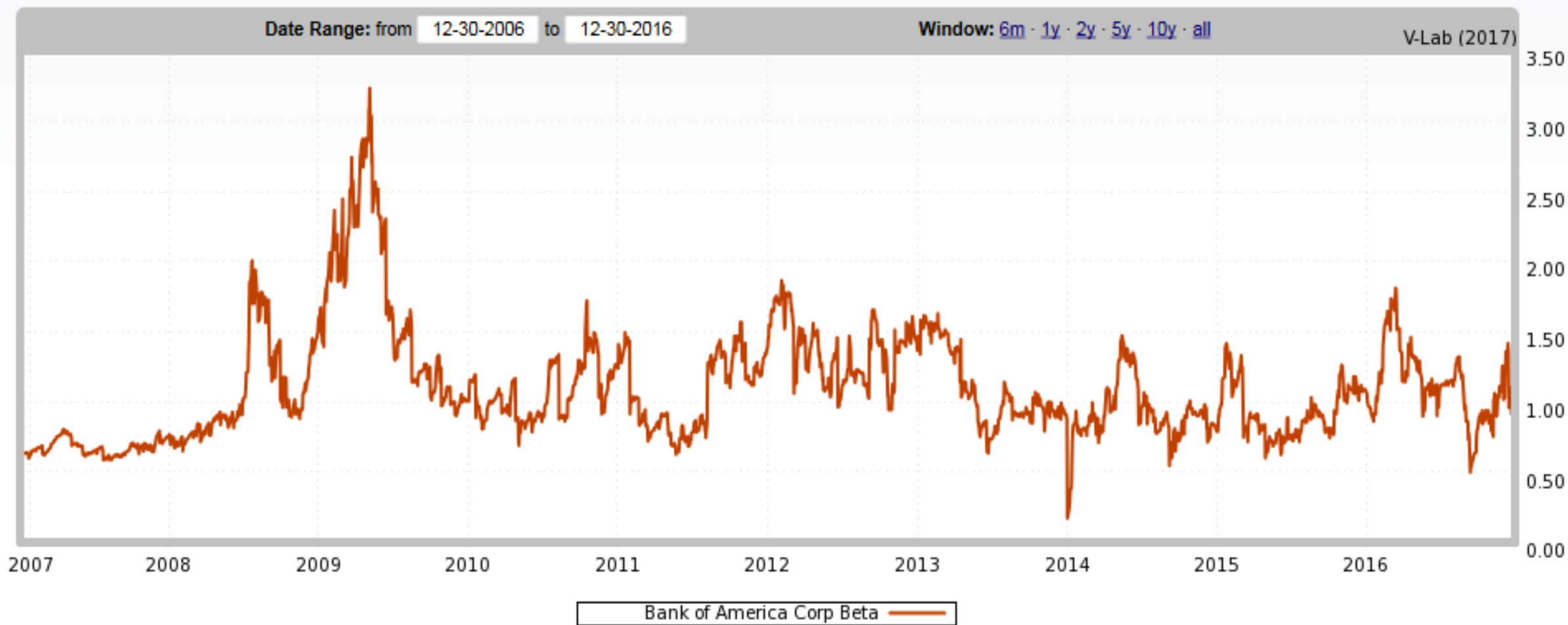
- ▣ Regression is the most widely used statistical tool for economists.
- ▣ In time series this incorporates the assumption that the coefficients are constant.
- ▣ In order to allow the coefficients to change over time, we will use the technology of multivariate volatility to model the changes.



DYNAMIC CONDITIONAL BETA

JOURNAL OF
FINANCIAL
ECONOMETRICS,
2016

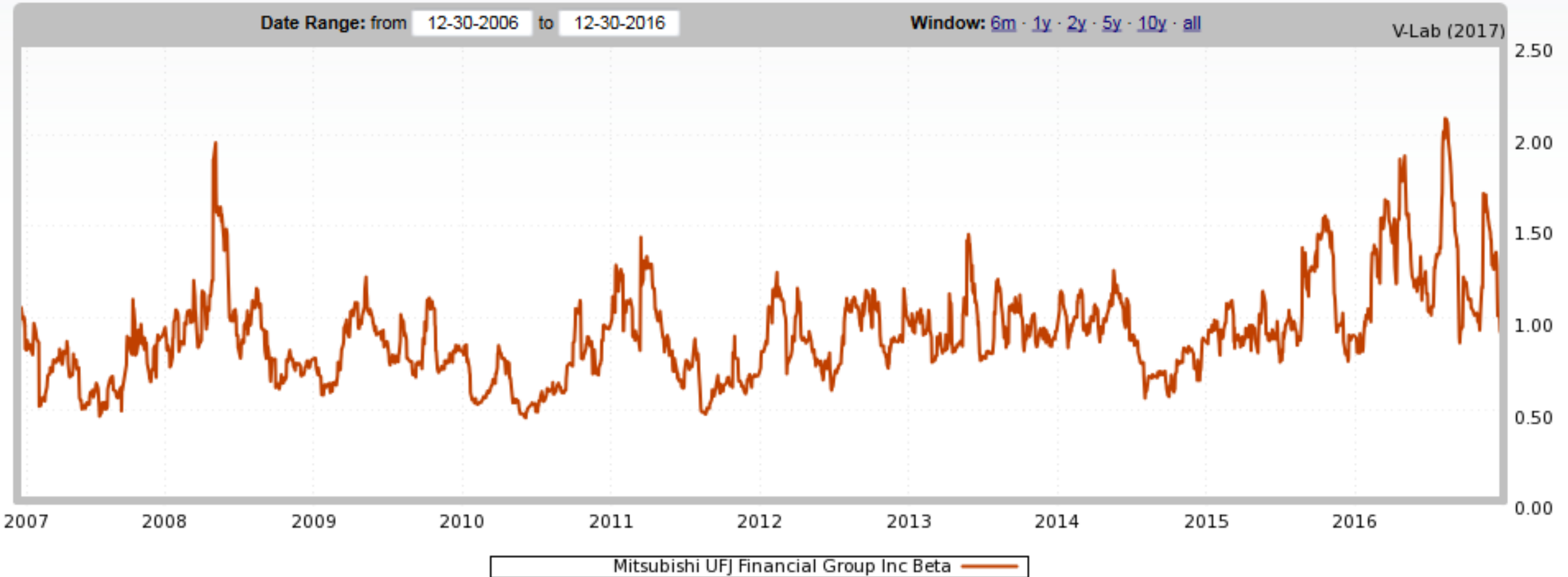
BANK OF AMERICA BETA



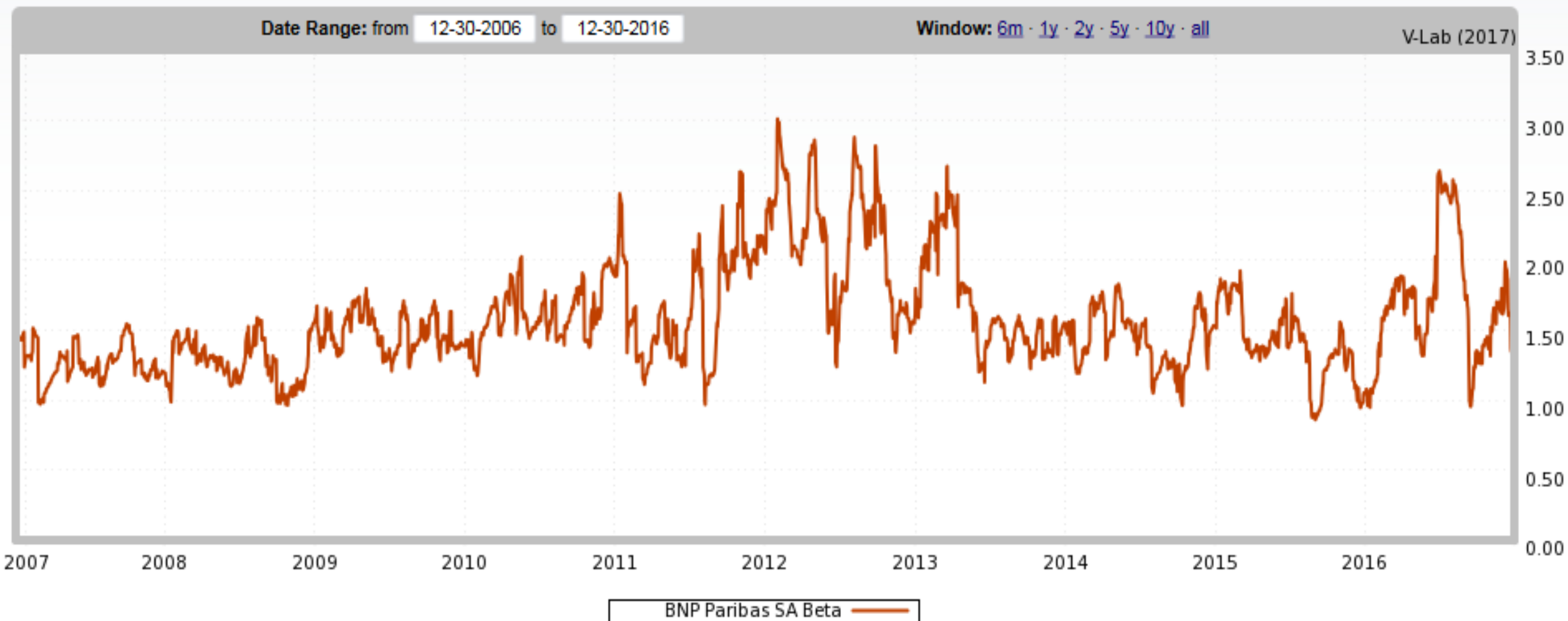
GOLDMAN SACHS BETA



mitsubishi ufj beta



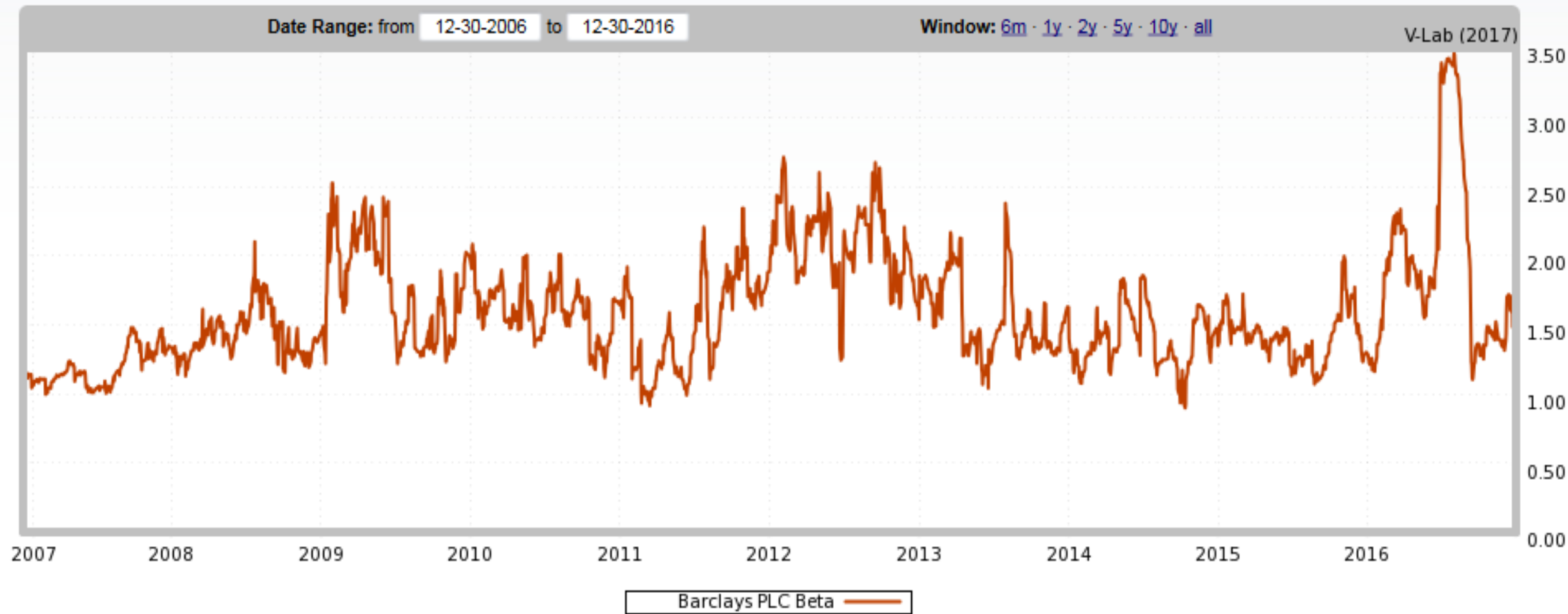
BETA FOR BNP PARIBAS



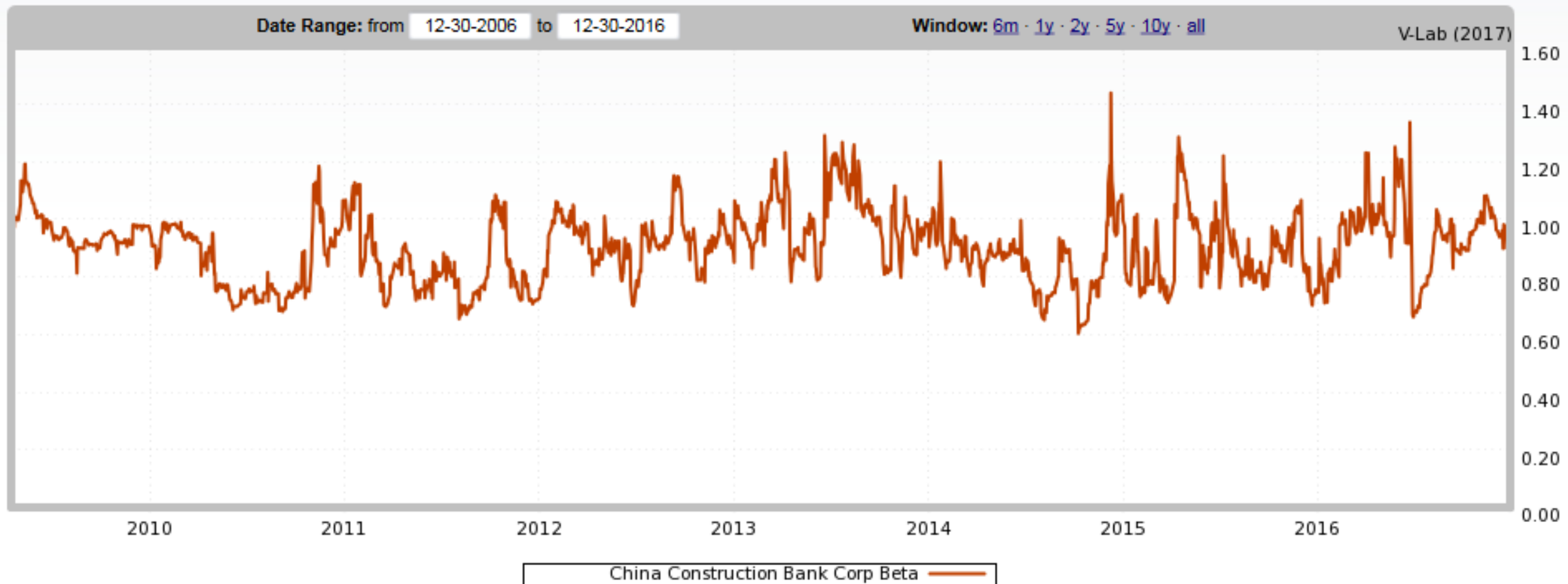
BETA FOR DEUTSCHEBANK



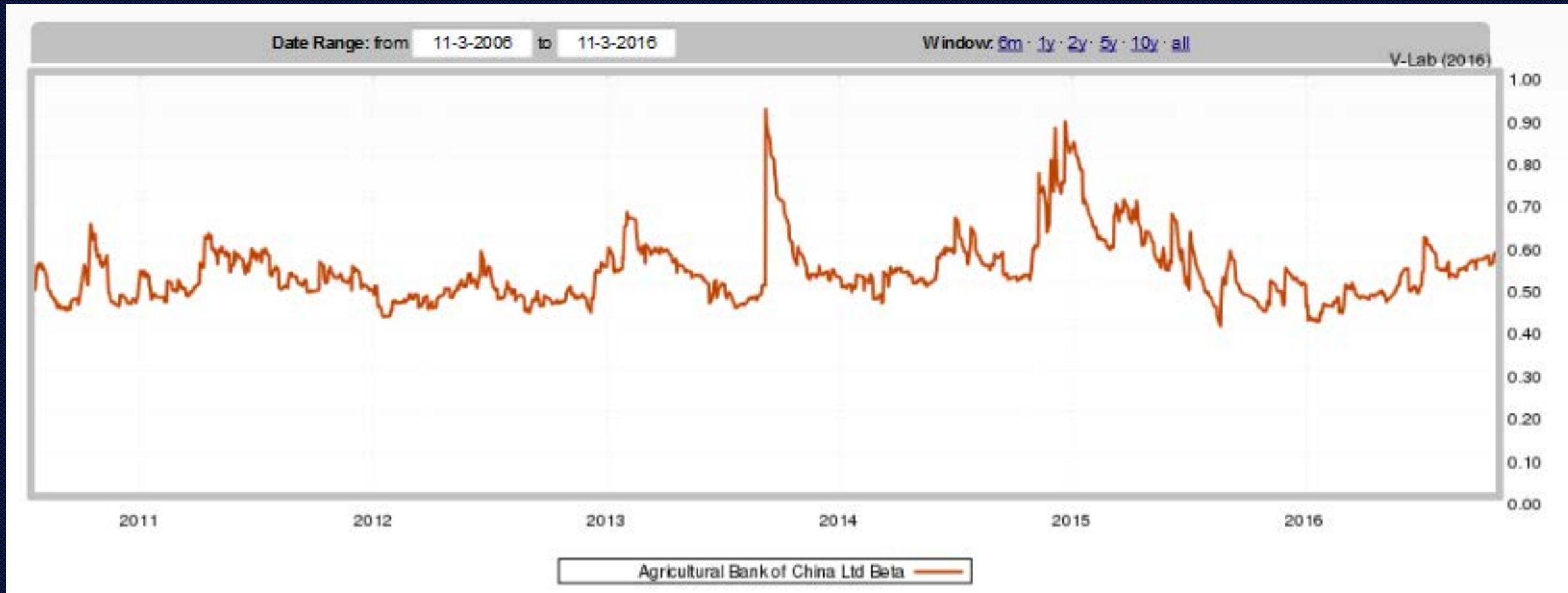
Barclay's Beta



BETA CHINA CONSTRUCTION BANK



BETA: AGRICULTURAL BANK OF CHINA

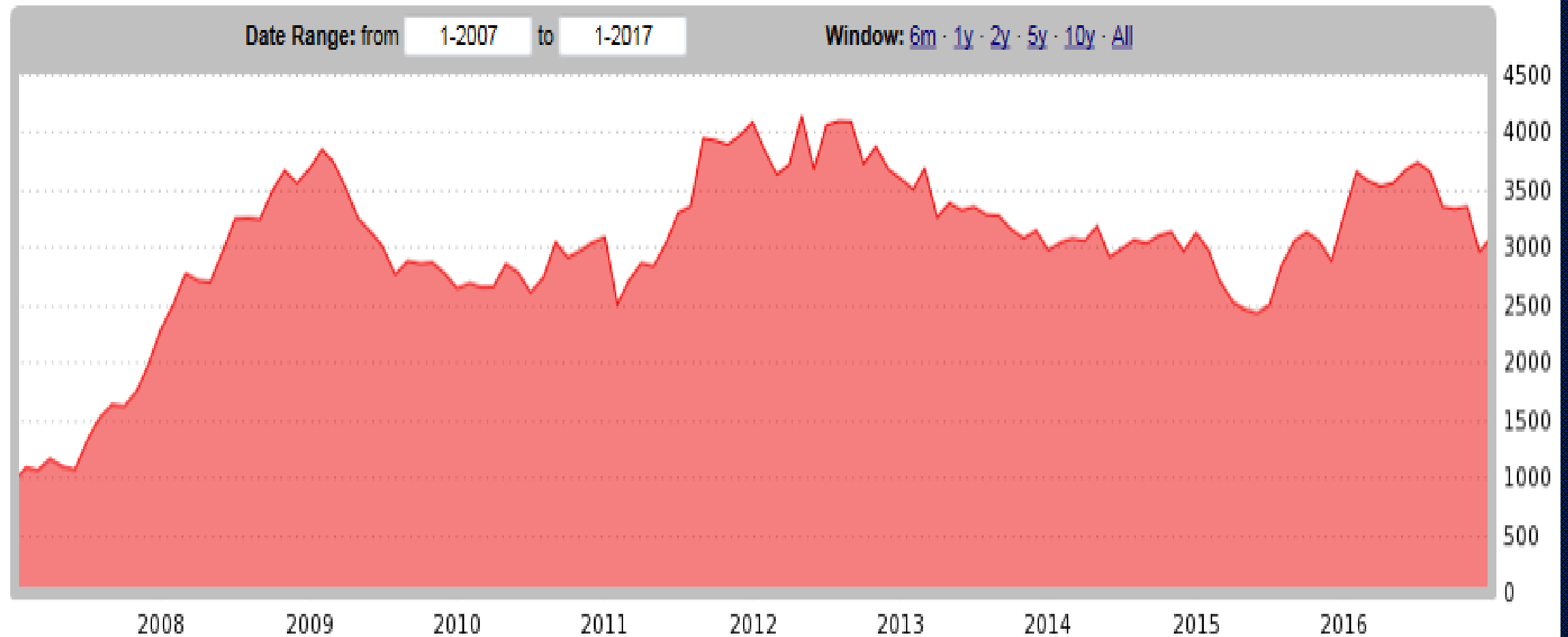


WHERE IS THE SRISK?

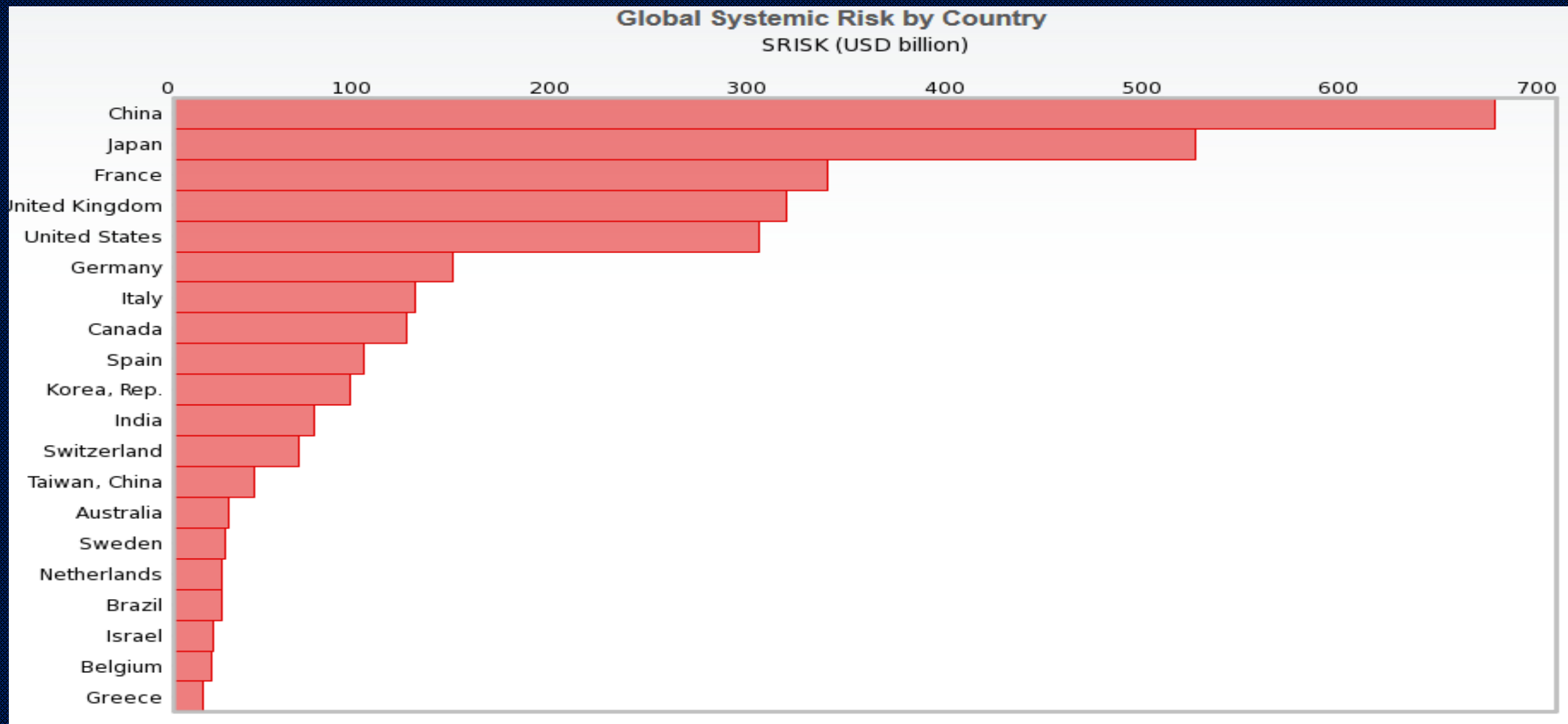


WORLD SRISK – LAST 10 YEARS

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



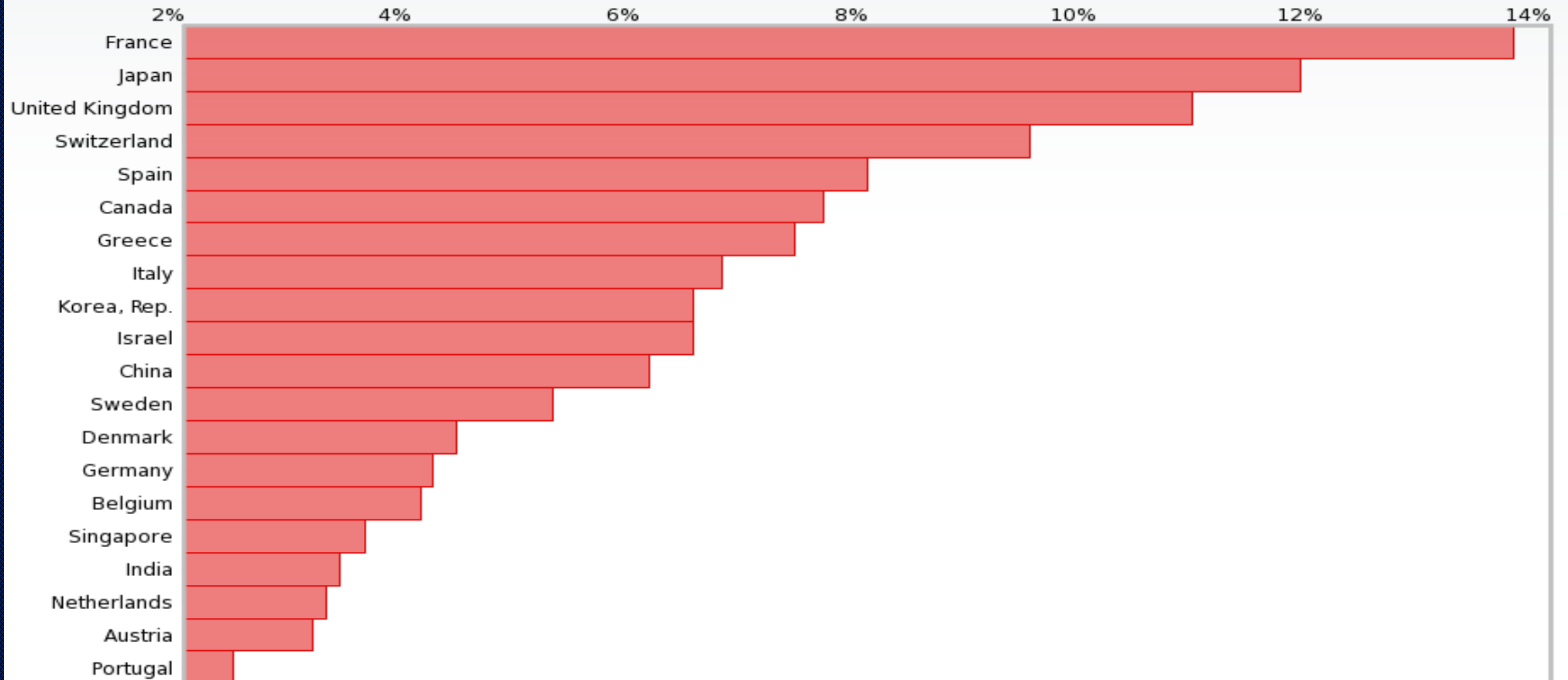
WHERE IS THE SRISK today?



AS PERCENT OF GDP

Global Systemic Risk by Country

SRISK / GDP

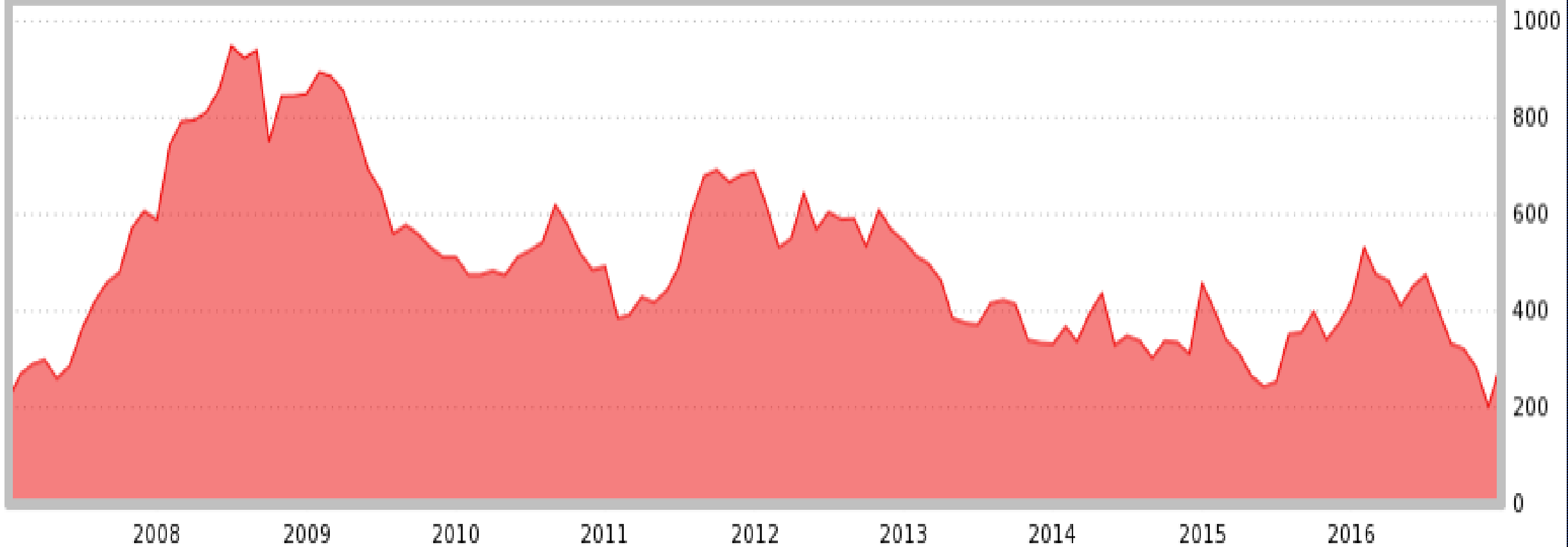


US SRISK

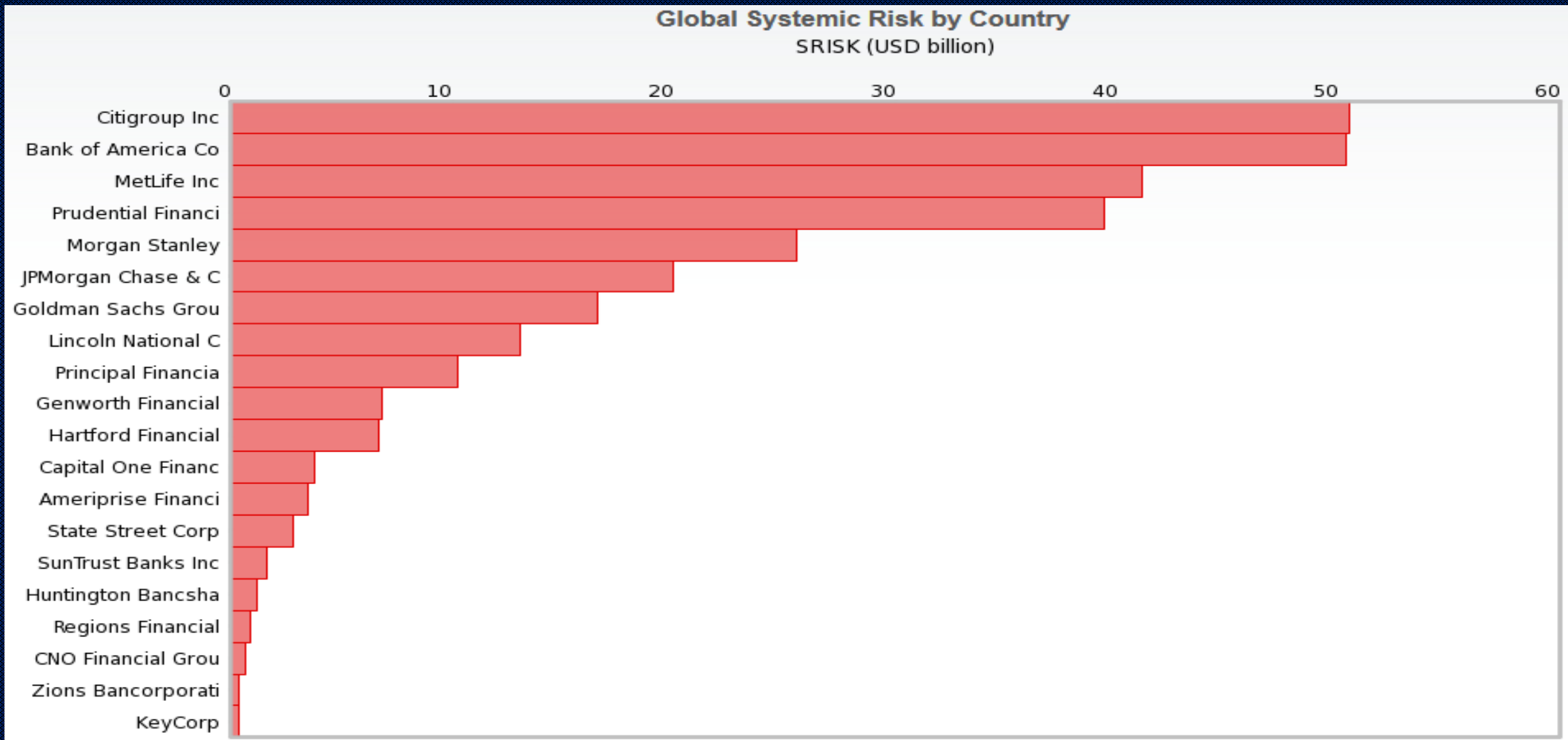
Risk Analysis Overview - United States Financials Total SRISK (US\$ billion)

Date Range: from 1-2007 to 1-2017

Window: [6m](#) · [1y](#) · [2y](#) · [5y](#) · [10y](#) · [All](#)

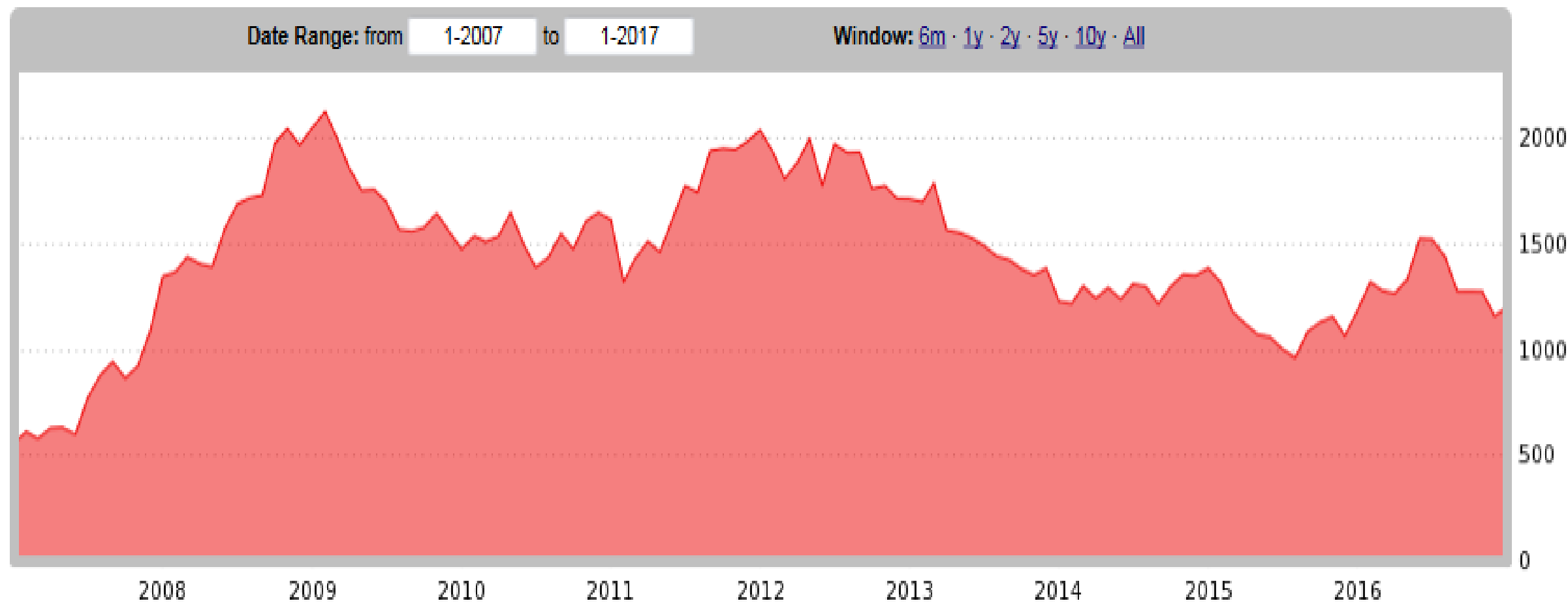


WHERE IS THE RISK IN US?



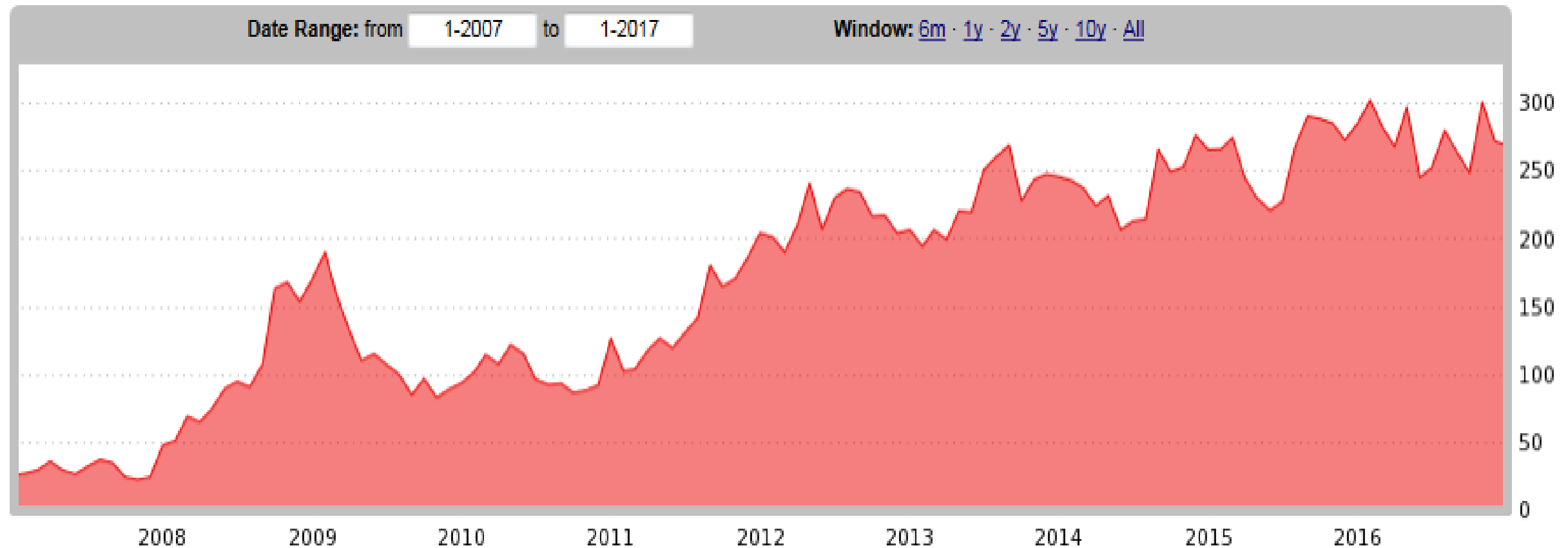
EUROPE SRISK

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



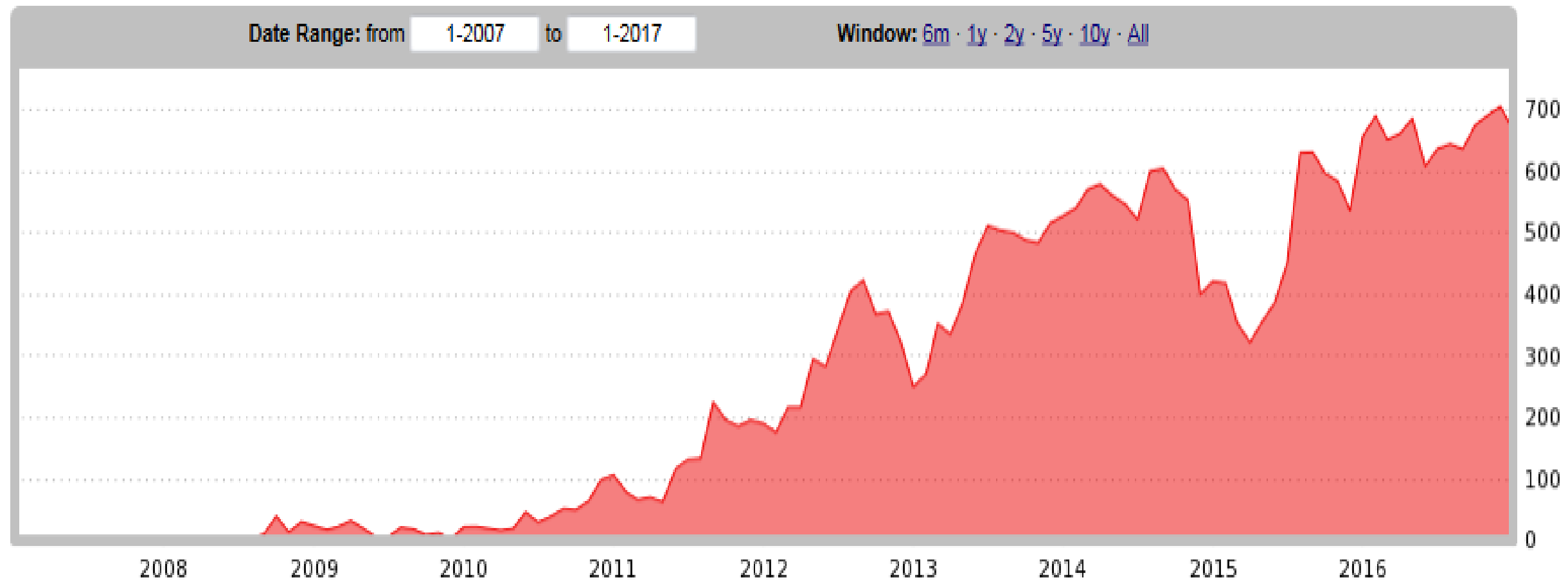
EMERGING MARKETS EXCEPT CHINA

Risk Analysis Overview - 23 Selected Countries Financials Total SRISK (US\$ billion)

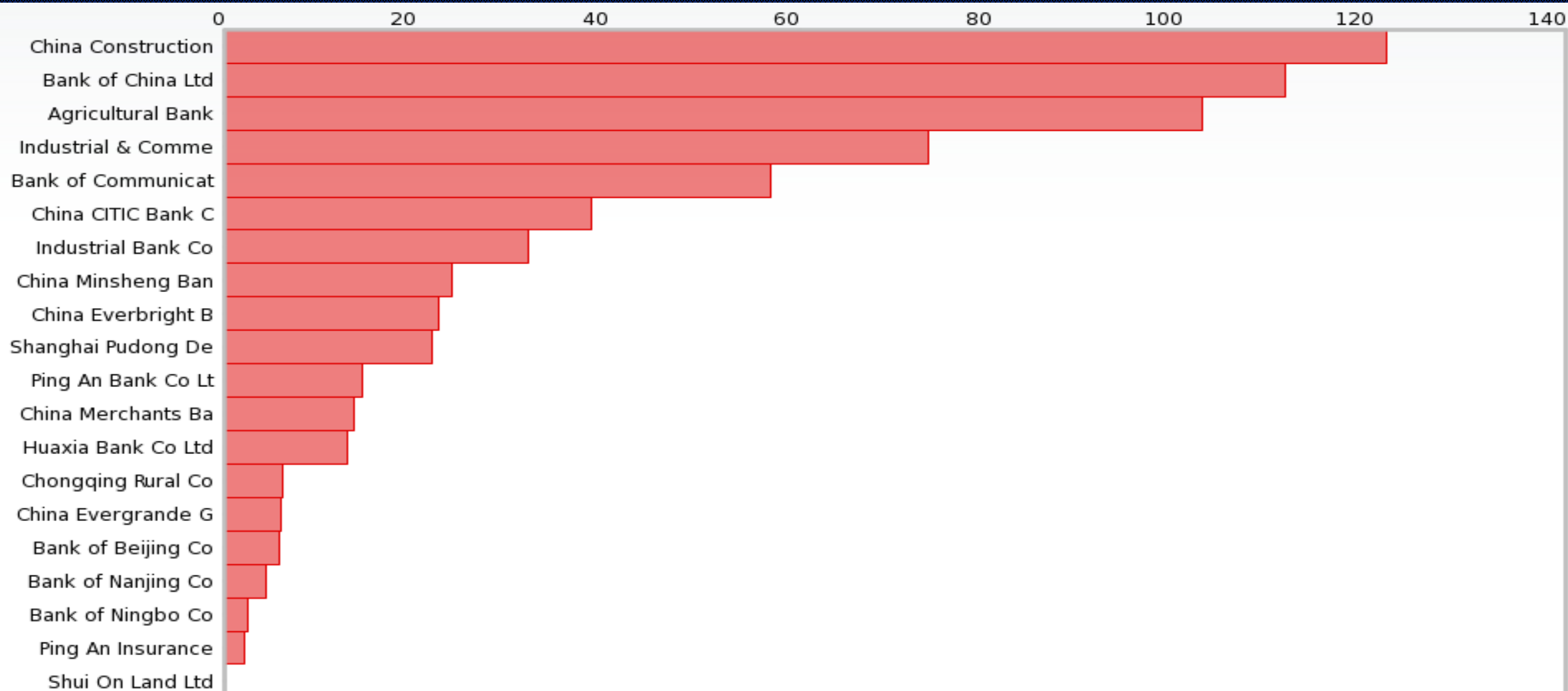


CHINA SRISK

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



Chinese Financials






DOES THIS MODEL APPLY TO CHINA?

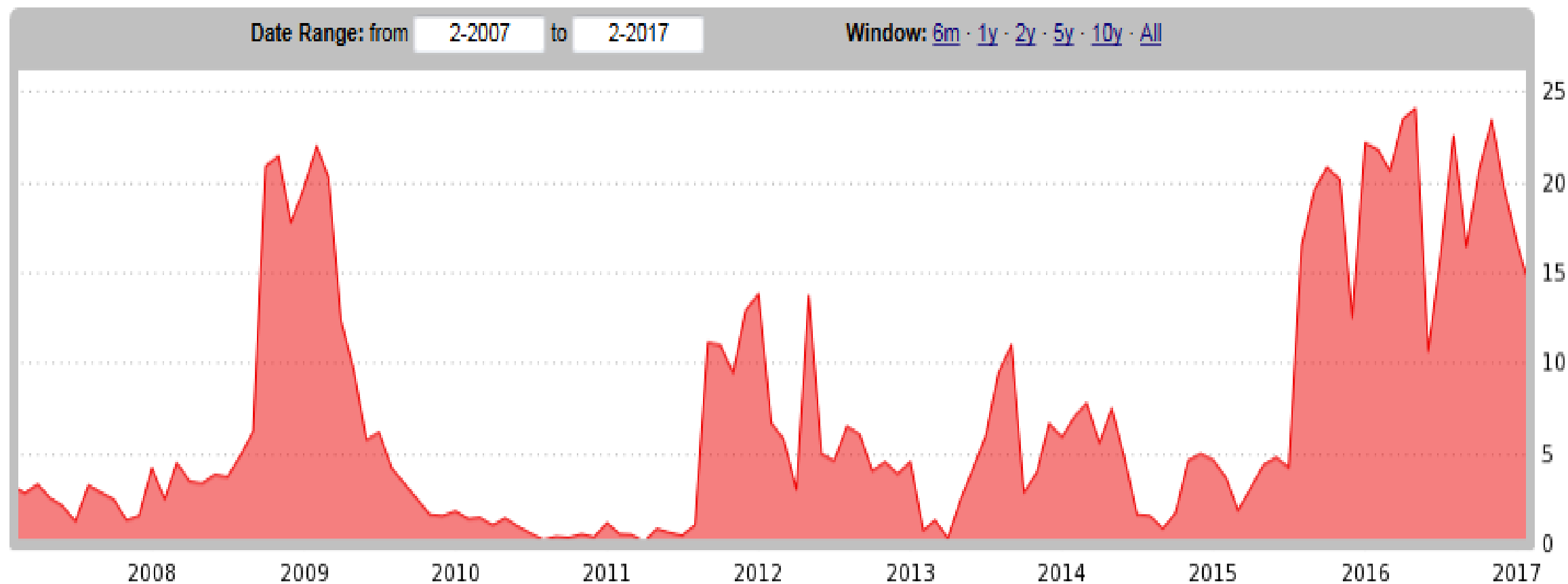


MANY FACTORS ARE SIMILAR IN CHINA

- State owned banks give new meaning to “too big to fail”.
 - Government guarantees distort risk taking.
 - Regulatory incentives encourage lending that might not be prudent.
 - Shadow banking has uncertain governmental protections.
 - Sovereign has plenty of capacity to recapitalize banks and does so when needed. Hence
 - The risk in my view is stagnation, not collapse
- 

ASEAN SRISK

Risk Analysis Overview - 6 Selected Countries Financials Total SRISK (US\$ billion)



ASEAN COUNTRIES

Singapore

Malaysia

Vietnam

Thailand

Indonesia

Philippines



INDONESIAN FINANCIALS

Systemic Risk Rankings for Feb 17, 2017 ☐ View changes

Institution	SRISK%	RNK	SRISK (\$ m)▼	LRMES	Beta	Cor	Vol	Lvg
Bank Tabungan Negara Persero Tbk PT	63.12	1	152	31.74	0.75	0.11	26.3	10.11
Bank Pan Indonesia Tbk PT	21.85	2	53	32.64	0.77	0.10	39.3	9.18
Bank Permata Tbk PT	15.03	3	36	23.97	0.54	0.09	60.6	10.11
Polaris Investama Tbk PT	0.00	4	-8	34.22	0.82	0.03	151.4	1.74
Bank CIMB Niaga Tbk PT	0.00	5	-62	28.54	0.66	0.10	49.3	8.83
Paninvest Tbk PT	0.00	6	-102	30.93	0.72	0.01	38.0	2.82
BFI Finance Indonesia Tbk PT	0.00	7	-267	18.79	0.41	0.06	68.5	2.37
Panin Financial Tbk PT	0.00	8	-276	29.98	0.70	0.14	31.3	1.63
Adira Dinamika Multi Finance Tbk PT	0.00	9	-295	14.13	0.30	0.04	29.4	4.11
Bank Tabungan Pensiunan Nasional Tbk PT	0.00	10	-392	18.76	0.41	0.08	40.1	5.89
Bank Maybank Indonesia Tbk PT	0.00	11	-471	18.68	0.40	0.10	31.6	7.07
Lippo Karawaci Tbk PT	0.00	12	-749	25.67	0.58	0.07	28.3	2.36
Bank Danamon Indonesia Tbk PT	0.00	13	-1,057	36.36	0.88	0.05	38.6	4.26
Bumi Serpong Damai Tbk PT	0.00	14	-1,377	42.40	1.08	0.15	31.5	1.38
Bank Negara Indonesia Persero Tbk PT	0.00	15	-2,494	34.17	0.82	0.11	28.6	4.98
Sinar Mas Multiartha Tbk PT	0.00	16	-2,983	12.00	0.25	0.03	28.3	1.83
Bank Mandiri Persero Tbk PT	0.00	17	-6,311	37.69	0.93	0.10	29.8	4.18
Bank Rakyat Indonesia Persero Tbk PT	0.00	18	-7,348	38.80	0.96	0.15	22.3	3.88
Bank Central Asia Tbk PT	0.00	19	-15,215	26.61	0.61	0.07	18.2	2.53

OUR INTERCONNECTED WORLD

THE VLAB VOLATILITY MAP

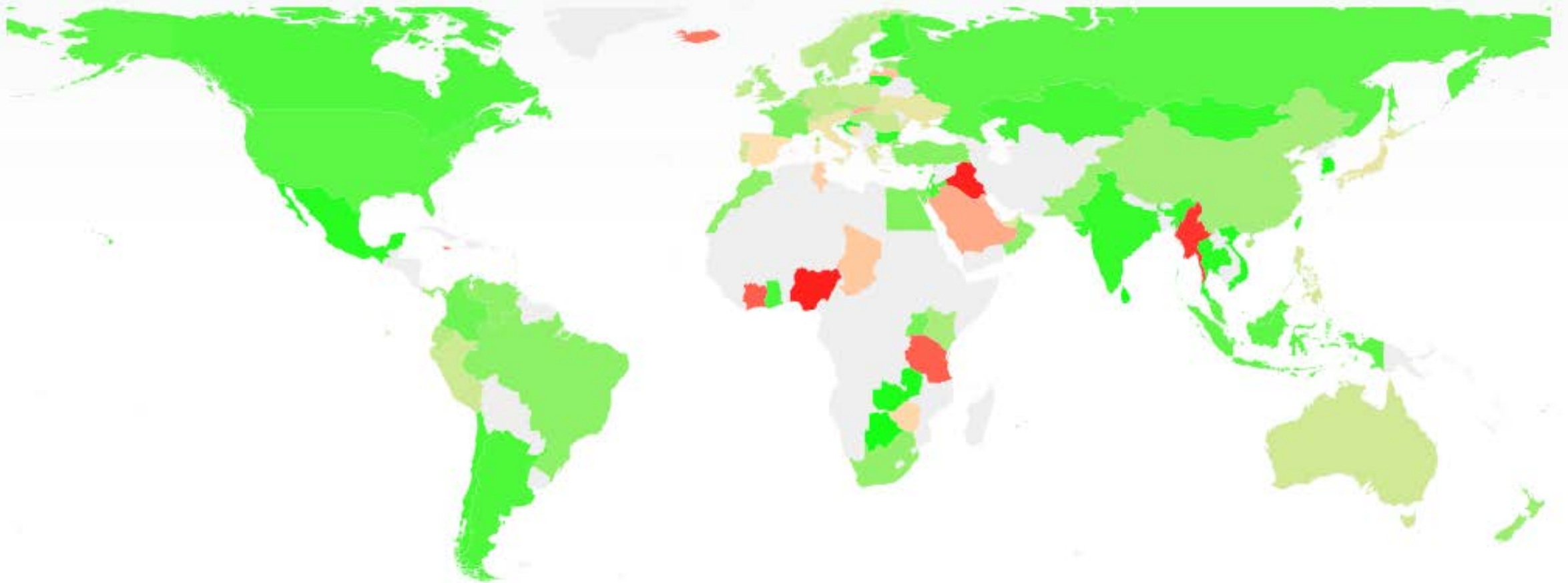
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JUNE 8, 2016

Global Volatility

Region:

22 Days Ago »

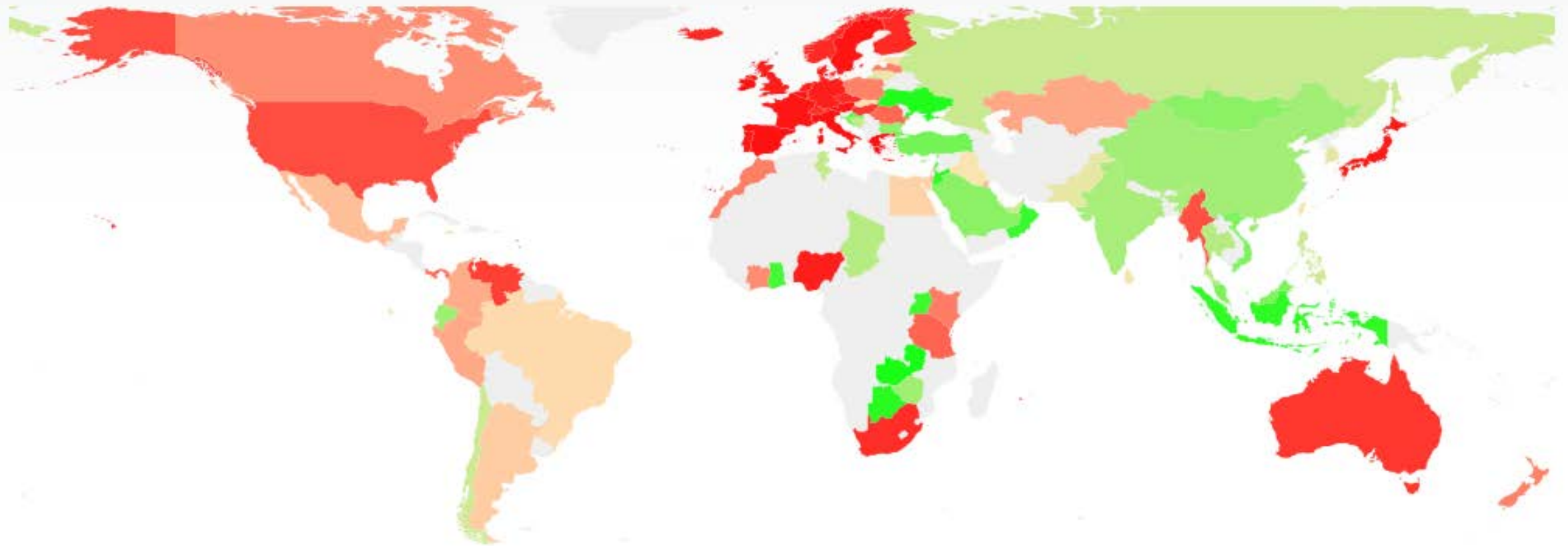


JUNE 28, 2016 ~ BREXIT

Global Volatility

Region:

8 Days Ago « »

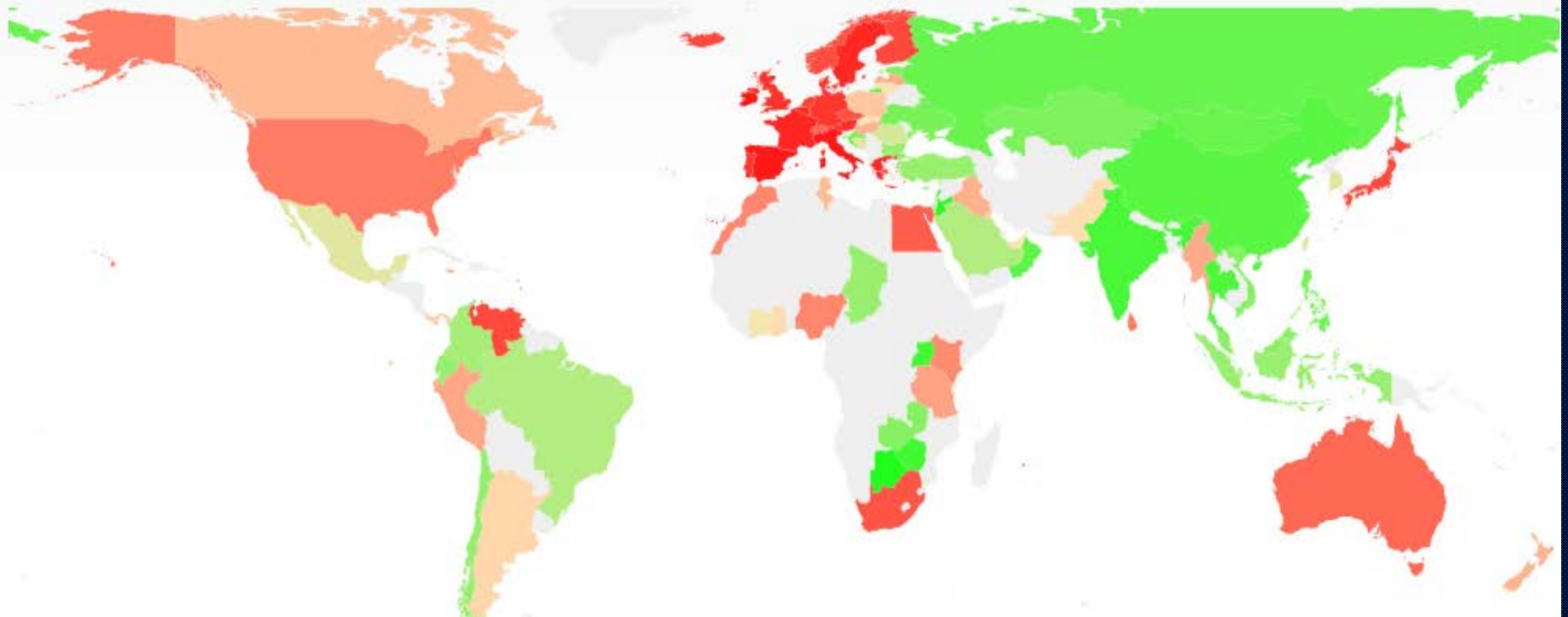


July 10, 2016

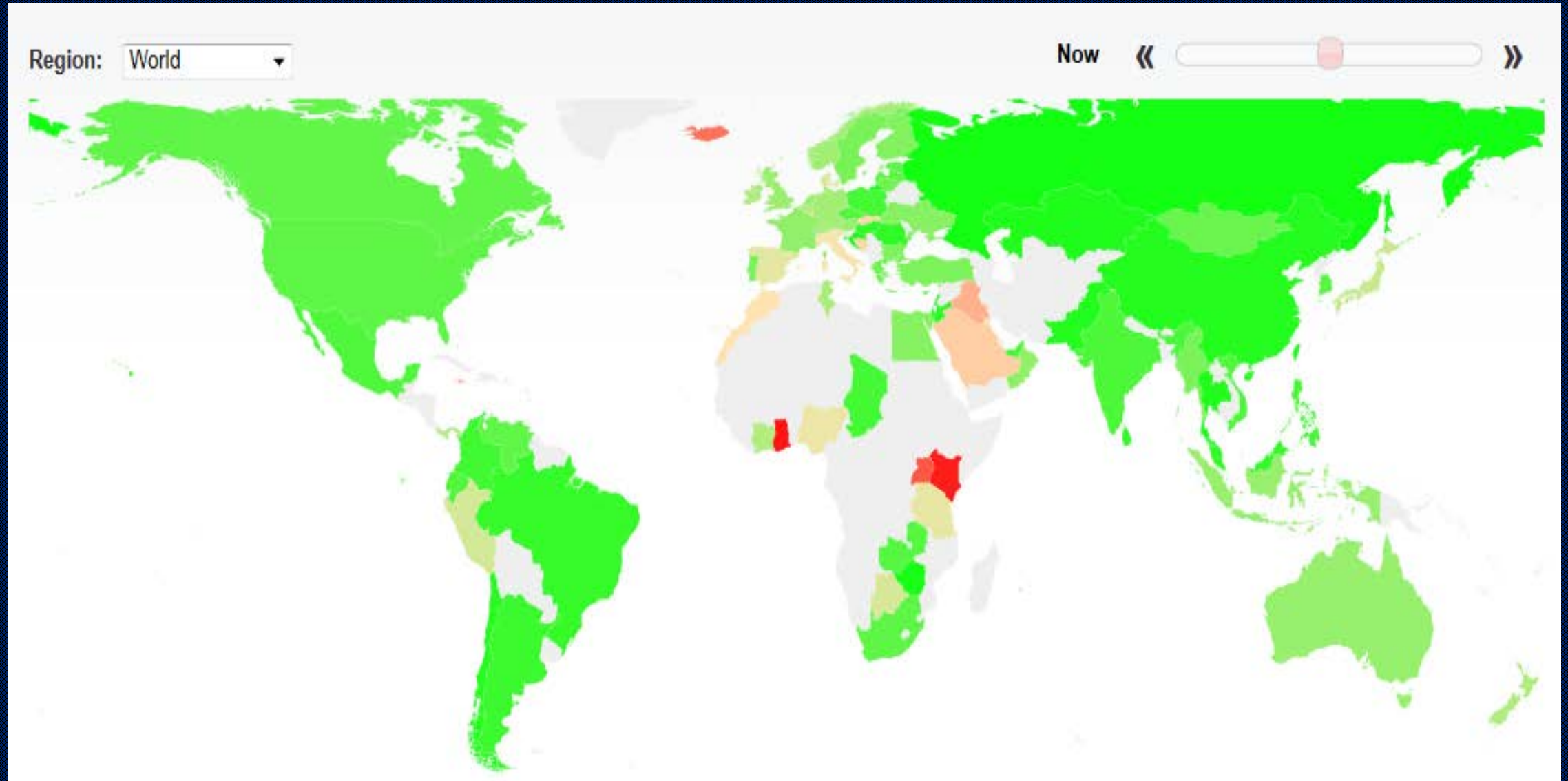
Global Volatility

Region:

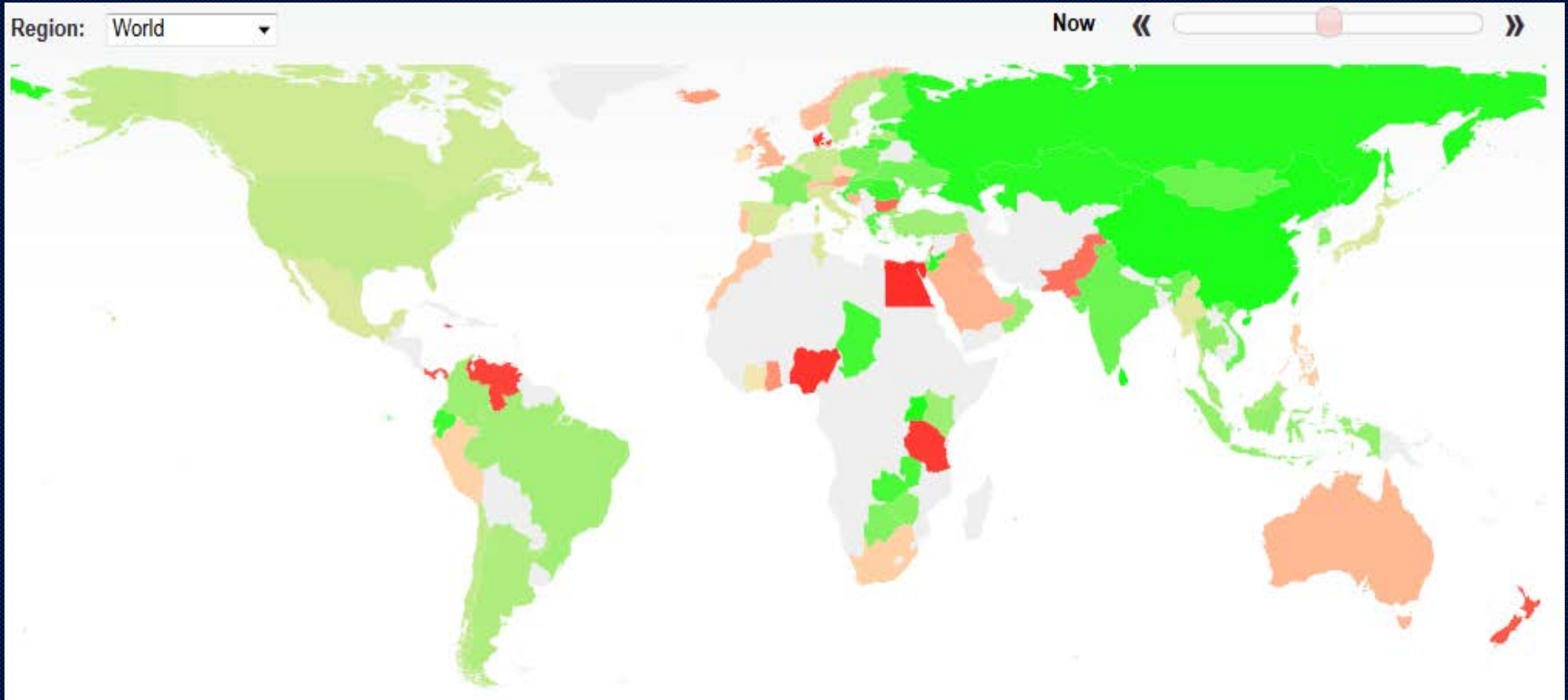
Now « » »



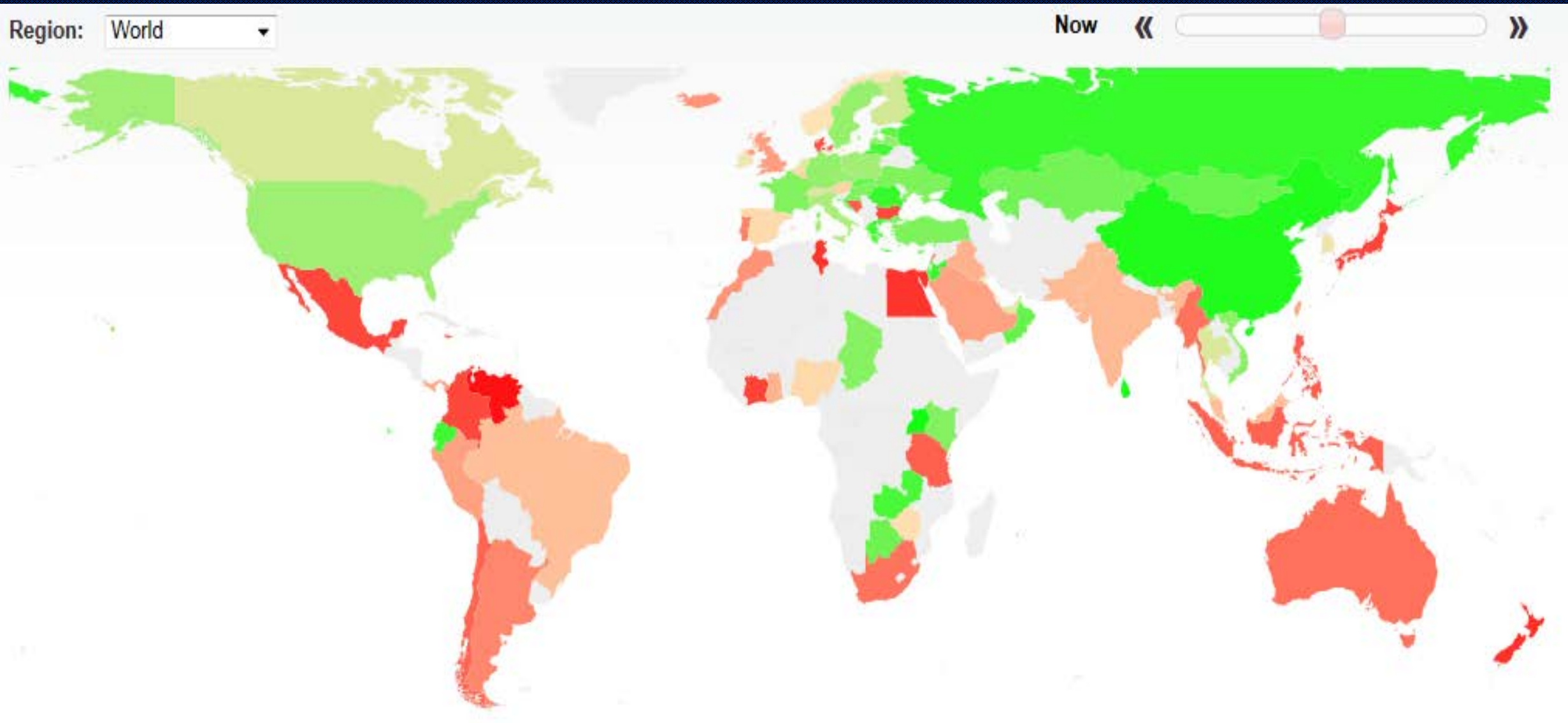
August 30, 2016



NOVEMBER 8, 2016 US ELECTIONS



NOVEMBER 14, 2016



THE FUTURE OF GLOBALIZATION



WHAT CAN WE EXPECT?

- ▣ The US under Trump will move to reduce immigration
- ▣ The US will negotiate and renegotiate trade policies
- ▣ The US will threaten tariffs on imports
- ▣ Within the US there will be increasing opposition to these policies – including by a Republican congress and by the business community and even the judiciary
- ▣ China will move aggressively to fill this void in expanding globalization
- ▣ The enforcement of anti-competitive behavior will become more difficult. The WTO will be weakened.

The US Stock Market Response

- ▣ Trump plans to reduce bank regulation
 - This has helped bank stocks.
 - Policy will lead to less risk in the near future and more risk in the long run.
- ▣ Trump plans to reduce corporate taxes and give incentives to repatriate dollars earned abroad.
 - This also makes business more profitable
- ▣ Plans for infrastructure investment have not yet materialized.
- ▣ His policies on immigration and tariffs are unpopular with business.

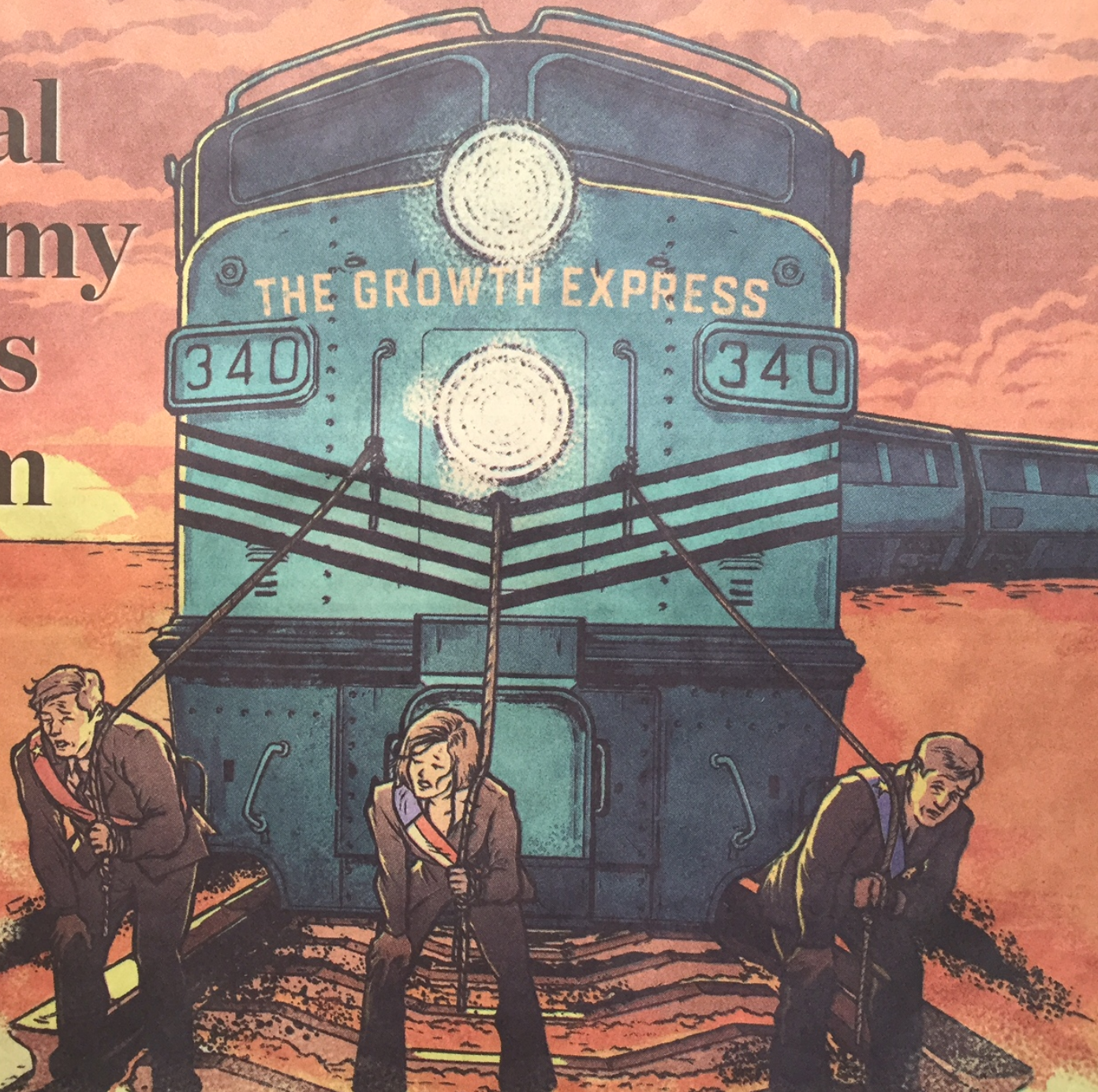


The US stock
market seems to
love these policies –
but could change.

Don't ask....

Global Economy Loses Steam

Markets are tanking and economies are slowing. Monetary policy in the U.S., Europe and Asia has just about reached its limits. If policy makers and politicians want to pull a global expansion into 2016 and beyond, they are going to have to come up with new economic solutions and long-term reform.



RECOMMENDATIONS – MY OPINION

- ▣ MONETARY POLICY ALONE CANNOT RESTORE GROWTH
- ▣ RESPONSIBLE FISCAL POLICY IS NEEDED
 - SPENDING THAT INCREASES GROWTH CAN LOWER THE DEFICIT
 - SPENDING THAT INCREASES THE MARGINAL PRODUCT OF CAPITAL CAN GENERATE PRIVATE INVESTMENT AND LOWER THE DEFICIT
 - INFRASTRUCTURE, EDUCATION, STRUCTURAL REFORMS CAN DO THIS
 - TRADE RESTRICTIONS CANNOT
- ▣ CHINA HAS FOLLOWED THIS POLICY EFFECTIVELY. NOW CHINA MUST SOLVE ITS DEBT CRISIS.

REMEMBER KEYNES?

- ▣ THE LIQUIDITY TRAP – ZERO INTEREST RATES
- ▣ WPA AND CCC AND OTHER DEPRESSION STIMULATION PROGRAMS –FISCAL POLICY
- ▣ BUT WE STOPPED IN 1936-7
- ▣ ONLY **WWII** REALLY ENDED THE GREAT DEPRESSION

- ▣ *CAN WE THINK OF A BETTER WAY?*
- ▣ *INFRASTRUCTURE AND EDUCATION?*

What is in their future?

