Volatility and Risk Institute

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RegTech Summit 2019

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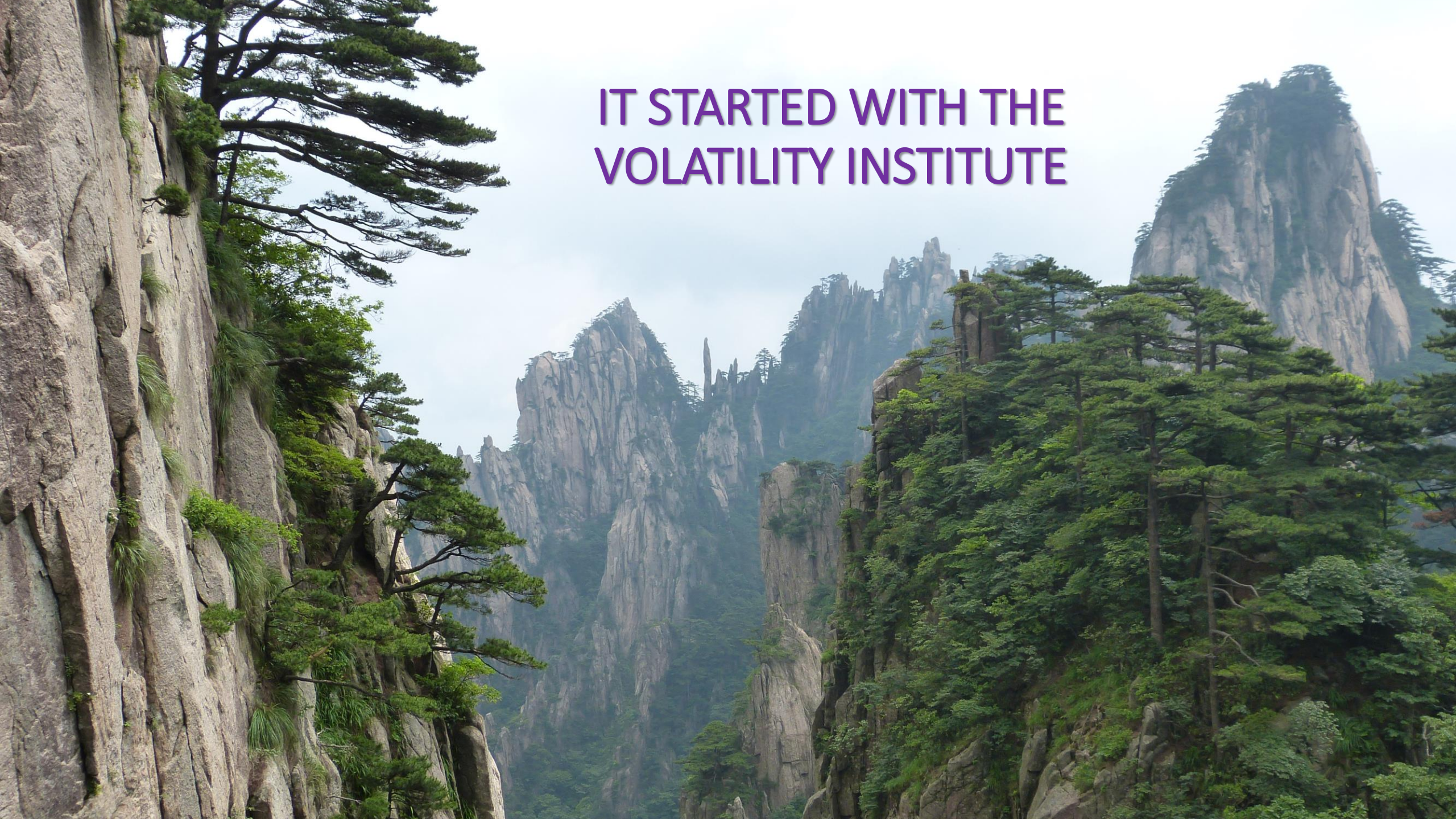
NEW YORK UNIVERSITY


IT STARTED WITH THE
VOLATILITY INSTITUTE

HISTORY OF THE VOLATILITY INSTITUTE

- Nobel Laureate Rob Engle founded the VI in 2009
- First conference in April 2009 “volatility and correlation in stressed markets”
- Produce research and data on systemic risk, liquidity, equities, fixed income, commodities and emerging markets, derivatives, climate change and geopolitical risk.
- Critically, we disseminate output via V-LAB.

V-LAB

- Google vlab nyu or hit this link: Vlab
- It features analyses of
  - Volatility
  - Correlation
  - Systemic Risk
  - Long Run Value at Risk
  - Liquidity
  - Fixed Income
  - Climate Risk
- These are updated with daily data as they are created.
- We currently follow more than 16,000 assets and compute more than 225,000 analyses daily.

Asset Classes in V-Lab

Asset Class	Count
Equities	**15296**
Equity Indices	**194**
Real Estate	**134**
Currencies	**108**
Commodities	**59**
ETFs	55
Open end funds	53
Government Bonds	**40**
Volatility Indices	**36**
CDS Indices	**21**
Equity Sectors	**9**
Corporate Bonds	**6**

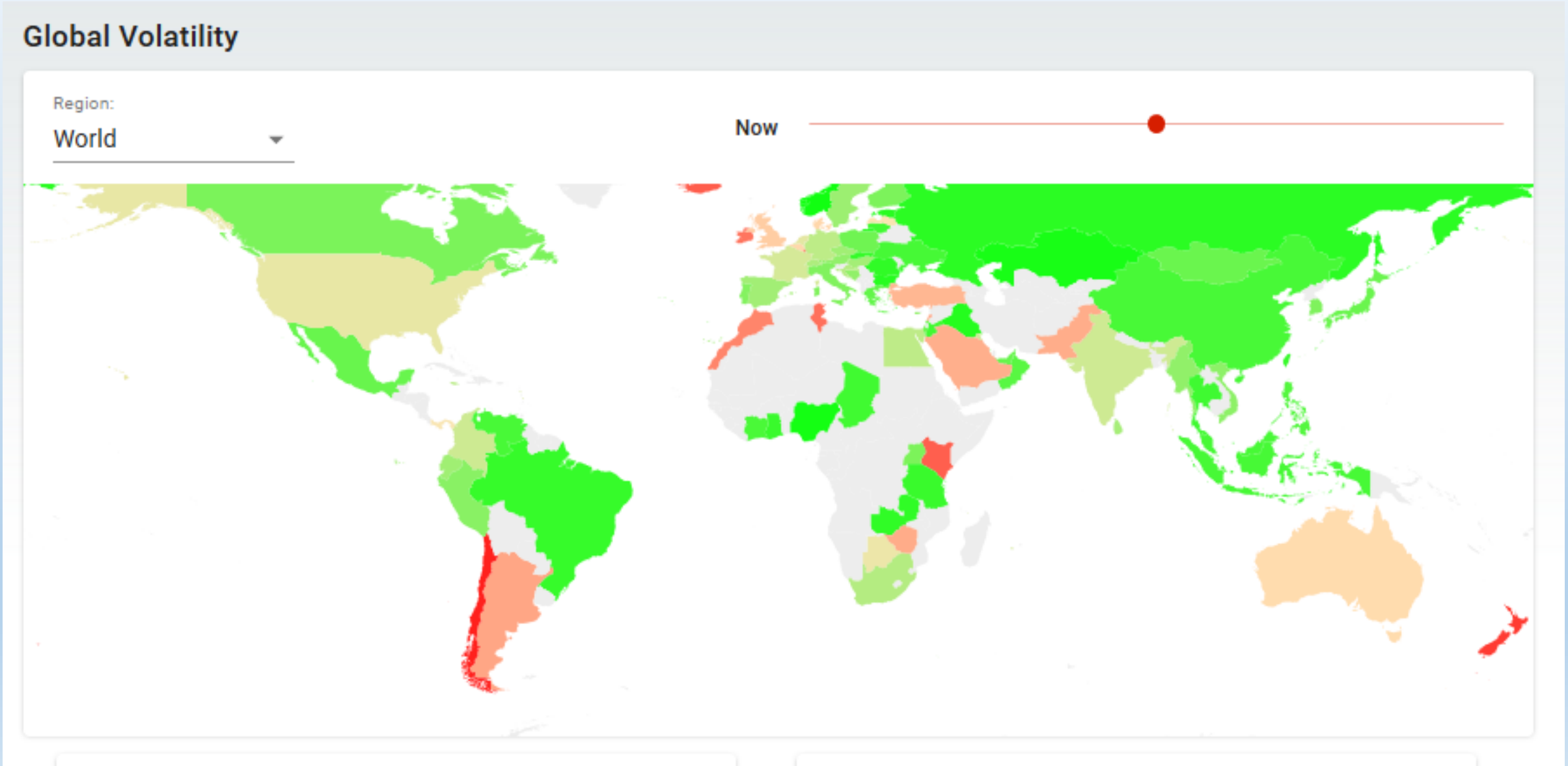
V-Lab Methods

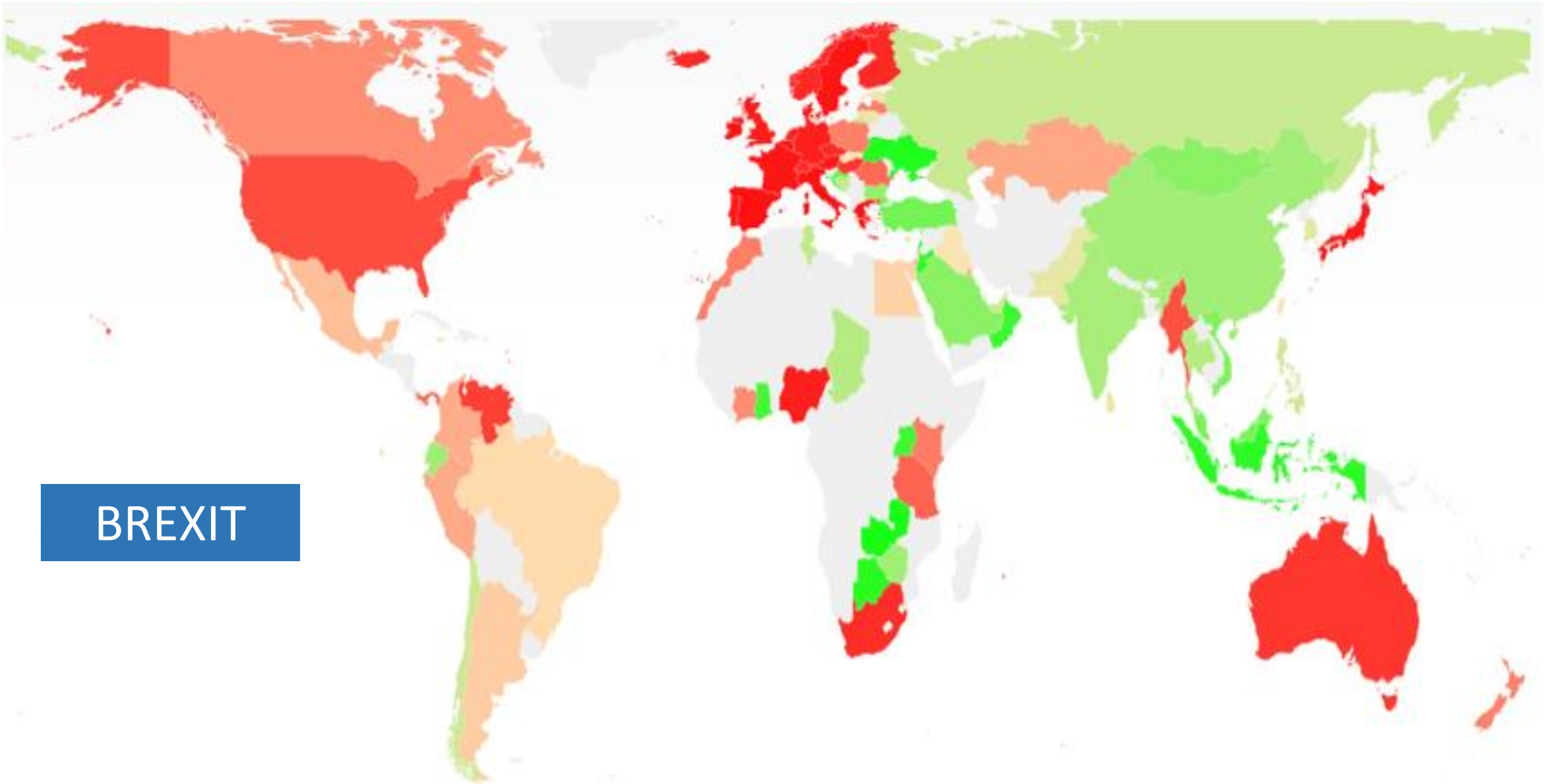
Volatility Models
Generalized Auto-Regressive Conditional Heteroskedasticity (GARCH)
Asymmetric GARCH (AGARCH)
Exponential GARCH (EGARCH)
GAS-GARCH Student T
Glosten, Jagannathan, and Runkle GARCH (GJR-GARCH)
Multiplicative Error Model (MEM)
Asymmeric MEM (AMEM)
Asymmetric Power MEM (APMEM)
Spline-GARCH (SGARCH)
Zero Slope Spline-GARCH (S0GARCH)

Correlation Models
Exponentially-Weighted Moving Average (EWMA)
Dynamic Conditional Correlation (DCC)
Dynamic Equi-correlation (DECO)

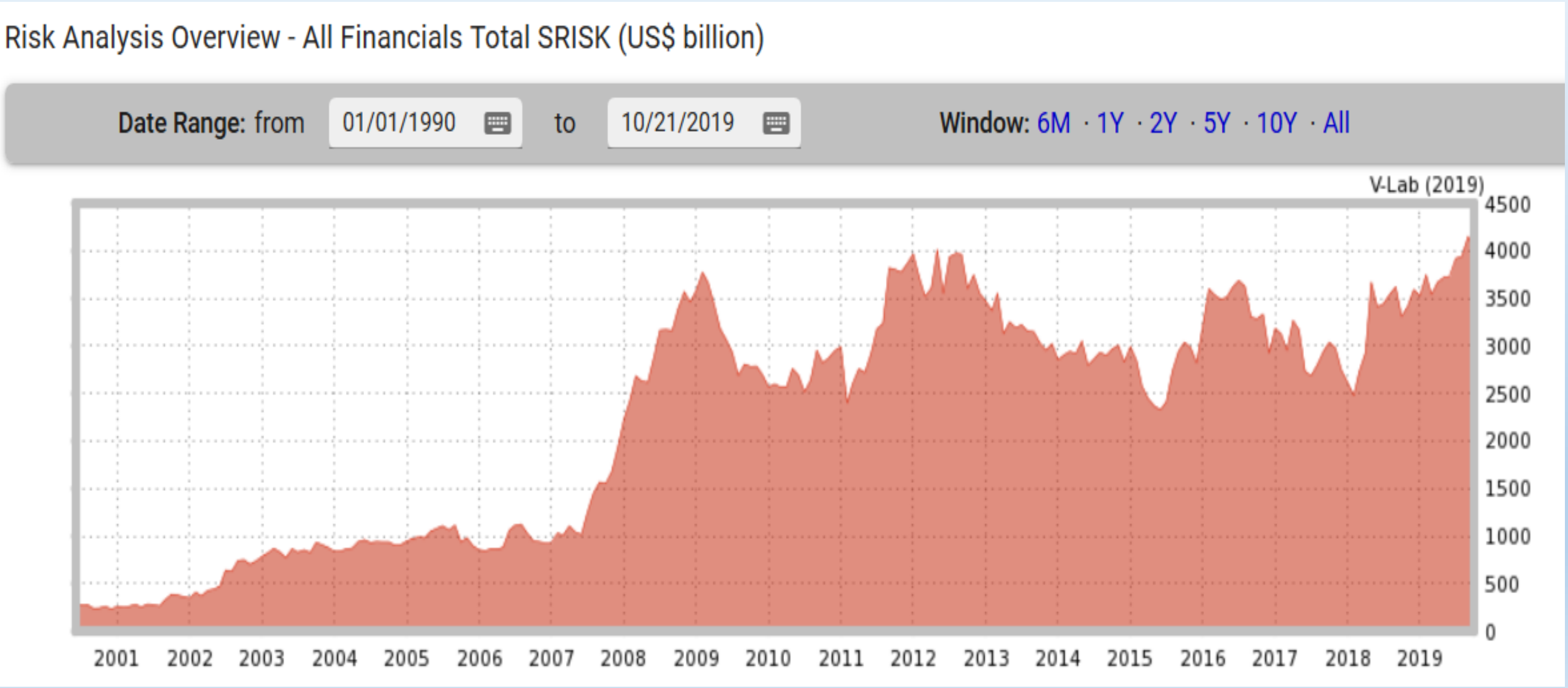
SRISK Models
Domestic SRISK
Domestic SRISK with Simulation
Global SRISK

VOLATILITY MAP TODAY

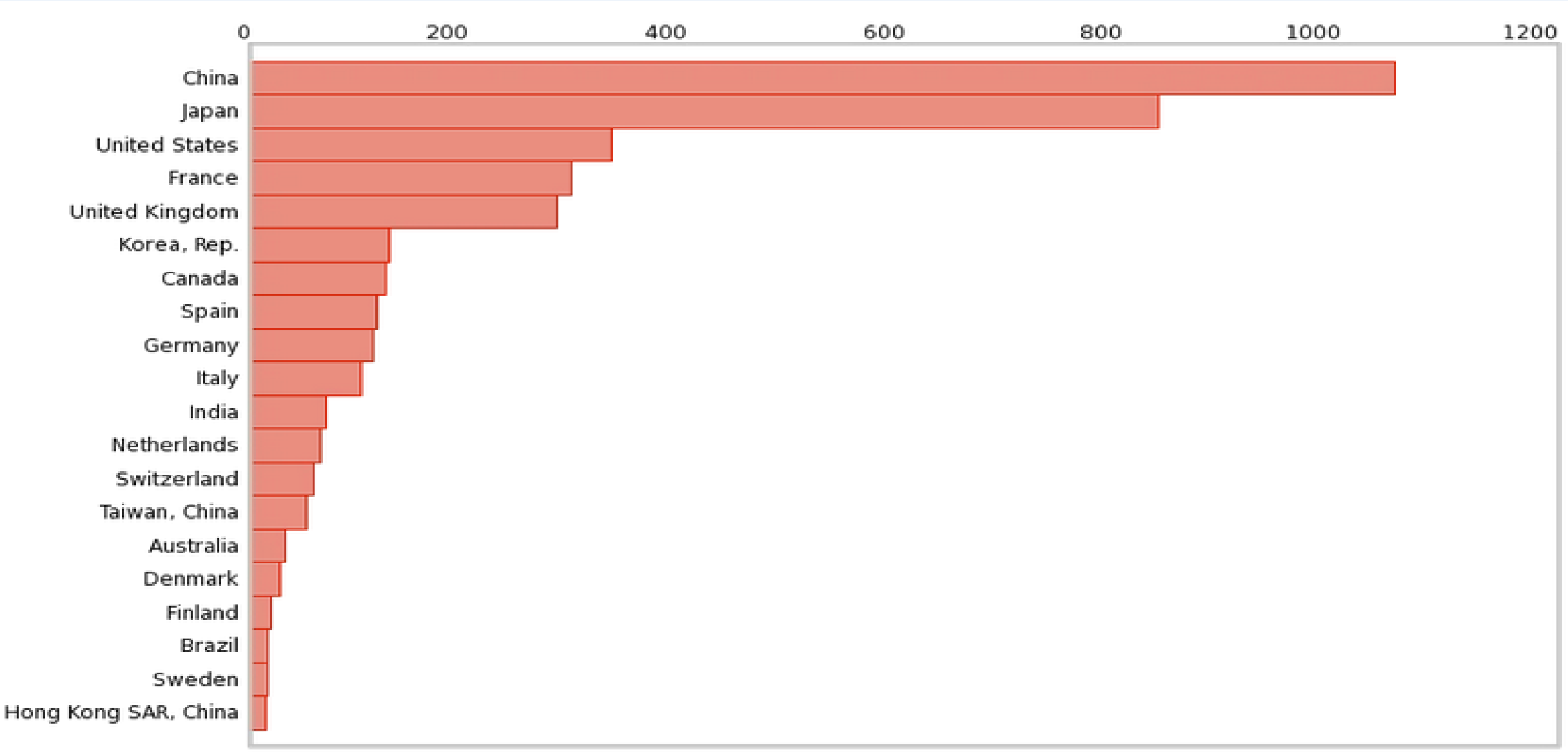



BREXIT

SRISK: How much capital would it take to recapitalize all financial institutions if we have another financial crisis like the last?



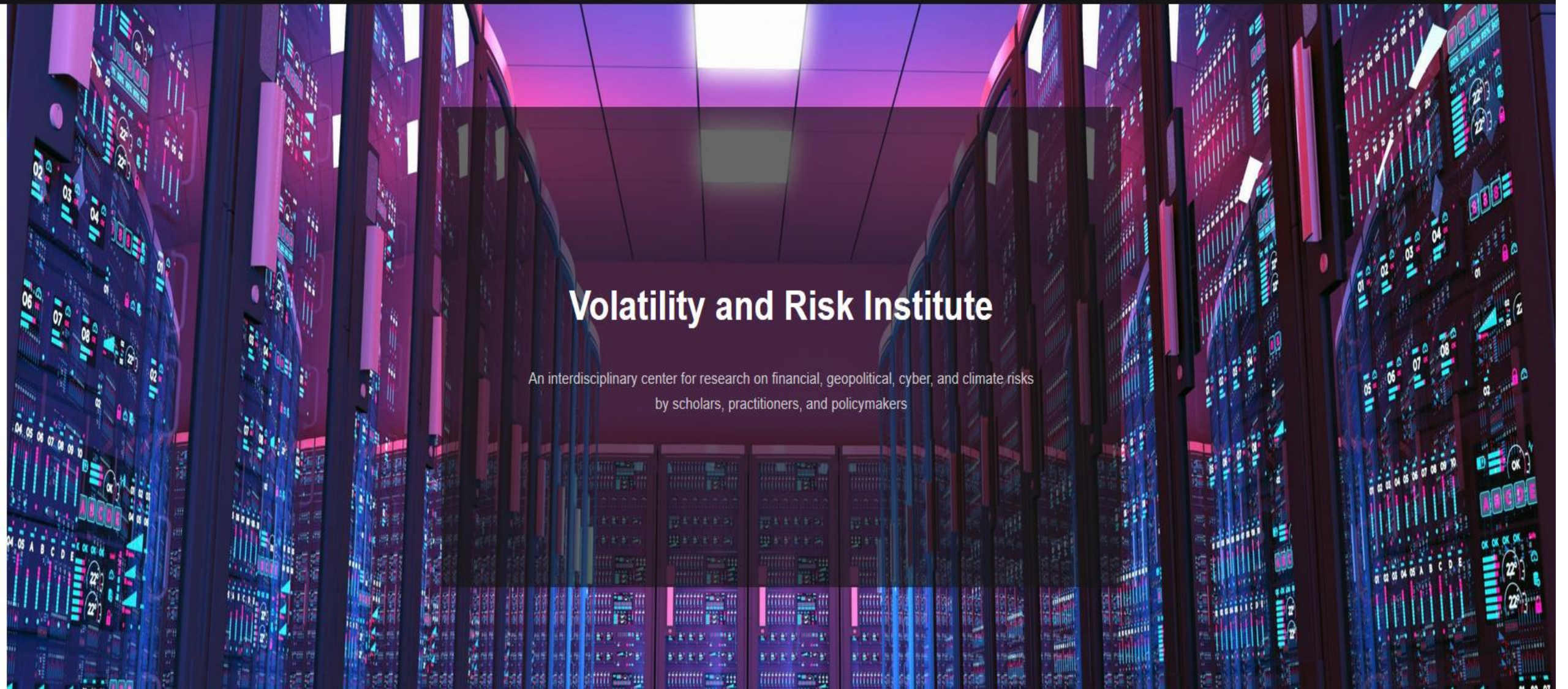
WHERE IS THE RISK TODAY?



A VALUABLE MEASURE FOR REGULATORS, PRACTITIONERS AND ACADEMICS

- The systemic risk measures are widely used by central banks and other regulators and by financial institutions.
- This provides a timely supplement to conventional stress tests based on an independent set of data.
- These measures are also used by academic researchers all over the world.

NEW RISKS…NEXT STEPS


Volatility and Risk Institute
An interdisciplinary center for research on financial, geopolitical, cyber, and climate risks
by scholars, practitioners, and policymakers

VOLATILITY AND RISK INSTITUTE

- The new VRI will *expand our scope* to include both financial and nonfinancial risks; e.g.,
  - Climate Risk
  - Geopolitical Risk
  - Cyber Risk
- It will be *interdisciplinary*; bringing more faculty from across NYU into the research on risk and collaborating with them to help shape the curriculum.
- It will *welcome engagement, suggestions and feedback* from an external advisory board to prioritize and tackle the most important risk issues.
- It will *aim at creating new metrics using new data and tools* that can be added to V-LAB and made available to help decision-making everywhere.

SOME QUESTIONS TO ANSWER

- How can hard-to-quantify risks, such as operational, cyber, geopolitical, climate change, and conduct and culture, be measured, assessed and managed?
- How can operational and other aspects of resilience be built, in both the financial system and in nonfinancial firms?
- How can new data and data science, and tools, such as AI and machine learning, be harnessed better to pursue these goals in finance?


Climate Risk


Geopolitical Risk


Cyber Risk


Financial Risk


Risk Interplay