

## Systemic Risk Centre Relevant Publications

### Artificial Intelligence and Systemic Risk

*Jon Danielsson, Robert Macrae and  
Andreas Uthemann*

Systemic Risk Centre Special Paper Series SP 16  
(2019)

<http://www.systemicrisk.ac.uk/publications/special-papers/artificial-intelligence-and-systemic-risk>  
Also available at SSRN:

<http://dx.doi.org/10.2139/ssrn.3410948> (June 27,  
2019)

Artificial intelligence (AI) is rapidly changing how the financial system is operated, taking over core functions because of cost savings and operational efficiencies. AI will assist both risk managers and microprudential authorities. It meanwhile has the potential to destabilise the financial system, creating new tail risks and amplifying existing ones due to procyclicality, endogenous complexity, optimisation against the system and the need to trust the AI engine.

### Cyber risk as systemic risk

*Jon Danielsson, Morgane Fouché,  
Robert Macrae*

VOXEU.org column (10 June 2016)

<https://voxeu.org/article/cyber-risk-systemic-risk>

The threat to the financial system posed by cyber risk is often claimed to be systemic. This column argues against this, pointing out that almost all cyber risk is microprudential. For a cyber attack to lead to a systemic crisis, it would need to be timed impeccably to coincide with other non-cyber events that undermine confidence in the financial system and the authorities. The only actors with enough resources to affect such an event are large sovereign states, and they could likely

create the required uncertainty through simpler, financial means.

### The dissonance of the short and long term

*Jon Danielsson, Robert Macrae*

VOXEU.org column (12 August 2019)

<https://voxeu.org/article/dissonance-short-and-long-term>

The type of risk we most care about is long-term, what happens over years or decades, but we tend to manage that risk over short periods. This column argues that the dissonance of risk is that we measure and manage what we don't care about and ignore what we do.

### Financial volatility and economic growth

*Jon Danielsson, Marcela Valenzuela,  
Ilknur Zer*

Working Paper (2019)

We investigate the impact of financial volatility on economic growth, using a panel spanning 150 years and 74 countries. A positive shock to volatility and persistent high volatility lead to a short-term decrease in growth. Persistent low volatility affects growth differently: Initially leading to higher growth, but with a reversal two years hence, consistent with theories of how continued low risk environment induces higher risk-taking. The impact is stronger when volatility is low globally, during the post Bretton Woods era, and for countries experiencing high credit growth. Furthermore, long-lasting global volatility has a significant impact on capital flows, investment, and lending quality.

## Market Resilience

*Jon Danielsson, Efstathios Panayi,*

*Gareth Peters and Jean-Pierre Zigrand*

Systemic Risk Centre Discussion Paper Series DP 78  
(2018)

<http://www.systemicrisk.ac.uk/publications/discussion-papers/market-resilience>

We propose a method to capture the notion of resilience, the dynamic aspect of liquidity in the limit order book, through the Threshold Exceedance Duration (TED) metric that we introduce. This measures the duration of liquidity ‘droughts.’ We illustrate the explanatory power of a survival regression framework for the duration of ‘droughts’ in terms of observable state variables reflecting the shape and evolution of the limit order book using Chi-X data. Finally, we introduce a method to summarise exceedance duration information across different thresholds, called Liquidity Resilience Profile, which enables the comparison and the ranking of liquidity resilience.

## Systemic consequences of outsourcing to the cloud

*Jon Danielsson and Robert Macrae*

VOXEU.org column to appear in December 2019

Financial institutions are increasingly outsourcing information technology to the cloud, motivated by efficiency, security and cost. This column argues that the consequence is likely to be short- and medium-term stability at the cost of the increased likelihood of catastrophic systemic events. Cloud providers are systemically important and should be regulated as such.