Volatility, Valuation Ratios, and Bubbles: An Empirical Measure of Market Sentiment

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Discussion – Sarah Mouabbi

Any views expressed are solely those of the discussant and do not necessarily represent those of the Banque de France.

This paper synoptically

- This paper defines a sentiment indicator based on option prices, valuation ratios and interest rates.
- The indicator is interpreted as a lower bound on the expected growth in fundamentals that a rational investor would have to perceive to want to hold the market.
- This indicator was *unusually* high in the late 1990s, reflecting unreasonably optimistic dividend growth expectations.

An indicator to spot bubbles in real time

- The authors observe that the Campbell-Shiller identity is accurate on average. However, the linearisation is problematic when the valuation ratio is far from its mean.
- The focus of the paper is on bubbles. Asset price bubbles are often thought of as price deviations from fundamental values.
- So the accuracy of log-linearisations at times when valuation ratios are unusually high is of importance.
- The construction of the sentiment indicator depends on two methodological contributions:
  - the derivation of a new valuation ratio decomposition (motivated by [Martin, 2013]),
  - the introduction of a volatility index that provides a lower bound on the market's expected *log* return (based on [Martin, 2017]).

The indicator delivers!

- The paper develops an indicator that, when high, is suggestive of unreasonable optimism $\longrightarrow$ allowing to signal bubbles in the stock market.
- The authors study the case of the US stock market from January 1996 to December 2017 and find that their sentiment indicator is unusually high in the late 1990s.
- They characterise the late 1990s as a bubble because valuation ratios and short-run expected returns were simultaneously high.
- The dot-com bubble is, indeed, the only stock market bubble in their sample.

More on the contributions of the paper

- The proposed measure of dividend yield has the advantage of being in **natural units**.
- The derivation of the market sentiment indicator is **very elegant**.
- This measure is data-driven and available in **real time**.
- Comments on the empirical aspect:
  - Further to the (mild) theoretical assumptions[1] stated in the paper, this indicator depends on specific **market characteristics**: the derivatives' market is large, liquid and has a wide array of strike prices $\longrightarrow$ this limits the empirical scope to few advanced economies.
  - Robustness checks on the expanding window or on another economy would be welcome.

[1] The modified negative correlation condition holds in the case of the stock market because it is not an insurance asset.

Not testable

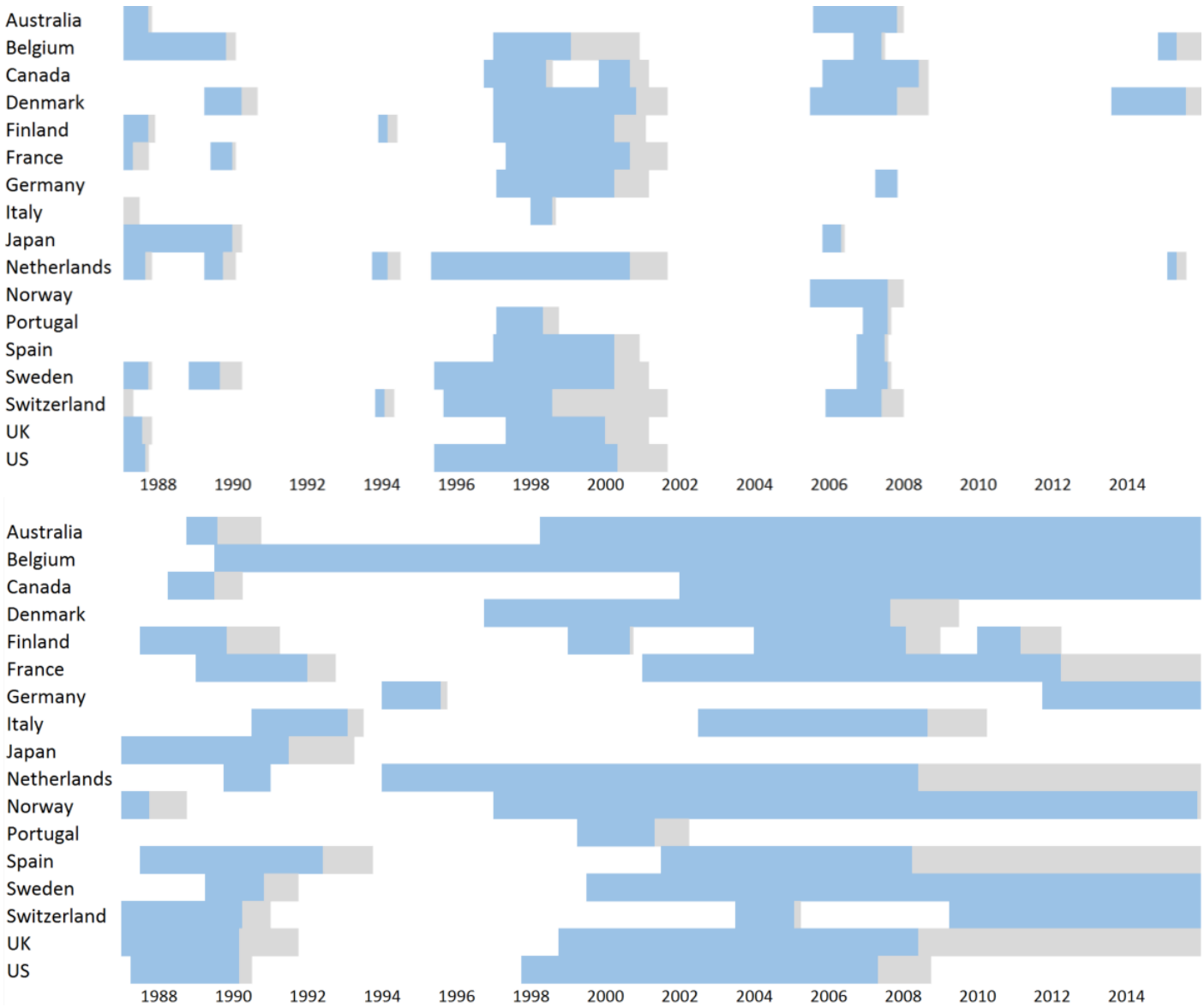
- *This indicator was **unusually** high in the late 1990s.*
- We do not have a clear idea of how high the indicator should be before we can safely claim there is a bubble.
- It would be nice if a test could be developed.
- [Giglio et al., 2016] test for the existence of housing bubbles associated with a failure of the transversality condition (e.g. rational bubble) using leaseholds and freeholds.

Why do we care about stock market bubbles?

- Asset price bubbles pose a threat to financial stability.
- The dot-com stock-market bubble was followed by a recession (Mar-Nov 2001) that was brief and shallow.
  - The recession lasted 8 months and peak unemployment and GDP decline were respectively 6.3% and -0.3%.
- The great recession (Dec 2007 - Jun 2009) was triggered by a housing bubble and was the most severe economic and financial meltdown since the Great Depression.
  - The recession lasted 18 months and peak unemployment and GDP decline were respectively 10% and -5.1%.
  - The indicator remains relatively low during this period.

Asset Price Bubbles and Systemic Risk

[Brunnermeier et al., 2019]



Asset Price Bubbles and Systemic Risk

[Brunnermeier et al., 2019]

- *While the risks associated with stock market bubbles are smaller, the estimated increase in systemic risk during these episodes suggests that stock market bubbles should not be disregarded as a potential source of financial fragility.*
- *Policies aimed at preventing financial turmoil resulting from an asset price bubble should thus not solely focus on the bust period of the bubble. Instead, the risks building up in the financial system should ideally be counteracted early on.*
- The sentiment measure can prove useful as it is a leading indicator, which is measured in real time.

Other sources of systemic risk

- Other sources of systemic risk include:
  - Private sector credit boom
  - Expansion of public debt
  - Banking panics
- Some studies we will see later on in this conference include:
  - [Adam and Merkel, 2019] $\longrightarrow$ boom-bust dynamics are more likely when the **risk-free interest rate is low** (macro-prudential policy implications?).
  - [Engle and Ruan, 2019] $\longrightarrow$ when financial firms are undercapitalized, they face difficulty in covering losses in a downturn; and reducing leverage through asset sales can start a financial crisis.
- A source of systemic risk that is under-represented in the literature is the default of large corporate firms.
  - General Motors & Chrysler received 20% of the Troubled Asset Relief Program funds (about $80bn).
  - The arguments used at the time: millions of jobs; closing factories; suppliers and dealerships liquidations; loss of industry.
  - [Azizpour et al., 2018]
  - [Gouriéroux et al., 2019]

Exploring the Sources of Default Clustering

[Azizpour et al., 2018]

- They find strong evidence of contagion in corporate default clustering.
- They reject the hypothesis that the conditional default rates depend on observed and latent systemic factors (e.g. interest rates, stock returns, GDP growth).
- Therefore, the default of a firm has a direct impact on the health of other firms and **contagion is not limited to the financial sector**.
- Financial, legal or business relationships between firms might act as a conduit for the spread of risk [default spillovers on business partners - network models].

Disastrous Defaults

[Gouriéroux et al., 2019]

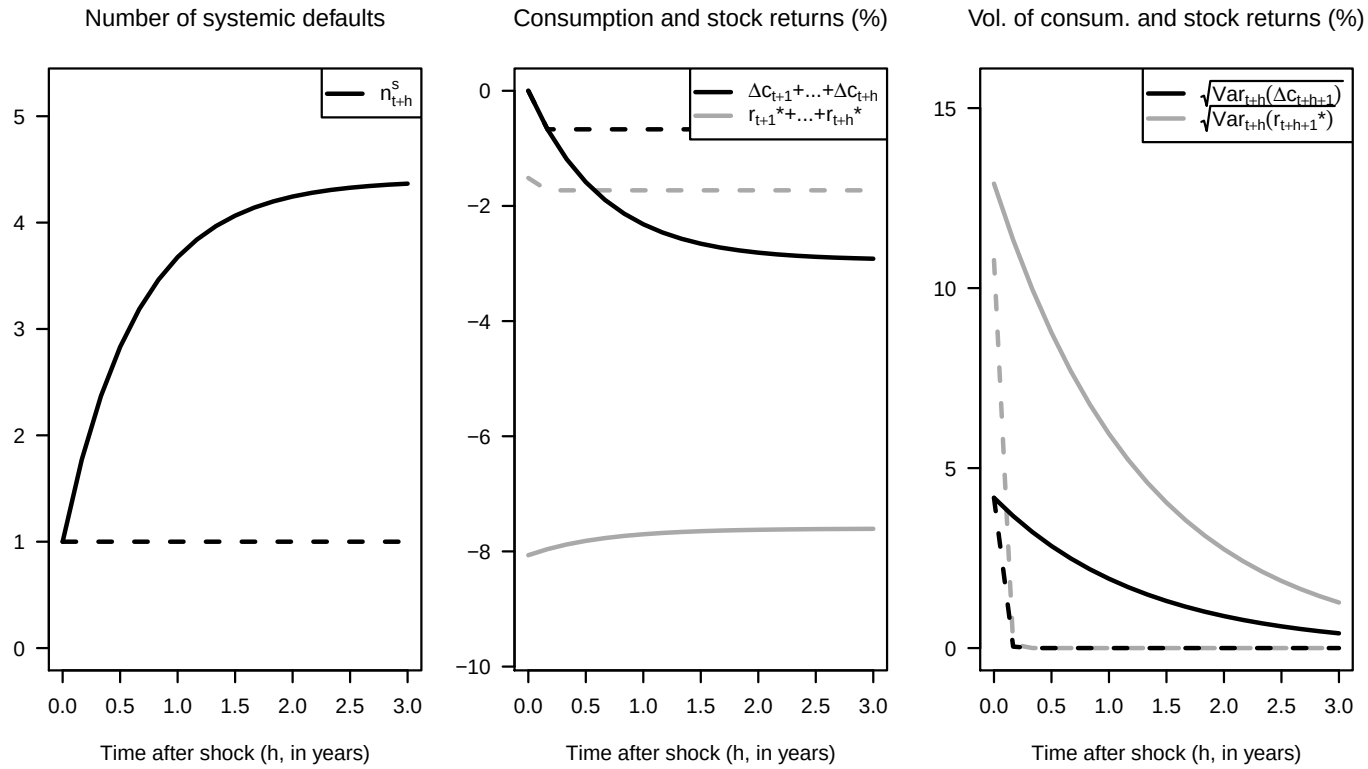
- Structural no-arbitrage asset-pricing framework where the defaults of some entities, called systemic entities, have economy-wide effects.
- The default of a systemic entity

$$\text{can have a negative effect on economic activity / consumption}$$
$$+$$
$$\text{is contagious (can provoke additional systemic defaults)}$$

$$\Rightarrow \text{A systemic default is disastrous.}$$

- The model is tractable. Closed-form formulas for various credit/equity options.
- The model captures the main fluctuations of prices of various disaster-exposed instruments (European data, 2006-2017):
  Credit Index swaps, Synthetic CDOs, far-out-of-the-money equity put options.

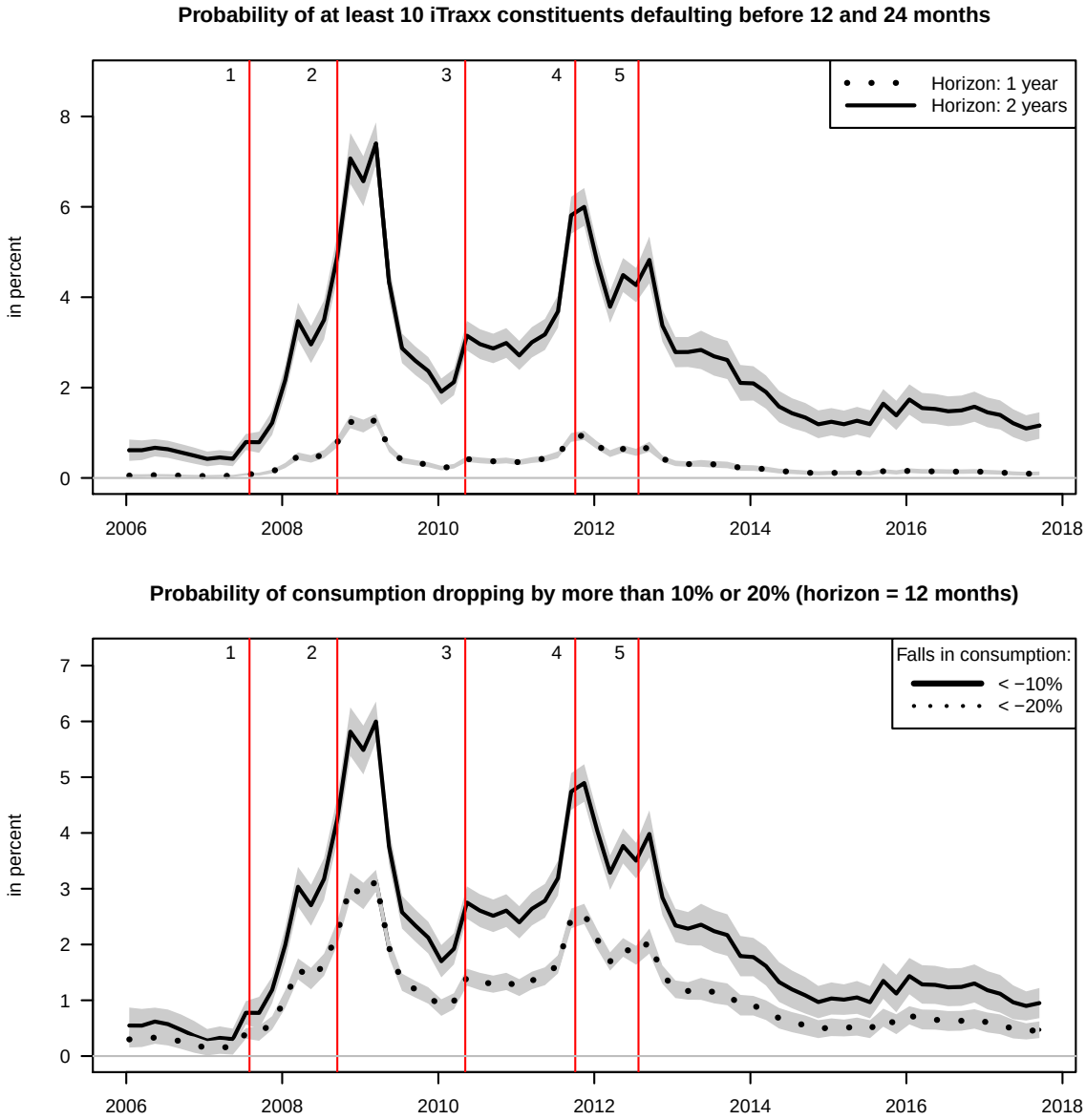
Responses to an unexpected default of a systemic entity



Responses are in percent. Dashed lines correspond to a no-contagion model.

- The estimated model suggest that a systemic default is anticipated to be followed by a 3% $\searrow$ in consumption (i.e. a systemic default is disastrous).

Systemic indicators



Thank you!

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