

## SOE 3: Financial Markets and Risk Management

Time: Monday 12:00–13:15

Location: GÖR 226

SOE 3.1 Mon 12:00 GÖR 226

**Endogenous bubbles in an equilibrium model of rational and noise traders without strategy switching** — ●MATTHIAS LEISS<sup>1</sup>, TAISEI KAIZOJI<sup>2</sup>, ALEXANDER SAICHEV<sup>1</sup>, and DIDIER SORNETTE<sup>1</sup> — <sup>1</sup>ETH Zurich, Switzerland — <sup>2</sup>International Christian University, Tokyo, Japan

We introduce a model of financial bubbles with two assets (risky and risk-free), in which rational investors and noise traders co-exist. Rational investors form expectations on the return and risk of a risky asset and maximize their expected utility with respect to their allocation on the risky asset versus the risk-free asset. Noise traders are subjected to social imitation and follow momentum trading. By contrast to previous models in the field, we do not allow agents to switch between trading strategies. Allowing for random time-varying herding propensity, we are able to reproduce several stylized facts of financial markets such as a fat-tail distribution of returns, volatility clustering and transient faster-than-exponential bubble growth with approximate log-periodic behavior. The model accounts well for the behavior of traders and for the price dynamics that developed during the dotcom bubble in 1995-2000. Momentum strategies are shown to be transiently profitable, supporting these strategies as enhancing herding behavior.

SOE 3.2 Mon 12:15 GÖR 226

**Universal behavior of the interoccurrence times between losses in financial markets: Independence of the time resolution** — ●JOSEF LUDESCHER and ARMIN BUNDE — Institut für Theoretische Physik, Universität Gießen, Germany

We consider representative financial records (stocks and indices) on time scales between 1 minute and 1 day and show that the distribution  $P_Q(r)$  of the interoccurrence times  $r$  between losses below a negative threshold  $-Q$ , for fixed mean interoccurrence times  $R_Q$  in units of the corresponding time resolutions, can be described on all time scales by the same  $q$ -exponentials,  $P_Q(r) \propto 1/((1 + (q-1)\beta r)^{1/(q-1)})$ . The parameters  $q$  and  $\beta$  depend only on  $R_Q$ , but not on the specific asset or time resolution. While the  $q$ -value increases logarithmically with  $R_Q$ ,  $q = 1 + q_0 \ln(R_Q/2)$ ,  $\beta$  depends only slightly on  $R_Q$  reaching a plateau for  $R_Q > 6$ . We propose that the analytic form of  $P_Q(r)$  can be regarded as an additional 'stylized fact' of the financial markets and represents a nontrivial test for market models. We analyze the distribution  $P_Q(r)$  as well as the autocorrelation of the interoccurrence times for five market models: MRC, MRW, ARCH, GARCH, FARIMA. Only the multiplicative random walk (MRW) model reproduces the  $q$ -Exponential form of  $P_Q(r)$ .

SOE 3.3 Mon 12:30 GÖR 226

**Free markets and the emergence of leverage thresholds** — JOAO P. DA CRUZ<sup>1,2</sup>, FRANK RAISCHEL<sup>3</sup>, and ●PEDRO G. LIND<sup>4</sup> — <sup>1</sup>Closer Consultoria Lda, Avenida Engenheiro Duarte Pacheco, Torre 2, 14-C, 1070-102 Lisboa, Portugal — <sup>2</sup>Departamento de Física, Facul-

dade de Ciências da Universidade de Lisboa, 1649-003 Lisboa, Portugal — <sup>3</sup>Instituto Dom Luiz, CGUL, 1749-016 University of Lisbon, Lisbon, Portugal — <sup>4</sup>ForWind and Institute of Physics, Carl-von-Ossietzky University of Oldenburg, DE-26111 Oldenburg, Germany

The emergence of critical behavior in economic systems has been reported in the literature as belonging to the same class of phenomena observed in models of self-organized criticality (SOC). Self-organized criticality lays on local state transitions which are triggered when local properties exceed a specific threshold value. While in many natural systems this threshold is not known, we show that for financial networks composed by financial agents and their trade connections it is possible to directly derive the threshold below which one agent enters insolvency. Focusing in empirical data sets of assets and liabilities from almost hundred thousand companies, we further show that the threshold to insolvency is related to the way asset and liability values are related with each other.

SOE 3.4 Mon 12:45 GÖR 226

**Asset Allocation as function of business policy, stressed market environment, risk and structure of liability in Austrian severance pay funds during 2003-2013** — ●ULI SPREITZER<sup>1</sup> and ALEXANDER RABANSER<sup>2</sup> — <sup>1</sup>Uli Spreitzer, Bonus Pensionskassen AG, Vienna, Austria — <sup>2</sup>Concisa Vorsorgeberatung und Management AG, Vienna

We analysed the asset allocation structure of austrian severance pay funds with respect to business policy, stressed market environment, risk management/measure and structure of liabilities. Despite the low guaranty (sum of contributions) and the not so short duration of liabilities, we recognised changes in the asset allocation, which we will discuss as driven by influences beside standard asset allocation/risk optimizations processes.

SOE 3.5 Mon 13:00 GÖR 226

**Can Google Trends search queries contribute to risk diversification?** — ●LADISLAV KRISTOUFEK — Institute of Information Theory and Automation, Academy of Sciences of the Czech Republic  
Portfolio diversification and active risk management are essential parts of financial analysis which became even more crucial (and questioned) during and after the years of the Global Financial Crisis. We propose a novel approach to portfolio diversification using the information of searched items on *Google Trends*. The diversification is based on an idea that popularity of a stock measured by search queries is correlated with the stock riskiness. We penalize the popular stocks by assigning them lower portfolio weights and we bring forward the less popular, or peripheral, stocks to decrease the total riskiness of the portfolio. Our results indicate that such strategy dominates both the benchmark index and the uniformly weighted portfolio both in-sample and out-of-sample.