

Tommaso Di Francesco

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tommasodf.github.io

Research Interests

Macroeconomics, Behavioral Economics, Non-linear Dynamics

Education

- 2025* **Ph.D.**, Economics, University of Amsterdam. Joint with Ca' Foscari University of Venice
Advisors: Cars Hommes (UVA) and Paolo Pellizzari (UNIVE)
EU MSCA programme Economic Policy in Complex Environments (EPOC)
- 2020 **M.A.**, Economics and Finance, Ca' Foscari University of Venice
- 2017 **B.Sc.** Economics and Management, University of Rome Tor Vergata

Research

Job Market paper

Sticky Information across the Wealth Distribution

This paper investigates the role of wealth-dependent information stickiness in the transmission of monetary policy in a Heterogeneous Agent New Keynesian (HANK) model. Using survey data, I provide empirical evidence that households do not form expectations according to the full-information rational expectations (FIRE) hypothesis but instead exhibit stickiness in updating their information, with wealthier households updating more frequently. I evaluate the effect of this evidence on macroeconomic dynamics using a quantitative model. My findings reveal that inequality significantly affects the aggregate responses to monetary shocks. Specifically, models that neglect heterogeneity in information updating underestimate both the magnitude and the delay of the peak response to monetary policy shocks. Estimating the model by matching simulated impulse response functions (IRFs) to empirical ones shows that stickiness is crucial for accurately capturing the dynamics observed in the data.

Working papers

Sentiment-Driven Speculation in Financial Markets with Heterogeneous Beliefs: A Machine Learning Approach

Revise and Resubmit at *Journal of Economic Dynamics and Control*

(with Cars Hommes)

We study a heterogeneous asset pricing model in which different classes of investors coexist and evolve, switching among strategies over time according to a fitness measure. In the presence of boundedly rational agents, with biased forecasts and trend following rules, we study the effect of two types of speculation: one based on fundamentalist and the other on rational expectations. While the first is only based on knowledge of the asset underlying dynamics, the second takes also into account the behavior of other investors. We bring the model to data by estimating it on the Bitcoin Market with two contributions. First, we construct the Bitcoin Twitter Sentiment Index (BITSI) to proxy a time varying bias. Second, we propose a new method based on a Neural Network, for the estimation of the resulting heterogeneous agent model with rational speculators. We show that the switching finds support in the data and that while fundamentalist speculation amplifies volatility, rational speculation has a stabilizing effect on the market.

*Expected.

Work in Progress

(with Daniel Torren Peraire)

This paper investigates the interplay between information diffusion in social networks and its impact on financial markets with an agent based model (ABM). Agents receive and exchange information about an observable stochastic component of the dividend process of a risky asset à la Grossman and Stiglitz (1980). A small proportion of the network has access to a private signal about the component, which can be clean (information) or distorted (misinformation). Other agents are uninformed and can receive information only from their peers. All agents are Bayesian in updating their beliefs, but in a behavioural way. They adjust their beliefs according to the confidence they have in the source of information. We examine, by means of simulations, how information diffuses in the network and provide a framework to account for delayed absorption of shocks, that are not immediately priced as predicted by classical financial models. We show the effect of the network topology on the resulting asset price and offer an interpretation for excess volatility with respect to fundamentals, persistence amplification and leptokurtosis of returns.

Teaching

Ca'Foscari University of Venice

2019, 2022 Teaching Assistant, Optimization (EM2Q12)
2019 Teaching Assistant, Financial Mathematics (ET0046)
2019 Tutorial Assistance, Mathematics For Economics (ET0047)

University of Amsterdam

2024 Tutorial Assistance, Mathematics 1 for Economics (6011P0236Y)
2024 Tutorial Assistance, Microeconomics (6011P0139Y)

Programming

Python, Julia, R

Other Experiences

2020-2021 Financial Consultant, Ernst&Young, Milan, Italy

References

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Prof. Dr. Jan Tuinstra
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