

Fragmentation in trader preferences among multiple markets: Market coexistence versus single market dominance (Working paper, Version 1 July 2020)

Robin Nicole ^{*1}, Aleksandra Alorić ^{†2}, and Peter Sollich ^{‡1,3}

¹*Department of Mathematics, King's College London, Strand, London, WC2R 2LS, United Kingdom*

²*Scientific Computing Laboratory, Center for the Study of Complex Systems, Institute of Physics Belgrade, University of Belgrade, Pregrevica 118, 11080 Belgrade, Serbia*

³*Institut für Theoretische Physik, Georg-August-Universität Göttingen, Friedrich-Hund-Platz 1, D-37077 Göttingen, Germany*

1 Abstract

Technological advancement has led to an increase in number and type of trading venues and diversification of goods traded. These changes have re-emphasized the importance of understanding the effects of market competition: does proliferation of trading venues and increased competition lead to dominance of a single market or coexistence of multiple markets? In this paper, we address these questions in a stylized model of Zero Intelligence traders who make repeated decisions at which of three available markets to trade. We analyse the model numerically and analytically and find that parameters that govern traders' decisions – memory length and intensity of choice, e.g. how strongly decisions are based on past success – make the key distinctions between consolidated and fragmented steady states of the population of traders. All three markets coexist with equal shares of traders only when either learning is too weak and traders choose randomly, or when markets are identical. In the latter case, the population of traders is fragmented across the markets. For the more general case of markets with different biases, we note that market dominance is the more typical scenario. These results are interesting because previously either strong differentiation of markets or heterogeneity in the needs of traders was found to be a necessary condition for market coexistence. We show that, in contrast, these states can emerge simply as a consequence of co-adaptation of an initially homogeneous population of traders.

*robin.nicole.m@gmail.com

†aleksandra.aloric@gmail.com

‡peter.sollich@kcl.ac.uk