# IEF Grant 2016 Report

## Markets of Tomorrow: Blockchain Trade Settlement and Liquidity

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**General Research Context. A number of recent reforms showcase markets’ appetite for faster settlement: In September 2017, the U.S. and Canadian markets migrated from a three-day (T+3) to a two-day (T+2) settlement cycle for equity transactions. Previously, European equity markets had transitioned to T+2 in 2014; Singapore followed in December 2018, and Japan in 2019.**

**Efforts to speed up trade settlement date back to the “Black Monday” in 1987, and the subsequent U.S. markets’ migration in 1996 from a five- to a three-day settlement cycle. In principle, regulators and the financial industry agree that faster settlement reduces risk exposure in financial markets. However, post-trade infrastructure reforms stopped short of implementing real-time settlement, even though such an option is nowadays technologically feasible using Blockchain. The reason is that markets’ appetite for fast settlement is tempered by liquidity concerns: In a 2018 white paper, the Depository Trust & Clearing Corporation (DTCC, 2018) supports future efforts to accelerate trade settlement in the U.S. beyond T+2, while at the same time cautions that real-time settlement could have “major implications” for market liquidity.**

**In my research, I ask what are the benefits and drawbacks from real-time security settlement? How can we leverage new technologies such as distributed ledgers (Blockchain) to build a more liquid and robust market?**

**Research Output. The research resulted in one *Management Science* publication, together with Mariana Khapko from University of Toronto** (Khapko & Zoican, 2020)**. We emphasize three insights emerging from our results. First, flexible settlement cycles allow traders to individually balance trading urgency and borrowing costs on the securities loan market. Second, and most importantly, we find that the optimal trade contract combines flexible failure- to-deliver penalties with real-time settlement. The equilibrium penalty resembles a put option on the repo market, and it serves a double purpose: First, it provides insurance for traders against high borrowing costs. Second, it fosters competition on the security lending market and reduces capital commitments for intermediaries. Finally, mandatory borrowing is not necessarily a panacea for market quality. Imperfect competition between security lenders generates a strong incentive to settle trades before everyone else. In an attempt to reduce borrowing costs, traders engage in a settlement rat race. In equilibrium, there is excess demand for fast, or even immediate, settlement, leading to high rents for security lenders at the expense of traders.**

**The key economic trade-off is intuitive. On the one hand, impatient traders have a preference for faster settlement: to exercise voting rights, to receive dividends, or to reduce the duration of counterparty risk exposure. A Boston Consulting Group study (BCG, 2012) commissioned by the DTCC estimated a 38% ($1 billion) market-wide reduction in counterparty risk exposure following U.S. markets’ transition from T+3 to T+2. Currently, the U.S. financial system uses over $5 billion in collateral to manage counterparty default risk (DTCC, 2018): Speeding up settlement by one day could therefore release $5bln × 38% = $1.9 billion. worth of collateral. On the other hand, a shorter settlement cycle requires broker-dealers to either pre-fund their trades, and therefore to carry inventory risk, or to borrow the securities they need to settle. Market imperfections drive up security borrowing costs: Security lenders typically wield market power, as demonstrated, for example, by recent U.S. lawsuits in 2017 filed by pension funds. Borrowing costs can be so important as to trigger settlement cycle reforms by themselves: In 2013, the Moscow Stock Exchange transitioned from real-time settlement to T+2, citing security borrowing costs as the key rationale.**

**Research funding. The IEF research grant allowed us to disseminate our paper and obtain feedback at a number of first-order academic conferences in the field of financial economics, such as the European Finance Association (August 2017), the SFS Cavalcade (May 2017), the 2017 NFA Meeting, the 13th Central Bank Conference on the Microstructure of Financial Markets (October 2017), or the 8th Erasmus Liquidity Conference in Rotterdam (July 2017). Second, the grant was instrumental in allowing us to pay for journal submission and copy-editing fees. Finally, the grant allowed Marius Zoican to visit his co-author in Toronto in May 2017 to develop the research project draft.**

**Researcher bio.** Marius Zoican is an Assistant Professor of Finance (on tenure track) at the University of Toronto from 2018. He is appointed with the Department of Management at UTM, and cross-appointed at the Rotman School of Management and the Institute for Management and Innovation. Previously, Marius held a position at Paris-Dauphine University in France from 2015. Marius’ research agenda focuses on theoretical and empirical market microstructure, and particularly on the impact of technology on securities exchanges. His research was published in leading academic journals (The Review of Financial Studies, Management Science, or Journal of Financial Markets), as well as covered by media outlets such as The Economist and Bloomberg News. Marius obtained academic grants for work in the field of financial technology, e.g., from the Social Sciences and Humanities Research Council (SSHRC), Canadian Securities Institute, and the French National Research Agency (ANR). He received several awards, including the Federation of European Securities Exchanges "De la Vega Award" (2016) for outstanding research in financial markets.

**References**

Khapko, M., & Zoican, M. (2020). How fast should trades settle? *Management Science, 66*(10), 4573-4793. doi:10.1287/mnsc.2019.3408