

Working Papers on Economics - Estimating Financial Institutions' Intraday Liquidity Risk: A Monte Carlo Simulation Approach

Download Keep in mind

The series Working Papers on Economics is published by the Office for Economic Studies at the *Banco de la República* (Central Bank of *Colombia*). It contributes to the dissemination and promotion of the work by researchers from the institution. This series is indexed at Research Papers in Economics (RePEc).

On multiple occasions, these works have been the result of collaborative work with individuals from other national or international institutions. The works published are provisional, and their authors are fully responsible for the opinions expressed in them, as well as for possible mistakes. The opinions expressed herein are those of the authors and do not necessarily reflect the views of Banco de la República or its Board of Directors.

AUTHORS AND/OR EDITORS León-Rincón, Carlos Eduardo Publication Date: Sunday, 15 of April 2012

The most recent financial crisis unveiled that liquidity risk is far more important and intricate than regulation have conceived. The shift from bank-based to market-based financial systems and from Deferred Net Systems to liquidity-demanding Real-Time Gross Settlement of payments explains some of the shortcomings of traditional liquidity risk management. Although liquidity regulations do exist, they still are in an early stage of development and discussion. Moreover, not all connotations of liquidity are equally addressed. Unlike market and funding liquidity, intraday liquidity has been absent from financial regulation, and has appeared only recently, after the crisis.

This paper addresses the measurement of Large-Value Payment System's intraday liquidity risk. Based on the generation of bivariate Poisson random numbers for simulating the minute-by-minute arrival of received and executed payments, each financial institution's intraday payments time-varying volume and degree of synchrony (i.e. timing) is modeled. To model intraday payments' uncertainty allows for (i) overseeing participants' intraday behavior; (ii) assessing their ability to fulfill intraday payments at a certain confidence level; (iii) identifying participants non-resilient to changes in payments' timing mismatches; (iv) estimating intraday liquidity buffers. Vis-à-vis the increasing importance of liquidity risk as a source of systemic risk, and the recent regulatory amendments, results are useful for financial authorities and institutions.

The opinions and statements are the sole responsibility of the author and do not necessarily represent neither those of Banco de la República nor of its Board of Directors. Results are illustrative; they may not be used to infer credit quality or to make any type of assessment for any financial institution. The author is indebted to Clara Machado for the numerous and vital discussions that supported the model's design and the document's final version. Valuable comments and suggestions were provided by Fernando Tenjo, Joaquín Bernal, Freddy Cepeda and Fabio Ortega. LVPS data was processed with assistance from Freddy Cepeda and Fabio Ortega. As usual, any remaining errors are the author's own.