

# The Transaction Concept: Concurrency and Durability for Financial Markets

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## Abstract

A transaction is a form of exchange with a bounded beginning and end, and thus differs strongly from other manifestations of dyadic social exchange, such as a gift or loan, whose endogenous social repercussions may persist long past the moment of direct interaction. Markets for financial securities are predicated on the material mediation and optimization of flows of transactions. These environments—when coexistent with technological systems which permit said mediated flows to be reliable and durable in situations of varying volatility—can eventually facilitate the “automation” (or symbolically-structured initiation and execution) of said transactions. The underlying historical and sociotechnological question, then, is: how was the high reliability for large volumes of continuous transactions achieved, especially in what had been an era of both low reliability and limited concurrency in computing hardware and software? I suggest that the digital mechanization and automation of market processes, while demonstrably a historically gradual and socially contingent development (Pardo-Guerra (2010b), MacKenzie (2012)), is one whose possibility is also prefigured in the very concept of the transaction as a materializable, temporally bounded and socially disembedded object. A close examination of the historical ontology of the computerized transaction (as it developed in the nascent database research literature of the 1970s, and subsequently in the commercial implementations of Tandem Computers in the 1980s) can then be used to illustrate the crucial early transitions of mechanization at the NYSE which took place between the Paperwork Crisis of the 1960s—in which over 100 member brokerages departed due to “severe cases of too much business” (Rustin, 1975)—and the Black Monday crash of 1987, which instead saw then-doubled rates of 200,000 transactions a day with no major backend system failures.