A Historical Overview of Settlement Systems in the U.S.

Material in this report is excerpted from the working paper *Net Settlement and Counterparty Risk: Evidence from the Formation of the NYSE Clearing House in 1892* by Bernard McSherry, Berry K. Wilson, and James J. McAndrews

The structure of a financial system’s mechanism for settling money and securities transfers can have an impact on overall systemic risk. Transitions from one type of settlement system to another, as seen in the U.S. over the history of the New York Stock Exchange, offer a unique opportunity to understand the risk posed by settlement systems and what type of system offers the lowest risk.

An empirical analysis by Bernard McSherry of New Jersey City University, Berry Wilson of Pace University, and James McAndrews of the New York Federal Reserve Bank explores transitions of settlement systems in U.S. history, with a focus on the move from a bilaterally-cleared gross settlement system to a multilateral net settlement system in 1892 via the creation of the New York Stock Exchange Clearing House (NYSECH).

Findings suggest that settlement under a multilateral net settlement system, as compared to a bilateral gross settlement system, reduces broker insolvency and enhances system stability. This has implications both for developed economies considering moving away from bilateral processing and for developing economies looking to structure new settlement systems.

**Types of Settlement Systems**

Bilateral gross settlement is a fully decentralized method of settlement in which settlement occurs with each transaction on a one-to-one basis. The parties exchange gross amounts at different times. This requires parties to hold enough funds to settle all transactions or obtain intraday credit from a third party. As a result, risk occurs in the form of “time-gap” risk, or the risk that one party will deliver the full amount but fail to receive the contracted amount. (One solution to this is clearing and trading simultaneously using a Continuous Linked Settlement Bank, introduced in the U.S. in 2002.)

Alternatively, multilateral net settlement systems take into account all commitments over the course of a settlement session, and settlement is deferred so that net obligations are cleared in a single payment by the end of a cycle. The benefit to this type of system is that liquidity requirements are typically lower than with gross settlement.
**History of Settlement in the U.S.**

Clearing and settlement on the New York Stock Exchange (NYSE) began as a bilateral gross settlement system between brokers, with a settlement deadline each afternoon for physical delivery of securities and checks. This type of system required that brokers have access to a large amount of overnight funds (often beyond their own), so brokers had to work with New York City’s clearing banks to facilitate settlement. This process was known as “overcertification” and occurred when clearing banks certified a broker’s check in excess of the brokers’ cash balance in anticipation that the broker would deposit sufficient funds before this loan had cleared through the clearing bank.

This arrangement increased counterparty risk, though, and was particularly harmful during periods of financial stress or crises. Overcertification provided opportunities for strategic default and when conditions were such – as in the Panic of 1873 – clearing banks restricted or suspended the option for brokers, creating a lack of liquidity. The NYSE’s first clearinghouse was the result of the Barings Panic of 1890, another such event when the clearing banks ceased funding.

This first clearinghouse took advantage of a net settlement system in which processing took place overnight. The netting process reduced the required liquidity, while also decreasing the number of securities deliveries required.

The New York Stock Exchange Clearing House (NYSECH), a multilateral settlement system, was introduced in 1892 to accommodate the larger number of trades and an increasing number of securities. It was intended to reduce the amount of funding needed for settlement and increase operational efficiencies. The NYSECH was also thought that the system – which relied on private regulation for settlement activities – would reduce counterparty risk.

The NYSECH employed a multilateral settlement system known as “ring settlement”, in which a central agent coordinated settlement activities for a group, or ring. The ring’s members had established agreed-upon rules which the agent followed. The use of ring settlement was widespread in the late 19th and early 20th centuries and was the primary method used in the U.S.

In 1922, as the NYSE grew, a central counterparty, the Stock Clearing Corporation (SCC), was established.

**Implications for Systemic Stability**

Using data on the NYSE from 1873 to 1910, the authors examine broker insolvency under the different settlement systems. Insolvency in the data is defined as when a NYSE member failed to comply with contractual obligations or became insolvent. The authors look at several key variables: monthly NYSE trading volume; a NYSE equity market index taken from Goetzmann, Ibbotson, and Peng (2001); the maximum monthly call loan rate; a monthly series for NYSE seat prices; and a NBER recession variable.

The authors anticipated that the formation of the NYSECH would reduce the number of broker insolvencies, particularly during two key times: periods of high trading activity and market downturns. During peak trading times, a clearinghouse would improve operational efficiencies which would reduce the need for external financing for settlement. In market downturns, losses on securities due to buyer’s remorse could be lessened by a clearinghouse.
Results of the study show a reduction in the number of broker failures following the creation of the NYSECH in 1892. The mean number of insolvencies fell from 1.96 per month to 0.58 per month, a reduction in broker failure of 70%, and overall, the distribution of the frequency of insolvencies moved to the left.

Broker insolvencies were found to be highest when trading volumes were increasing, call loan rates were high, and when stock market prices were falling. Several historical events resulted in sharp increases in broker insolvencies, including the stock market panics in 1873; 1884; and 1890. After the Panic of 1873, the authors find that the number of broker insolvencies declined and that there were fewer insolvencies associated with financial panics after the creation of the NYSECH, despite significant panics in 1893 and 1907.

The transition to a multilateral net settlement system also led to a significant increase in trading volume, due in part to operational efficiencies gained from the implementation of the NYSECH. The NYSE experienced an average trading volume growth of 4.61% per month prior to establishing the NYSECH and 12.94% after the NYSECH began facilitating settlement.