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Systemic risk in the netting system

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Abstract

In interbank clearing networks, a bank experiencing sudden liquidity or solvency problems may prevent settlement of the claims of its direct creditors, which may in turn jeopardize settlement of other institutions. The paper presents an empirical assessment of the potential size of this 'domino effect' in the Italian netting system. A participant's settlement failure is simulated and the impact on the rest of the system measured. On average, only about 4 percent of participants were large enough to trigger systemic crises; less than 1 percent defaulted due to systemic reasons; the average monetary loss was less than 3 percent of the daily flow of funds through the clearing system. Similar simulations by other authors for the U.S. system yielded a much larger impact of systemic risk. We argue that the difference is mainly due to the much smaller volume of funds flowing through the Italian system and to structural differences.

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1. Introduction

The history of national banking systems records a large number of crises, often triggered by single troubled institutions, that spread rapidly to the rest of the system. In these episodes the risk borne by banks as a natural part of their normal

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activity would take on a different, systemic nature. The expression 'systemic risk' was originally designed for situations of this kind, which became less and less frequent with the development of modern banking systems, with their central banks, deposit insurance schemes and active risk control policies. Interest in systemic risk has been recently revived by the development of electronic large-value interbank clearing systems (also called netting or net settlement systems), in which operators exchange huge sums during the business day, settling net balances at the end. In these systems, payments become irrevocable (i.e. 'final') [1] only if every participant is able to settle its end-of-day balance; thus at any time during the day participants that have sent out more payments than they have received can be viewed as 'daylight debtors' to the rest of the system. Clearly, if one of them suddenly proves unable to meet its obligations, its direct creditors' ability to settle may be jeopardized as well, possibly setting off a chain reaction.

The external nature of systemic risk helps explain why the first to voice concern about it have been policy makers. In the mid-eighties the Federal Reserve began to worry about the amount of intraday credit extended over the main U.S. systems, which averaged more than $100 billion a day. As a result, a major risk-reduction program was launched, which led to substantial changes in the operation of these systems. [2] Shortly afterwards, the debate extended to the G-10 and the EU. [3] In their risk-reduction efforts, policy makers have increasingly stressed settlement finality, [4] which may be achieved through two main approaches. One is based on so-called real-time gross settlement, which entails settling payments individually through transfers of monetary base, forgoing the benefits of clearing altogether; this eliminates interbank daylight credit, and hence risk, but implies liquidity costs for system participants. The second involves the introduction of risk management features in clearing systems. Real-time gross settlement systems, supported by central banks for their enhanced safety, are scheduled to be implemented in all EU countries by mid-1997 (see European

[1] According to BIS (1992) a final payment is an irrevocable and unconditional transfer which effects a discharge of the underlying payment obligation. See also Mengle (1990), Committee of Governors of the Central Banks of the Member States of the European Economic Community (1992a), and Borio and van den Bergh (1993).

[2] The most recent innovation was implemented in April 1994: the Fed adopted a pricing mechanism for daylight overdrafts on its own gross settlement system, Fedwire, which in 1992 had reached peak values of approximately $170 billion per day. See Board of Governors of the Federal Reserve System (1988, Board of Governors of the Federal Reserve System (1990, Board of Governors of the Federal Reserve System (1992) and BIS (1993).

[3] See BIS (1990b) and Committee of Governors of the Central Banks of the Member States of the European Economic Community (1992a, Committee of Governors of the Central Banks of the Member States of the European Economic Community (1993).

[4] See, e.g., Board of Governors of the Federal Reserve System (1988, Board of Governors of the Federal Reserve System (1989), Padoa-Schioppa (1988), and Committee of Governors of the Central Banks of the Member States of the European Economic Community, 1993).