Chapter 5 **Systemic Risk**

The financial system is composed of many parts, including all the financial institutions and markets that match savers with borrowers around the world. The threats to the system as a whole – known as *systemic risks* – typically differ from the risks that menace specific households, firms, financial institutions or even markets. Naturally, government officials are more concerned about these systemic threats as they can be catastrophic for an economy (core principle 5). Their policy goal is a robust financial system that is not vulnerable to the failure of specific parts.

Cell biology provides a useful analogy for understanding a financial system. Complex organisms are composed of many cells with specialized purposes. Every day, a large number of these cells die (and new ones are created) without threatening the organism as a whole. In financial systems, too, many intermediaries fail without posing a systemic threat, even as new firms emerge. Yet, in both biology and finance, some threats (say, a lethal virus) can undermine both the parts and the whole.

This biological analogy can be taken a step further. Think of financial institutions as the cells of the financial system, and of markets as the means by which these institutions transmit messages to coordinate their actions. Cells operating alone cannot make a complex organism function. Their actions are coordinated by the messages that travel along diverse electrical and chemical pathways. In the same way, an effective financial system requires markets that collect and transmit information necessary to coordinate the behavior of financial institutions.

How does this biological comparison help us understand systemic risk? It provides hints about what might threaten the system as a whole, not just its parts, and also about possible corrective mechanisms.

In the world of finance, systemic risk arises when a set of vulnerabilities in markets and financial institutions threatens to disrupt the general function of intermediation (matching lenders and borrowers). Connections among financial institutions and markets, even when unseen, may transmit and amplify a shock across the system. Obstacles to the flow of information make a system more vulnerable, because information is needed to coordinate the system's parts.

A financial system also may contain critical parts (comparable to a heart or a brain) without which it cannot function. For example, the largest, most interconnected financial firms can become *too big to fail* if their failure threatens a cascade of bankruptcies among other institutions. In the extreme, such a *systemic firm* may even become too big and costly to save.

As one possible source of systemic risk, consider the role of liquidity, which is often called the lifeblood of a financial system. Usually, the smooth circulation of liquid assets around the financial system makes it possible for financial institutions to

convert their holdings easily into cash and to trade in markets. But what happens if that circulation is interrupted, or if the overall supply of liquidity is inadequate?

Like a heart attack, obstacles to the flow of liquidity pose a catastrophic threat to the financial system. Some financial institutions may become unable to trade or make payments, while markets for a range of assets may dry up. If these shocks weaken other firms, the result can be a wave of bankruptcies. Central bankers have well understood the menace of such a "liquidity crisis" since the nineteenth century, but crises still erupt. On any list of possible systemic disruptions, a liquidity crisis would rank at or near the top.

Reducing Systemic Risk. Policymakers naturally wish to minimize systemic risk (core principle 5). Policies that reduce the vulnerability of the system to the failure of specific financial institutions or markets are an important way to achieve this goal. There are many policy approaches that can help lower system risk. The list that follows is a partial one that highlights the potential role of: (1) redundant systems; (2) transparency; (3) targeted taxes; (4) oversight; and (5) orderly settlements of failed firms.

One approach is to favor *redundancies* in the system. While redundancies may seem inefficient, they provide backup mechanisms in the event of failure. Human beings, for example, have two kidneys, but can survive with one. Similarly, financial systems that rely equally on *direct* finance (borrowing through the sale of bonds and equities) and *indirect* finance (borrowing through banks) may be less vulnerable if only one of these mechanisms is impaired. Another example of potentially helpful redundancy in finance is the existence of multiple exchanges (including electronic exchanges) for trading assets.

A second approach is to foster *transparency* that allows financial institutions to discipline one another. For example, a financial institution that conceals the risks that it takes can pose an unseen threat to its trading partners should it fail. We call the risk posed by the failure of a trading partner *counterparty risk*.[1] By compelling a financial institution to disclose its risky assets and obligations, government rules can help others judge whether it is a safe counterparty. If one financial institution tries to take on too much risk in a visible way, others will require extra compensation for trading with it (core principle 2), or may refuse to trade at all, helping to limit counterparty risk.

A third approach is to impose *taxes* to discourage behavior that poses risk to the system. Government rules that penalize holdings of risky assets can function like a tax on risk-taking.[2] If the rules are well conceived and enforced, they can discourage

[1] A counterparty is the person or institution that is on the other side of a financial contract. See Chapter 3.

[2] Government rules require that banks have greater net worth (capital) if they wish to hold riskier assets (see Chapter 14). Like a tax, such *capital requirements* raise the cost of holding risky assets.

behavior that boosts systemic risks. In this way, each intermediary bears the cost of the systemic risk that it creates.

A fourth approach is to impose *special oversight* over the largest, most interconnected financial institutions that may be systemic. The problem is that declaring an institution too big to fail can allow it to become even riskier, because counterparties no longer have incentive to monitor its activities. As a result, regulators may prefer to prevent financial firms from becoming too big or too interconnected to fail.

Finally, a fifth approach is for a government to *intervene* when an institution of systemic importance is close to failure. By arranging for an orderly settlement of the failed institution's debts, officials can prevent a catastrophic cascade of further failures. However, such interventions may protect counterparties against risks that they took, reducing their incentive to guard against future risks.