The Flawed Architecture of the Financial System

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The architecture of the financial system is fatally flawed. Without anyone's being aware of it, the core of the system has become what is known as a "hairball." It is a clump of disastrously entangled claims, in which everything is linked to everything else. Given this architecture, it is inevitable that all investors must all pay for the poor judgment of a few.

The opposite of a hairball is a modular system. In modular systems, shocks are contained close to their origins, and do not propagate in unexpected directions. Risks are also contained and not inflicted on those who had no part in the original risk-bearing contract.

It is instructive to compare the architecture of the financial system with the architecture of the Internet. Both are large, complicated global networks. However, unlike the financial system, the Internet was designed with a particular goal in mind: to withstand nuclear war. The idea was that if a big chunk of the network suddenly dropped off the map, the rest of the system would still work and would reroute around the damage.

In the financial system the equivalent of a nuclear strike is the failure of a large counterparty. It is abundantly clear that the system we have is not proof against such a shock. It does not recover gracefully, it does not reroute itself, and it amplifies risk to the detriment of everyone.

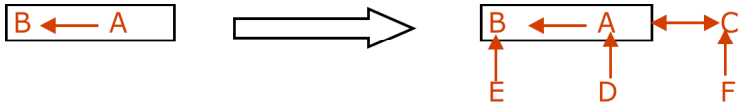
This is because the global financial system is a hairball. Two things have caused it to become one: the multiplication of claims and counterparties, and an insidious, related effect, which I'll call "collateral damage."

Multiplication of Claims and Counterparties

In the simplest system of credit, A borrows money from B. B is at risk if A cannot repay. End of story.

But in today's system A will borrow from B, and then do an interest rate swap with C. Now, not only B is at risk, but so is C. And A is also at risk if its counterparty C defaults.

All parties can then buy insurance against default by a borrower or counterparty. Insurers D, E, and F write the contracts. At this point, everyone is "safer." But we have gone from one claim and two participants to a cluster of six claims and six participants.



In the pursuit of safety, we have multiplied both the claims and the counterparties. This is where the hairball begins.

Let's now look at how the derivatives—the swap and the insurance claims—are managed. In each contract, there is a counterparty and counterparty risk. Counterparty risk can be managed in two ways: through credit or through collateral.

Suppose your counterparty is a large, safe institution with a good track record and a AAA credit rating. Default on the contract is only a remote possibility, and so you simply trust them. Because they are trusted, triple-A counterparties have low costs and are very active in derivatives markets.

The other way to manage counterparty risk is through collateral. If your counterparty's credit isn't good enough, they must put assets in escrow. If they default, you get the assets and use them to settle the claim. Of course collateral is only as good as the underlying assets, thus it normally takes the form of very safe assets, things that are close to cash.

Collateral Damage

Collateral damage occurs when one of the counterparties that *was* safe becomes not-so-safe. Let's say that in our little derivatives cluster, D's credit rating is cut, and its counterparties demand that it post collateral.

Where does D get this collateral? It is still a big institution with lots of assets, so it uses them. When it runs out of cash and near-cash, it sells other things. It can sell the stocks and bonds in its portfolio. It can sell whole businesses, if it can find a buyer. It can sell its own securities, including common stock. All of these asset sales will bring in cash, which D can post as collateral on its derivative contracts. D liquidates assets to post collateral, so from now on, we'll call D "the liquidator."

This is where the hairball becomes dangerous. There is a price to these asset sales. Writing in the *Journal of Finance*, George Chacko, Jacob Jurek, and Erik Stafford called it "the price of immediacy." Essentially it is the discount the liquidator must pay for a quick sale. The bigger and quicker the sale, the bigger the discount.

Liquidations at a discount cause are what are called "cross-market" effects. Cross-market effects arise when a price decline in one market triggers *price declines in apparently unrelated markets*. They are caused by liquidators scrambling to raise collateral. They are signals of a liquidity implosion.

The problem is that these cross-market effects, although they have nothing to do with the fundamental value of underlying assets, affect market prices. The liquidator's need for collateral *to insure other positions* imposes costs on *anyone who holds the same assets*. Thus we all pay the price of the liquidator's quick sale.

This is the "collateral damage" that accompanies the need for liquidity in derivatives markets. It's fine to say that collateral damage is temporary and that the market will self-correct. That's harsh comfort for those who are unwittingly caught in the cross-fire.

Design Rules

Our financial system violates a fundamental design rule, which is to prevent the propagation of shocks. Modular systems do this. But we have the opposite of a modular system: we have a hairball where shocks propagate willy nilly and collateral damage is a real and present danger.

As a result of its hairball architecture, poor judgment or excessive risk-taking by one firm can harm people in distant and unrelated parts of the financial system. Ironically, posting collateral increases the safety of the liquidator's *direct* counterparties, but does so *at the expense of others who never traded with the liquidator but happened to own the same assets*.

The only way to avoid suffering collateral damage from a liquidator's implosion is to hold cash or near-cash assets. Hold what the liquidator is trying to buy. Or, ironically, hold non-liquid assets—things the liquidator won't even try to sell.

Once investors realize that their life savings can suffer collateral damage from the liquidity implosion of a derivatives trader, does it make sense to hold such assets at all? The risks of collateral damage are not risks that ordinary investors or even large institutional investors can protect themselves against. To guard against these risks you would have to know the overall position and probability of collateral calls *for every investor whose portfolio overlapped with yours*. You would have to disentangle the hairball, something no one yet knows how to do.

It is time to see the hairball at the center of the financial system for what it is—a threat to us all. Then we can begin to re-architect the system based on the principles of segregated risks, limited propagation, and modularity.

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