

until productive agents can rebuild their net worth through retained earnings. Besides persistence, amplification is the second macroeconomic implication we cover in this survey. An initial shock is *amplified* if productive agents are forced to fire-sell their capital. Since fire-sales depress the price of capital, the net worth of productive agents suffers even further (loss spiral). In addition, margins and haircuts might rise (loan-to-value ratios might fall) forcing productive agents to lower their leverage ratio (margin spiral). Moreover, a dynamic amplification effect can kick in. The persistence of a temporary shock lowers future asset prices, which in turn feed back to lower contemporaneous asset prices, eroding productive agents' net worth even further and leading to more fire-sales.

The amplification effects can lead to rich volatility dynamics and explain the inherent *instability* of the financial system. Even when the exogenous risk is small, *endogenous risk* resulting from interactions in the system can be sizable. Credit risk can be dwarfed by *liquidity risk*. Liquidity is *fragile* as an infinitesimally small shock can lead to a large discontinuous drop in the price level and a dry-up of funding. Similar systemic risk effects can arise in a setting with multiple equilibria in which simply a sunspot can lead to these large shifts. Secured funding markets are subject to “collateral runs” when collateral values drop and margins rise. Unsecured funding markets are subject to a traditional bank runs or “counterparty runs”, when they are unable to roll over their debt.

To understand these destabilizing effects it is useful to distinguish between three liquidity concepts: technological, market and funding liquidity. Physical capital can be liquid either because the investment is reversible (*technological liquidity*) or because the capital can be sold off easily with limited price impact (*market liquidity*). The latter is the case if the asset has low specificity and hence, has a high value in its second best use. The market liquidity of claims on the payoffs generated by capital goods depends on the liquidity of the underlying physical asset, especially for aggregate shocks, but also on the funding structure of the holder of these claims. Assets with high technological or market liquidity lead to a small fire-sale discount and hence the amplification effects are contained. Instead of getting rid of the asset either by reverting physical capital or fire-selling it, it can also be used as collateral to fund it. Funding liquidity is primarily determined by the maturity structure of debt and the sensitivity of margins/haircuts. If the margin can move from 10% to 50% over night, then 40% of the loan has essentially a maturity of one day. Since margins depend on the volatility of the collateral assets, all three concepts of liquidity interact. The determining factor for the above destabilizing effects is the *liquidity mismatch* – not necessarily the leverage and maturity mismatch