Neglected risks, financial innovation, and financial fragility

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1. Introduction

Many recent episodes of financial innovation share a common narrative. It begins with a strong demand from investors for a particular, often safe, pattern of cash flows. Some traditional securities available in the market offer this pattern, but investors demand more (so prices are high). In response to demand, financial intermediaries create new securities offering the sought after pattern of cash flows, usually by carving them out of existing projects or other securities that are more risky. By virtue of diversification, tranching, insurance, and other forms of financial engineering, the new securities are believed by the investors, and often by the intermediaries themselves, to be good substitutes for the traditional ones and are consequently issued and bought in great volumes. At some point, news reveals that the new securities are vulnerable to some unattended risks and, in particular, are not good substitutes for the traditional securities. Both investors and intermediaries are surprised by the news, and investors sell these false substitutes, moving back to the safety of traditional securities and markets become fragile, even without leverage, precisely because the volume of new claims is excessive.

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leveraged). The prices of traditional securities rise while those of the new ones fall sharply.

A notorious recent example of this narrative is securitization of mortgages during the 2000s. Various macroeconomic events, including sharp reductions in government debt during the Clinton administration and massive demand for safe US assets by foreigners, created a shortage of safe fixed income securities. By pooling and tranching mortgages and other loans, financial institutions engineered AAA-rated mortgage backed securities (MBS) as substitutes for US government bonds. The perception that these securities were safe, apparently shared by both buyers and intermediaries who engineered them, was justified by historically low default rates on mortgages in the US and by more or less continuously growing home prices since World War II. Trillions of dollars of mortgage- and other asset-backed securities were created and sold to investors.

Both the holders of these securities and financial intermediaries appeared to be caught by surprise in the summer of 2007, when the news that AAA-rated securities were not safe hit the market. It is not that investors failed to understand that home prices could decline and mortgages could default. Yet two things came as rather substantial surprises. The first was how fast home prices declined and defaults grew. Gerardi, Lehnert, Sherlund, and Willen (2008) show that few, if any, Wall Street professionals expected the housing bubble to deflate so rapidly. The second surprise was the sensitivity of the prices of AAA-rated securities engineered from mortgages, especially collateralized debt obligations (CDOs), to home prices, a phenomenon largely overlooked by the models utilized by rating agencies (Jarrow, Li, Mesler, and van Deventer, 2007; Coval, Jurek, and Stafford, 2009). As these securities were downgraded, prices fell and new issuance stopped. The losses from MBS spread through the financial system, precipitating the market collapse in September 2008.

This recent episode is far from unique in recent US financial history. In the 1980s, investment banks began selling collateralized mortgage obligations (CMOs), securities created out of mortgage portfolios and intended to substitute for government bonds. To avoid a possible risk to the value of CMOs resulting from mortgage prepayments by homeowners (which would occur if interest rates fell and people refinanced their homes) and consequent prepayments on the high-yielding bonds, intermediaries engineered CMOs nearly invulnerable to prepayment risk if historical patterns continued. In the early 1990s, however, as the Federal Reserve sharply cut interest rates, prepayments skyrocketed to levels unprecedented by historical standards, so even the prices of CMOs most protected against prepayment risk declined sharply. The investors were caught by surprise and dumped the CMOs, turning back to government bonds (Carroll and Lappen, 1994). Financial intermediaries were evidently caught by surprise as well, and many (particularly those who sold prepayment insurance) suffered substantial losses. Like the collapse of home prices in 2007–2009, massive prepayments appear to have been unanticipated by the market.

A similar narrative describes what happened to money market funds in 2008. The industry was originally created to offer investors a substitute for bank deposits, with slightly higher returns, instant liquidity, and no risk. Because investment in money market funds was not protected by deposit insurance, however, these funds were engineered never to “break the buck”, that is, have their value per share drop below $1. To slightly raise returns, prime money market funds invested in generally safe nongovernment securities, such as commercial paper. The collapse of Lehman Brothers in September 2008 led to its default on commercial paper, which caused one large holder of that paper, the Reserve Fund, to break the buck (Kacperczyk and Schnabl, 2010). This event shocked investors and precipitated hundreds of billions of dollars in withdrawals not just from the Reserve Fund, but also from the whole prime money market fund sector, and a return to traditional bank deposits and government securities only funds (Pozsar, Adrian, Ashcraft, and Boesky, 2010). Only government guarantees of prime money market funds saved the industry.

In this paper, we present a model that captures some key elements of this narrative. The model shares with the traditional accounts of financial innovation, such as Ross (1976) and Allen and Gale (1994), the view that innovation is driven by investor demand for particular cash flow patterns. This demand allows intermediaries to profitably engineer these patterns out of other cash flows. We add two new assumptions to this standard story.

First, we assume that both investors and financial intermediaries do not attend to certain improbable risks when trading the new securities. This assumption captures what we take to be the central feature of the historical episodes we describe: the neglect of potentially huge defaults in the housing bubble and of the sensitivity of AAA-rated securities to these defaults, the neglect of the possibility of massive prepayments in the early 1990s, or the neglect of the possibility that a money market fund can break the buck. We model the neglect of certain states of the world using the idea of local thinking, introduced by Gennaioli and Shleifer (2010), which is a formalization of the notion that not all contingencies are represented in the decision maker’s thought process. The neglect of some states of the world in models used to price CDOs is a good example.

Second, we make the preferred habitat assumption that investors have a very strong preference for safe cash flow patterns. We model this assumption through preferences, namely, infinite risk aversion, but it can reflect psychological or institutional characteristics of demand. An alternative way to model such demand might be to consider investors who have lexicographic preferences with respect to particular characteristics of investments (e.g., AAA ratings). Yet another approach might be to stress regulatory requirements imposed on investors such as banks and insurance companies that favor safe assets. This assumption on demand is not strictly necessary for our results but makes them much stronger.1 We have obtained similar results in a model with finite risk aversion and Epstein-Zin preferences.

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1 The demand for riskless debt can also come from the preference for information-insensitive claims (Gorton and Pennacchi, 1990; Demarzo and Duffie, 1999).
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