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THE CREDIT CRISIS: CONJECTURES ABOUT CAUSES AND REMEDIES

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ABSTRACT

What caused the financial crisis that is sweeping across the world? What keeps asset prices and lending depressed? What can be done to remedy matters? While it is too early to arrive at definite answers to these questions, it is certainly time to offer informed conjectures, and these are the focus of this paper.

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Abstract

What caused the financial crisis that is sweeping across the world? What keeps asset prices and lending depressed? What can be done to remedy matters? While it is too early to arrive at definite answers to these questions, it is certainly time to offer informed conjectures, and these are the focus of this paper.

Introduction

What caused the financial crisis that is sweeping across the world? What keeps asset prices and lending depressed? What can be done to remedy matters? While it is too early to arrive at definite answers to these questions, it is certainly time to offer informed conjectures, and these will be the focus of our paper.

There is some consensus on the proximate causes of the crisis: (i) the U.S. financial sector misallocated resources to real estate, financed through the issuance of exotic new financial

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instruments; (ii) a significant portion of these instruments found their way, directly or indirectly, into commercial and investment bank balance sheets; (iii) these investments were largely financed with short-term debt. Let us first dig deeper into the more fundamental reasons for these proximate causes.

I. Misallocation of Investment

This is a crisis born in some ways from previous financial crises. A wave of crises swept through the emerging markets in the late 1990's: East Asian economies collapsed, Russia defaulted, and Argentina, Brazil, and Turkey faced severe stress. In response to these crises, emerging markets became far more circumspect about borrowing from abroad. Their corporations, governments, and households cut back on investment and reduced consumption. From net absorbers of financial capital from the rest of the world, a number of these countries became net exporters of financial capital.

Clearly, the net financial savings generated in one part of the world have to be absorbed by deficits elsewhere. Industrial country corporations initially absorbed these savings by expanding investment, especially in information technology, but investment was cut back sharply following the collapse of the IT bubble.

Extremely accommodative monetary policy by the world's central banks, led by the Federal Reserve, ensured the world did not suffer a deep recession. The low interest rates in a number of countries ignited demand for housing. House prices started rising as did housing investment.

The United States was not by any means the highest in terms of price growth. Housing prices reached higher values relative to rent or incomes in Ireland, Spain, the Netherlands, the United Kingdom, and New Zealand, for example. Then, why did the crisis first manifest itself in

the United States? Probably because the U.S. went further on financial innovation, thus drawing more marginal-credit-quality buyers into the market!

A home mortgage loan is very hard for an international investor to hold directly because it requires servicing, is of uncertain credit quality, and has a higher propensity to default than an arm's-length conservative investor feels comfortable with. Securitization dealt with some of these concerns. If the mortgage was packaged together with mortgages from other areas, diversification would reduce the risk. Furthermore, the riskiest claims against the package could be sold to those who had the capacity to evaluate them and an appetite for bearing the risk, while the safest AAA-rated portions could be held by international investors. Indeed, because of the demand from international investors for AAA paper, securitization became focused on squeezing out the most AAA paper from an underlying package of mortgages (see Efraim Benmelech and Jennifer Dlugosz, 2008); the lower quality securities issued against the initial package of mortgages were packaged together with similar securities from other packages, and a new range of securities, including a large quantity rated AAA, issued by this "Collateralized Debt Obligation."

The "originate-to-securitize" process had unintended consequences. Because rating agencies were at a distance from the homeowner, they could process only hard information such as the credit score of the homeowner and the loan-to-value ratio, and per force had to ignore the detailed soft information that loan officers collected in assessing borrower creditworthiness (see Uday Rajan, Amit Seru, and Vikrant Vig, 2008). In turn, this meant originators stopped collecting this useful information, and focused instead only on ensuring borrowers had good credit scores and observable low loan-to-value ratios. Of course, originators could not completely ignore the true quality of borrowers since they would be responsible for initial

defaults, but because house prices were rising steadily over this period, even this source of discipline weakened; the house price rise would give the homeowner the "equity" with which he could finance loan repayment.

Moreover, the slicing and dicing through repeated securitization of the original package of mortgages created very complicated securities. The problems in valuing these securities were not obvious when house prices were rising and defaults were few. But as the house prices stopped rising and defaults started increasing, the valuation of these securities became very complicated.

II. Why Did Banks Hold These Instruments?

Given that originators would have understood the deterioration of the underlying quality of mortgages, it is surprising that they held on to so many of the mortgage-backed securities (MBS) in their own portfolios. These were not just the low-rated equity portions that would have signaled their faith in the packages, but also the high-rated tranches that found a ready market around the world.

The amounts of MBS held seemed too high to be purely inventory. Some holdings could have been portions of the package they could not sell, but then this would not explain why banks held on to AAA-rated securities, which seemed to be the most highly demanded of mortgage backed securities. The real answer seems to be that bankers thought these securities were worthwhile investments, despite their risk.[1] Investment in MBS seemed to be part of a culture of

[1]As the crisis developed, some banks bought AAA-rated tranches and sold lower quality securities as a partially hedged bet on the further deterioration of the housing market. This came back to haunt them as the AAA-rated portion deteriorated more than the low-rated securities.

excessive risk taking that had overtaken banks (see Raghuram G. Rajan, 2005; and Anil K. Kashyap, Raghuram G. Rajan, and Jeremy C. Stein, 2008).

A key factor contributing to this culture is that, over short periods of time, it is very hard, especially in the case of new products, to tell whether a financial manager is generating true excess returns adjusting for risk, or whether the current returns are simply compensation for a risk that has not yet shown itself but that will eventually materialize. Consider the following specific manifestations of the problem.

A. Incentives at the Top

The performance of CEOs is evaluated based in part on the earnings they generate relative to their peers. To the extent that some leading banks can generate legitimately high returns, this puts pressure on other banks to keep up. Follower-bank bosses may end up taking excessive risks in order to boost various observable measures of performance. Indeed, even if managers recognize that this type of strategy is not truly value-creating, a desire to pump up their stock prices and their personal reputations may nevertheless make it the most attractive option for them. There is anecdotal evidence of such pressure on top management.[2]

B. Flawed Internal Compensation and Control

[2]Perhaps most famously, Citigroup Chairman, Chuck Prince, describing why his bank continued financing buyouts despite mounting risks, said: "When the music stops, in terms of liquidity, things will be complicated. But, as long as the music is playing, you've got to get up and dance. We're still dancing." *Financial Times*, July 9, 2007.

Even if top management wants to maximize long-term bank value, it may find it difficult to create incentives and control systems that steer subordinates in this direction. Given the competition for talent, traders have to be paid generously based on performance. But, many of the compensation schemes paid for short term risk-adjusted performance. This gave traders an incentive to take risks that were not recognized by the system, so they could generate income that appeared to stem from their superior abilities, even though it was in fact only a market-risk premium. The classic case of such behavior is to write insurance on infrequent events such as defaults, taking on what is termed "tail" risk. If a trader is allowed to boost her bonus by treating the entire insurance premium as income, instead of setting aside a significant fraction as a reserve for an eventual payout, she will have an excessive incentive to engage in this sort of trade. Indeed, traders who bought AAA MBS were essentially getting the additional spread on these instruments relative to corporate AAA securities (the spread being the insurance premium) while ignoring the additional default risk entailed in these untested securities.

This is not to say that risk managers in a bank are unaware of such incentives. However, they may be unable to fully control them, because tail risks are by their nature rare, and therefore hard to quantify with precision before they occur. While they could try and impose crude limits on the activities of the traders taking maximum risk, these traders are likely to have been very profitable (before the risk actually is realized), and such actions are unlikely to sit well with a top management that is being pressured for profits.

III. Short-Term Debt

Given the complexity of bank risk-taking, and the potential breakdown in internal control processes, investors would have demanded a very high premium for financing the bank long term. By contrast, they would have been far more willing to hold short-term claims on the bank,

since that would give them the option to exit -- or get a higher premium -- if the bank appeared to be getting into trouble. So, investors would have demanded lower premia for holding short-term secured debt in light of potential agency problems at banks (as shown in Douglas W. Diamond and Raghuram G. Rajan, 2001).

From the banker's perspective, a certain sense of confidence that any troubles were far away (which is what made them take on tail risk), would have made financing with short-term debt claims much more attractive to the banks than issuing long-term claims. Clearly, banks should have been worried about the possibility that they could become illiquid and incapable of rolling over financing. Douglas W. Diamond and Raghuram G. Rajan, 2008, show formally that the incentive of levered institutions to become more illiquid increases with expectations that future interest rates would be low. With global savings pouring in, and with the Federal Reserve emphasizing its willingness to pump in liquidity and cut interest rates dramatically in case of a sharp downturn (the so-called "Greenspan Put"), it is not surprising that banks were willing to take illiquidity risk.[3]

The more general point is that in good times, short-term debt seems relatively cheap compared to long-term capital and the costs of illiquidity remote. Markets seem to favor a bank capital structure that is heavy on short-term leverage. In bad times, though, the costs of

[3]This is why Diamond and Rajan, 2008, argue that regulators may want to raise interest rates more than strictly necessitated by current economic conditions in good times, so as to offset the incentive for banks to take on illiquidity when they know it will cut rates sharply in bad times.

illiquidity seem to be more salient, while risk-averse (and burnt) bankers are unlikely to take on excessive risk. The markets then encourage a capital structure that is heavy on capital.[4]

IV. The Crisis Unfolds

Given the proximate causes of high bank holdings of mortgage-backed securities (as well as other risky loans, such as those to private equity), financed with a capital structure heavy on short-term debt, the crisis had a certain degree of inevitability. As house prices stopped rising, and indeed started falling, mortgage defaults started increasing. MBS fell in value, became more difficult to price, and their prices became more volatile. They became hard to borrow against, even short term. Banks became illiquid, the canonical example being Bear Sterns, which was taken over by JP Morgan in March of 2008.

The Federal Reserve opened new facilities that allowed banks to borrow against illiquid positions. But as more banks tried to sell out of their positions, prices plummeted further, and concerns about illiquidity turned to potential insolvency -- despite being able to borrow against the full value of their illiquid assets -- there was now not enough asset value to offset the liabilities. Bank runs started, with the bankruptcy of Lehman Brothers the trigger for a worldwide panic. Interbank lending froze up, with banks resuming lending to one another overnight only after a variety of interventions by central banks and finance ministries, including

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[4]This suggests a difficulty with countercyclical regulatory capital requirements. They are inconsistent with the "market capital requirement," prompting banks to escape stricter regulatory norms in good times through regulatory arbitrage, while providing little relief in bad times as banks are held to the higher market norms.

guarantees of bank debt and bank recapitalizations. But, even well-capitalized banks still seem unwilling to lend.

V. The Credit Crunch

As we write this, only overnight credit seems to be available, except for the most unimpeachable credit risks. Why are banks so reluctant to lend? One possibility is that they worry about borrower credit risk, though worries need to be extreme to justify the complete cessation of term lending. A second is that they may worry about having enough liquidity of their own, if their creditors demand funds. Yet, the many Federal Reserve facilities that have been opened should assuage these concerns.

Perhaps, however, it is not just the fear of being short of funds to meet creditor demands that drives the reluctance to lend, but the fear of being short of funds if investment opportunities get even better. Take, for example, the possibility that a large indebted financial institution becomes distressed in the future and starts dumping assets in the market. Not only will the price of those assets fall if there are only a few entities with the liquid funds to buy them, the absorption of market liquidity by the distressed institution (see Diamond and Rajan, 2005) will ensure that it will be very hard for any institution that does not already have liquid funds to borrow at that time. If they expect that banks with liquidity could make a killing in the future (by buying financial assets or banks at fire sale prices), banks will restrict their lending to very short maturities and not lock up liquidity in term loans. The point is that it need not be "own" distress that prevents a bank from lending, expectations of aggregate liquidity shortages that may cause other distressed entities to sell in a future fire sale can be enough.

This may also explain why markets for some assets have dried up completely. Some distressed banks clearly possess large quantities of mortgage backed securities (which is why

they are distressed). They have some hope that the prices of these securities will rise in the future, saving them from failure. They will be reluctant to sell those assets today. At the same time, potential buyers feel they could get better prices down the line. While there is a price today that reflects those expectations, it is not a price that the distressed banks want to sell at.

VI. Dealing with the Crunch

Banks still fear threats, as well as see opportunities, from future episodes of illiquidity. Illiquid assets still compose significant portions of bank balance sheets, as well as non-bank balance sheets. To the extent that they could be unloaded on the market if other institutions have financing difficulties or become insolvent, price volatility is still a concern. For some, low prices would render them insolvent. And for others, low prices would be a tremendous buying opportunity. A resumption of lending will necessitate reducing both fears and potential opportunities. Note that in this view, central bank intervention to lend against all manner of collateral may not be an unmitigated blessing because it may have allowed weak entities to continue holding illiquid assets, serving as an overhang on the market.

There are three possible ways the overhang can be reduced. First, the authorities can offer to buy illiquid assets through auctions and house them in a federal entity, much as was envisaged in the original Troubled Asset Relief Program. This can reverse a freeze in the market caused by distressed entities that are unwilling to sell at prevailing market prices for the reasons described above. The fact that the government is willing to buy in the future (and now) should raise prices today because it reduces the possibility of low prices in a future fire sale. Moreover, once sufficient distressed entities sell their assets, prices will rise simply because there is no longer a

potential overhang of future distressed fire sales. Both effects can lead to increased trade in illiquid assets today, and unlock lending.[5]

A second approach is for the government to ensure the stability of significant parts of the financial system that holds illiquid assets through the recapitalization of entities that have a realistic possibility of survival, and the merger or closure of those that do not. For those entities that are closed down, this will mean moving illiquid assets into a holding entity that will dispose them off slowly over time. One issue here is that in order to be successful in avoiding future fire sales, the authorities might decide that they also have to intervene in institutions in the unregulated "shadow" financial system. Not only will this create political difficulties if these interventions provide subsidies (the public appetite for a bailout of hedge funds is rightly small), interventions without subsidies could result in legal difficulties as the authorities are sued by any claimholder who argues he is made worse off by the intervention.

The third approach is some mix of the first two, where the authorities buy illiquid assets, even while cleaning up the regulated financial sector, focusing particularly on resolving entities that are likely to become distressed. Note that this differs substantially from the current approach where well-capitalized entities are given even more capital; while the current approach certainly prevents them from unloading illiquid assets on the market, it does not deal with the

[5]A non-issue in our view is the oft-quoted point that recapitalization allows the government more bang for the government buck than buying assets directly because banks can lever up against the government equity infusion. If the government wants to limit the amount of dollars devoted to asset purchases, it can create an entity that buys assets after leveraging an initial government equity infusion with additional funds borrowed from the market.

overhang of illiquid assets that more distressed entities hold. Unless those entities fail or are forcibly taken over, those illiquid assets are not going to make their way on to the balance sheets of well-capitalized banks, allowing the overhang of illiquid assets to persist, and forcing lending to be subdued until the distressed entities actually fail.

We have offered some conjectures on the causes of the crisis and suggested some potential remedies to the current credit crunch. Time will certainly offer more data allowing us to sharpen these views.

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