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LEVERAGED LIQUIDITY: BEAR RAIDS AND JUNK LOANS IN THE NEW CREDIT MARKET

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I. INTRODUCTION

By now, we have all noticed the instability in our credit market. Defaults on residential mortgages have climbed, prices for structured credit products have fallen, and banks have tightened lending standards. To counter some of this, the Federal Reserve ("Fed") has been adding "liquidity" to the credit system, by lending banks cash (or financial resources that act like cash) against collateral pledged by the banks.[2] Liquidity injections reassure nervous banks and, it is hoped, coax them into making loans of their own to consumers and businesses, jump-starting confidence in the economy. One such liquidity tool is the Fed's discount window, which lets a bank pledge its own loans to bank customers and securities from its portfolio in exchange for a cash loan from the Fed.[3] Think of it as the Fed's pawnshop for commercial banks facing short-term liquidity problems.

During the discount window's near-century of operations, only depository institutions like commercial banks could use it, with the exception of some nonbank firms that got emergency loans during the Great Depression.[4] But in March 2008, Bear Stearns, an investment bank facing a liquidity crisis, accessed the discount window by using J.P. Morgan (a depository institution that is a member of the Fed) as a financing conduit.[5] (J.P. Morgan then acquired Bear.[6]) Bear's use of Fed liquidity is significant. Legal authority for the deal with Bear Stearns ("Bear," aptly named since "bear" means downward price pressure) came from a section of the Federal Reserve Act that lets a

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[2] Press Release, Fed. Reserve (Mar. 11, 2008), *available at* http://www.federalreserve.gov/newsevents/press/monetary/20080311a.htm. Most recently, the Fed did this by increasing the term of its securities lending facility from overnight to 28 days and by increasing the dollar amount of the facility. *Id.* The previous week, the Fed had also increased the dollar amount of a special auction facility and begun a series of open market transactions, both designed to add liquidity. *Id.* These actions supplemented the Fed's recent steps of lowering the discount rate and the targeted rate for the inter-bank Federal Funds market. *Id.*

[3] David L. Mengle, *The Discount Window*, in INSTRUMENTS OF THE MONEY MARKET 22, 26 (Timothy Q. Cook & Robert K. LaRoche, ed., 1993) ("Appropriate uses of discount window adjustment credit include meeting demands for funds due to unexpected withdrawals of deposits, avoiding overdrafts in reserve accounts caused by unexpected financial flows, and providing liquidity in case of computer failures, natural disasters, and other forces beyond an institution's control.") (omitting reference to table).

[4] Federal Reserve Act of 1913, §13(3); 12 USC 343. The original Federal Reserve Act (Act") provided access to central bank liquidity only to member banks of the Federal Reserve and prohibited a member bank's use of the discount window even for the benefit of nonmember bank. BD. OF GOVERNORS OF THE FED. RESERVE SYS., LENDING FUNCTIONS OF FEDERAL RESERVE BANKS: A HISTORY 118 (hereinafter FEDERAL RESERVE LENDING HISTORY). When credit contracted during the Depression, Congress amended the Act in 1932 to allow the central bank to provide emergency credit to individuals, partnerships, and corporations. *Id.* at 127-129 (analyzing legislative history 1932 amendment providing emergency authority). Between 1932 and 1936, the Federal Reserve used the emergency authority to loan about $1.5 million to 123 business enterprises, of which the largest loan was $300,000. *Id.* at 130.

[5] Kate Kelly et al., *Fed Races to Rescue Bear Stearns in Bid to Steady Financial System*, WALL ST. J., Mar. 15, 2008, at A1.

[6] *Id.*

majority of Fed governors extend emergency credit to individuals and firms in "unusual and exigent circumstances," as they had in the 1930s.[7]

No isolated transaction, the Fed's Bear deal is part of an evolving response on the part of regulators to a new credit market that is forcing them to rethink their paradigm for regulating financial markets. Just two weeks after the deal, the U.S. Department of the Treasury proposed a new approach to financial market regulation – the *Treasury Blueprint for a Modernized Financial Regulatory Structure* (hereinafter "*Treasury Blueprint*").[8] It blessed the Bear deal and endorsed access to the discount window for financial firms other than banks.[9] This too is noteworthy. The reason for the about-face over the discount window – in practice and, now, in theory – is the current credit crunch.

This Article explains what led to the crisis and offers an analytic framework (accessible to the nonfinancial reader) for understanding the new credit market, particularly its novel liquidity dynamics. Like most credit sagas, it starts in rosier times of easy borrowing, most recently one in which the balance of bargaining power shifted to borrowers and away from lenders. They typically make borrowers promise to take certain steps to protect the lender from credit loss, but this time lenders had waived many of these covenants.[10] And after the loans were made, some corporate borrowers could cut their interest rate on existing loans just by asking.[11] Borrowers with the upper hand (or so it seemed at the time) took on loans to execute a record number of mergers, acquisitions, and restructurings of their own capital. Many of these were so called "shareholder-friendly" transactions because they transferred value (often borrowed value) to firm owners through share purchases or dividends on shares.[12] One thinks of dividends as a return to owners of their firm's net profits, but this time many firms borrowed to pay dividends to their owners.[13] Because borrowing to fund a dividend leaves the firm more

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[7] See FEDERAL RESERVE LENDING HISTORY, *supra* note 4.

[8] DEPARTMENT OF THE TREASURY BLUEPRINT FOR A MODERNIZED FINANCIAL REGULATORY STRUCTURE (Mar. 2008) (hereinafter TREASURY BLUEPRINT).

[9] *Id.*

[10] Jacqueline Doherty, *For Banks, a $300 Billion Hangover*, BARRONS, August 27, 2007, at 21 (analyzing commercial and investment bank financing of twelve large leveraged buyouts to show how weak covenants exposed the lenders to interest-rate risk).

[11] Cynthia Koons, *Just Saying No to Repricings Investors Rein in Market That Funds Leveraged Buyouts*, WALL ST. J., Apr. 27, 2007, at C5 (referencing Reuters loan pricing data that between January, February, and March lenders had cut rates on between $16.6 to $44.3 billion each month but that for April only $1 billion in loans had been repriced). *See, e.g.*, Serena Ng, *Bond Investor's Lament Fallout as Moody's S&P Cut Ratings on Issues Tied to Subprime Loans*, WALL ST. J., May 3, 2007, at C1 (reporting on actual or potential credit downgrades of $1 billion in securitizations of high yield mortgage loans, including investment-grade securities).

[12] Greg Ip & Jon E. Hilsenrath, *How Credit Got So Easy and Why It's Tightening*, WALL ST. J., Aug. 7, 2007, at A1 ("By 2006, the volume of such leveraged buyouts was smashing records from the 1980s. Generous credit markets enabled private equity firms to do larger deals and pay themselves bigger dividends.").

[13] *The Dividend Recap Game: Credit Risk vs. The Allure of Quick Money*, STANDARD & POOR'S, Aug. 7, 2006 (giving example of a one billion dollar leveraged dividend which returned half of the capital investment of a private equity group). By one estimate, the annual volume of leveraged dividends increased from under five billion in 2000 to between 20 and 40 billion in 2004-2006. *Id.* Borrowing to capitalize a dividend works to the detriment of bondholders in two ways: it increases the firm's leverage and, at the same time, reduces its

highly leveraged and, if it is a floating-rate borrowing, exposed to interest-rate risk, financiers mordantly called them "drive-by" dividends.[14]

The day of reckoning began in July 2007 as losses in sub-prime mortgages startled lenders and other investors.[15] New borrowing dropped sharply.[16] "Corporate Bond Market Has Come To A Standstill," said the Wall Street Journal, as deals were reduced, postponed, or canceled outright.[17] Deals were still being done, granted, but this time for discounted debt that had dropped in value as confidence receded.[18] As many wondered "whither liquidity?," the bargaining power returned to lenders, the new credit market came into view, and the Fed went into action. Not tulips, but periods of financial euphorias do share certain elements, including the tendency to reflect about volatility and loss after the fact and to revisit core assumptions about financial markets, hence this Article.[19]

The Bear deal represents nothing less than a watershed in U.S. banking and finance, a market break brought on by cumulative changes in the credit system that make the novel liquidity dynamics of the new credit market come into view. As the Chairman of the U.S. Securities and Exchange Commission emphasized about Bear, it was "a loss of liquidity – not inadequate capital – [that] caused Bear's demise.[20] Liquidity "feeds fantasies that risk has evaporated….Just as inflation shaped psychologies a generation

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asset liquidity by upstreaming value to shareholders. *See* Bank of America, *The Pros and Cons of Dividend Recapitalization*, CAPITAL EYES (Sep./Oct. 2006) ("The desire to return capital to the limited partners has been one of the primary drivers of the dividend recap trend over the last few years.").

[14] It is a telling phrase: "The temptation to load up on debt is exacerbated by the fact that dividend recaps can be planned and carried out quickly—sometimes within a matter of days. 'They're sometimes called "drive-bys" because they can be that opportunistic,' said Standard & Poor's credit analyst Sucheet Gupte." *The Dividend Recap Game* 3, STANDARD & POOR'S, Aug. 7, 2007.

[15] SEC. INDUS. & FIN. MKTS. ASS'N, *Capital Markets Review* (Sept. 2007) (hereinafter SIFMA, *Capital Markets Review)* http://www.sifma.org/legislative/financial_services/pdf/market-summary-907.pdf.

[16] *Id.*

[17] Anusha Shrivastava, *Corporate Bond Market Has Come To A Standstill*, WALL ST. J., Aug. 7, 2007, at C2. *See* Danielle Reed, *A Mortgage-Bond Power Shift – Investors Spurn Commercial Loans Deemed to be Too Risky*, WALL ST. J., May 4, 2007, at C7 (noting how prospective investors forced issuer to exclude underlying loan from securitization because of the loan's credit quality); Michael Aneiro, *Risky Debt Issuance Meets Investor Resistance*, WALL ST. J., June 23, 2007, at B5 (discussing decisions by three issuers to shrink offering of high yield debt).

[18] *See, e.g.*, Pierre Paulden, *Lehman Raises $3 Billion Fund to Purchase Buyout Debt*, BLOOMBERG, Oct. 29, 2007, *available at* http://www.bloomberg.com/apps/news?pid=20601087&sid=aIT37LNeTPvw&refer=home (describing how Lehman Brothers has set up a $3 billion dollar Loan Opportunity Fund to buy market-discounted leveraged loans).

[19] Bevis Longstreth, *The SEC After Fifty Years: An Assessment of its Past and Future*, 83 COLUM. L. REV. 1593, 1597 (1983) (reviewing Joel Seligman's history of the U.S. Securities and Exchange Commission) ("For [securities] legislation to pass, a crisis, scandal or other dramatic event was required to open a "window of opportunity," through which it was possible for the Commission or other advocates of reform to move the Congress to action.").

[20] Christopher Cox, Chairman, U.S. Securities and Exchange Commission, Letter to Dr. Nout Wellink, Chairman, Basel Committee on Banking Supervision 1 (Mar. 20, 2008)(emphasizing the importance of liquidity management during market downturns).

ago, liquidity determines our behavior in a world of short-term performance."[21] Part of the problem is a lack of precision in speaking and thinking about liquidity.[22] A major conceptual shift about liquidity, though, is now underway among financial regulators and academics to make theory reflect what markets have made clear.[23]

This Article explains the shift and brings it into legal scholarship.[24] My specific contribution is to point out the implications of liquidity when it is encumbered by other financial claims, as is the case when liquidity comes about by borrowing. As consumers, we are likely to see credit intermediaries like commercial and investment banks only as lenders, but one goal of the Article is to make the reader understand lenders as generic firms that borrow to lend, engendering special liquidity dynamics both for themselves and for their own borrowers. Part II starts with a liquidity account of the corporate leverage market that introduces nonfinancial readers to the Article's concept base: the choices that borrowers and lenders face before and after entering a loan, corporate leverage waves, the credit crunch that began in July 2007, and the liquidity implications of these dynamics.

To do so, I distinguish between borrower and market liquidity. A liquid borrower is one that can meet its debt obligations as they come due. Here, liquidity is not the same as solvency since a borrower that is bankrupt can be liquid, insofar as it has cash on hand to meet maturing liabilities. Conversely, a solvent borrower can be illiquid if its current debts exceed its cash and credit, so called "equitable insolvency." For example, even though Bear had ample capital throughout the crisis leading to its discount window borrowing and subsequent takeover by J.P. Morgan, its capital could stave off its liquidity crisis.[25] Moving from the liquidity of a firm to that of a market, a market is said to be liquid when it can accommodate large orders to buy and sell an asset without major changes in the price at which the entire trade is executed.

Part III provides a theoretical context for understanding how borrower and market liquidity interact. This means thinking critically about the culture of "financial innovation" that benignly frames the risk from new financing arrangements in terms of "entrepreneurial imagination" and a "general fascination with novelty."[26] This frame rests on the idea that

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[21] Robert Teitelman, *Transactions*, 5 THE DEAL, 2008, at 10.

[22] Tobias Adrian & Hyung Son Shin, *Liquidity and Leverage* 4 (Working Paper) (hereinafter *Liquidity and Leverage*) (on file with author) (criticizing financial commentary about "'excess liquidity' in the financial system [and to] financial markets being 'awash with liquidity', or liquidity 'sloshing around' [because] the precise sense in which 'liquidity' is being used in such contexts is often left unspecified.").

[23] The single most comprehensive example (although it is short on legal implications) is a recent special issue of *Financial Stability Review*, a periodical on liquidity published by the Banque de France. *See generally* 11 FIN. STABILITY REV. (SPECIAL ISSUE) (2008) [hereinafter BANQUE DE FRANCE].

[24] Frank Partnoy & David A. Skeel, Jr., *Debt as a Lever of Control: The Promise and Perils of Credit Derivatives*, 75 U. CIN. L. REV. 1019, 1051 (2007).

[25] *See* Cox, *supra* note 20, at 1 ("[E]ven at the time of its sale on Sunday, Bear Stearns' capital, and its broker-dealers' capital – exceeded supervisory standards. Counterparty withdrawals and credit denials, resulting in a loss of liquidity – not inadequate capital – caused Bear's demise.").

[26] *See* Charles R.P. Pouncy, *Contemporary Financial Innovation: Orthodoxy and Alternative*, 51 SMU L. Rev. 505, 509 (1998).

financial innovation obeys the irreversible path of progress associated with the natural sciences or new technology.[27] This type of financial hubris most recently took the form of liquidity euphoria. As a counterpoint to it, I emphasizes that these liquidity dynamics reflect a "regulatory dialectic" between market innovation, finance theory, and official responses.[28] To do this, I draw on the work of economist Hyman Minsky.[29] A proponent of John Maynard Keynes' theories about liquidity and the financial sector, Minsky wanted to strengthen capitalist economies, like ours, by stabilizing the economy. Although classified as a "radical" post-Keynesian, his insights seem mild (though valuable) and, frankly, hard to contest in the context of our current credit market, a point made in a recent New Yorker article about Minsky.[30] It is a good time, then, to look back at the post-Keynesian theory that flowered during the reconstruction of financial markets after World War II. Minsky is one of its major theorists, one who wrote in a highly accessible style.

Trained at Harvard under economic historian Joseph Schumpeter, Minsky observed that "It turns out that the fundamental instability of a capitalist economy is the tendency to explode – to enter into a boom or "euphoric" state," followed by a bust like the current one.[31] He put firms that borrow to lend front and center in his analysis, particularly their tendency to borrow at "speculative" and "Ponzi" terms that contribute to financial fragility because these terms assume unsustainable growth.[32] These riskier forms of financing have been encouraged by four major shifts occurring after Minsky

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[27] Not seeing how the same financial risk of loss can take different instrument forms in different periods is one effect, as Pouncy points out, of thinking of financial innovation as a form of progress: "Our confidence in our understanding of financial innovation is based on the assumption that financial innovation is similar to the process of technological innovation. Legal scholarship assumes that both processes are the natural result of bursts of entrepreneurial creativity." *Id.* (citation omitted).

[28] Pouncy notes that attributing financial innovation solely to classical conceptions of supply and demand do not tell the whole story: "Legal scholarship has not produced critical examinations of financial innovation as an economic process….Legal scholarship assumes that both processes are the natural result of bursts of entrepreneurial creativity. It further assumes that these processes arise in response to consumer demand….The products generated are readily accepted and adjudged good." (citation omitted) *Id.* at 508-9.

[29] Legal scholarship has cited him generally for his thesis about financial instability. Frank Partnoy, *Why Markets Crash and What Law Can Do About It*, 61 U. PITT. L. REV. 741, 755-56 (2000) (identifying Minsky's financial instability thesis as a precursor to Charles Kindleberger's economic history of financial market crashes). Partnoy situates Minsky as a source of economic arguments that financial markets crash because of "cognitive error" on the part of individual borrowers and lenders in the market. *Id.* at 754-55 (comparing theories based on cognitive error with those based on moral hazard and information asymmetry). I focus on the liquidity implications of how Minsky classified borrowing. *See infra* notes 113-19, 158-89 and accompanying text.

[30] John Cassidy, *The Minsky Moment*, THE NEW YORKER (Feb. 4, 2008) ("Many of Minsky's colleagues regarded his 'financial-instability hypothesis,' which he first developed in the nineteen-sixties, as radical if not crackpot. Today, with the subprime crisis seemingly on the verge of metamorphosing…Minsky's hypothesis is well worth revisiting.") *available at* http://www.newyorker.com/talk/comment/2008/02/04/080204taco_talk_cassidy.

[31] HYMAN P. MINSKY, *Can "It" Happen Again? in* ESSAYS ON INSTABILITY AND FINANCE 118 (1982) [hereinafter MINSKY, *Can It?*].

[32] Economist Nouriel Roubini has noted on his website that Minsky's model does a good job of explaining the 1980s savings and loans bubble and 1990s tech bubble and that "the experiences of the last few years suggest another Minsky Credit Cycle that has probably now reached its peak." Nouriel Roubini, *Are We at The Peak of a Minsky Credit Cycle?*, RGE MONITOR, July 30, 2007, http://www.rgemonitor.com/blog/roubini/208166.

introduced his theory: the increased acceptance of leverage as a fact of business life, more corporate borrowing at floating-rates, the growth of nonbank firms as both lenders and credit traders, and, finally, the convergence of business models for different types of financial intermediaries thanks to the operation of secondary credit markets.[33] These shifts have made the financial sector more fragile and the implications of this fragility deserve attention.

First, it is a mistake to always see trading liquidity in the credit market as a proxy for a loan's quality or a borrower's own liquidity. When loans are changing hands in a market, investors may take their cues about the loan's value from each other's assessments about value, rather than from the loan's underlying cash flows. That is, investors join the herd in a "beauty contest" where the contestants are loans and the judges other investors.[34] Second, borrowing at floating-rates, as more firms are now doing, creates liquidity risk for borrowers, which borrowers, lenders and other investors may not be able to shift or manage, even with credit derivatives and financial insurance. Third, nonbank lenders – like Bear – add uncertainty to credit markets (especially in a downturn) because they move nimbly in and out of it beyond the reach of regulators. Finally, both borrower liquidity and market liquidity may themselves be leveraged insofar as either rests on layered borrowing whose repayment is predicated on unsustainable increases in the value of assets. When the escalation stops, so too do the liquidities of firms and markets. And then the losses and introspection begin. So it is not only an "Age of Leverage" but, rather, one of *leveraged liquidity* in which the mutually-reinforcing dynamics between leverage and liquidity came into view.[35]

Part IV offers a case study of a credit instrument that epitomizes the leverage and liquidity dynamics of the new credit market – leveraged loans. These are high-risk, floating-rate loans arranged by banks, syndicated through nonbank lenders like pension, hedge, and private equity funds, and used to finance leveraged restructuring. Imagine the corporate equivalent of sub-prime mortgages (both sub-prime residential and leveraged loans tend to be priced off the same interest rate), as suggested by the International Monetary Fund.[36] The growth of these loans illustrates what Minsky saw as a trend in

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[33] *See infra* notes 196-283 and accompanying text.

[34] Economist John Maynard Keynes coined the phrase: "Keynes likened the stock market to a 'beauty contest' where participants devoted their efforts not to judging the underlying concept of beauty, but instead to 'anticipating what average opinion expects the average opinion to be.'" Kevin J. Lansing, *Asset Price Bubbles* 3, *Fed. Reserve Bank of S.F. Econ. Letter* (Oct. 26, 2007), *available at* http://www.frbsf.org/publications/economics/letter/2007/el2007-32.html (internal citation omitted). In such a contest, "speculators base their expectations of future asset prices not only on what they think the true values is, but, more importantly, on what they think the average opinion about the average opinion is." Korkut A. Erturk, *On the Minskyan Business Cycle* 11 (Levy Econ. Inst., Bard Coll., Working Paper, 2006).

[35] The phrase belongs to Wall Street Journal writer George Anders. GEORGE ANDERS, MERCHANTS OF DEBT KKR AND THE MORTGAGING OF AMERICAN BUSINESS 5 (1992) ("But in every capitalist boom, the most frenzied period comes just before the crash . . . . The Age of Leverage in late 1989 and early 1990 came to a cataclysmic halt as well.")

[36] *See, e.g.*, INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT[:]FINANCIAL MARKET TURBULENCE CAUSES, CONSEQUENCES, AND POLICIES 12 (2007) [hereinafter, FUND, 2007 FINANCIAL STABILITY REPORT] (comparing higher loan-to-value ratios, negatively amortizing loans, and cash out

capitalism toward speculative and Ponzi borrowing and lending. The Fed admitted as much when it linked these loans to our credit woes.[37] Some have defended leveraged loans from the "junk" moniker.[38] I do not, although "junk" is no slur in finance. It is just the name for a high-risk, high-return asset class. Like the junk bonds of the 1980s, leveraged loans are sub-investment grade but, unlike junk bonds, they are issued at a floating rate, carry nominal forms of junior lien security, and can be repaid by the borrower more easily.[39]

As junk bonds did in their day, leveraged loans helped to finance many of the recent mergers and acquisitions. These loans trade in over-the-counter secondary markets beyond the purview of regulatory agencies because leveraged loans are not "securities" under the federal securities laws. That is fine, since there is no evil here calling for registration requirements or substantive regulation. However, I recommend some modest transparency requirements for this market. Part V also recommends that financial and regulatory models better account for leveraged liquidity.[40] These liquidity dynamics are here to stay, so the sooner regulators face up to them, the better.

II. A LIQUIDITY ACCOUNT OF CORPORATE LEVERAGE MARKETS

To set up the rest of this Article, this Part presents a snapshot of how liquidity dynamics play out in the current credit market (the next Part explains how we got here). These are the dynamics that led to the credit crunch and the Bear deal and that are leading financial academics to rethink the business of banking. These are also the same dynamics behind the *Treasury Blueprint*, and the growing debates on Capital Hill and Main Street about what is wrong with our credit system. Before analyzing these liquidity dynamics, I start with how borrowers and lenders choices interact.

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refinancing features in subprime residential mortgages with high debt-to-earnings ratios, covenant-lite debt, and dividend recapitalizations in the leveraged loan market).

[37] Ben S. Bernanke, Chairman, Fed. Reserve, Address at the Economic Club of New York: The Recent Financial Turmoil and its Economic and Policy Consequences (Oct. 15, 2007), *available at* http://www.federalreserve.gov/newsevents/speech/bernanke20071015a.htm ("The retreat by investors from structured investment products [based on housing finance] also affected business finance . . . . Demand for leveraged loans slowed sharply, reducing credit access for private equity firms and other borrowers seeking to finance leveraged buyouts (LBOs).")

[38] While noting that "[o]ther terms for high-yield, such as 'speculative-grade' and 'junk bond,' have given the asset class some negative connotation over the years," the main argument which the rating agency makes against the moniker is that it is a big market: "but high-yield has matured into a solid 20% of the overall corporate bond market." STANDARD & POOR'S, HIGH YIELD BOND MARKET PRIMER 1 (2007).

[39] *The Evolution of the U.S. Second-Lien Leveraged Loan Market – 2006 Year-End Update*, FITCH RATINGS, Jan. 17, 2007, at 3.

[40] My interest in liquidity began while an attorney at the U.S. Securities and Exchange Commission ("SEC"), where I participated inter-agency surveillance of the repurchase agreement market and in market structure inspections of the stock exchanges, the NASD, clearing agencies, and other industry utilities. I then went to the Office of the Comptroller of the Currency's Treasury and Market Risk Division, which regulated the bank trading book and oversaw bank liquidity management. Between the two positions, I got to compare securities and banking approaches to liquidity regulation, learning to understand liquidity in the context of capital markets. As it became clear that liquidity dynamics had contributed to the current credit crunch, I wrote this Article to share what I had learned in practice and to explore its theoretical implications.

A firm may finance its activities either by borrowing or by issuing shares to owners. In general, borrowing costs less than issuing equity because lenders may accept a lower return on their investment in the firm than will shareholders, whose financial interest in the firm is subordinated to that of creditors. Also, the firm can deduct the costs of paying interest on debt but not dividends paid on shares, so the after-tax cost of debt tends to be lower than that of equity. Firms borrow to finance operations, pay off maturing debt, or transfer proceeds up to owners. When borrowing to finance an extraordinary transaction, such as acquiring a company or rearranging the borrower's capital structure, these deals are "leveraged restructurings," insofar as they increase the firm's debt both in absolute terms and in proportion to the borrower's equity capital.

Borrowing impacts a firm's *funding liquidity*, which is its ability to manage its cash flow and credit such that it can service its debt obligations as they mature. Too much borrowing can lead lenders to raise the rate on the borrower's loan, demand more collateral for their credit exposure to the borrower, or refuse to lend at a longer term.[41] Worse still, a rating agency may notch down a borrower with too much debt.[42] To understand how borrowing affects a firm's future funding liquidity, careful firms play liquidity war games that consider how different scenarios will impact the firm's ability to weather adverse markets.[43]

The firm may borrow from a bank or nonbank lender or raise debt capital by issuing securities such as bonds. Based on their probability of default, bonds of high credit quality are considered "investment-grade," while those of lesser quality are rated "sub-investment-grade" or, as known colloquially, "junk."[44] Based on a similar evaluation of a loan's credit quality, a loan may be investment-grade or, like the leveraged loans discussed later, sub-investment grade.[45] Junk bond financing has received substantial attention, but, since junk loans are a relatively new asset class, in this

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[41] Funding liquidity risk may take other forms, but the common signs are rising funding costs, requests for collateral, a rating downgrade, decreases in credit lines, or reductions in the availability of long-term funding. OFFICE OF THE COMPTROLLER OF THE CURRENCY, COMPTROLLER'S HANDBOOK ON LIQUIDITY 1 (2001) [hereinafter LIQUIDITY HANDBOOK], *available at* http://www.occ.treas.gov/handbook/liquidity.pdf.

[42] It is actually a company's unsecured senior long-term debt which gets rated up or down, not the company overall. CAROLYN E.C. PARIS, DRAFTING FOR CORPORATE FINANCE 29 (2007) ("Rating agencies rate securities, not companies. If you want to use a rating to refer to a company's creditworthiness, you would refer to the rating of the company's unsecured unsubordinated long-term debt.").

[43] The advice given to banks by their regulators applies with equal force to other firms too: use a contingency funding plan to anticipate both routine and extraordinary needs for liquidity. LIQUIDITY HANDBOOK, *supra* note 41, at 37. Whether a borrower anticipates and provisions for different liquidity scenarios manages or waits for funding emergencies to arise, the borrower is, in effect, working following a contingency funding plan.

[44] Moody's Investors Service, *Tracing the Origin of Investment Grade* 4 (Jan. 2004)(analyzing the history of bond ratings).

[45] Steven Bavaria, *Introduction: Rating Agencies and the Loan Market*, *in* THE HANDBOOK OF LOAN SYNDICATIONS & TRADING 521, 522-24 (Allison Taylor & Alicia Sansone eds., 2007) [hereinafter LOAN SYNDICATIONS HANDBOOK] (analyzing the evolution of ratings for loans).

Article I focus on them.[46] The rate on the loan that a borrower takes out may be fixed, as in a conventional 30 year fixed-rate mortgage, or it may float with open market interest rates. Among floating rates, the London Interbank Offering Rate ("LIBOR") is popular, especially in the kind of corporate borrowing considered in this Article.[47] A floating rate exposes the borrower to the risk that interest rates will rise, adding to the borrower's interest costs.[48] But this risk may suit the borrower if it does not expect rates to rise; just as the risk may suit a lender that think that rates will rise.

A firm may borrow from a federally-regulated bank or a nonbank lender, like a hedge fund or insurance company. Federal law caps the amount of leverage that a bank can assume.[49] Nonbank lenders need not comply with federal limits on how much the lender can leverage itself.[50] Nor do nonbank lenders disclose much to regulators, so they have a leg up in the lending business.[51] Despite these formal differences, both bank and nonbank lenders are intermediaries because they borrow to lend, standing between the ultimate lender and the ultimate borrower and brokering their respective credit.[52] Firms that borrow to lend present special risks to themselves and other firms, a point elaborated on later when considering the effect on the financial sector as a whole of how financial firms finance themselves.[53]

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[46] *See, e.g.*, EDWARD I. ALTMAN, ed., THE HIGH-YIELD DEBT MARKET: INVESTMENT PERFORMANCE AND ECONOMIC IMPACT; General Accounting Office, *Issuers, Purchasers, and Purposes of High-Yield, Non-Investment Grade Bonds* (Feb. 1988); GLENN YAGO, JUNK BONDS[:] HOW HIGH YIELD SECURITIES RESTRUCTURED AMERICA (1991).

[47] Companies have an estimated $9 trillion in debt pegged to the LIBOR. Carrick Mollencamp et al., *Libor's Rise May Sock Many Borrowers*, WALL ST. J. Apr. 19-20, 2008, at B1 (analyzing impact of climbing LIBOR rates on borrower's funding liquidity). Calculated by the British Bankers' Association, the LIBOR is intended to reflect the average cost of borrowing to banks in the London money market. *Id.* at B5.

[48] OFFICE OF THE COMPTROLLER OF THE CURRENCY, COMPTROLLER'S HANDBOOK ON INTEREST RATE 14-18 (1997) (distinguishing between different types of interest-rate risk).

[49] 12 C.F.R. Pt. 3.

[50] For example, banks must comply with federal capital adequacy rules which impose additional capital costs, which banks pass off to borrowers: "Ignoring transaction costs, a bank with market-rate funding would have to charge the borrower some 75-100 basis points attributable to capital requirements, in order to provide an adequate return on equity to its shareholders." Stephen A. Lumpkin, *The Integration of the Corporate Bond and Commercial Loan Markets*, FIN. MKT. TRENDS, Oct. 2003, at 51, 53 [hereinafter Lumpkin]. Banks also benefit from nonmarket funding sources like the discount window and deposit funding at a below market interest rate due to the federal deposit insurance guarantee, so any net effect of this regulatory capital cost must be viewed in the context of a bank's all-in cost of capital.

[51] *Private-Equity Firms Still in the Money*, WALL ST. J., July 3, 2007, at C1 (noting the nimbleness of private equity funds to develop new strategies when regulators begin investigating their market practices) ("Similarly, don't underestimate private equity's knack for making money in just about any environment. Call it feral adaptability.")

[52] For example, during the thirty year period ending in 1998, the share of commercial credit provided by banks dropped from 43% to 26% while that of nonbank intermediaries increased from 30% to 48%. BD. OF GOVERNORS OF THE FED. RESERVE SYS., GUIDE TO THE FLOW OF FUNDS ACCOUNTS 28 (2000). The amount of credit provided by the nonfinancial sector stayed roughly the same, ranging from 22% to 27% during this period. *Id.*

[53] For example, a bank – or other lender – faces liquidity risk when it is called on to fund a loan. For that reason, a revolving or contingent credit commitment which may have to be funded in the future creates more uncertainty and, hence, liquidity risk, to the lender.

Rather than holding a loan to maturity, a lender may sell it to another investor in the secondary market. Before these secondary markets developed, banks made loans and held them to maturity. Now, banks originate loans with an eye to disposing of them in the secondary market, a business model for lending known as "originate-to-distribute."[54] Selling loans liquefies a lender's assets by letting it convert a loan into cash, with which it can make new loans.[55] These secondary markets tell both traders and regulators about the market perception of a firm's credit quality.[56] Regulators warn banks to monitor how their debt securities trade in the secondary market.[57] If the bank's debt begins to change hands at a steeply discounted rate, this suggests that the bank is losing the confidence of investors.[58] For this reason, regulators have considered using secondary market assessments of subordinated debt issued by a bank to monitor trends in the banks solvency and liquidity.[59] These markets matter to borrowers too because liquefying assets gives lenders more cash for fresh loans and gives them an "out," should they no longer want to hold the borrower's credit.[60] But if no buyer wants the loan, it gets stranded on the lender's balance sheet, as banks discovered beginning in the summer of 2007.[61]

A second kind of liquidity comes into play in secondary markets: *market liquidity*.[62] This kind of liquidity speaks to the ease with which one can trade an asset (in

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[54] *See infra* notes 253-59 and accompanying text.

[55] This is the same dynamic at work in the Federal Reserve's attempts to inject liquidity by acting as a "buyer." In the case of the central bank's open market operations, it lets banks and primary dealers "liquefy" themselves by trading securities for cash.

[56] For example, when major banks and the U.S. Department of the Treasury were considering ways of stabilizing the credit market, the key proposal involved supporting the secondary market value of credit products

[57] LIQUIDITY HANDBOOK, *supra* note 41, at 7 (listing "bearish secondary market activity" as one type of early warning sign of a bank's liquidity risk).

[58] *Id.*

[59] Secondary market prices for this subordinated debt, it is thought, will reflect an open market assessment of what federal bank examiners would otherwise discover by reviewing the issuing bank's financial condition. See Gramm-Leach-Bliley Act gaveGramm-Leach-Bliley Financial Services Modernization Act, Pub. L. No. 106-102 §108, 113 Stat. 1338 (Nov. 12, 1999)(mandating study on the use of subordinated debt as a tool of banking supervision).

[60] Indeed, "[w]hen considering various financing options, prospective issuers will receive information from their agent bank/or investment bank regarding the pricing of their existing liabilities in the loan, bond and derivative markets, as well as the prevailing prices of liabilities of comparable credits." Lumpkin, *supra* note 50, at 72.

[61] Though referring to banks, this was the case for other financial firms too: "…some firms had relied on securitization…as a way to reduce assets on the balance sheet under normal market conditions, but during times of stress were forced to postpone some securitisations, leading to a build up of warehoused assets." WORKING GROUP ON LIQUIDITY, BASEL COMM. ON BANKING SUPERVISION, LIQUIDITY RISK: MANAGEMENT AND SUPERVISORY CHALLENGES 3 (2008) [hereinafter BASEL COMM.].

[62] Scholars also distinguish between two kinds of market liquidity risk: exogenous risks affecting the market as a whole and endogamous ones which affect a particular firm. Anil Bangia et al., *Modeling Liquidity Risk, With Implications for Traditional Market Risk Measurement and Management* 3, Wharton Financial Institutions Center Working Paper 99-06 (1999).

this case, a loan) at its expected price.[63] A "fire sale" price reflects a market liquidity discount. You can gauge market liquidity by measuring the difference between the price at which an asset can be sold (the "bid") and the price at which it can be bought (the "ask"). The narrower the bid-ask spread, the more liquid the market is said to be.[64] The depth of supply and demand also influences an asset market's liquidity.[65] Reliable market liquidity requires professional dealers (like the specialists on the New York Stock Exchange) who stand ready to trade from their own account to manage trading volume.[66]

Funding and market liquidity are different, although both measure imminent value in a real-time market for, respectively, a firm and an asset.[67] To some extent, market liquidity for a loan reflects the borrower's ongoing ability (its funding liquidity) to make good on the loan. In the secondary market, though, speculation in the value of the loan can create its own market dynamics, producing prices for the loan that may not always reflect the borrower's ability to pay.

Market and funding liquidity interact in several ways, though, including in a rarified lending market that the Bear deal brought into the limelight: the repurchase agreement ("repo") markets.[68] In this market, a firm holding a security can make money

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[63] For example, a trader wanting to sell a large block of securities may pay a liquidity discount for selling the block at once because its size may clear all demand at the best bid price such that part of the sale must be executed at less attractive bids. (The price cycle is repeated into a falling market until the seller liquidates the entire block.) Contra, a trader wanting to buy a large block may pay a liquidity premium because the desired size of the block may clear all supply at the best offer price such that part of the purchase must be executed at higher offer prices. A deep and liquid secondary market is one in which there is enough buy-interest behind the bids and sell-interest behind the offers such that large transactions can be executed without paying liquidity discounts or premia.

[64] Market liquidity includes several aspects of how a transaction is consummated in a market:

> The dimensions of market liquidity include: market "depth", or the ability to execute large transactions without influencing prices unduly; "tightness", or the gap between bid and offer prices; "immediacy" or the speed with which transactions can be executed; and "resilience", or the speed with which underlying prices are restored after a disturbance.

Andrew Crockett, *Market liquidity and financial stability*, in BANQUE DE FRANCE, *supra* note 23, at 13-19.

[65] For example, the volume of secondary market trading in corporate loans climbed from $8 billion a year in 1991 to $100 billion a year in 2000 and then climbed slowly to over $238 billion in 2006. LOAN SYNDICATION AND TRADING ASS'N, http://www.loanpricing.com/analytics/pricing_service_volume1.htm. These figures express the then market value of the loans, i.e., par for loans that were not distressed and the discounted rate for distressed loans.

[66] This means that the secondary market must be a dealer market; in other words, there needs to be a set of position-takers who will buy significant amounts for their own account and who sell out of their own stock of assets. See MINSKY, *Can It?*, *supra* note 31.

[67] See BASEL COMM, *supra* note 61, at 1 & n.7.

[68] Although not well known, repo markets serve key background functions in the financial system. First of all, the Fed conducts monetary policy by adjusting liquidity in the banking system through repo deals, as it has in the liquidity injections mentioned earlier. The Fed, the SEC, and the U.S. Treasury surveil this market because it can be the first place where problems emerge that can have wider implications for the financial system. DEPT. OF THE TREASURY, SEC. AND EXCH. COMM'N, & BD. OF GOVERNORS OF THE FED. RESERVE SYS., JOINT REPORT ON THE GOVERNMENT SECURITIES MARKET 1-5 (1992). Also, investment banks with large securities portfolios use repo (and reverse repo deals that are the mirror image of the transaction) to extract the collateral value of their securities portfolios. *Repurchase Markets*, WALL ST. J., Mar. 17, 2008, at C1 (finding that up to one-fifth of the securities inventory of major firms tends to be "repoed" out). *See also*

on it (without parting with it for good) by pledging it as collateral for a loan. The deal liquefies the asset for the borrower by turning a security into cash for the term of the loan. In truth, this is a collateral market but, due to market convention, the loans are styled as back-to-back purchase and sale agreements, typically for a term of one day that gets rolled over into a longer effective term.[69] Capturing the collateral value of the security reduces the cost to the firm of carrying the security in its portfolio, in effect adding to the value of the security itself.

Depending on how badly the cash lender wants the security (typically to avoid failing on its duty to deliver that security in a short sale), it will charge the cash borrower an interest rate on the cash loan below the market rate or even a "negative interest rate," i.e., the lender will "pay" the borrower for making the loan.[70] What is distinctive about repo markets is that, from the point of view of the lender of cash, they illustrate a negative liquidity preference. That is, the cash lender would rather sacrifice liquidity (cash) for the chance to hold the collateral, so it is really the cash that collateralizes the loan of the security.[71] Part of what induced the Fed to lend to Bear through the discount window was that, even though the firm was amply solvent, other firms had become reluctant to do repo with the firm, alarming because the repo market had been more immune to liquidity panics even than investment-grade commercial paper.[72]

To recapitulate: borrowing lets a firm change its mind about the terms of its financing, although taking on more debt may add funding liquidity risk, especially if it is floating-rate debt. Lenders can also change their minds about whether to wait patiently for a borrower to repay a loan or cash out the loan by selling it. As more nonbank lenders

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Michael J. Fleming & Kenneth D. Garbade, *Repurchase Agreements with Negative Interest Rates*, CURRENT ISSUES IN ECONOMICS AND FINANCE 1,2 (Apr. 2004) (finding that in 2003 investment banks were financing $2.41 trillion of fixed-income securities in their portfolios through repo).

[69] The market includes both repurchase and reverse repurchase agreements. *See* Stephen A. Lumpkin, *Repurchase and Reverse Repurchase Agreements*, in INSTRUMENTS OF THE MONEY MARKET, *supra* note 3, at 59. Both types of agreements involve two sequential steps: a purchase by A of a security belonging to B followed by the sale by A of the same (or a substitute) security to B. In a repurchase agreement, a firm pays cash for a security from a counterparty, who promises to unwind the deal at the end of the agreement by "buying back" the security. Entering into a repo reduces the firm's liquidity (because cash has been exchanged for a security) but, booked as an asset on the firm's balance sheet, the repurchase agreement is viewed as a highly liquid asset because cash for it is forthcoming. The opposite happens in a reverse repurchase agreement, which is booked as a liability for a firm. This time the reverse repo obligates the firm to pay cash for a forthcoming buyback of a security from a counterparty who tendered the cash in exchange for the security on the first leg of the deal. Financial intermediaries like these agreements because they are a flexible way to earn a profit on excess cash or capture the collateral value of a security that is on "special," i.e., in demand, perhaps because of uncovered short sales of the security. *Id.* at 68.

[70] *See* Fleming & Garbade, *supra* note 68, at 1 (generalizing about negative interest rates from the 2003 repo market for a ten year Treasury note).

[71] This type of loan is the opposite of the leveraged liquidity analyzed by my article, a point I take up later. *See infra* notes 189-92 and accompanying text.

[72] *See* Cox, *supra* note 20, at 3 ("Notwithstanding that Bear Stearns continued to have high quality collateral to provide as security for borrowings, market counterparties became less willing to enter into collateralized funding arrangements with Bear Stearns.")

have become active, regulators have less control over the credit market, particularly as secondary credit markets "relate back" both to the borrower and lender choices.

These liquidity dynamics shed light on what happened to credit market as of the summer of 2007. Indeed, nothing highlights the interaction difference between types of liquidity better than a downturn in the credit market coming after a leverage wave. Jin and Wang identify three such periods since the 1970s during which firms borrowed heavily for "leveraged restructurings."[73] Despite the similarities between the three periods, I want to highlight the distinctiveness of the most recent one, which involved riskier takeover targets, larger deal sizes, more rapid cycling of cash, and more financing from foreign investors.[74] Traditionally, merger waves target companies with stable cash flows, often in manufacturing. This time, though, acquirors went after companies in sectors with cyclical cash flows or companies with large intangible assets, whose cash flow may be even less stable.[75] The size of the mergers increased too.[76] And cross-border financing reached a peak.[77]

Lenders acted differently too during the last merger wave.[78] This time, many waived standard contractual protections, as suggested by a Standard & Poor's study of rated secured borrowings in which almost one-third of the dollar value of the 500 secured debt issues consisted of "covenant-lite" loans, lacking debt covenants typically found in

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[73] *See, e.g.*, Li Jin & Fiona Wang, *Leveraged Buyouts: Inception, Evolution, and Future Trends*, 6 PERSPECTIVES 3 (2002) [hereinafter Jin & Wang] (tracing leverage buyout cycles from 1980 to 2000). Flow of funds data from the Federal Reserve supports their assertion. BD. OF GOVERNORS OF THE FED. RESERVE SYS., GUIDE TO THE FLOW OF FUNDS ACCOUNTS 23-26 (2000) (finding debt growth in the household, government, and commercial sectors). The first phase of equity extraction occurred during the junk bond boom between 1984 and 1990, during which nonfinancial corporations withdrew nearly $650 billion in equity. *Id.* at 26. Flow of funds data for the period between 1993 and 1997 suggests a similar pattern of high debt issuance and equity extraction occurred, as reflected in flow of funds data. *Id*. (This data set ends in 1997.) This second period roughly corresponds with a small wave of leveraged buyouts beginning around 1996. *Id.* at 5 (noting that dollar value of leveraged buyouts approached the volumes of the early 1980s). A similar leverage trend seems to have been underway recently too, as suggested by the increase since 2000 in the ratio of gross debt underwriting to gross equity underwriting from a ratio of 5 to nearly 9. Data taken from the Securities Industry and Financial Markets Association. Ideally, one would compare net issuance (or repayment) of debt and net issuance (or extraction) of equity, but I have not been able to find comprehensive data on net capital structure figures for more recent periods.

[74] Mark Whitehouse, *Deals and Dealmakers: LBOs May Spoil the Corporate-Bond Party – Private-Equity Firms Ladle Debt Onto Investment-Grade Buyouts Putting Ratings, Prices at Risk*, WALL ST. J., Aug. 1, 2005, ("As low-hanging fruit becomes scarce, buyout artists are going after companies with shakier finances.").

[75] *Id.*

[76] Press Release, Mergerstat, M & A Wrap Up for 2006 (Jan. 1, 2007), *available at* http://www.mergerstat.com/newsite/press/release35.htm (reporting 11,000 deal announcements overall for 2006).

[77] For example, in mergers and acquisitions involving financial institutions, the percentage of deals involving entities outside of a single country increased from less than 1% in 1996 to nearly 40% in 2006. INTERNATIONAL MONETARY FUND, 2006 GLOBAL FINANCIAL STABILITY REPORT 99.

[78] The first wave was characterized by junk bond financing. Mergers in the 1990s transactions involved less debt levering, in part because consolidation in the finance sector had increased the relative bargaining power of lenders vís-a-vís buyout groups. *See* Jin & Wang, *supra* note 73, at 6

such issues.[79] In these leveraged deals, the cash moved more quickly from lenders through borrowers and, then, up to the borrower's owners, leaving the borrower with unproductive debt. This cash cycle had taken an average of seven years for private buy-out groups in the 1980s;[80] but this time the horizon of private equity investors shortened, sometimes only to months.[81] This leverage wave also included borrowing to fund dividends, euphemistically called "leveraged dividends."[82]

Leveraged loans played a key role in much of this leveraged restructuring, leading bondholders to complain about the risk to borrowing firms from these loans.[83] Investors in high-yield bonds of a company that has also issued leveraged loans are likely to recover less if the bonds default than compared with bonds of borrowers who do not take out leveraged loans.[84]

Overall, many borrowers became less liquid as secondary markets for their debt became more liquid, a dynamic obscured by liquidity euphoria.[85] Small wonder that credit downgrades piled up before the July 2007 credit crunch.[86] In the first quarter of 2007, downgrades of nonfinancial companies exceeded upgrades.[87] Banking and finance firms did better than nonfinancial sectors, given that the lion's share (80%) of all credit rating upgrades were of banking and finance firms.[88] Eventually, though, even financial firms became riskier, despite the surplus profits from fees charged to other firms for their

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[79] Standard & Poor's, *The Leveraging of America: Covenant-Lite Loan Structures Diminish Recovery Prospects* 5 (Jul. 18, 2007).

[80] Steven Kaplan, *The Staying Power of Leveraged Buyouts*, 29 J. FIN. ECON. 287 (1991).

[81] Sarah Childress & Dennis K. Berman, *BCE's $32.6 Billion Buyout Reinforces a Private Equity Trend*, WALL ST. J., July 2, 2007, at A2 ("This deal [the buyout of a Canadian telecommunications company] is another in a crescendo of buyouts in which private-equity companies take on increasingly greater risks, looking for profits in a matter of months, not years."). Nevertheless, even re-released public companies may remain profitable. Jerry Cao & Josh Lerner, *The Performance of Reverse Leveraged Buyouts* 4 (Nat'l Bureau of Econ. Research, Working Paper No. 12626) (analyzing several hundred leveraged buyouts between 1980 and 2002 and finding that restructured firms were not compromised by the additional leverage).

[82] *Id.*

[83] *The Evolution of the U.S. Second-Lien Leveraged Loan Market – 2006 Year-End Update*, FITCH RATINGS, Jan. 17, 2007, at 2 (finding that a "substantial majority" of leverage deals involved leveraged loans).

[84] *Speculative Grade Balance Sheets Becoming More Loan-Heavy – Recovery Prospects at Risk*, FITCH RATINGS, May 2007.

[85] Serena Ng, *Investors Fret Buyout-Induced Risk – Some Money Managers Fear Surge in Leveraged Deals Stretches Corporate Finances*, WALL ST. J., July 18, 2006, at C4 (noting that in the past year one credit rating agency – Fitch – had lowered its credit ratings or credit outlooks on $53 million in corporate debt obligations).

[86] For example, the 2005 downgrades of investment-grade debt of Ford Motor Company and General Motors added $80 billion in "fallen angel" leveraged debt, making up nearly 10% of the high-yield bond market for that year. *See* STANDARD & POOR'S, *supra* note 38, at 1.

[87] *U.S. Corporate Bond Market: A Review of First-Quarter 2007 Rating and Issuance Activity*, FITCH RATINGS, May 15, 2007, at 6 (analyzing rating and issuance activity by industrial sector).

[88] *Id*.

leveraged deals.[89] The number of issuers rated sub-investment-grade also increased during this period.[90]

The day of reckoning for risky borrowing started with residential mortgage loans. Less well known, but similarly troubling, is a similar pattern in the corporate leverage market.[91] When new borrowing dropped in July 2007, financial fragility came into view.[92] The Securities Industry and Financial Markets Association noted that the contraction had been "more severe than many investors anticipated" and that "investor risk tolerance quickly has turned to risk aversion."[93] Corporate bond issuance declined, most notably in the high-yield sector.[94] (Equity underwriting shrank too.[95]) Short term commercial paper was volatile, which is unusual because issuer default here is rare and may portend weakness elsewhere in financial markets.[96] And demand for leveraged loans dropped.[97] High-yield corporate bond traded at widening discounts between July and August.[98] Less debt meant fewer "shareholder-friendly" deals. Several large deals had to be canceled, others were delayed, and those that came to market paid more for the debt

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[89] Libby Bruch, *Trading Places—U.S. High-Yield Issuers Poised to Outnumber Investment-Grade Counterparts*, STANDARD & POOR'S.

[90] *Id.* (noting decline of issuers rated investment-grade from 72% in 1992 to 51% in 2006).

[91] Roubini notes the importance of nonbank firms in this process of "releveraging" by firms:

> While the process of releveraging started in the household sector – that is the most financially stretched sector of the US economy – the releveraging more recently spread to the corporate and financial system: in the financial system the rise of hedge funds, private equity and speculative prop desks led to a sharp rise in the financial system leverage. In the corporate sector given the cheapness - until recently - of credit we observed a massive process of switch from equity to debt that took the form of leveraged buyouts, share buybacks and privatization of formerly public companies. This releveraging fed that equity/asset bubble: as expectations of more LBOs occurred equity valuation of many firms went higher and higher….Notice also that the amount of issuance of low grade corporate bonds (below investment grade "junk bonds") had been rapidly rising in the last few years. Nouriel Roubini, Are We at The Peak of a Minsky Credit Cycle? (Jul 30, 2007) *available at* http://www.rgemonitor.com/blog/roubini/208166/,

[92] The declines showed up in each of the major credit classes: long-term debt issuance by federal agencies dropped to $57.2 billion compared with a monthly average of $83.5 billion for the first-half of 2007; issuance of "higher quality" mortgages dropped to $169.3 billion compared with a monthly average of $193.2 billion for the first-half of 2007; and the issuance of asset-backed securities shrank to $39.0 billion compared to a monthly average of $105. *See* SFMA, *Capital Markets Review*, *supra* note 15, at 3-4.

[93] *Id.* at 1.

[94] Overall, corporate bond issuance shrank to $38.3 billion in July compared to a monthly average of $108.6 billion for the first-half of 2007; in the high-yield sector, however, the contraction was more severe as issuance dropped to $2.4 billion from an average of $15.9 billion for the first-half of 2007. *Id.*

[95] Equity underwriting halved from a monthly average of $22.2 billion for the first half of 2007 to $12.6 billion. *Id.*

[96] Three prominent examples are the 1970 Penn Central problem, the 1980 commercial paper involving Chrysler, and the 1989 problem caused by Federated Department stores.

[97] *See* FUND, 2007 FINANCIAL STABILITY REPORT, *supra* note 36, 14 ("An estimated $300 billion of leveraged loans was planned to come to the market in the second half of this year, equivalent to around one-third of the total shareholder equity of the top 10 banks most involved in financing leveraged buyouts. But overall demand for the loans… is now uncertain.")

[98] *See* SFMA, *Capital Markets Review*, *supra* note 15, at 4. The daily trading volume of high-yield bonds increased in July to $4.23 billion from a daily average of $3.97 billion in the second quarter of 2007 as holders of these bonds dropped them in order to invest in less-risky investments. *Id.*

financing that had been plentiful in 2006.[99] Lenders who had made funding commitments for leveraged transactions in the pipeline suddenly faced the prospect of losses.[100]

Leading up to the credit crunch of 2007, some investment banks had decided to cut their credit exposure to hedge funds.[101] Cutting their risk exposure made sense, but it had cascading effects as market liquidity dried up for structured credit products being sold by these same investment banks.[102] By cutting off the credit of these hedge funds, the investment banks reduced the market for their own credit products, sending bearish signals.[103] As market liquidity evaporated, so too did the funding liquidity of firms begin to suffer.[104] As international bank regulators put it, financial instability "flowed" through asset markets and into banks.[105] As the International Monetary Fund put it, "market illiquidity can quickly become funding illiquidity," and vice-versa, I would add.[106] This was because, the borrowing and the secondary trading fed off each other, as noted by a Banque de France official: "…an increase in leverage in the system makes it more vulnerable to a sudden re-appraisal of risks and abrupt shifts in the liquidity demand…This fragility is concealed in periods of euphoria...But it comes to the forefront again when distress erupts. As distress cascades through the system, liquidity providers turn into liquidity demanders."[107]

To reverse or at least mitigate the cycle, the Fed responded by letting Bear and others exercise the Bernanke liquidity put, financial short-hand for the idea that by borrowing against collateral – as Bear did – the borrower has transferred risk in the collateral to the Fed.[108] If the borrower defaults, then the Fed has stepped into the shoes

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[99] Michael Aneiro, *Risky Debt Issuances Meet Investor Resistance*, WALL ST. J., Jun. 23, 2007, at B5 (discussing reductions and cancellations of proposed deals).

[100] *See* Doherty, *supra* note 10, at 21 (analyzing commercial and investment bank financing of twelve large leveraged buyouts to show how weak covenants exposed the lenders to interest-rate risk).

[101] Peter R. Fisher, *What happened to risk dispersion? in* BANQUE DE FRANCE, *supra* note 23, at 29-38, 32 ("In response to the decay in prices and the simultaneous rise in volatility, a number of major financial firms began to reduce their credit exposures to hedge funds, provided through their prime brokerage arms.")

[102] *Id.* By cutting off funding liquidity to the hedge funds, reducing credit exposure also made market liquidity dry up: "While [reducing credit exposure to hedge funds] may have been a prudent counterparty credit decision, it had the seemingly-unanticipated consequence of reducing demand for the very mortgage-backed securities and structured credit instruments that were being underwritten…" *Id.*

[103] *Id.*

[104] *Id.*

[105] BASEL COMM., *supra* note 61, at 11 ("The loss of investor confidence in a wide range of structured securities markets led to risks flowing on to banks' balance sheets.").

[106] Jaime Caruana & Laura Kodres, *Liquidity in Global Markets*, in BANQUE DE FRANCE, *supra* note 23, at 66.

[107] Arnaud Bervas, *Financial innovation and the liquidity frontier*, in BANQUE DE FRANCE, *supra* note 23, at 128 (internal citation omitted).

[108] A put is an option which gives the holder the right (but not the duty) to sell an asset for a fixed price. BARRON'S DICTIONARY OF BANKING TERMS 330-331 (1997). In this context, those who pledge structured credit products as collateral for a loan from the Fed are "long" the put, while the Fed is "short" the put because it stands ready to bear the risk of the collateral by lending. This is the same kind of put which bank owners exercise against the Federal Deposit Insurance Corporation ("FDIC") when they walk away from an illiquid bank, forcing the FDIC to step into their shows as owner of the bank's assets (and obligor on insured

of the borrower, hence the metaphor that the Fed is "short a put" on liquidity.[109] In effect, the Fed's remedy builds on the same interplay between funding and market liquidity that led to the problem in the first place. The loan from the Fed promotes market liquidity by creating a miniature secondary market for the collateral (this time including private structured credit products) such that other investors are reassured that this type of collateral has value. At the same time, by making cash available to the borrower, the loan shores up its own liquidity, propping the borrower up so that it can stay in the game. This matters because firms that borrow from the Fed are the financial intermediaries that play a key role in generating and circulating liquidity to other borrowers.

The Treasury, Congress, and various trade groups have begun proposing legislative fixes to the credit market, although the hope is that this round of reforms will reflect a more nuanced understanding of market behavior than did the last such financial reform, Sarbanes-Oxley.[110] In March, the President's Working Group on Financial Markets responded to the credit conditions from 2007 with a comprehensive policy statement recommending a variety of changes to credit underwriting, rating, and risk management.[111] The *Treasury Blueprint* came out soon thereafter.[112] One factor that will determine whether reforms work is whether they address the liquidity conundrum that this market break brought to light: does market liquidity help or hurt borrower liquidity? That is, did the secondary markets add financial stability or did their churning make borrowers, lenders, and financial markets more fragile?

One advocate for secondary credit markets claims that they mitigate the effect of a recession by making more liquidity available to borrowers.[113] The hope is that the

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deposits). Moral hazard arises because the Fed and the FDIC come to own the collateral only when the borrower can no longer bear its downside risk. Unlike an ordinary equity investor, neither the Fed nor the FDIC get any of the upside risk from this collateral: it has been extracted by the borrowers before they exercised their puts. In private markets, the writer of the put collects a premium for making the put promise. Although Bernanke is the Fed Chairman who now has to perform on these puts, you could say that it was Alan Greenspan who collected the premiums on writing them.

[109] The Fed's franchise right over printing money gives it, literally, a "money machine": in addition to fees charged for FedWire and other banking services, the Fed funds itself through seignorage, the profit spread captured by printing money. After covering its expenses and paying its shareholders a statutory dividend, the Fed turns over its surplus profits each year to the U.S. Treasury. This is another example of the way the bargaining power shifted from lenders –in this case the Fed – to borrowers (Bear Stearns), although we worry less about the Fed's own creditworthiness because its monopoly right to print money makes it the ultimate deep pocket.

[110] José Gabilondo, *Financial Moral Panic! Sarbanes-Oxley, Financier Folk Devils, and Off-Balance Sheet Arrangement*, 36 SETON HALL L. REV. 781, 781-809 (2006) (analyzing populist and legislative reactions to off-balance sheet assets and liabilities).

[111] PRESIDENT'S WORKING GROUP ON FINANCIAL MARKETS, *Policy Statement on Financial Market Developments* (Mar. 2008).

[112] *See* TREASURY BLUEPRINT, *supra* note 8.

[113] It is a bullish view of credit markets: the bank loan market lets lenders "remove riskier loans from their balance sheets. This enables lenders to avoid restricting credit when the economy contracts. By providing a steady stream of credit into the business sector, the impact of a recession may be reduced." LOAN SYNDICATION AND TRADING ASS'N, THE U.S. LEVERAGED LOAN MARKET: A PRIMER 39 (2004) (hereinafter

market liquidity would "carry over" into the firm's funding liquidity, as it does in the repurchase market. As noted above, though, the opposite also happened.[114] Contra, hyper-liquidity in the secondary market for corporate credit products encouraged lenders to relax underwriting standards knowing that a ready secondary market would purchase their corporate loans.[115] After all, if a liquid secondary market lets a lender accelerate the expected cash flow from a loan, why should the lender wait or care about the loan's longer-term cash flows or care about monitoring the ongoing credit quality of the borrower? This is fine as long as the secondary market keeps going, but if it sputters than unwanted loans become stranded on the lender's balance sheet. When that happens, the loan's value to the lender reverts back to the cash flow expected from the loan, not the proceeds of selling the loan. For this reason, at least one commentator has noted that the value of the "debt should not correlate with market liquidity" but with its underlying cash flow.[116]

Academics and regulators are still digesting the conceptual implications of these credit events. To aid in this process, this Article offers a framework for making sense of these liquidity dynamics drawing on Minsky's theory. One of its advantages is that it zeros in on the relationships between the firm's borrowing, its liquidity, and the impact to the financial sector as a whole. As described below, how he thought about debt helps to understand the relationships between borrowing, the borrower's liquidity, and that of secondary markets.

III. MANEUVERING IN THE NEW CREDIT MARKET

Soon before the 2007 summer credit crunch, a Fed official noted that "there is little reason to believe we have entered a new era of permanent stability."[117] Hyman Minsky would have chuckled, given his view that financial instability is a routine part of our economy. When the economy was strong and interest-rates low, Minsky said, firms would borrow themselves (and the economy as a whole) into periods of acute financial fragility, hence the economy's "tendency to explode."[118] So he thought that economic analysis should set out the "institutional prerequisites for successful capitalism."[119] One

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LEVERAGED LOAN PRIMER), *available at* http://www.lsta.org/assets/files/Research_Data/MilkenLevLoanPrimer1004.pdf.

[114] *See supra* notes 101-106 and accompanying text.

[115] *See* LEVERAGED LOAN PRIMER, *supra* note 113, at 66.

[116] *Id.*

[117] Timothy Geithner, Liquidity Risk and the Global Economy 2, Federal Reserve Bank of Atlanta's Financial Markets Conference on Credit Derivatives at Sea Island, Georgia (May 15, 2007) ("[T]here is little reason to believe we have entered a new era of permanent stability. Financial innovation and global financial integration do not offer the prospect of eliminating the risk of asset price and credit cycles, of manias and panics, or of shocks that could have systemic consequences."), *available at* http://www.ny.frb.org/newsevents/speeches/2007/gei070515.html. Geithner is the President of the Federal Reserve Bank of New York.

[118] MINSKY, *Can It?*, *supra* note 31, at 118.

[119] Hyman P. Minsky, *Uncertainty and the Institutional Structure of Capitalist Economies*, 30 J. ECON. ISSUES 357, 357-68 (1996) ("The current crisis of performance and confidence in the rich capitalist countries makes it necessary, once again, to think about the institutional prerequisites for successful capitalism.").

of those "prerequisites" was stabilizing the economy and, in particular, the financial sector.[120]

This view suggests "built-in" limits to expansion through borrowing, raising objections from growth boosters. For example, as Fed Chairman, Alan Greenspan reassured growth skeptics that a new plateau of efficiency was behind the then prosperity (leveraged, as it is turning out to have been).[121] In chorus, the International Monetary Fund ("Fund") reported in 2006 that the high levels of corporate borrowing reflected "capital structure arbitrage" in which under-leveraged firms took healthy advantage of investor appetite for risk.[122] By the following year, the tone had changed. In 2007, the Fund found itself objecting to the "credit indiscipline" of the same borrowers and lenders that it had praised the previous year.[123] Because loss makes a market for reflection, Minsky's messages about financial stability may get a better hearing now.

Before presenting the core of Minsky's ideas about borrowing, Section A briefly explains how leverage cycle theory developed. Although only the Trust Indenture Act of 1935 targeted the issuance of debt, the creation of the New Deal created regulatory demand for conceptual tools to see the credit market as a whole. Cyclical approaches to leverage like Minsky's responded to that demand and now enjoy a revival of sorts. Section B presents the substance of Minsky's theory as it relates to borrowing by firms. He divided borrowing into three types based on how each type impacted the borrower's

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[120] HYMAN P. MINSKY, STABILIZING AN UNSTABLE ECONOMY 5-6 (1986) [hereinafter UNSTABLE ECONOMY]. Although committed to social justice, he saw some degree of economic stability as a pre-condition for all other projects:

> Distasteful as inequality and inefficiency may be, there is no scientific law or historical evidence that says that, to survive, an economic order must meet some standard of equity and efficiency (fairness). A capitalist economy cannot be maintained, however, if it oscillates between threats of an imminent collapse of asset values and employment and threats of accelerating inflation and rampant speculation, especially if the threats are sometimes realized. *Id*.

[121] Dean Foust, *Alan Greenspan's Brave New World*, BUSINESS WEEK (Jul. 14, 1997) (analyzing how his assumptions about the possibility of continuing growth influenced the Federal Open Market Committee's decision not to raise interest rates). The Federal Open Market Committee minutes for that meeting reflect the Committee's assumption about ongoing growth. Minutes 6, Fed. Open Market Committee (May 20, 1997) ("…prospects for subsequent quarters were subject to substantial uncertainty, but the members generally felt that the economy retained considerable underlying strength. In the circumstances and assuming no changes from current financial conditions, the individual members saw likely prospects for expansion over the forecast horizon at a pace close to, or a little above, the estimated growth of the economy's long-run potential.").

[122] The Fund distinguished these transactions from those of the 1980s because this time investors also committed equity capital: "[M]any of these leveraged restructurings also involve a higher degree of proprietary exposure on the part of acquirers – not only do they mobilize other investors' credit resources but they are also taking equity stakes in the acquired firms – than did the leveraged restructurings of the 1980s." INT'L MONETARY FUND, 2006 GLOBAL FINANCIAL STABILITY REPORT 29.

[123] See FUND, 2007 FINANCIAL STABILITY REPORT, *supra* note 36, at p. 2 ("These risks have been exacerbated by signs of similar credit indiscipline in the leveraged buyout (LBO) sector. Through mid-2007, there had been a marked rise in covenant-lite loans, less creditworthy deals, leverage, and price multiples on acquisitions….Although aggregate corporate leverage remains relatively low, its increase over the past year, particularly for those entities that have been the subject of buyouts, has heightened vulnerabilities, especially as financial, and possibly economic, conditions turn less benign.")

future liquidity, especially when the borrower would have to refinance. Firms and their financing markets have changed substantially since Minsky developed his analytical tools, so Section C applies borrowing classification to analyze the major changes that have made the finance sector more fragile. Here I explain how we got to the liquidity dynamics set up in the previous Part.

A. *Leverage and financial cycles still matter*

The Great Crash created demand for models that explained the economy as a whole.[124] For example, a study of national money flows from 1952 would lead to the Fed's flow of funds accounts.[125] These accounts include the equivalent of a national cash flow statement detailing who borrows, who lends, and how. Another aggregate measure that developed during this time was the set of National Income and Product Accounts, which are still used for in our balance-of-payments reporting system.[126]

In this milieu, business cycle theory also developed through work by economist Arthur Burns and his student Geoffrey Moore.[127] Business cycle theory emphasized that the economy as a whole includes long-term patterns of relative growth or contraction punctuated by shorter-lived specific phases during which the economy may expand, peak, contract, hit a trough, or recover.[128] The U.S. economy has since faced no crashes of the size of the Depression, but cycle theory still informs how we determine whether or not we are in an economic recession. It would seem that we have entered one, although the National Bureau of Economic Research (at this writing) continues to analyze data before reaching a conclusion.[129]

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[124] *See* Pouncy, *supra* note 26, at 568. This affected both the domestic and global economy. The standard industrial classification which divides industries (financial industries are in the four digit series beginning with "6") began as an outgrowth of the Department of Labor. The National Income and Product accounts which would be used to track global balance of payments also began in the 1930s. The NIPA accounts were the precursors to what would become the Flow of Funds system.

[125] The seminal study on this question was one published by Morris Copeland in 1952. Morris A. Copeland, *A Study of Moneyflows in the United States*, *in* NAT'L BUREAU OF ECON. RESEARCH, PUBLICATIONS OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH, INC. (1952).

[126] Carol S. Carson, *The History of the United States National Income and Product Accounts: The Development of an Analytical Tool,* 21 REV. OF INCOME & WEALTH 153–181, 154 (1975) ("The generally recognized need for economic information during the Great Depression stimulated the request that the Department of Commerce undertake what became the first official continuing series on national income in the United States. These estimates were prepared with the cooperation of the National Bureau of Economic Research and were published in 1934.").

[127] The business cycle was the insight that some economic indicators moved in tandem. During a period of economic expansion, output rose along with new construction, employment rates, and many prices; conversely, during an economic downturn – a recession – output, employment and new construction declined while unemployment increased. Werner H. Strigel, *Business Cycle Surveys: A New Quality in Economic Statistics*, *in* ANALYZING MODERN BUSINESS CYCLES[:] ESSAYS HONORING GEOFFREY H. MOORE 69, 72 (Philip A. Klein ed., 1990).

[128] *Id.*

[129] A member of the National Bureau of Economic Research, economist Martin Feldstein, recently suggested that the U.S. economy had already entered into a recession. Ros Krasny (Reuters), *U.S. faces severe recession: NBER's Feldstein* (Mar. 14, 2008), available at

Business cycle theory looks at the economy as a whole, but it has obvious applications to borrowing cycles too. Beginning in 1946, W. Braddock Hickman carried out the first major study of corporate borrowing cycles as part of the Corporate Bond Project, a Work Projects Administration effort of the Federal Deposit Insurance Corporation and the National Bureau of Economic Research.[130] Hickman looked at bond issuance over the prior fifty year period of his study and found that the realized yield on the most senior secured obligations exceeded that of the least secured obligation in all but two of the four year blocks during which the study period was divided.[131] In other words, bond issuers had paid too much for the senior secured financing given that lenders should have been willing to accept a lower rate of return in exchange for risk that was collateralized. And the yield spread between the most secured bonds and the lowest ranked unsecured securities was not as large as one would have expected.[132]

Both results seemed counter-intuitive in that they did not reflect the intuition that return should be proportional to financial risk. In fact, though, they were an early demonstration of financial diversification of risk through Markowitz's portfolio theory.[133] And Hickman's findings about returns from high-yield instruments would help Michael Milken to promote junk bonds thirty years later.[134] Moody's Investor Services revisited and corroborated Hickman's findings in 2004 when explaining how it distinguishes between investment-grade and speculative bonds.[135]

Hickman also wondered whether corporate borrowing followed the same pattern as the business cycle, so he plotted bond issuance by firms against business cycle indicators.[136] Rather than following the bust and boom of the business cycle, net bond issuance, it turned out, increased at the bottom of the trough (when the real economy was contracting) and decreased at the peak (as the real economy was expanding).[137] Perhaps retained earnings let firms fund growth at the top of the peak and firms borrowed more when earnings were lean. Or the reluctance to borrow may have reflected the memory of

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http://www.reuters.com/article/businessNews/idUSN1438837520080314 ("The United States is in a recession that could be 'substantially more severe' than recent ones, National Bureau of Economic Research President Martin Feldstein said on Friday.").

[130] Between 1953 and 1960, this project produced three volumes. The first volume was CORPORATE BOND FINANCING (1953). The second, CORPORATE BOND QUALITY AND INVESTOR EXPERIENCE (1958), considered different measures of bond quality. The final volume, STATISTICAL MEASURES OF CORPORATE BOND FINANCING (1960), presented the statistical data on which the previous volume was based. Other studies looked at trade credit. Martin H. Seiden, *The Quality of Trade Credit* 7 (Nat'l Bureau of Econ. Research, Occasional Paper No. 87, 1964). The study formed part of the National Bureau of Economic Research's Quality of Credit Program. *Id.* at xix.

[131] *See* W. BRADDOCK HICKMAN & ELIZABETH T. SIMPSON, STATISTICAL MEASURES OF CORPORATE BOND FINANCING 340-47 (1960).

[132] *Id*.

[133] Markowitz published his article on the financial benefits of diversification in 1952.

[134] *See* YAGO, *supra* note 46, at 18-19.

[135] *See* Moody's Investor Services, *supra* note 44, at 4-6.

[136] W. Braddock Hickman, *Trends and Cycles in Corporate Bond Financing* 20-25 (Nat'l Bureau of Econ. Research, Occasional Paper No. 37, 1952) [hereinafter *Bond Cycles*].

[137] *Id.* at 21.

the Great Crash or a more general conservative impulse to protect the firm's gain from risk.[138] Hickman offered no specific explanation, but he concluded that bond issuance was counter-cyclical and could have a stabilizing effect on the business cycle.[139]

An increasingly prominent line of research on financial cycles is congruent with Minsky's claim that the financial sector borrows itself into fragility and, at the same time, qualifies Hickman's earlier argument that bond financing is countercyclical. Like Minsky and Hickman, economists Tobias Adrian and Hyun Song Shin have recently suggested that borrowing cycles do exist, but going in the opposite direction.[140] That is, leverage is "pro-cyclical" for some types of financial intermediaries, increasing as asset values grow, which they do during a price bubble.[141]

Adrian and Shin compared the leverage ratios of four kinds of economic units to see whether these units borrowed more or less (in proportion to their equity) when their asset value increased.[142] The four units were households, nonfinancial firms, commercial banks, and investment bank broker-dealers.[143] The units displayed different tendencies. The leverage of households declined as asset value increased.[144] (Because the household data runs only from 1963-2006, the finding does not reflect the pro-cyclical leveraging – much of it subprime – that has destabilized many current households.) No discernible relationship emerged between leverage and asset size for nonfinancial firms.[145] Clearer patterns emerged for both commercial and investment banks. The leverage ratio of commercial banks tended to remain constant as their balance sheets grew, suggesting that commercial banks "target" their leverage ratio.[146] This should come as no surprise because federal prudential regulation imposes leverage ratios on commercial banks.

Broker-dealer investment banks, however, displayed a "strongly positive relationship between changes in total assets and changes in leverage."[147] These firms managed their balance sheet in ways that amplified bull market prices during a boom and

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[138] Pouncy notes that risk is itself is perceived differently in different risk environments, such that a firm may be more conservative to protect gains but more willing to take on risks – in this case by borrowing – to reverse a pattern of losses. *See* Pouncy, *supra* note 26, at 563-564.

[139] Part of what was new about the insight was that it suggested that particular kinds of credit might have their own dynamics:

> These findings throw new light upon the familiar theory that "credit," in a generic sense, plays a dominant role in the business cycle. Clearly a distinction needs to be drawn between the various forms of credit. Many types of financing – for example short-term and stock financing – appear to behave in the way theory would indicate; but bond financing runs a contrary course to other types and thus acts, so to speak as a stabilizing force.

See Bond Cycles, *supra* note 136, at 21.

[140] *See Liquidity and Leverage*, *supra* note 22, at 3 ("We show that leverage is strongly procyclical for these intermediaries, and that the margin of adjustment on the balance sheet is through repos and reverse repos (and other collateralized borrowings.").

[141] *Id.*.

[142] *Id.*.

[143] *Id.*.

[144] *See Liquidity and Leverage*, *supra* note 22, at 5-6.

[145] *Id.* at 7.

[146] *Id.*

[147] *Id.* at 8.

bear market prices during a bust.[148] They did this in the repo market discussed earlier.[149] These firms borrowed (increasing leverage) while asset prices rose, so their borrowing funded investment demand that helped to keep prices rising.[150] In other words, this type of firm borrowed pro-cyclically. Anecdotal evidence about the growth of leverage at major investment banks suggests as much. Between 2000 and 2007, the debt-to-equity ratio of the five largest U.S. investment bank firms increased from 30:1 to 41:1, increasing their ability to capture bumper returns but exposing them to funding liquidity risk on the downside.[151]

This procyclical argument is the opposite of what Hickman had observed about bonds and, at the same time, is consistent with Minsky's claim that financial firms have the tendency to borrow themselves into fragility during periods of easy money. This analysis is similar to Minsky's but it offers no explanation for what causes the direction of price trends to change. So it is a model of a "financial cycle" without the causation that Minsky posited: it is the escalating increases themselves during the bull cycle that leads to the bear raids on the way down.

The liquidity implications of the procyclical argument support my claims about liquidity dynamics. Expressed in terms of liquidity dynamics, pro-cyclical leveraging boosts asset prices and promotes market liquidity by creating investment demand, but the extra leverage may compromise the borrower's liquidity. Herd behavior intensifies this trend insofar as it encourages firm managers to take on more financial risk – including through leverage – to avoid standing out from the prevailing sentiment of the moment.[152] This is especially true when financial uncertainty is greatest.[153] Conversely, these firms shed leverage as asset prices fall.[154] Insofar as doing so uses the firm's cash flow to retire debt rather than to invest in assets, the value of these assets would tend to drop, adding to a bear cycle.[155] One example of pro-cyclical deleveraging is the earlier example of investment banks that cut-back their credit exposure to hedge funds, in so doing destabilizing the price for credit products being marketed by the same investment banks.[156]

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[148] *See Liquidity and Leverage*, *supra* note 22, at 10-11.
[149] *Id.* at 17-18.
[150] *Id.*.
[151] Shawn Tully, What's Wrong with Wall Street and How to Fix It, Fortune 72, 74 (Apr. 14, 2008).
[152] *See* Pouncy, *supra* note 26, at 564 ("..a manager's decision will be evaluated based on whether it is consistent with, or departs from, conventional decision-making and popular sentiment, and rewarded asymmetrically in a manner consistent with conventional decision-making.") (citation omitted).
153 As Pouncy puts it: these managers "prefer to accept the risk of being wrong and losing money along with everyone else to what appears to be the greater risk of being wrong and losing money alone." *Id.* at 465.
[154] *Id.*
[155] *Id.*
[156] *See supra* notes 101-103 for hedge fund example.

Even those who concede that borrowing cycles contributes to financial instability might reasonably conclude that regulation has already "corrected" the cycle.[157] After all, it has been years since a major crash, so it becomes more plausible to think that we have transcended financial instability.[158] And meaningful cycle arguments may need comparable information about borrowing in different periods that is just not available, as noted about high-yield issuance,[159] corporate debt,[160] and interest-rate history in general.[161] Despite these points, thinking in terms of leverage or financial cycles helps to theorize about cause-and-effect relationships. My point in the next section is to look more closely at how different types of borrowing intensify the direction of these cycles.

B. *Minsky: modeling leveraged liquidity*

Perhaps because he had seen the effects of the Depression first hand, Minsky recognized that self-policing markets could productively coordinate many of the details of economic life but he saw the need for regulatory intervention too.[162] Coming of age intellectually in the 1950s, he learned economics before the rise of deductive financial models that assumed away how firms and markets actually behaved for the sake of reaching elegant mathematical conclusions. His doctoral dissertation at Harvard focused on macroeconomics but it had strong elements of microeconomic thought too, insofar as

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[157] "As the sixties progressed, eminent economists – especially those associated with government policy formulation – who in their own minds were disciples of Keynes, were announcing that endogenous business cycles and domestic financial crises were a thing of the past, now that the secrets of economic policy had been unlocked." HYMAN P. MINSKY, JOHN MAYNARD KEYNES 15 (1975) [hereinafter KEYNES].

[158] "Thus an economic theory based upon a business cycle associated with a financial-instability view of how the economy operates can be replaced by theory with an equilibrium and steady-growth perspective, because the relevant observations to substantiate the cyclical, financial instability view cannot be made. This is what took place as the forties, fifties, and sixties spun their tales of war and apparent economic success – a success achieved with the aid of apparently monetary and fiscal policy." *Id.* at 16.

[159] As noted about these markets, "A serious problem exists even with what should be simple measures of volume and value – not all published measures are the same. The "size of the market" can alternatively mean "all outstanding" or "outstanding less defaults," leading to indeterminacy. GLENN YAGO & SUSANNE TRIMBATH, BEYOND JUNK BONDS[:] EXPANDING HIGH YIELD MARKETS vii-viii (2003) [hereinafter BEYOND JUNK BONDS].

[160] Acknowledging the lack of a central data base for bond transactions, one group of researchers used the database of a securities custodian to examine bond trading. George Chacko, *Liquidity Risk in the Corporate Bond Markets* 8 (2005) (arguing that broker or market marker accessibility to a security is a proxy for a bond's trading market liquidity).

[161] At best, one gets an impressionistic sense of certain lending trends: "Economists sometimes ask the impossible: a series of yields or interest rates over long periods of time derived from instruments of substantially identical terms…The objectives of some forms of economic analysis require just this uniformity. In real life it often does not exist, even from year to year." SIDNEY HOMER & RICHARD SYLLA, A HISTORY OF INTEREST RATES 433-34 (2005) [hereinafter HISTORY OF INTEREST].

[162] His is a good synthesis for those who respect financial markets while wanting to improve on them:

> For a new era of serious reform to enjoy more than transitory success it should be based on the understanding of why a decentralized market mechanism – the free market of the conservatives – is an efficient way of handing the many details of economic life, and how the financial institutions of capitalism, especially in the context of production processes that use capital-intensive techniques, are inherently disruptive.

UNSTABLE ECONOMY, *supra* note 120, at 5.

it pointed to the special role played by finance firms in the economy overall.[163] Indeed, Minsky's doctoral thesis anticipated the insight that not only did the firm's liability structure matter in terms of liquidity generally but that it helped to determine that type of assets that the firm would hold.[164] It was in this context that he developed the financial instability thesis, the idea that the financial sector – as a whole – had a tendency to borrow itself into periods of financial fragility that would culminate in acute episodes of financial instability.[165]

He elaborated the thesis as part of his project of re-interpreting the work of John Maynard Keynes on financial markets.[166] For much of his career, Keynes had worked within the dominant paradigm for financial and monetary policy.[167] Known as the "quantity theory of money," the theory explained the amount of money in circulation in terms of "economic equilibrium."[168] Keynes explored this idea in *A Treatise on Money*, his major economic work before the *General Theory*, which introduced his own theory about money and became a pillar in the field.[169] The *General Theory* and, said Minsky, *A Treatise on Money* broke with the establishment by saying that investor preference for liquidity influenced the money supply and that uncertainty pervaded the production and circulation of money.[170] Holding liquidity helped to mitigate the uncertainty of future states of the world.[171]

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[163] It is this general insight about the importance of market structure for secondary liability markets which later parts of this Article develop: "The bulk of Minsky's thesis turns out to be an extended examination of the consequences of financial liabilities on the investment behavior of firms." Jan Toporowski, *Methodology and Microeconomics in the Early Work of Hyman P. Minsky* 5 (Working Paper No. 480, 2006).

[164] *Id.*

[165] *Id.*

[166] KEYNES, *supra* note 157, at v.

[167] His work in economics during the twenty-five years prior to 1935, while novel in detail, often subject to controversy, and typically deviating from the conventional wisdom when discussing public policy, was, on the whole, in the discipline's mainstream: his criticisms were within but not of standard theory. *Id.* at 2.

[168] "The fundamental propositions of the quantity theory of money are that for positions of equilibrium, money is neutral, in the sense that relative prices, incomes, and output do not depend upon the quantity of money; that the general level of prices is determined by the quantity of money; and that a decentralized economy is fundamentally stable. Keynes' attitude, prior to *The General Theory*, was that these quantity-theory propositions were basically valid, but that the theory was vague and imprecise about the mechanisms and processes by which the long-run results were achieved…" *Id.* at 2.

[169] *Id.* at 10.

[170] "*The General Theory* marked a sharp break with this earlier position on the quantity theory. Keynes attacked with great gusto and obvious relish the logical and empirical foundations of traditional economics…He introduced novel tools of analysis, such as the consumption preference and the liquidity preference, and employed concepts unfamiliar to mainstream economists, such as uncertainty." KEYNES, *supra* note 157, at 2.

[171] Liquidity has special value in an uncertain world because people

> …recognize that predictions of both future earnings and future liabilities are unreliable. Faced with the unknowability of the future, economic actors view money differently from the way they view other goods. Money is a liquid store of value that can be used to satisfy contractual commitments if earnings fail to meet, or liabilities exceed predictions. *See* Pouncy, *supra* note 26, at 543-544 (citation omitted).

Keynes' peers accepted some of these ideas, which have stood the test of time given that active intervention in monetary policy has come to be taken for granted. The economics establishment of Keynes' day, however, accepted his ideas only piecemeal, rejecting elements deemed too radical, like the central role of uncertainty, the cyclical nature of a capitalist economy, and the importance of the firm structure of financial relations.[172] Minsky wanted to correct the omission by using Keynes to explain the economic instability that had emerged after the period of post-war financial conservatism by pointing to "cumulative changes in financial relations and institutions over the years following World War II."[173] In other words, he wanted a more robust version of the *General Theory* that emphasized the institutional structure of financial markets. As he put it, "[i]gnoring financial markets while trying to explain the behavior of advanced capitalist economies is like ignoring the Prince in casting a production of Hamlet."[174] So Wall Street and The City (a reference to the London capital market) figure prominently in his work.[175] Importantly, Minsky defined financing "functionally" in terms that transcend whether or not a firm is organized as an insured depository institution or not, making his approach especially relevant as nonbank lenders become active in the credit market.[176] In particular, the liability structure of these finance firms – how they used debt to finance themselves – was central to his theory of instability.[177]

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[172] "The substance of what was neglected in the development of the synthesis [of Keynes into mainstream economics] can be grouped under three headings: decision-making under uncertainty, the cyclical character of the capitalist process; and financial relations of an advanced capitalist economy." *See* KEYNES, *supra* note 157, at ix. Avoiding these elements made the General Theory easier to swallow: "That is, once uncertainty and the cyclical perspective were ignored, which is a tall order, [Keynes'] new theory could be phrased in terms of familiar constructs, first modified and then put together in a novel manner." *Id.* at 60. The introduction in the Banque de France's recent collection of fifteen essays on liquidity highlights these very three issues: the role of uncertainty, liquidity, and the structure of the finance sector. *See Liquidity in a time of financial turbulence*s, in BANQUE DE FRANCE, *supra* note 23, at ii-iii. Somewhat ironically, a friend and colleague of his notes that towards Minsky's final days (he died of cancer in 1996), he proposed his own synthesis of his economic approach to neoclassical economics. "Minsky's reconciliation was pointing to the fact that his brand of economics augments and transforms standard theory by stressing the need to understand market processes in their institutional and historical context." Charles J. Whalen, *A Minsky Moment: Reflections on Hyman P. Minsky* (1919-1996), J. OF ECON. ISSUES 249, 252 (Mar. 2008) (citation omitted).

[173] MINSKY, UNSTABLE ECONOMY, *supra* note 120, at 5.

[174] Hyman P. Minsky & Mark D. Vaughan, *Debt and Business Cycles*, BUS. ECON., July 1990, at 23, 24 [hereinafter *Business Cycles*]. Minsky noted that "in the various versions of the neoclassical synthesis the financial mechanism, which is central to Keynes' interests, is almost always treated in a truncated fashion." KEYNES, *supra* note 157, at ix.

[175] *See, e.g.*, UNSTABLE ECONOMY, *supra* note 120, at 223-253.

[176] As he notes, the business of banking is – effectively – dispersed across several financial intermediaries: "The line between commercial banks…other depository thrift institutions, miscellaneous managers of money (like life insurance companies, pension funds and various investment trusts), and investment bankers is more reflective of the legal environment and institutional history than of the economic function of these financial institutions." *See* UNSTABLE ECONOMY, *supra* note 120, at 223.

[177] It is the opposite of what the Miller-Modigliani approach suggests: "We must develop economic institutions that constrain and control *liability structures, particularly of financial institutions* and of production processes that require massive capital investment." *Id*. at 5 (emphasis added). *Cf.* Francisco Modigliani & Merton H. Miller, *The Cost of Capital, Corporate Finance, and the Theory of Investment*, 48 AM. ECON. REV. 261, 268 (1958) "Any decision [by a firm] to acquire real capital assets, as he was keen to emphasize, bequeaths the firm with a certain liability structure that shapes its balance sheet for a long time to come. This liability structure is either validated or contradicted by future events, with possibly dire

Others have observed that financial instability always involves debt speculation, but what Minsky adds is a method for classifying borrowing based on how it impacts the borrower's liquidity and how it will be impacted by future market liquidity.[178] Granted, many forces can make the financial sector more fragile, but Minsky's method diagnoses how specific financing deals can set the stage for both funding and market liquidity problems later. It also has the virtue explaining sectoral trends by starting with an example of how an individual firm finances itself and extrapolating from there to suggest sector-wide trends. (Minsky did not provide many extended analyses of particular liability markets, so the next Part is a case study of leveraged loans.[179])

Taking loans as a fact (not as a modeling assumption), he noted that a borrower pays back both the principal and interest at different points during a loan.[180] Making what is really a Coasian move, Minsky divided loans into three types: hedged, speculative, and Ponzi, each of which produces different liquidity dynamics.[181] In a hedged borrowing, the borrower expects the cash flow forthcoming from investment of the loan proceeds to be enough to cover both the principal and interest due in each of the loan's payment periods.[182] That is, the borrowing is "self-liquidating" in the old-fashioned sense used by the Fed to identify collateral acceptable for rediscounting.[183] By paying down the principal, the borrower gradually reduces its leverage attributable to the

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consequences as firms' expected returns might never be realized." Korkut A. Erturk, *On the Minskyan Business Cycle* 1 (Levy Inst. of Econ., Working Paper No. 474, 2006).

[178] See JOHN KENNETH GALBRAITH, A SHORT HISTORY OF FINANCIAL EUPHORIA 20 (1993) ("All crises have involved debt that in one fashion or another, has become dangerously out of scale in relation to the underlying means of payment.") *See also id.* at 76-77 (discussing the role of margin leverage in contributing to the 1929 crash). Legal scholars have cited him generally for his thesis about financial instability, but the recent events in the credit market make the specifics of his classification of borrowing timely. Frank Partnoy, *Why Markets Crash and What Law Can Do About It*, 61 U. PITT. L. REV. 741, 755-56 (2000) (identifying Minsky's financial instability thesis as a precursor to Charles Kindleberger's economic history of financial market crashes). Partnoy situates Minsky as a source of economic arguments that financial markets crash because of "cognitive error" on the part of individual borrowers and lenders in the market. *Id.* at 754-55 (comparing theories based on cognitive error with those based on moral hazard and information asymmetry).

[179] For example, he points out that the U.S. Treasury is a speculative, rather than hedge borrower because of its tendency to refinance maturing principal obligations: "The Treasury with its large amount of outstanding short-term bills is, in effect, a speculative unit, as are commercial banks. In the sense the term is used here, any financing of long-term assets with short-term debt makes the borrower a speculative unit." *Business Cycles*, *supra* note 174, at 26. Given the doubling of U.S. public debt in the last 5 years, it might be more accurate to see the Treasury as a Ponzi borrower.

[180] UNSTABLE ECONOMY, *supra* note 120, at 206-207. "Hedge financing units and their bankers…expect the cash flow from operating capital assets (or from owning financial contracts) to be more than sufficient to meet contractual payments commitments now and in the future."

[181] *See infra* note 363 and accompanying text.

[182] UNSTABLE ECONOMY, *supra* note 120, at 206-207. "Hedge financing units and their bankers…expect the cash flow from operating capital assets (or from owning financial contracts) to be more than sufficient to meet contractual payments commitments now and in the future."

[183] Self-liquidating paper refers to "paper which is issued or drawn under such circumstances that in the normal course of business there will automatically come into existence a fund available to liquidate each piece of paper, that fund being the final proceeds of the transaction out of which the paper arose." *See* FEDERAL RESERVE LENDING HISTORY, *supra* note 4, at 31 (quoting a 1918 Bulletin of the Federal Reserve).

loan. If it is a fixed-rate loan, rising interest rates do not increase the interest costs to the borrower or jeopardize its liquidity, although the borrower "loses" if rates drop, especially if the borrower has floating-rate assets. On the other side of the loan, the lender in a hedged-borrowing has less default risk (although, conversely to the borrower, the value of the loan to the lender will deteriorate if rates rise). Unless the lender has negotiated a pre-payment penalty, the lender may lose value if interest rates drop.

A loan is "speculative," the second of Minsky's borrowing types, when the proceeds of its investment will produce enough cash flow to pay the interest as it becomes due but not the principal as it matures.[184] To pay principal, the borrower will have to refinance, risking higher interest rates or a decline of its own creditworthiness, risks that liquidity euphoria make seem distant.[185] The speculative lender also risks more, particularly if it has waived debt covenants. And, a speculative loan may "cost" the lender more in terms of regulatory capital, a cost that increases with the risk of the loan or the borrower. To the lender, too, these costs can seem remote so long as the lender anticipates off-loading the loan in the secondary market, as has become common. Minsky saw a floating-rate loan as "inherently speculative."[186] A borrower can hedge the risk from a floating-rate by swapping into a fixed rate, but the borrower incurs costs and the risk that the swap counterparty will default.

The cash flow from a Ponzi borrowing, the third of Minsky's types, will finance neither the interest nor the principal due on the loan as these payments become due.[187] As in the speculative loan, even on its first day the borrower expects to re-enter the market to refinance rather than count on operating cash flow to repay the loan, a dynamic suggested by the subprime residential mortgage market.[188] A Ponzi lender also faces the risk that the loan's value will deteriorate, more so than with a speculative loan.

Thinking in terms of the three borrowing types explains the funding and market liquidity both reflect the effect of leveraged liquidity. First, Minsky's classification shows how borrowing affects a firm's funding liquidity and exposes it to future price risk when refinancing. Hedged borrowing has low funding liquidity risk because the firm can pay interest and principal from its internal cash flow, rather than refinancing. Speculative borrowing exposes the firm to liquidity risk and forces it back into the credit market.

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[184] UNSTABLE ECONOMY, *supra* note 120, at 207. "Speculative finance involves the short [term] financing of long [term] positions. Commercial banks are the prototypical speculative financial organization."

[185] *Id.*

[186] "[A] unit that borrows at floating rates is engaged in a form of speculative finance, even though at ruling interest rates it is engaging in hedge financing." MINSKY, UNSTABLE ECONOMY, *supra* note 120, at 208.

[187] Whether or note the borrower and lender make this assumption explicit, Ponzi borrowing assumes future borrowing to meet the contractual repayment obligations on the debt: "whereas the short-period cash flows for speculative units are such that financing costs do not increase outstanding debt, for Ponzi finance units financing costs are greater than income, so that the face amount of the outstanding debt increases: Ponzi units capitalize interest into their liability structure." *Id.* at 207.

[188] Even though subprime borrowers who had taken out floating-rate loans with low "teaser" rates knew that the rates on their loans would rise eventually, the prospect of refinancing at the reset debt to avoid the rate hike would have seemed likely insofar as these borrowers also assumed that real estate prices would also rise.

Ponzi borrowing does the same, only more so because the borrower can fund neither the interest nor the principal due from internal cash flow. That is, speculative and Ponzi borrowings make the borrower provisionally more liquid (through inflow of cash), but they encumber that liquidity with claims to repayment that exceed the expected cash flow from the use of the loan proceeds. In this sense, speculative and Ponzi financing compromise the borrower's future liquidity.[189] This is "leveraged liquidity" as it applies to the borrower's funding liquidity.

Second, Minsky's classification also shows how borrowing influences leveraged (market) liquidity in several ways. First, the spending power made possible by speculative and Ponzi borrowing funds the borrower's demand for return from investment in other assets, whose prices go up, as noted in the research on pro-cyclical financial firms. This is an example of market liquidity because the borrower's leverage helps to underwrite the salability of assets in their secondary markets. Second, borrowing on speculative and Ponzi terms is likely to encourage investment by the borrower of the loan proceeds in speculative and Ponzi assets because they promise a higher return (think of what happened to the savings and loans in the 1980s). Finally, both of these effects on market liquidity loop back to the funding liquidity of borrowers because the assets pursued for investment by these borrowers may be themselves – as is the case with leveraged loans and other structured credit products – the speculative and Ponzi borrowing of another firm.

This final point reflects the circularity produced by the originate-to-distribute model. Lenders originate a loan and then sell it in the secondary market as a credit asset. With the proceeds of the loan, the borrower can invest in other assets, including in the distributed loans of other borrowers in the secondary credit market. The lender anticipates this demand for distributed loans, so it may be more willing to make speculative and Ponzi loans in the first place. There may be leverage on both sides of the transaction: the borrower leverages when taking out the loan and, to the extent that borrower funds are used to buy distributed loans, the demand for these loans is also leveraged. In this scenario, borrowing can challenge the borrower's funding liquidity while contributing to the liquidity of the secondary market for loans, hence the inverse relationship mentioned earlier between borrower and market liquidity.[190]

Contrast this with the opposite of leveraged liquidity: the liquidity produced in a repurchase agreement.[191] In this case, market demand for a less liquid security induces investors to sacrifice liquidity by offering cash as collateral for what is, in effect, a

[189] Pouncy notes that on the upside of the cycle the firm is becoming less liquid as asset values are rising: "This period of euphoric expectations leads to increased investment, improved corporate earnings, and lower unemployment. These conditions validate the recent use of speculative finance and the maintenance of higher debt-to-equity ratios. However, the rise of debt-to-equity ratios results in less liquidity. Firms go to the debt market, which is now responding to increased demand, with higher interest rates." *See* Pouncy, *supra* note 26, at 567 (citation omitted).

[190] *See supra* notes 85-90 and accompanying text.

[191] *See supra* notes 68-72 and accompanying text.

securities loan (what I called a negative liquidity preference earlier).[192] It is a fully hedged borrowing in Minsky's scheme, because the liquidation value of the security can cover the loan (and many repos have an extremely short term, i.e., overnight, such that risk is limited by the deal structure itself). So long as all borrowing is of the hedged type, there is little financial fragility and, presumably, slower growth because it is as though the borrower is on a gold standard of its own: it will borrow only when the credit can be backed by its assets.

It is speculative and Ponzi borrowing that introduces risk both to the borrower and to the sector as a whole. When a firm that has borrowed on speculative or Ponzi terms faces a maturing payment of interest or principal, the borrower must either refinance or sell an asset to fund the payment. Refinancing is fine so long as the origination and credit trading markets continue to escalate, but when this is not the case, the borrower must sell assets. If many borrowers find themselves in this situation at the same time, their liquidating asset sales have the effect of a bear raid on these credit products, driving down the trading price of these assets and making lenders skittish about refinancing. This means that other borrowers facing maturing debt may also have to sell assets, liquidity dynamics that potentiate each other and can lead to the extreme events that show up as "fat tails" but not as foreseeable losses in most financial models.[193] Leveraged liquidity, then, can engender financial fragility leading to instability, even as it seems to be contributing to stability by facilitating exchange.[194]

Expressed in terms of Minsky's borrowing types, then, what began to happen in July 2007 was that firms could no longer refinance their speculative and Ponzi financing. A report of the European Central Bank on leveraged buyout financing by European banks issued three months before the summer 2007 credit crunch suggested that banks anticipated that these financing structures were "unsustainable":

> Interestingly, some market participants [European banks] tend to admit that some of the LBO deals currently being financed are characterized by capital structures that are known to be unsustainable in the long term, on the assumption that the deals can be refinanced on more favourable terms in the near future.[195]

That is, these bankers knew that they were engaging in speculative and Ponzi lending that would fall apart when the bubble burst. The market's validation of what these bankers expected has led some financial commentators to speak of the credit contraction as a "Minsky moment." But just as Minsky had objected to the selective

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[192] *Id.*

[193] It is another example of the link between asset and market liquidity: "Ultimately, however, financial innovation will be unable to generate the profits necessary to service debt. Firms will attempt to sell assets to service debt, and the asset market will become flooded." *See* Pouncy, *supra* note 26, at 568

[194] Adrian and Shin's argument that leverage is pro-cyclical and that market structure creates channels of new contagion are in line with Minsky's argument about how borrowing increases on the upside of the market. *See Liquidity and Leverage*, *supra* note 22.

[195] EUROPEAN CENTRAL BANK, LARGE BANKS AND PRIVATE EQUITY-SPONSORED LEVERAGED BUYOUTS IN THE EU 39 (April 2007).

incorporation of Keynes' *General Theory*, seeing "Minsky moments" as *only* the acute contractions misses Minsky's more basic point: it is the liquid moments leading up to the contraction – specifically speculative and Ponzi deals put on during stable periods – that resolve into financial instability. The next section looks at why and how corporate leverage markets have become increasingly prone to both leveraged liquidity and speculative and Ponzi financing.

C. *Shifts toward speculative and Ponzi financing*

Leveraged liquidity is more common now because of trends towards more speculative and Ponzi financing that, as discussed below, have changed the structure of corporate leverage markets. Market structure matters because, as has been observed about the quality of trade execution for retail investors in equities, the market is its market structure because it is this structure that determines the outcomes for buyers and sellers and defines the dynamics that regulators must address.[196] Thinking in terms of market structure is more common when law requires it, for example in telecommunications, anti-trust law, and the federal securities market.[197] Credit markets have a structure too, but the divide between bank and securities regulation creates a regulatory gap. True, the SEC has a statutory mandate to look after the national capital market system, but it has focused on equity markets, even though more debt than equity is raised in capital markets. Banking regulators do consider the market structure of banking; but regulation has yet to catch up with current banking practices let alone a specialized practice area like corporate lending.[198] Indeed, the financial sector may be changing too rapidly to freeze in any single regulatory model.[199]

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[196] Lawrence E. Mitchell, *Structure as an Independent Variable in Assessing Stock Market Failures*, 72 GEO. WASH. L. REV. 547 (2004). The equity markets which he analyzes include the physical and over-the-counter trading mechanisms in which buyers and sellers exchange equity securities. *Id.* at 560-63 (listing the major stock exchanges, securities associations, and alternative trading systems where equities trade). Mitchell argues that focusing on market structure would better reveal the effect of market dispersion on competition and its effects on execution quality for retail investors. *Id.* at 563-568 (focusing on order routing and execution of equity trades by retail investors).

[197] Congress gave the Securities and Exchange Commission ("SEC") authority to analyze the national structure of capital markets in the National Market System Amendments of 1975, some forty years after establishing the SEC. Dale A. Oesterle, *Has the SEC Exceeded its Congressional Mandate to Facilitate A "National Market System" in Securities Trading*, 1 N.Y.U. J. L. & BUS. 613, 617-29 (2005) (analyzing the history and context of the National Market System Amendments). *See* Corinne Bronfman, Kenneth Lehn, & Robert A. Schwartz, *Market 2000: The SEC's Market 2000 Report*, 19 IOWA J. CORP. L. 523 (1994) (describing the enactment of the National Market System Amendments of 1975, which identified specific aspects of market structure policy on which the agency should concentrate). Congress and the SEC disagreed over what the agency's role in market structure should be: Congress favored a more substantive role in promoting competition while the SEC preferred to analyze and influence market structure through requiring disclosure about firms and products. *Id.* at 528-29.

[198] Since passage of the Bank Merger Act of 1960, Federal Reserve member banks have held annual conference to report on trends in U.S. banking structure. *See* FED. RESERVE BANK OF CHICAGO, A BRIEF HISTORY OF THE CONFERENCE ON BANK STRUCTURE & COMPETITION, *available at* http://chicagofed.org/news_and_conferences/conferences_and_events/2005_bank_structure_history.cfm.

[199] Alastair Clark, *Analytical models of financial stability* 12-13, Cass Business School (Mar. 28, 2007) ("…there is one further difficulty [in modeling financial stability] – namely that the structure of the financial

I emphasize four trends that contribute to these changes. First, like Dr. Strangelove with the bomb, we have gotten used to speculative and Ponzi forms of borrowing, both in our personal finances and as stewards of firms. Second, during the recent period of low volatility and easy money, firms borrowed more at floating-rates, exposing themselves to interest-rate risk. Third, more nonbank lenders are both originating and trading corporate credit, beyond the purview of federal financial regulators. Finally, the business models for different types of financial intermediaries (commercial banks, investment banks, insurance companies) are converging with respect to their pursuit of revenues from credit risk assets. It is secondary markets for credit that have made these convergences possible and helped to underwrite speculative and Ponzi financing.[200] Each of these four factors represents the kind of "financial innovation" whose impact on financial stability has not been properly appreciated by neoclassical explanations of financial markets.[201]

In his wry history of credit expansion, James Grant traces how U.S. borrowers became more "leverage-friendly."[202] Credit was limited in the 19th and early 20th centuries, because firms were reluctant to borrow and financial institutions were reluctant to lend except on a fully (or over-) collateralized basis.[203] During this period, the gold standard helped to limit credit by linking it to the real economy.[204] Before the Great Crash, margin leverage greatly contributed to speculation in securities.[205] And public utility holding companies bucked the trend of the times against leverage.[206] Willingness

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sector is changing and arguably changing faster than any other sector in the economy.") (comparing different financial models used by central banks).

[200] The factors are common in the literature on securities and credit market structure. Equity market literature focuses on the identity, function, and interests of institutions (like brokers and proprietary exchanges); how the markets themselves are organized and connect to each other; the depth and liquidity of securities markets when they are spread across a national system; and the role of Commission rules on, among other things, whether consumer protections for retail investors are adequate. The banking market structure literature focuses on the kinds of loan assets which banks hold, how these banks fund themselves, and, crucial given the Federal Deposit Insurance Corporation's role in bearing residual downside risk for insured deposits, how the mix of bank assets and liabilities affects the liquidity of the institution itself.

[201] *See* Pouncy, *supra* note 26, at 524-538 (identifying floating-rate notes, swaps, and, securitization as financial innovations).

[202] *See generally* JAMES GRANT, MONEY OF THE MIND (1992) (tracing the history of credit expansion from the establishment of the Comptroller of the Currency through the 1980s leverage buyout phase).

[203] The process of credit expansion took about a century: "For a time in the 1980s, it seemed that anyone could get a loan; that, indeed, almost nobody would be given the opportunity to refuse one. The opposite condition ruled around the turn of the century." *Id.* at 76.

[204] *Id*. at 7 ("The gold standard, which President Cleveland championed a century ago, was a system for coordinating the growth of money and credit with growth of production and population.") Under the standard, money was a liability of the issuer, i.e. the Treasury or the central bank, which would issue only so much money as was backed by gold in reserve.

[205] *See* GALBRAITH, *supra* note 178, at 76-77 (showing how margin leverage of 10:1 with margin credit rates as high as 15 contributed to leverage before the 1929 crash).

[206] By establishing a holding company to hold the equity interest in the base company, the enterprise could multiply the number of related entities that could issue preferred stock and debt. The quality of the preferred and debt suffered. Although the Public Utility Holding Company Act of 1935 curbed the use of holding company leverage, overall, the New Deal began a period of credit expansion and laid the groundwork for the

to leverage began to increase again after the implementation of New Deal credit programs.[207] Federal deposit insurance helped to create confidence in lending as did other New Deal credit allocation programs that contributed to a "democratization of credit."[208] The public debt grew too, especially during World War II.[209] Nevertheless, immediately after World War II, a culture of "financial conservatism" contributed to relatively little leveraging by firms and individuals.[210] This would change in the following decades, in part as housing finance programs expanded, making home ownership (at least in formal terms) a reality for more people. Formal homeownership (and mortgage debt) increased from around 60% in the early 1990's to more than 65% by 2000.[211] But these owners have extracted (and spent) much of the equity in their homes through refinancing and equity lines of credit.[212] While formal homeownership has grown, then, the average net equity in homes has decreased.[213] As one journalist recently put it – "Why do we love leverage so much that it hurts?"[214]

A second factor that has contributed to speculative and Ponzi financing is the growth of floating-rate debt, a kind of borrowing that Minsky considered *per se* speculative because it exposes the borrower to liquidity risk as interest rates change.[215]

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corporate leverage cycle. Blair-Smith and Helfenstein, *A Death Sentence of New Lease on Life? A Survey of Corporate Adjustments Under the Public Utility Holding Company Act*, 94 U. PA. L. REV. 148 (1946).

[207] As Grant puts it:

> [I]t was in the Depression that the government first offered its guarantee wholesale in lieu of the credit of banks and individuals. The consequences of this epochal change were slow in coming, awaiting the time when the existing generation of lenders, whom the Depression had scarred for life, were ready to move on. In time, the socialization of risk – in which A paid B's debts, and perhaps Z's – would help to ignite the greatest credit expansion in American annals.

See GRANT, *supra* note 202, at 242.

[208] The phrase belongs to Arthur J. Murray, an early advocate of credit expansion. *Id.* at 77.

[209] Between 1940 and 1945, the federal public debt grew nearly six-fold from $43 billion to $260 billion. BUREAU OF THE PUBLIC DEBT, *Statistics.*

[210] *Business Cycles*, *supra* note 174, at 24. "Due in large part to the financial structure conservatism induced by the Great Depression and the [price] controls of World War II, extraordinarily low ratios of private indebtedness to aggregate income obtained for much of that period…In practical terms, cash flow commitments due to liabilities were very small relative to incomes."

[211] *See* Wenli Li, *Moving Up: Trends in Homeownership and Mortgage Indebtedness*, BUSINESS REVIEW, Federal Reserve Bank of Philadelphia, at 3 (Second Quarter 2005), *available at* www.phil.frb.org/files/br/brq105wl.pdf (analyzing home ownership and financing trends using consumer and banking data).

[212] For example, in 2003 homeowners liquidated $312 billion in equity through refinancing and equity lines of credit. *See* Federal Deposit Insurance Corporation, *Households Use Home Equity to Increase Cash Flow*, *Consumer Sector Outlook for 2005*, *available at* http://www.fdic.gov/bank/analytical/regional/ro20044q/na/2004winter_01.html (summarizing trends in economic indicators reflecting consumer income, wealth, and consumption).

[213] *See* Javier Silva, *A House of Cards Refinancing The American Dream*, DĒMOS (public policy institute which studies economic insecurity and advocates for interventions and to reduce it), January 9, 2005, http://www.demos.org/pub409.cfm (concluding that much of the cash flow from refinancing and equity lines of credit obtained between 2001 and 2003 went to cover living expenses and pay down consumer credit)

[214] Michael S. Rosenwald, *Why We Borrow Until It Hurts*, WASHINGTON POST, Mar. 23, 2008, at F1 (comparing leverage by households with corporate and investment leverage).

[215] The conclusion predates the growth of interest-rate swaps that let borrowers convert floating-rates to fixed rates, albeit by taking on default risk to the swap counterparty: "[A] unit that borrows at floating rates is

Firms must contend with interest-rate risk even when using fixed-rate debt, but floating-rate debt adds complexity.[216] For example, it was the mismatch between variable-rate liabilities and fixed-rate assets that triggered the savings and loan crisis of the 1980s.[217] These institutions found themselves locked-in to mortgages and other long-term assets paying only a fixed-rate while their liabilities – that kept rolling over during the term of these fixed-rate assets – became more expensive to service as interest rates rose.[218] In response, these institutions took increasingly riskier bets in real estate and other investments, a strategy that ultimately led many of them into insolvency.[219]

The rate on most firm borrowing before the 1970s tended to be fixed.[220] U.S. banks had lent at floating rates abroad but not in domestic markets.[221] This began to change in the 1970s, as banks lent at floating rates domestically to protect themselves from rising interest rates.[222] Today, the LIBOR is the most widely used floating-rate for corporate borrowing.[223] For example, a climb in LIBOR of 26 basis points (a quarter of a percent) between April 14-18 of 2008 increased the annual interest cost to corporate borrowers by about $18 billion.[224] To protect their own risk from drops in the LIBOR, lenders have begun to impose floors on LIBOR loans, which means that the borrower faces only the downside risk that rates will rise while not enjoying the upside risk that LIBOR will fall.[225] It is an example of bargaining power returning to lenders. Granted, firms can "swap" out of floating-rate risk but these arrangements do not always work because the firm becomes exposed to the swap counter-party's own credit risk, as suggested by recent experiences with monoline bond insurance.

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engaged in a form of speculative finance, even though at ruling interest rates it is engaging in hedge financing." UNSTABLE ECONOMY, *supra* note 120, at 208.

[216] For example, if interest rates decline against a fixed-rate liability of the issuer, then the real costs of servicing that liability increase (if interest-rates rise against a fixed-rate liability, that debt does "into-the-money" for the issuer, who would have to pay more to secure comparable funding in the then current market).

[217] JERRY W. MARKHAM, 3 A FINANCIAL HISTORY OF THE UNITED STATES 152 (2002)

[218] *Id.*

[219] *Id.*

[220] Interest rate historians Sidney Homer and Richard Sylla identify 1981 as the peak of this trend: "At their 1981 peaks, seasoned prime long corporate bonds were selling to yield 15.50%. Commercial paper yields reached 16.66%, three-month Treasury bills sold to yield about 16.30%, and the Federal Reserve's discount rate was raised to 14%. The annual average of the prime rate in 1981 was 18.87%." HISTORY OF INTEREST, *supra* note 161, at 335.

[221] HAROLD VAN B. CLEVELAND & THOMAS F. HUERTAS, CITIBANK 1812-1970 267–68 (1985) (analyzing the history of Citibank).

[222] Variable- or floating rate instruments – loans, notes and mortgages – came in as another way to cope with market fluctuations and inflation. The interest rate on instruments was linked to other key interest rates, such as U.S. Government bill, note, and bond rates, or the London inter-Bank Offered Rate (LIBOR), a rate akin to the U.S. Federal Funds rate, in the Eurodollar market. To the extent that such key interest rates follow inflation rates, there is little difference between variable- or floating-rate financing and inflation indexing. HISTORY OF INTEREST, *supra* note 161, at 433.

[223] *See* Mollencamp, *supra* note 47, at B1 (analyzing impact of climbing LIBOR on $9 trillion in corporate borrowing and $900 billion in sub-prime residential debt).

[224] *Id.*

[225] *Id.* at B5

A third factor tending towards the fragility of the finance sector is the growth of nonbank financial intermediaries as both originators and traders of corporate credit products. These nonbank lenders include investment banks, insurance companies, pension funds, hedge funds, sovereign wealth funds, and others. Noting that a new "credit paradigm" had emerged due, in part, to the participation of hedge funds, a credit rating agency noted that hedge funds as lenders both add liquidity and increase the risk of fragility in the finance sector.[226] More generally, if Adrian and Shin's conclusion that investment banks engage in more pro-cyclical leveraging than do commercial banks is right, then other nonbank lenders may do the same, thereby facilitating more speculative and Ponzi financing. Moreover, nonbank lenders make it harder to track the credit supply and to understand the links between the financial economy and the real economy. At a recent monetary research conference, Fed Chairman Bernanke encouraged academics to study nonbank lenders in the credit market.[227] His comments echo Minsky's focus on the role played by liability structures in increasing financial instability.[228]

To be sure, commercial banks still lend to highly-leveraged borrowers, leading to the occasional slap on the wrist from regulators.[229] During the last merger financing wave, banks earned the ire of their regulators for bridge lending, purportedly on an interim basis although the term lengthened as market liquidity evaporated.[230] As noted earlier, though, nonbank lenders now provide more credit than do depository institutions.[231] For this reason, the Fed has begun to offer liquidity support to nonbank firms, not only through the discount window but also through new credit facilities open to investment banks.[232]

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[226] "The growing role of hedge funds in the credit markets without question has introduced greater [funding and market] liquidity in the near term. Of concern would be an ill-timed event that led to a sudden reversal of this liquidity across multiple segments of the credit markets." Fitch Ratings, *Hedge Funds: The Credit Market's New Paradigm* 7 (Jun. 5, 2007).

[227] Ben S. Bernanke, The Financial Accelerator and the Credit Channel, Conference: The Credit Channel of Monetary Policy in the Twenty-First Century (June 15, 2007).

[228] Bernanke noted that "Nonbank lenders may well be subject to the same forces" to which banks are in the credit channel. *Id.*

[229] Federal interagency guidance from 2001 found that about one-third of all syndicated bank loans involved exposures to borrowers whose leverage (as measured through debt-to-assets, debt-to-equity, cash flow-to-total debt or other standard financial ratios) significantly exceeded industry norms for capital structure. OFFICE OF THRIFT SUPERVISION, FED. DEPOSIT INS. CORP., *Leveraged Financing* 1 (2001). The same thing had occurred in the late 1990s when the Federal Reserve complained to member banks underwriting standards for corporate loans. BD. OF GOVERNORS OF THE FED. RESERVE SYS., *Lending Standards for Commercial Loans* (1998). The following year, the Federal Reserve would repeat its advice. BD. OF GOVERNORS OF THE FED. RESERVE SYS., *Recent Trends in Bank Lending Standards for Commercial Loans* (1999).

[230] *Banks on a Bridge Too Far*, WALL ST. J., June 28, 2007, at C1 (reporting that prospective purchasers of buyout debt are objecting to the contractual protections in these bonds, thereby increasing the risk to commercial bank balance sheets).

[231] *See supra* note 52 (using Federal Reserve flow of funds to show that nonbank lenders now provide more credit than do depository institutions).

[232] The Fed added three new credit facilities after the effects of the credit crunch beginning in 2007 became more serious:

> The three newbies – the term auction lending facility, the primary-dealer credit facility, and the term securities lending facility – total more than half-a-trillion dollars, with more if needed. Much

Hickman's breakdown of bond issues by industry did not include the financial sector, so comparing across the period is difficult.[233] In the fifty years since his research, however, finance has become a major sector in its own right, so much so that a research literature examines the "financial accelerator" of the economy.[234] One attempt to move beyond the banking model is the recent statement of the President's Working Group on Financial Markets, which addressed the role of "private capital pools." [235] The open-ended category – "private capital pools"— sounded a new, though tardy, note by nodding to a variety of intermediaries whose financial impact on other firms was unknown but suspected of being material.[236] More specific than the "pool" idea is the concept of "leveraged financial intermediaries" used in the research on procyclical borrowing broker-dealers.[237]

Of the nonbank firms, sovereign wealth funds raise special questions about their role in engendering fragility in the financial sector because they operate behind the cloak of sovereignty. These funds are semi-private capital pools funded by countries with budget surpluses, earned from exports of oil and other commodities.[238] These funds use

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> of this money is available not only to commercial bank [Fed members] but also to investment banks, which normally aren't allowed to borrow from the Fed.

Allan Sloan, *On the Brink of Disaster*, FORTUNE 78, 82 (Apr. 14, 2008)(analyzing federal regulatory efforts to stabilize the credit market by adding liquidity)..

[233] Railroads, public utilities, and other industrial were the three major classifications of bonds. Each major group was further divided into minor groups, of which the manufacturing groups in the industrial classification were the most differentiated. Hickman, *Bond Cycles*, *supra* note 136, at 153-168.

[234] One line of recent research views the financial sector as a "financial accelerator" of the business cycle. "Over the 1990s, the knowledge base about finance and its linkages to thee real economy grew. Financial factors are now understood to amplify and propagate changes in the business cycle. Decisions about capital structure and corporate strategy coincide into what has come to be known as the "financial accelerator" of the economy as a whole…" BEYOND JUNK BONDS, *supra* note 159, at 124-125 (internal citation omitted).

[235] PRESIDENT'S WORKING GROUP ON FIN. MKTS., AGREEMENT AMONG PWG AND U.S. AGENCY PRINCIPALS ON PRINCIPLES AND GUIDELINES REGARDING PRIVATE POOLS OF CAPITAL (2007). *See also* Press Release, U.S. Dep't of the Treasury, Common approach to private pools of capital guidance on hedge fund issues focuses on systemic risk, investor protection (Feb. 22, 2007), *available at* http://www.ustreas.gov/press/releases/hp272.htm. The Working Group is an inter-agency body with representatives of the U.S. Treasury, the Board of Governors of the Federal Reserve, the U.S. Securities and Exchange Commission, and the U.S. Commodity Futures Trading Commission charged with examining financial market trends with regulatory and risk implications that cut across the narrower interests of each particular government agency.

[236] The warning is odd because it raises basic principles of counterparty risk management with professional investors who are already in the best position to grasp the risks of the new credit market. *Id.* at 3-5. Recommendations 7 and 8 address the due diligence of, respectively, creditors and investors in these pools of capital. *Id.*

[237] *See Liquidity and Leverage*, *supra* note 22. *See also, e.g.*, Christian Ewerhart & Natacha Valla, *Financial market liquidity and the lender of last resort*, in BANQUE DE FRANCE, *supra* note 23, at 138- 140 (examining how these entities tend to liquidate their securities portfolios quickly in response to unanticipated downturns, thereby intensifying downward price cycles).

[238] STATE STREET LEGAL ADVISORS, *Who Holds the Wealth of Nations*? (2005), *available at* http://www.ssga.com/library/esps/Who_Holds_Wealth_of_Nations_Andrew_Rozanov_8.15.05REVCCRI1145995576.pdf. For example, here I have extracted only the oil-based sovereign wealth funds (these are the largest types) with a reported value of more than $1 billion: Abu Dhabi Investment Authority (United Arab

foreign reserves in two general ways: as "stabilization" funds and as "savings funds."[239] Stabilization funds promote financial stability in the sponsoring country, essentially by putting revenues from major exports into a cookie jar to manage budget shortfalls. Savings funds serve the "inter-generational" goal of pooling current commodity export revenues (that are not only volatile but may be finite) for the benefit of future citizens.[240] While laudable goals, they may impact the economic stability of other countries.[241] The United States and other governments have begun to insist on surveillance of these funds.[242]

These funds added "mobile capital" that intensified the leverage wave by creating investment demand for financial assets.[243] Because their goal is to support a government's various financing needs, "The claims on sovereign wealth portfolios will typically be more equity-like."[244] If so, these funds might prefer riskier investment, which promises a higher return to the lender, including speculative and Ponzi lending. For example, sovereign wealth funds have increased their aggregate investment in Western financial firms from less than 500 million dollars in the first quarter of 2007 to over 10 billion since the following quarter.[245] As a Financial Times editorial put it, the

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Emirates) $250 billion; Government Petroleum Fund (Norway) $170 billion; Kuwait Investment Authority (Kuwait) $65 billion; Brunei Investment Authority (Brunei) $30 billion; Alaska Permanent Reserve Fund (U.S.) $30 billion; Oil Stabilisation Fund (Russia) $28 billion; Alberta Heritage (Canada) $10 billion; Foreign Exchange Reserve Fund (Iran) $8 billion; Kazakhstan National Fund (Kazakhstan) $5 billion; Oman State General Reserve Fund (Oman) $2 billion; and Azerbaijan State Oil Fund Azerbaijan) $1 billion. *Id.* at 2. This list does not include Saudi Arabia's sovereign wealth fund, although it is estimated to be as large as that of the United Arab Emirates. *See* MORGAN STANLEY, HOW BIG COULD SOVEREIGN WEALTH FUNDS BE BY 2015? (2007), *available at* http://www.morganstanley.com/views/gef/ (estimating Saudi Arabia's sovereign wealth fund at $300 billion). The IMF's Financial Stability Report mentions these funds too. FINANCIAL STABILITY REPORT, *supra* note 36, at 74.

[239] Fred Weinberger & Bennett Golub, *Asset Allocation and Risk Management for Sovereign Wealth Funds*, *in* SOVEREIGN WEALTH MANAGEMENT 74 (Jennifer Johnson-Calari & Malan Rietveld eds., 2007) [hereinafter SOVEREIGN WEALTH).

[240] *Id.* at 74-75.

[241] As one journalist noted: "[E]xperts are asking whether cross-border investment is evolving into something new that could be called cross-border nationalization, raising the specter of government interference in free markets – only this time, in other countries' markets rather than their own." Steven R. Weisman, *'Sovereign funds' stir growing unease*, INT'L HERALD TRIB., Aug. 21, 2007, at 1 (noting the U.S. Treasury's request to the International Monetary Fund to increase financial surveillance of country-funded investment pools). (noting growing U.S. official interest in monitoring sovereign wealth funds).

[242] *Id.* at 1.

[243] New York Fed President Geithner mentioned these funds as one factor which had changed the structure of financial markets: "The increase in size of sovereign wealth funds, the shift in assets to hedge fund and private equity managers, and the possible reduction in home bias among private savers have increased the amount of mobile capital in search of higher returns." *See* Geithner, *supra* note 113.

[244] *See* Weinberger & Golub, *supra* note 239, at 73.

[245] *UBS's Subprime Hit Deepens Credit Worries*, WALL ST. J., Dec. 11, 2007, at A1. *See* Henny Sender, *Abu Dhabi Considers Apollo Stake*, WALL ST. J., July 6, 2007, at C1 (discussing proposed investment of Abu Dhabi sovereign fund in private equity fund). Last year a sovereign subsidiary of the Abu Dhabi Investment Authority established a small fund of hedge funds, the Multi-Strategy Hedge Fund. Press Release, Abu Dhabi Investment Company, (anticipating initial funding of $60 million). The Abu Dhabi Investment Authority owns a majority interest (97% as of December 2006) in the Abu Dhabi Investment Company. ERNST & YOUNG, CONSOLIDATED FINANCIAL STATEMENTS ABU DHABI INVESTMENT COMPANY 17 n. 11 (2006). The

equity bailout of U.S. financial institutions by one of these funds suggests the "virulence of the Minsky Moment." [246] And the specter of sovereign wealth liquidity may have encouraged the Fed to bail out Bear Stearns and, this way, avoid another bargain purchase of a distressed U.S. financial institution.[247]

In effect, these funds are the sovereign version of the off-balance sheet ("OBS") items that came into focus in the domestic context after the collapse of Enron.[248] In private firms, OBS arrangements let a firm avoid the brunt of legal prohibitions keyed to the firm's balance sheet figures.[249] In this sense, the liquidity in sovereign capital pools gives government officials "switching options" with respect to investment.[250] Indeed, recession might drive many of these switching options into-the-money as market liquidity for assets dries up, creating investment bargains.[251] The key question is how they did and will invest.[252]

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same subsidiary also syndicates loans, deals in foreign exchange and the money market, provides trade financing, and offers securities, commodities, and other investment services. *Id.* at 6.

[246] George Magnus, *Market insight: Tough tactics to end credit crisis*, FIN. TIMES, Nov. 28, 2007, at A23. Magnus sees the $7.5 billion equity investment of a sovereign wealth fund in a U.S. bank as "yet another strong indicator of the virulence of the Minsky Moment – a credit crisis named after economist Hyman Minsky who analyzed the causes of financial instability." *Id.*

[247] The bailout also raises an important public policy question going forward about these funds: if public funds (that is what Fed liquidity is) bore losses for Bear Stearns, should foreign investors like these funds get the benefit of acquiring a future controlling stake in the post-bailout firm?

[248] *See* Gabilondo, *supra* note 110, at 810-19.

[249] *Cf. In re* Explorer Pipeline Co., 781 A.2d 705 (Del. Ch. 2001) (holding that corporation's decision to enter into an OBS operating lease was not subject to a supermajority provision found in the corporation's certificate of incorporation); *see* Samir El-Gazzar et al., *The Use of Off-Balance Sheet Financing to Circumvent Financial Covenant Restrictions*, 4 J. ACC. AUDITING FIN. 217 (1989) (analyzing forty-three addenda to leases which contained debt covenants to examine how firms use OBS arrangements to modify covenant-based restrictions).

[250] George Triantis, *Financial Slack Policy and the Laws of Secured Transactions*, 29 J. LEGAL STUD. 35, 39 (2005) ("As a general proposition, managers are much more prone to take actions that increase their welfare (for example, perquisite consumption or empire building) or the welfare of their shareholders (for example, share repurchases or high-risk investments) if they have cash at their disposal.").

[251] Some funds have already started exercising these in-the-money options: "UBS joins a growing list of Western banks, including Bear Stearns Cos., Barclays PLC, and HSBC Holdings PLC, that have received [governmental] capital injections from Asia and the Middle East this year. The sovereign funds 'are really smart and are getting to see a huge number of opportunities around the globe at this moment,'" says Guy Cornelius, a managing director in Lehman Brothers Holding Inc.'s fixed income department. *See* Magnus, *supra* note 246, at A23. He sees the $7.5 billion equity investment of a sovereign wealth fund in a U.S. bank as "yet another strong indicator of the virulence of the Minsky Moment – a credit crisis named after economist Hyman Minsky who analyzed the causes of financial instability." *Id.*.

[252] *See, e.g.*, Jennifer Johnson-Calari, *Managing Commodity Revenues and Windfall Profits: Investment Income Funds*, *in* SOVEREIGN WEALTH, *supra* note 239, at 47 (discussing alternative asset allocation and spending policies for sovereign wealth funds designed to produce perpetual income); Bernard Lee, *Robust Portfolio Construction in a Sovereign Wealth Context*, *in* SOVEREIGN WEALTH, *supra* note 235, at 157 (analyzing the "tactical allocation of professional money managers within the chosen strategy bucket, after the appropriate combination of broad asset strategies for the sovereign wealth fund has been determined using").

One final major factor has contributed to speculative and Ponzi financing: the convergence of the business models of financial intermediaries that had previously specialized in different parts of the credit market. Already much has been written about the shift in the banking model from a lend-to-maturity to an originate-to-distribute. An excellent recent discussion of the issue in the context of European banks active in leveraged buyout financing introduced the distinction between "capital turnover" and ""portfolio" banks.[253] Capital turnover banks pursue fee income and tend to quickly distribute any exposure to merger deals in the secondary markets.[254] Portfolio banks pursue both fees and interest income anticipated from holding debt positions in leveraged buyouts in which they have provided financing.[255] Apart from deriving income differently, capital turnover and portfolio banks offer different kinds of debt instruments in their merger financing.[256]

Less is known about the other side of the convergence – the way that nonbank lenders discussed are evolving towards a business model that derives revenue from originating and trading credit. For example, E*Trade, the third largest online brokerage firm, came close to declaring bankruptcy in January 2008 because of losses in its loan portfolio, which held mortgage-backed securities.[257] In the years immediately preceding, E*Trade had come to derive as much as 58% of its revenues from its loan portfolio, rather than from its traditional brokerage business. [258] And this was part of a general trend. Between 2000-20007, several major investment banks increased the proportion of their revenues from (risky) proprietary trading, while their profit margins declined on less risky, fee-based businesses like underwriting, brokerage, and financial advisory services.[259]

An important report by financial market regulators from the U.S., U.K., France, Germany, and Switzerland on how financial firms managed the credit market events since the summer of 2007 emphasized the need for financial firms to better manage their funding liquidity.[260] Liquidity management, however, is one aspect of regulation that has not kept up with the convergence of these business models. In part, this is because we still think about the liquidity dynamics of financial intermediaries in terms of a fading distinction between, on the one hand, broker-dealer investment banks regulated by the SEC and, on the other hand, insured depository institutions under the jurisdiction of federal and state banking regulators.[261] The old distinction about liquidity made sense when banks and broker-dealers served fundamentally different functions. In the past, banks borrowed at shorter terms and lent at longer ones, making longer term credit

[253] *See* EUROPEAN CENTRAL BANK, *supra* note 195, at 19-20.
[254] *Id.*
[255] *Id.*
[256] *Id.* at 27-29.
[257] Katrina Booker, *The Day $2 Billion Walked Out of the Door*, FORTUNE, 99, 100 (Apr. 14, 2008).
[258] *Id.*
[259] Shawn Tully, *What's Wrong with Wall Street and How to Fix It*, FORTUNE 72, 72-74 (Apr. 14, 2008).
[260] Senior Supervisors Group, Observations on Risk Management Practices During the Recent Market Turbulence 3, 10-12 (Mar. 6, 2008).
[261] *See* Lumpkin, *supra* note 50.

available to credit consumers and, in so doing, exposing themselves to funding liquidity risk from mismatches in their payables and receivables.[262] So bank regulators have long been the citadel of funding liquidity.[263] (The liquidity gospel is also spreading to finance firms generally though.[264]) These regulators are now facing up more seriously to how market liquidity affects the bank's own liquidity, especially as banks move from a "lend-and-hold" model to one based on "originate-to-distribute."[265]

In contrast, transforming the maturity of credit had never been the function of broker-dealers as it had been of banks. Instead, broker-dealers provided investment and advisory services and, importantly, held customer deposits of securities. To protect the value of these customer deposits, the U.S. Securities and Exchange Commission's regulatory capital rule for broker-dealers ("net capital rule") has always taken market liquidity into account by insisting that broker-dealers hold liquid assets (with a ready market).[266] Now, though, the SEC's capital rules are changing somewhat in the direction of the banking approach to funding liquidity and capital. For example, the SEC now allows complex financial firms to use what are essentially banking models of risk management to evaluate their regulatory capital requirements as part of the agency's consolidated supervision program.[267] And other securities regulators are also grappling with how borrower and market liquidity interact for their securities firms.[268]

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[262] This dynamic is less true to the extent that banks originate and then distribute their loan assets, but it still describes much of the business of banking: "The fundamental role of banks in facilitating the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, the risk that demands for repayment outstrip the capacity to raise new liabilities or liquefy assets." BASEL COMM., *supra* note 61, at 2.

[263] One good plain-English source on liquidity management in banks – although its implications extend to any firm facing changes in its funding provider – is the U.S. Comptroller of the Currency's handbook for national banks on liquidity. LIQUIDITY HANDBOOK, *supra* note 41, at 1

[264] INST. OF INT'L FIN., PRINCIPLES OF LIQUIDITY RISK MANAGEMENT (2007). IIF's committee on liquidity risk includes treasury management officers from forty of the largest globally active finance firms. The report addresses government officials too by encouraging them to think in terms of a firm's "integrated liquidity position." *Id*. at 40. The report recommends that firms conduct scenario analysis using both firm-specific events and market-wide events which may influence the firm's liquidity. Although not mentioned in the IIF report, detecting the early warning signs of liquidity risk is key as well. LIQUIDITY HANDBOOK, *supra* note 41, at 6-8.

[265] Taking account of capital market volatility is another reflection of the way the banking business has changed from a lend-and-hold business to an originate-and-distribute business:

> The market turmoil that began in mid-2007 has highlighted the crucial importance of market liquidity to the banking sector…These events emphasised [sic] the links between funding and market liquidity risk, the interrelationship of funding liquidity risk and credit risk, and the fact that liquidity is a key determinant of the soundness of the banking sector.

BASEL COMM., *supra* note 61, at 2. Established by G-10 countries in 1975, the Basel Committee on Banking Supervision formed the Working Group on Liquidity in 2006 to "take stock of liquidity supervision" in its current member countries – Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States. *Id.* at 1. *See also* Geithner, *supra* note 113

[266] Steven L. Molinari & Nelson S. Kibler, *Broker-Dealers' Financial Responsibility under the Uniform Net Capital Rule -- A Case for Liquidity*, 72 GEO. L.J. 1, 18-22 (1983)(emphasizing the centrality of mandating broker-dealer investment in liquid assets in the net capital rule).

[267] Erik Sirri, Director, Division of Market Regulation, U.S. Securities & Exchange Commission, *Testimony Concerning the Consolidated Supervision of U.S. Securities Firms and Affiliated Industrial Loan*

One factor driving the convergence of these business models is the growth of secondary markets in which formally distinct types of financial intermediaries invest in similar credit products.[269] Minsky recognized that secondary markets promote funding liquidity for firms because they let firms sell an asset for cash, although he noted that only a central bank could avoid "epidemics of confidence or lack of confidence." [270] (Indeed, a central bank tends to act against the confidence cycle.) But secondary market trading have changed the nature of credit underwriting: an originating lender makes a loan based on the borrower's creditworthiness but, anticipating the resale of that loan later, the lender may also anticipate how the loan would be valued in the "beauty contest" in the secondary market.

The standardizing discipline of cash flow discounting would suggest that both the lend-to-maturity model of a portfolio lender and the originate-to-distribute model of a capital turnover bank would result in the same value for a loan, whether or not it is held to maturity or held out for sale. In fact, though, this may not be the case. Already, some have noted mark-to-market pricing (to secondary market expectations) when liquidity is tight may not reflect a loan's fundamental value.[271] If so, mark-to-market pricing would contribute to price "contagion," reducing the value of the loan asset on an investor's balance sheet and, at the same time, compromising the investor's funding liquidity by leaving it with assets of less value with which to satisfy its maturing obligations.[272] But this is only half of the picture: market pricing may not reflect fundamental value on the upside of the market either, during which rapidly escalating asset values lead to "upside contagion" by inflating the book value of the investor.

Granted, the secondary market for bonds is much less active than that of equity securities, although it is growing since electronic trading platforms for debt emerged in

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Corporations, Senate Committee on Banking, Housing, and Urban Affairs (Oct. 4, 2007) ("The [consolidated supervision] program provides consolidated supervision to investment bank holding companies that is designed to be broadly consistent with Federal Reserve oversight of bank holding companies.").

[268] TECHNICAL COMM., INT'L ORG. OF SEC. COMM'NS, SOUND PRACTICES FOR THE MANAGEMENT OF LIQUIDITY RISK AT SECURITIES FIRMS (2002).

[269] One sees the trend toward both nonbank lenders and secondary markets in the history of the money market, which includes credit obligations of less than one year. When analyzing money market rates trends between 1900 and 1945, Homer and Sylla's history of interest rates uses prime commercial paper, call loan rates, short-term Treasury rates, short prime corporate bonds, banker's acceptances, and, after, the establishment of the Federal Reserve System, a discount window rate. HISTORY OF INTEREST, *supra* note 161, at 356-363. In order to convey the same information for the period after 1946, federal funds are added, short-term Eurodollars (to reflect the growth of concentration in overseas concentrations of dollars), and, importantly, the secondary market rates for negotiable certificates of deposit. *Id.* at 387.

[270] For secondary markets to be an effective determinant of system stability, they must transform an asset into a reliable source of cash for a unit whenever needed. MINSKY, *Can It?*, *supra* note 31, at 149.

[271] *See generally* Franklin Allen & Elena Carletti, *Mark-to-Market Accounting and Liquidity Pricing* (2006) (on file with author) (arguing that mark-to-market accounting does not reflect the "true value" of bank assets during periods of tight market liquidity).

[272] *Id.*

the 1990s.[273] Even before these trading platforms arose, version of a secondary market for corporate loans has always existed because banks would sell loans to correspondent banks and bankruptcy trustees also sold loans.[274] But two things had to happen before the secondary markets for syndicated loans would take off.[275] First, in the 1990s banks decided to divest themselves of risky corporate loans in response to pressure from their regulators and shareholders.[276] Second, the business of banking changed from capturing a net interest spread on lending to an "originate-to-distribute" model, in which banks went after fee income, creating loan supply along the way.[277]

Credit derivatives (one kind of secondary market product) have both helped and hurt in terms of providing market liquidity. Credit derivatives let a lender reduce its exposure to the borrower's default by supplementing or substituting the cash flow from the borrower with a promise from another firm to make the lender whole for credit losses.[278] During the current credit crunch, the cost of credit insurance for investment-grade debt became volatile, even intra-day.[279] An investor may increase its exposure to a loss if the investor owns related products that derive from that loss.[280] Credit derivatives create (and are intended to create) risk-shifting channels between different types of

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[273] The median stock trades every few minutes while the median bond trades once every two months. George *See* Chacko, *supra* note 160, at 8 (analyzing liquidity trends in bond market). Each year, the Securities Industry Financial Markets Association surveys the status of these trading platforms. SEC. INDUS. & FIN. MKTS. ASS'N, *eCommerce in the Fixed-Income Markets The 2006 Review of Electronic Trading Systems* 1-3 (2006). No single platform covers all the following asset classes, but, in the aggregate, these trading platforms feature asset-backed securities, commercial paper, credit derivatives, certificates of deposit, Euro bonds, foreign exchange forwards, futures, and options, interest rate swaps, repurchase agreements, over-the-counter derivatives, agency and private mortgage-backed securities, structured notes, sovereign debt, whole loans, and exchange-traded funds. *Id.* at 17.

[274] Hugh Thomas & Zhiqiang Wang, *Integration of Bank Syndicated Loan and Junk Bond Markets*, J. OF BANKING AND FIN., Feb. 2004, at 299.

[275] For example, the dollar-volume of secondary trading of these syndicated loans increased ten-fold more than twelve-fold between 1991 to 2001. *Id.* at 302 (showing increase in secondary market trading volume from $8 billion in 1991 to $110 billion in 2001).

[276] Lumpkin, *supra* note 50, at 2.

[277] The shift to fee-based revenues coincided with consolidation in the banking sector too: consolidation produced "large entities more oriented toward fee-driven business than to straight portfolio lending. As these institutions have moved from originating loans to be held in their portfolios to originating loans and then collecting fees for structuring, distributing and servicing loan assets, the secondary market for commercial loans has grown and taken on many of the same characteristics of the corporate bond market. *Id.* at 51, 62.

[278] Partnoy & Steele, *supra* note 24, at 1022-1031.

[279] Mark Whitehouse et al., *The Sky Darkens for Bondholders – Backfiring Bets on Derivatives, Corporate Allegiances are Among Worries Raising Risk*, WALL ST. J., May 12, 2006, at C1 (noting that after an S&P downgrade of some major industrials, the "average annual cost of buying protection on $10 million in investment-grade corporate debt rose to $76,000 from $71,500" before settling "nearly unchanged" by the market close).

[280] Chairman Bernanke identifies this as a risk of complex financial activity: "What is essentially the same risk can appear in different forms; for example, investments in a CDO tranche, a bond, and a credit default swap may all entail credit risk to a given obligor." Ben S. Bernanke, Regulation and Financial Innovation (May 15, 2007), speech presented at the Federal Reserve Bank of Atlanta's 2007 Financial Markets Conference—Credit Derivatives, Sea Island, Georgia, available at http://www.federalreserve.gov/boarddocs/speeches/2007/20070515/default.htm.

intermediaries, for example banks and insurance companies.[281] It was thought that these derivatives would spread credit risk beyond banks and into other deep pockets to bear credit losses. When these deep pockets were asked to perform, however, some of the credit insurers had liquidity (and solvency) problems of their own. And risk channels can spread contagion between markets, as suggested when a downgrade of one tranche of collateralized debt obligations triggered concern about structured credit products generally.[282] These are all examples of risk diversification not living up to what the model predicted.[283]

Taken together, these four trends – acceptance of leverage, the use of floating-rate debt, the growing role of nonbank lenders, and changes in the business models of financial intermediaries – have permanently changed the business of banking and the market structure of financing. The *Treasury Blueprint* mentioned earlier is the first major executive branch initiative to recognize that the paradigm for financial regulation needs to be radically retooled. For any reform to be effective though, financial market regulators and, to a lesser extent, lawmakers must understand the current credit market in more detail than they do now. Toward that end, the next Part offers a case study of leveraged loans because they are rich in lessons about speculative and Ponzi financing.

IV. CASE STUDY: LEVERAGED LOANS

The growth and structure of leveraged loans and their origination and trading markets epitomize each of the four trends discussed above. These are floating-rate loans that are, in large part, funded and traded by nonbank lenders. Leveraged loans financed much of the "shareholder-friendly" activity discussed before, including mergers and leveraged dividends.[284] How borrower, lenders, traders, and brokers came to think about leveraged loans reflects the semantic shifts that come with financial euphoria. The financial prefix "leverage" came to substitute for the harsher sounding "sub-investment-grade" or, worse still, "junk" before the word "loan." Rather than thinking in terms of "credit supply" and borrower "demand for credit," the loans became "supply" for which

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[281] Although its forms differ, in a credit derivative contract, the "protection seller" promises the "protection buyer" to transfer a cash flow to the buyer if the buyer suffers a credit loss on a transaction with a counterparty:

> The recent growth of risk transfer across sectoral boundaries leads to increased inter-linkages among the sectors. Credit derivatives are an example. Because of the nature of their core business, banks tend to operate as net protection buyers. Insurers, on the other hand, tend to be protection sellers, whereas securities firms take positions from a trading perspective. Intra-group risk mitigation, a special form of cross-sectoral risk mitigation, is discussed below.

JOINT FORUM ON FINANCIAL CONGLOMERATES, *Regulatory and Market Differences: Issues and Observations* 25 (May 2006).

[282] Henny Sender et al. Risky Strategies Take Toll on Traders – Derivative Products Suffer Amid Increasing Concerns About Corporate Debt, WALL ST. J., May 11, 2005, at C6 (noting that the effects in secondary and derivative credit markets of S&P downgrades of the underlying debt of several major U.S. industrials revealed the scope and sensitivity of cross-market links).

[283] Peter R. Fisher, *What happened to risk dispersion?*, in BANQUE DE FRANCE, *supra* note 23, at 29.

[284] *CLOs More Concentrated in Shareholder-Friendly and Covenant-Lite Loans*, FITCH RATINGS, Dec. 21, 2006, at 2.

investment demand competed, completing the semantic shift.[285] Much as the petro-liquidity of the 1970s led to this type of investment demand,[286] this last leverage wave led to increasingly complex products that were further removed from their underlying cash flows.[287] Like most credit sectors, this one too has contracted since last summer, but it seems to have become a permanent part of the credit market. After explaining the instrument and its liquidity implications, I recommend some modest steps to increase the transparency of this market.

A. *Instrument and market structure*

In line with the prevailing originate-to-distribute model of lending, I analyze the market structure of leveraged loans in terms of their origination and trading practices. I conclude by considering the role of borrower covenants. These are made during origination and go on to influence how the loan trades in the secondary market.

1. Origination

Leveraged loans are secured, floating-rate loans (typically priced off LIBOR) that are syndicated between banks and other types of lenders. Corporate borrowers may seek these loans for many reasons. Start-up companies may be unable to secure investment-grade ratings.[288] Cyclical businesses may need capital during a low point in their operations.[289] Firms exiting bankruptcy or "fallen angels" – formerly investment-grade issuers that have been notched down – may be relegated here until the issuer's financial prospects improve.[290] The leveraged loan market represents about one fifth of the overall corporate loan market and equals about one-half of overall bond issuance. [291]

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[285] *See, e.g.*, LEVERAGED LOAN PRIMER, *supra* note 113, *passim* (viewing leveraged borrowers as the "supply side" of the leveraged loan market and investor-lenders as the "demand side"). Indeed, even the concept of "structured finance" can be misleading, not only because it spans several distinct asset classes with little in common but because it obscures the fact that our expectations about traditional debt instruments are much more settled and, in that sense, more "structured" than with new esoteric products that have never been seasoned through exposure to cyclical changes in financial markets.

[286] A promoter of the leveraged loan market traces its origin to the recycling of petro-liquidity in the in 1970s to sovereign borrowers (which culminated in the Brady Bond securitization of bank exposures into securities) and to the 1980s leveraged buyout boom. *Id.* at 16.

[287] For example, collateralized debt obligations which held "real" mortgages on the asset-side of their balance sheet gave way to synthetic collateralized debt obligations which were, in effect, contracts mirroring the performance of "real" financial assets. RGE MONITOR, STRUCTURED FINANCE GLOSSARY 3 (2007) (showing how the market for securitized credit products moved from cash CDOs, to synthetic CDOS, to securitizations of the asset-backed securities themselves).

[288] *Id.* at 2

[289] *Id.*.

[290] *Id.*.

[291] Richard W. Stewart, *Collateralized Loan Obligations: A Primer*, *in* LOAN SYNDICATIONS HANDBOOK, *supra* note 45, at 646, 658-661 ((tracing the history of the CLO market). Between 1994 and 2005 both corporate bond and loan issuance increased, but the growth in loans outpaced that of bonds: bond issuance more than doubled from $306 billion to $681 billion while loan issuance quadrupled from $389 billion to $1,648 billion. Allison A. Taylor & Ruth Yang, *Evolution of the Primary and Secondary Leveraged Loan Markets*, *in* LOAN SYNDICATIONS HANDBOOK, *supra* note 45, at 21, 25.

Had the trends in the first half of 2007 continued throughout the year, the volume of leveraged loans would have exceeded that of high-yield bonds.[292]

Like the junk bonds that financed the takeovers of the 1980s, leveraged loans rest on the assumption that lending at a subinvestment-grade (albeit at a floating rate) is fine, so long as the rate reflects the default risk and is diversified in a portfolio.[293] The Loan Pricing Corporation classifies as leveraged those loans with BB, BB/B, and B or lower.[294] Others use the loan's spread over a reference rate at the time the loan is made, typically a spread of between 125 to 275 basis points over a reference rate.[295] Not surprisingly, leveraged loan correlate most closely as an asset class to high-yield (junk) bonds, despite formal differences between the two.[296] Most leveraged loans may be prepaid without penalty while high-yield bonds may not be callable by the issuer at all or only occasionally and then subject to a premium.[297] These loans generally have a shorter term than high-yield bonds.[298] These loans may also have more financial covenants than do high-yield bonds.[299]

The arranger of the leveraged loan gets a fee of between 1.5 and 2.5 per cent for putting the loan together, more than the fees charged for investment-grade loans, which may have no arranger fees.[300] Initially, leveraged loans included a revolving credit line and an amortizing term loan – so called "pro rata" tranches that bank investors preferred.[301] While banks prefer to hold pro rata tranches, nonbank investors have tended to prefer junior tranches that did not amortize, had longer terms, and, often lower security. So it has tended to be nonbank institutional investors who provided the riskier financing, a trend borne out by a finding in a 2006 federal review of syndicated lending generally that the credit quality of syndicated loans held by banks increased while that held by nonbanks decreased.[302]

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[292] STANDARD & POOR'S, S&P/LSTA LOAN INDEX 4 (Apr. 2007)(explaining the composition of the index and its role in the leveraged loan market)..

[293] The corporate leveraged (or "high yield") market is made of several different types of credit facilities: senior unsecured high yield bonds (43%), first-lien bank debt (39%), other forms of subordinated debt (11%), senior secured high yield bonds (5%), and second-lien bank debt. STANDARD & POOR'S, S&P/LSTA LOAN INDEX 5.

[294] LEVERAGED LOAN PRIMER, *supra* note 113, at 11-12.

[295] *Id.* at 12 (comparing leveraged loan classification by Bloomberg, Standard & Poor's, and Thompson Financial).

[296] *Id.* at 10-13 .

[297] Gary D. Chamber & Jolie Amie Tenholder, *Converging Markets: Leveraged Syndicated Loans and High-Yield Bonds*, COM. LENDING REV., Nov./Dec. 2005, at 7.

[298] *Id.*

[299] *Id.* at 13.

[300] Lumpkin, *supra* note 50, at 6.

[301] The change made these loans riskier: "However, by early 2002, most loans were structured without an amortizing term loan component, and while the typical structure still included a revolver, it was usually a much smaller share of the overall package than would have been the norm in the past." Lumpkin, *supra* note 50, at 51, 69.

[302] Joint Press Release, Bd. of Governors of the Fed. Reserve Sys., Fed. Deposit Ins. Corp., Office of the Comptroller of the Currency, & Office of Thrift Supervision, Shared National Credit Data Reflect Good Credit Quality Performance, Large Increase in Credit Commitment Volume, and Small Rise in Riskier Deals

Nonbank investors became interested in leveraged loans because of their high-rates and secured status.[303] For example, hedge funds also contributed to this activity, providing as much as 13% of the credit extended in the origination market for leveraged loans.[304] It was nonbank demand for these loans led to the concept of the "institutional loan," to refer to the funding provided by them.[305] Indeed, nonbank investors have become so dominant in these loans such that "by early 2002, most [leveraged] loans were structured without an amortising loan component, and while the typical structure still included a revolver, it was usually a much smaller share of the overall package than would have been the norm in the past."[306] The S&P/LSTA Leveraged Loan index tracks only the institutional sector of the leveraged loan market, not the bank sector, suggesting that nonbank lenders are, indeed, changing the structure of credit, much as the Fed's decision to fund the Bear deal implies.[307]

Leveraged loans have their own trade group – the Loan Syndications & Trading Association ("LSTA"). LSTA promotes standardization of loan and settlement documentation, credit ratings for loans, Committee on Uniform Securities Identification Procedures (CUSIP) numbers for loans, and benchmark indices.[308] Credit rating agencies helped to promote these loans by rating them, beginning with S&P in 2000.[309] Within a

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(Sep. 25, 2006), *available at* http://www.federalreserve.gov/boarddocs/press/bcreg/2006/20060925/default.htm. *See generally* John Murchison, *Warning Signs From Increases in Non-Performing Loans*, 5 N.C. BANKING INST. 299 (2001) (explaining how federal banking agencies evaluate syndicated loans and noting a rise in nonperforming loans).

[303] While in 1994, banks originated 71% leveraged loans in the primary market and nonbank intermediaries bought only 29% of these assets, the proportions reversed in one decade: in the primary credit market of 2004, nonbank credit providers originated 78% of these leveraged loans and banks accounted only for 22%. LEVERAGED LOAN PRIMER, *supra* note 113, at 19. However, the 2006 report of the Shared National Credit Review notes that nonbank credit providers provided only 14% of syndicated loan commitments. *See* Bd. of Governors of the Fed. Reserve Sys., Fed. Deposit Ins. Corp., Office of the Comptroller of the Currency, & Office of Thrift Supervision , *2006 Shared National Credit Review* One source of the difference is that the Review targets both leveraged and unleveraged loans but only those with a value of more than $20 million and in which three or more regulated depository institutions participate. *See also* LEVERAGED LOAN PRIMER, *supra* note 113, at 20 (finding that bank purchases of leveraged loans decreased from 70% in 1994 to just over 20% in 2004)

[304] *See* STANDARD & POOR'S, *supra* note 34, at 4.

[305] *Id.*. ("Powered by strong demand, the pool of outstanding institutional loans grew to $400 billion at the end of 2006 from $35 billion at year-end 1997. As a result, institutional loans grew to 41% of the overall universe of institutional and high-yield bonds, or $355 billion of $953 billion, from 28% a year earlier and from 25% at the end of 2004…"). Sometimes banks purchase an interest (i.e. extend credit) in an institutional loan. *Id.* at 3.

[306] Lumpkin, *supra* note 50, at 69.

[307] The loans which make up the Index must be syndicated U.S. dollar-denominated term loans for amounts of at least $50 million and a term of one year and whose spread is at least one hundred and twenty-five basis points over the London Interbank Offering Rate ("LIBOR"). *Id.* at 14.

[308] Steve Miller, *Players in the Market*, *in* LOAN SYNDICATIONS HANDBOOK, *supra* note 45, at 47, 73.

[309] It also began to evaluate not just the likelihood of issuer default (as it always had) but also to estimate the actual amount which an investor could expect to recover in the event of a default. STANDARD & POOR'S, A GUIDE TO THE LOAN MARKET 31-36 (2006). To arrive at a recovery rating for an issue, S&P simulates the most likely default scenario What distinguishes the recovery rating from the default rating

few years, specialized recovery ratings had developed to supplement the projected default rate with estimates of how much an investor would recover in the event of default.[310] Anticipating such ratings by several decades, Hickman's bond research had also considered the effective recovery rate on defaulted bonds.[311]

Between June and August 2007, leveraged loans faced their first major market liquidity crisis: origination dried up, loan products traded at a discount in the secondary market, and traders shorted loan indices.[312] As activity slowed in the secondary market, these loans became stranded on the books of originating lenders, including banks.[313] Surges in volume delayed trade settlement to an average of seventeen days after the trade date.[314] Banks with contractual duties to fund future leveraged loans found themselves choosing between paying "break-up fees" to walk away from the deal or to honor their commitments to originate the loans.[315]

2. Secondary markets

Buyers and sellers deal in previously-issued leveraged loans in the secondary market, sometimes at a discount over the loan's par value based on changes in interest rates or the borrower's creditworthiness. Secondary market trading of most loans happens right after the initial allocation of a loan (as investors adjust their holdings to reach their target), but more continuous trading in the aftermarket takes place in leveraged loans than in investment-grade ones.[316] Currently, about half of the secondary market activity involves trading in distressed debt, defined by S&P as trading for less

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is the recovery methodology's extensive analysis of "recovery factors" which require a close firm- and market-specific analysis of the cash flow behavior of an issue in the event of default. The methodology involves an ex ante projection of ex post recovery associated with credit underwriting standards. *Id.* at 31-32.

[310] Steven Bavaria, *Standard & Poor's Loan Recovery Ratings*, *in* LOAN SYNDICATIONS HANDBOOK, s*upra* note 45, at 526, 528-29..

[311] *Bond Cycles*, *supra* note 136, at 25-30.

[312] *See* Doherty, *supra* note 10. The average spread over [30 day] Libor during the first half of 2007 for single B rated loans was 244 points but it increased to 431 points in August, dropping to 412 by September. Steve Miller, Standard & Poor's, presentation at LSTA conference. The spread on double B loans had been 183 points over Libor for the first half of 2007, but increased to 343 in August, settling at 318 in September. *Id.*

[313] The loss of secondary market liquidity had ripple effects upstream in the "pipeline": "Arranging banks found themselves either delaying loan placements or making a significant number of concessions to investors…the credit crisis strained the banks' balance sheet capacity as they were forced to fund bridge loans on postponed loan syndications." *Developments in the US Leveraged Loan and CLO Markets*, FITCH RATINGS, Feb. 7, 2008, at 3 (suggesting that banks had a backlog of $200 billion in leveraged loan commitments awaiting syndication).

[314] Conversation with Allison Taylor, Director, Loan Syndication & Trading Association (Nov. 14, 2007).

[315] Justin Menza, *Leveraged loans loom large*, BUSINESS WEEK, Feb. 24, 2008, at 1, 1-2 (discussing reduction of commitments to fund leveraged loans by Credit Suisse and prospective charge-offs from funding commitments by Citigroup, Goldman Sachs, Merrill Lynch, and JPMorgan Chase), *available at* http://businessweek.com/print/investor/content/feb2008/pi20080222_065212.htm.

[316] Lumpkin, *supra* note 50, at 73.

than 90 cents on the dollar.[317] Reporting of secondary loan transactions – along the lines of what is common in the equity markets – still does not occur, with the exception of trading in municipal debt securities. So more is known about price quotes than about actual trades.[318] As in the origination market, in the secondary market nonbank investors are more active than banks.[319] As this market grew, investment banks that had traded these loans as brokers for the accounts of others began to take more proprietary positions in the loans.[320] The same seems to be true for hedge funds that specialize in the credit market exposures.[321]

In the secondary markets, loans went from being a "cash flow" product to a "market value" product based on investors' perceptions of what the loans might fetch on resale.[322] And price outcomes in the secondary market "relate back" to primary underwriting,[323] for example, by influencing the spread that the borrower must pay on new loans.[324] Moreover, loans held by institutional investors became subject to the allocation preferences determined by the overall portfolio preferences of individual investors.[325] At the same time, the introduction of a leveraged loan index and the growth of derivative products keyed to leveraged loans made it possible for investors to express

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[317] *Id.* at 22.

[318] LEVERAGED LOAN PRIMER, *supra* note 113, at 29 (describing a collaboration between the LSTA and LPC which gathers information about 4,400 dealer quotes on more than 2,000 facilities on a daily basis).

[319] Nonbank investors tend to trade these loans more than banks: "[I]nstitutional investors accounted for most of secondary market demand during the 1990s…although [highly-leveraged syndicated loans] account for a minority of the total amount of syndicated loans outstanding, they account for more than 80% of secondary market trading. Thomas & Wang, *supra* note 270, at 304.

[320] *See* LEVERAGED LOAN PRIMER, *supra* note 113, at 21.

[321] The volume of "credit-oriented" hedge fund assets increased six-fold to $300 billion in 2005, reflecting and intensifying the leverage cycle. *Hedge Funds: The Credit Market's New Paradigm*, FITCH RATINGS, June 5, 2007, at 3. "Notably, this number excludes the multiplier effect of leverage and, therefore, understates the real amount of credit risk taken and the impact on trading volumes. …prime brokers reported that credit strategies represented one of the fastest growth areas for hedge funds, outpacing equity-oriented growth of strategies." *Id.*

[322] Also, an over-the-counter market now exists for financial contracts designed to absorb, shift, or increase liquidity risk from the secondary market. Here, market participants use credit derivatives and credit default swaps to reduce or increase their credit exposure to particular obligors. An originator who decides to hold on to a loan may purchase a credit insurance product, as can someone in the secondary market. Also, another type of derivative has developed that tracks the performance of credit products. These are also over-the-counter products. For example, the ABS index is an over-the-counter index tied to the performance of a specific bundle of credit positions, much as the S&P 500 index tracks the performance of a weighted average of major industrial concerns.

[323] The cost to a borrower of issuing new loans is "now determined not only by rating and leverage profile, but also by trading levels relative to par of an issuer's previous loans, and market sentiment tied to demand and supply…the effect has been to increase market volatility with regard to trading and to make the pricing of primary market syndicated loans far more dynamic than in the past." Lumpkin, *supra* note 50, at 51, 70.

[324] *Id.* at 10.

[325] Part of the increased volatility may also be due to the growth of nonbank investors in this market. While bank investors may be more willing to hold a deteriorating loan in order to further a relationship objective with the borrower, nonbank investors concerned more narrowly with the instrument's rate of return are more likely to purge losing positions, increasing volatility.

"negative" positions about these products.[326] Until the introduction of the LCDS x index in May 2007, these leveraged loans had relatively low volatility.[327]

In particular, investment vehicles called "collateralized loan obligations" ("CLO") played a key role in the secondary market by buying leveraged loans to collateralize the issuance of their own securities. Such CLOs may have accounted for over one-fifth of all secondary market demand for the loans.[328] Compared with other forms of asset-backed securities like mortgage-backed securities and collateralized-debt obligations, CLOs tend to contain a more diverse set of receivables whose prepayment characteristics are harder to predict.[329] Most frequently, CLOs buy leveraged loans based on one, two, or three month LIBOR.[330] And CLOs seem to hold a disproportionate share of loans with fewer covenants[331] used for "shareholder-friendly" activities.[332] (Although modest, a secondary market in which interests in CLO trade has also developed.[333]) The notes issued by the CLO also tend to be floating-rate instruments with a coupon equal to a fixed basis point spread over three-month LIBOR.[334] Rising interest rates, then, do not create rate risk for the CLOs because both their assets and liabilities tend to be prices off the same rate. Just as there are balance sheet and synthetic collateralized debt obligations, CLOs may also be structured around a real portfolio of loans (so called "balance sheet" CLOs) or hold an unrelated pool of securities as collateral but issue securities priced off of loan obligations (so called "synthetic" CLOS).[335]

Repackaging leveraged loans into CLOs changes the total amount of leverage built into the product, hence increasing the product's exposure to financial instability. To begin with, the CLO is itself leveraged, typically at a debt-to-equity ratio of 10:1 to 12:1.[336] The CLO uses these leveraged resources to acquire leveraged loans issued by a borrower that is itself already levered, i.e., to the extent of any debt issued by the leveraged borrower. With these leveraged loans as collateral, the CLO then issues

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[326] For example, an investor who was long loans could hedge market risk by shorting the index, such that price declines in the loans would be partially offset by profit on the short position. The index and derivatives also let investors take synthetic positions in these products without going through the work needed to carry out cash trades in the underlying.

[327] The Sharpe Index measures an asset's return vis-à-vis its volatility. The more volatile an asset, the more return one would expect its investors to demand. The higher the Sharp index, the greater the return to volatility. Before the credit crunch of summer 2007, the Sharpe index had been .92. In just one month, that number dropped to .62, suggesting an increase in liquidity.

[328] *CLOs More Concentrated in Shareholder-Friendly and Covenant-Lite Loans*, FITCH RATINGS, Dec. 21, 2006, at 1.

[329] *Id.* at 49.

[330] Stewart, *supra* note 291, at 646, 669.

[331] *CLOs More Concentrated in Shareholder-Friendly and Covenant-Lite Loans*, FITCH RATINGS, Dec. 21, 2006, at 2-3.

[332] *Developments in the US Leveraged Loan and CLO Markets*, FITCH RATINGS, Feb. 7, 2008, at 5.

[333] Stewart, *supra* note 291, at 646, 664-665 (estimating annual secondary market volume in CLOs to be more than $10 billion).

[334] *Id.* at 646, 652.

[335] Andrew Jobst, *Collateral Loan Obligations: A Primer* 34-47 (2007) (on file with author) (distinguishing between balance sheet and synthetic CLOs).

[336] Stewart, *supra* note 291, at 646, 651.

securities that may be more or less levered than the underlying leveraged loan collateral. For example, a senior position in a CLO represents a "deleveraging" with respect to underlying collateral while a junior position multiplies the leverage already built-in to the leveraged loans.[337] And the investor who purchases a security issued by the CLO may borrow (through margin or other form of credit) to invest in the security. Each of the three different leverage "points" in the transaction – the debt burden of the leveraged loan issuer, the borrowing of the CLO, and the margin (or other) debt of the investor in the CLO – props up the price of the ultimate investment asset, i.e., the interest held by the investor in the CLO. That is, the leverage supports the market liquidity for the product while, at the same time, exposing three borrowers to funding liquidity risk: the leveraged loan borrower, the CLO, and the leveraged investor. It is easy to see, then, how a product with so many layers of leverage can lose value quickly when speculative and Ponzi euphoria slows down.

3. Covenant structure

In general, a borrower's covenant practices vary with the respective funding market segments, which are differentiated by the degree of private contracting: public securities markets, the private loan market, and, in between, the private placement market.[338] Higher-grade credits can use public debt markets to float issues with skeletal covenants that impose minimal constraints on the issuer's freedom of action.[339] Investors in these issues take comfort in the issuer's credit-rating and in secondary markets in which to sell a position.[340] In contrast, firms with a lower credit-rating may have recourse only to private placement or bank loan markets in which lenders typically demand more covenants.[341]

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[337] *Id.* at 646, 648 ("Senior tranches deleverage the asset class, whereas junior tranches and the equity tranche leverage both the credit risk and return embedded in the asset class.").

[338] William W. Bratton, *Bond Covenants and Creditor Protection: Economics and Law, Theory and Practice, Substance and Process*, EUR. BUS. ORG. L. REV. (forthcoming). In the bank loan segment, lenders negotiate relatively complete contracts after examining the creditworthiness of the particular borrower. In the public securities segment, lenders accept less complete contracts because they rely on the borrower's "name" and the availability of secondary markets in which the lender may exit its position should the lender's holding preferences change. In between the bank loan and the public securities segments in terms of contractual completeness, the private placement segment involves debt contracts with some features of public debt contracts and the possibility of a secondary market later through Rule 144 filings. *Id.*

[339] *Id.*

[340] *Id.*

[341] Understandably, then, the trade group for the issuer community – the Securities Industry and Financial Markets Association ("SIFMA") has objected to rating covenants on noninvestment grade debt. Letter from Mary Kuan, Vice Pres. & Asst. Gen'l Counsel, SEC. IND. & FIN. MKTS. ASS'N, to Christina Padgett, Moody's Investors Service (November 14, 2006). Because these securities are likely to involve some payment default, SIFMA notes, investors already scrutinize them more carefully and demand more covenant protection than they do for investment-grade issues. *Id.* at 3. Moreover, those who buy noninvestment-grade debt have less need for third-party covenant assessment because they tend to be professional investors in the private placement market who rely more on their independent analysis of the default risks of the issue. *Id.* at 3. The SIFMA reaction illustrates Bratton's observation about a differential use of covenants based on the issuer's credit quality. *See* Bratton, *supra* note 338.

The leverage boom reversed the distribution of covenants by market segment for both investment-grade bonds and leveraged loans. In investment-grade bonds, the frequency of covenants addressing a firm's debt-to-capitalization and debt-to-cash flow increased since 2001.[342] Also, the frequency of any covenants limiting a firm's leverage has also been at its highest levels in the past four years of the decade ending in 2005.[343] Moreover, in the public securities market – the segment of the three that has hitherto been willing to lend on the basis of the least-complete contracts – there has been a call for more specificity in contracting, as reflected in trends towards the increased interest of bondholders in event risk covenants that limit an issuer's leverage.[344] At the same time, as noted earlier, covenants in lower-quality bonds had become less common.[345] One effect of the volatility spike of summer 2007 ands its fallout is that investors will become choosier about structural protections in leverage loans that were overlooked in the earlier rush to lend and trade. This will likely be true not only upon issuance but in the secondary market, where seasoned leveraged loans issued with few covenants will likely trade at a discount.[346]

B. *Regulatory implications*

So far, no court has held that leveraged loans are "securities" as defined in the federal securities laws. Neither has the U.S. Securities and Exchange Commission attempted to regulate the origination or trading of leveraged loans. Participants in the leveraged loan market are subject to liability under common law fraud and contract law but not the registration and disclosure requirements of federal securities law.[347] Were leveraged loans classified as securities, the most natural exemption for them from registration would that of Rule 144A under Section 4(2) of the Securities Act of 1933.[348] At present, there is no evil peculiar to the secondary market for leveraged loans calling for substantive regulation. Nevertheless, some more disclosure about these loans might reduce our growing ignorance about credit markets.[349] The major goal of doing so would be to impose minimum trade reporting duties on the market in order to capture the information value of this market for public purposes. This way, regulators could capture

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[342] *Credit Quality Warning System Eroded by Disappearing Covenants*, FITCH RATINGS, Aug. 2007, at 4.
[343] *Id.*
[344] Moody's Investors Service, *Request for Comment on Moody's Indenture Covenant Research & Assessment Framework* (September 2006) (analyzing bondholder demand for event-risk covenants to limit leverage by issuing firms).
[345] *Id.* at 5.
[346] For example, during the summer credit slump of 2007 some covenant-lite loans dropped in price to 92, which is still considered "par" trading since the convention in this market is to divide it into two tiers: "par" for everything trading at 90 to par and "distressed" for anything trading below that.
[347] Tiziana M. Bason et al., *Effects of the Legal Characterization of Loans under the Securities Laws*, *in* LOAN SYNDICATIONS HANDBOOK, *supra* note 45, at 85, 94-95.
[348] *Id.* at 91-94.
[349] For example, in the case of Enron and related accounting scandals, legal and regulatory attention about the use of off-balance-sheet arrangements came too late. (And it is debatable whether the ensuing regulatory program – chiefly the Sarbanes-Oxley Act – rested on a solid foundation of how off-balance sheet arrangements fit into the larger funding market.) A secondary goal would be to promote the efforts already underway towards more standardization of loan terms and trading practices.

some of the information that the leveraged loan markets generate that would be relevant to several basic questions over which financial market regulators have jurisdiction.

For example, some argue that the high yield market – which includes leveraged loans and high-yield bonds – has particular value as an indicator of financial or business cycle trends because of its particular sensitivity to credit downturns.[350] If so, understanding origination and trading trends in leveraged loans might let regulators better anticipate changes in the real economy generally. And leveraged loans offer a window into the role of nonbank lenders both as originators of corporate credits and as market-makers for them in secondary markets. Exposing the SEC to data from what is essentially a capital market for credit would enhance the agency's knowledge base about the current state of credit markets.[351]

Creating a limited-purpose self-regulatory organization ("SRO") in order to conduct minimum market surveillance of the leveraged loan market is one way of obtaining this data. Historically, SROs have included only securities exchanges and other industry "utilities," like clearing agencies, which participated in markets for financial instruments meeting the legal definition of a "security."[352] Given the scope of legal reforms being considered in connection with the *Treasury Blueprint*, though, a novel approach to leveraged loans might be in order given their value as a source of knowledge about the current credit market. The obvious candidate for SRO status would be the LSTA.

V. BETTER MODELS FOR LEVERAGED LIQUIDITY

Before the rush to regulate and reform the credit market takes off, regulators and lawmakers must reckon – if only conceptually – with the liquidity dynamics analyzed in this Article. Noticeably absent from the *Treasury Blueprint*, though, was any serious emphasis on one of the most important drivers of speculative and Ponzi financing: that the financial models used for investment and regulation had done a poor job of suggesting the size and nature of the current credit contraction. As Fed chairman, even Alan Greenspan conceded (although not in terms that Main Street would understand) that

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[350] "The high yield market, and more generally the market for high yield financial innovations, represents a kind of 'canary in the coal mine' for the economy as a whole…Thus, when the high yield market stops singing, it signals the coming credit crunch that has the potential to signal a recession." BEYOND JUNK BONDS, *supra* note 159, at 126-127 (noting the relative advantages of high yield spreads to commercial paper or the Fed Funds rate as a business cycle indicator). *See id.* at 249 (discussing explanatory value of high yield spreads over commercial paper, Treasury bills, and the Federal Funds rate).

[351] The SEC already has substantive oversight over the municipal bond area through the Municipal Securities Rulemaking Board. A similar proposal to create a self-regulatory organization for the primary dealer market failed in 1992 when the Department of the Treasury and the Board of Governors of the Federal Reserve objected to the idea of SEC oversight over primary dealers, who play a key role in providing primary and secondary market liquidity for debt issuance by the Treasury. *See* JOINT REPORT ON THE GOVERNMENT SECURITIES MARKET 17-20 (1992). As a compromise, the agencies agreed that market surveillance of primary market dealers would adequately further the respective interests of the agencies. *Id.* at 22-23. For example, previous SEC initiatives have included a proposed trade tape capturing

[352] Securities Exchange Act of 1934, § 3(a)(28) (codified in 15 U.S.C.).

financial models may not adequately take into account the extreme events that give rise to liquidity panics or the panics themselves.[353] We have crossed the Rubicon in terms of abandoning the gold standard (which would constrain leverage and leveraged liquidity), so my point is not that leveraged liquidity can be avoided. Quite the contrary, it is a mainstay of financial capitalism, so it deserves better financial and legal modeling.

Part of the current problem is that two competing approaches to modeling credit markets developed after the New Deal: heavily empirical models that generalized inductively based on data-rich observation and, in contrast, elegant mathematical models that generalized based on deductive assumptions that simplified markets for the sake of the model. The two roads diverged and empirical models – of which Hickman's bond issuance research is a prime example – became the road not taken. Soon after Hickman published his bond research in the 1950s, Merton Miller and Franco Modigliani published an influential article on the capital structure of firms that epitomized the deductive finance model, signaling its future dominance.[354] The article refuted the common-sense intuition that borrowing reduced the cost of capital to the firm: as the firm borrows more, so went the proof, the costs of both its debt and equity increase as both creditors and shareholders demand a higher return for investing in a firm that has become more leveraged and, therefore, riskier.[355] These self-regulating price adjustments would balance each other out such that adjustments on the right-hand side of the balance sheet (the side that reflects financing) would not affect firm value.[356] Hence, financing structure was "irrelevant" because what was going on in the right-hand side of its balance sheet could not – as a theoretical matter – influence the value of the firm, which depended on the firm's assets.

Like any deductive model, the Modigliani-Miller ("M-M") approach works only within the four corners of its modeling assumptions: the absence of income taxes, equal borrowing costs to firms and individuals, efficient markets, and perfect markets.[357]

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[353] Alan Greenspan, Remarks, *New challenges for monetary policy* (Fed. Reserve Bank of Kansas City symposium), (Jackson Hole, Wyoming, Aug. 27, 1999). This is what began to happen during the summer of 2007 in leveraged loans and credit markets generally:

> Probability distributions that are estimated largely, or exclusively, over cycles excluding periods of panic will underestimate the probability of extreme price movements because they fail to capture a secondary peak at the extreme negative tail that reflects the probability of occurrence of a panic….Under these circumstances, fear and disengagement by investors often result in simultaneous declines in the values of private obligations…Consequently, the benefits of portfolio diversification will tend to be overestimated when the rare panic periods are not taken into account. *Id.*

[354] Four years after Minsky completed his thesis, Merton Miller and Franco Modigliani published their mathematical proof that the value of a firm is independent of its financing structure. *See* Modigliani & Miller, *supra* note 177. In this way, the Miller-Modigliani hypothesis "substituted a tool of analysis for the problem," taking the question of balance sheet financing out of mainstream economics. *See* Toporowski, *supra* note 163, at 9.

[355] *See* Modigliani & Miller, *supra* note 177.

[356] *Id.*

[357] Peter H. Huang & Michael S. Knoll, *Corporate Finance, Corporate Law and Finance Theory*, 74 S. CAL. L. REV. 175, 177-78 (2000).

Although it is not perfectly clear, the model also seems to assume fixed-rate debt.[358] A footnote in the M-M article does allude to firms' funding liquidity but it is not central to the argument.[359] By assuming away the realities of how firms actually fund themselves, the approach helped to sideline inquiry into how *real* firms manage their balance sheet. So what is most important in the liquidity account of corporate leverage markets given earlier gets assumed away. If the M-M assumptions were true, then finance professionals would have "all but disappeared, taking with them corporate finance as an area of scholarship and teaching. But the assumptions are not accurate, work is booming, and the discipline is flourishing."[360]

Nevertheless, this deductive approach to corporate finance took hold in the academy, so much so that in 1990, Merton Miller received the Nobel Prize for his work on capital structure. In his acceptance speech, Miller recalled the capital irrelevancy hypothesis when he observing that there was no such thing as an "overleveraged" firm because its cost of debt and equity capital would simply adjust to reflect its risk.[361] That may be the case inside the model of a single firm, but when leveraging practices could affect the finance sector as a whole – as Minsky suggested about speculative and Ponzi borrowing – then the effects of the firm's borrowing extended more widely. In Ronald Coase's acceptance speech the following year for the same Nobel prize that Miller had received, he warned against assuming away the economic realities of firms and markets, arguing that that "detailed knowledge of the economic system" was necessary to avoid having "[w]hat is studied [be] a system which lives in the minds of economists but not on earth."[362] Coase's award suggested growing appreciation for the value of more

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[358] *See* Modigliani & Miller, *supra* note 177, at 261, 268. ("All bonds (including any debts issued by households for the purpose of carrying shares) are assumed to yield a constant per unit of time.") Elsewhere in their paper, Modigliani and Miller note that, in fact, a range of interest rates exist. *Id.* at 273 ("In existing capital markets we find not one, but a whole family of interest rates varying with maturity, with the technical provisions of the loan and, what is most relevant for present purposes, with the financial condition of the borrower.") (internal citation omitted). In the context of the discussion, though, these would seem to be a range of fixed interest rates.

[359] *Id.* (discussing how creditors may constrain a firm's borrowing ability as its risk increases).

[360] Huang & Knoll, *supra* note 357, at 191.

[361] Merton H. Miller, Leverage, The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1991 (Dec. 7, 1990), *in* 1990 ECON. SCI. 291, 298-300 (1990), *available at* http://nobelprize.org/nobel_prizes/economics/laureates/1990/miller-lecture.pdf (arguing that market forces "self-correct" the supply and demand for leverage endogenously through interest rates).

[362] Ronald H. Coase, The Institutional Structure of Production, The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1991 (Dec. 9, 1991). Coase won the Nobel Prize for economics in 1991, the year after Merton Miller, whose work epitomizes the deductive finance that underwrites financial models. Coase's acceptance speech emphasized his concerns about deductive modeling. To make economics more earthly, Coase's *The Nature of the Firm* stressed the "transaction costs" of organizing production in one way or another would ultimately come to determine the structure of firms and, hence, the industrial structure of production. *Id.* at 4. Analyzing transaction costs figured too in *The Problem of Social Costs*, this time to evaluate how they influenced the efficacy of law, itself a source of transaction costs. *Id.* at 6. Thinking about these costs as an independent variable has found its way into legal scholarship, thanks more to *The Problem of Social Cost* than to *The Nature of Firm*. *Id.* Coase gave two reasons for why scholarship received the former article more warmly than the latter: Kuhnian resistance to paradigm change and the very absence of the empirical knowledge about industrial production on which his work insisted. *Id.* at 6.

empirically-grounded arguments about corporate leverage. Hickman, Minsky, and, certainly, this Article strive to be in that latter vein.

Insofar as it is financial models that contribute to speculative and Ponzi investment, closing the reality gap in these models might limit euphoric investment or at least better forecast the downside.[363] We already knew that these deductive models did not reflect the "fat tail" distributions associated with extremal events (although the positive fat tails meant bumper profits), but the shape of the omission did not become clear until financial losses mounted. In particular, models did not anticipate that asset market liquidity might shrink drastically.[364] More generally, any risk management models that uses the "mid-price" between the bid and the ask quote to estimate the price at which a hypothetical transaction will clear may underestimate the real liquidity risk of a trade.[365] When markets are moving against an investor's position, the investor may realize less than the mid-price.[366]

Another general shortcoming of the models was that relied on historical data about seasoned products and previous credit trends that had been less severe.[367] Structured credit products like collateralized debt or loan obligations had never been exposed to a major market downturn, so models failed to predict how they would behave, as market liquidity receded.[368] Moreover, while these econometric models did analyze how an adverse credit event particular to the firm, say a downgrade of the firm by a credit rating agency, they had failed to anticipate conditions that might affect the finance sector as a whole.[369] Nor did they predict that, as the credit market worsened, even large finance firms would face increased borrowing costs (including from each other as their respective judgments of each other's riskiness increased), compromising their own funding liquidity.[370]

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[363] The model is entrenched: "'If you try to attack [Black-Scholes],' says one longtime trader of abstruse financial options, 'you're making a case for your own unintelligence.' The math was too advanced; the theorists too smart; the debate for anyone without a degree in mathematics was bound to end badly." Michael Lewis, *Inside Wall Street's Black Hole*, PORTFOLIO, Mar. 2008, at 132.

[364] *See* Senior Supervisors Group, *supra* note 260, at 11. It is another expression of the failure to properly reckon with foreseeable financial instability: "In particular, banks had made assumptions about the asset market liquidity of certain structured products, ABCP [asset-backed commercial paper] and loan books that proved to be overly optimistic….It had not been anticipated that the liquidity of such markets would evaporate…" BASEL COMM., *supra* note 61, at 12.

[365] "Marking to market therefore yields an underestimation of the true risk in such markets, because the realized value upon liquidation can deviate significantly from the market mid-price." Anil Bangia et al., *Modeling Liquidity Risk, With Implications for Traditional Market Market Risk Measurement and Management* 3 (Wharton Fin. Insts. Ctr., Working Paper No. 99-06, 1999).

[366] *Id.*

[367] *See* Senior Supervisors Group, *supra* note 260, at 14, 16.

[368] *Id.* at 14.

[369] *Id.* at 11.

[370] *Id.*

And not only do these models fail to reflect actual markets but,"indeed, a model can induce a market."[371] It does this by contributing to a market-wide shift in attitudes towards risk and its management. As has been noted about the Black-Scholes option pricing model – "Black-Scholes is no longer just a model; it has evolved into a climate of opinion about a certain kind of financial risk."[372] Like the M-M approach, the Black-Scholes model rests on mathematical logic that is inaccessible to the mathematically-uninitiated.[373] Black-Scholes may have contributed to the recent leverage boom by failing to reflect how asset prices will really behave in an extreme downward turn in prices.[374]

The next generation of financial models will have the benefit of the present credit crunch and the ensuing unwinding of positions to better reflect the impact on a borrower's liquidity of market liquidity and, vice-versa, the impact on market liquidity of borrower liquidity in the aggregate. The Liquid Asset Pricing Model ("LAPM") is one attempt to reflect how market liquidity would impact the price that an asset will fetch.[375] Though based on the Capital Asset Pricing Model ("CAPM"), the LAPM uses assumptions about corporate demand for liquidity (rather than consumer demand as does the CAPM) to model the liquidity preferences of institutional borrowers and lenders more finely.[376] This is a step in the right direction.

VI. CONCLUSION

As a bridge to understanding the new credit market, this Article encouraged a conceptual shift in how we think about liquidity dynamics in firms and markets. I drew on financial history and market structure theory to highlight the most important trends in this credit market.[377] I spoke in terms of leveraged liquidity to point out that when liquidity – either in a borrower or in a market – is leveraged through borrowing (and that way encumbered with other claims), it can engender financial instability, even as it seems to be doing the opposite by facilitating exchange. Speculative and Ponzi borrowings give rise to leveraged liquidity, while hedged borrowing does not. It is time to revisit the

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[371] The financial model creates investment demand, which leads to investment supply: "'The model created markets,' [hedge fund manager John] Seo says. 'Markets follow models. So these markets spring up, and the people in them figure out that, at least for some of it, Black-Scholes doesn't work. For certain kinds of risk – the risk of rare, extreme events – the model is not just wrong. It's very wrong. But the only reason these markets sprang up in the first place was the supposition that Black-Scholes could price these things fairly.'" Michael Lewis, *Inside Wall Street's Black Hole*, PORTFOLIO, Mar. 2008, at 132

[372] *Id.*

[373] *Id.* at 130.

[374] *Id.*

[375] Jean Tirole, *Liquidity shortages: theoretical underpinnings*, *in* BANQUE DE FRANCE, *supra* note 23, at 53, 59-60. The model is set out in mathematical form in B. Holmström & Jean Tirole, *LAPM: a liquidity-based asset pricing model*, 56 J. FIN. 837 (2001).

[376] *See* Tirole, *supra* note 375, at 59-60.

[377] As economist John Kenneth Galbraith noted about finance: "[t]here can be few fields of human endeavor in which history counts for so little as in the world of finance." *See* GALBRAITH, *supra* note 178, at 1–17 (arguing that collective psychological mechanisms contribute to financial crises by, inter alia, discouraging criticism of financial speculation).

credit paradigm, as regulators are beginning to do; but until they reckon with these liquidity dynamics in a more systematic fashion, regulatory models for credit will still lag. Historically, repurchase markets for collateralized lending gave financial intermediaries access to both asset and borrower liquidity in a market that was, arguably, safer than even investment-grade commercial paper. To see confidence recede in the repurchase market, as it began to with Bear, is significant.

Let me recapitulate before concluding. First, the growth of floating-rate loans by corporations merits attention, in part because rising rates increase the liquidity risk of borrowers. Borrowers can play liquidity war games to manage this risk but, because borrowers follow the herd, market-wide shifts in the appetite for borrowing are properly regulatory concerns. Second, as nonbank firms have become active (and, at times, dominant) in originating and trading corporate credit, regulators with only commercial banks on their mind will not see the whole picture. Sovereign wealth funds raise thorny issues of their own because they act behind the cloak of sovereignty, but they are only one of the "private capital pools" about which the President's Working Group on Financial Markets is properly focused. Third, when beauty contests in the secondary market turn ugly, loans of questionable quality can get stranded on the books of lenders, turning intermediaries that normally provide liquidity to other firms (and market liquidity in general) into liquidity cost centers in the market. Leveraged loans are a paradigm case of these dynamics, showing how, during financial euphoria, even the semantics of credit changes so that borrower demand becomes "loan supply" and "leveraged" takes the place of the less sanguine "junk" moniker.

As Minsky reminded us, financial instability is an economic fact of life in a capitalist economy. But financial and regulatory models should do a better job of reminding borrowers and lenders about this. Leveraged liquidity is a growing feature of modern credit markets, so it deserves attention. Assuming that borrowing leads to financial instability may seem disconcerting, but it is a modeling assumption derived from how credit markets actually work. And if starting from the premise of financial instability could raise the bottom when the financial cycle turns for the worse (as it is doing now), then it is worth the theoretical discomfort of being accurate

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