Unenforceable Securitization Contracts

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A "portfolio" here is a bundled set of contracts. In this Article, we address a commercially important example, where a local bank finances home purchases. The bank bundles the resultant contracts—the mortgage-backed securities (MBS)—into a portfolio, which it then sells to a firm, denoted an "originator." The originator buys portfolios from several local banks and sells the portfolios to a large bank, which markets the portfolios to public-investment vehicles, such as trusts. "Portfolio contracts" govern each of these sales.

We show that the initial portfolio contract between the local bank and originator is unenforceable for two reasons. First, in contrast to goods sellers, who warrant that the goods perform, the local bank warranted that it created each of the constituent MBS in the portfolio according to good underwriting practice. Hence, while breach is observable to the goods buyer (who can see that the goods did not perform), the portfolio buyer cannot observe breach because efficiently and inefficiently created MBS are facially identical. Thus, an MBS buyer would have had to reconstruct how the local bank created particular loans in order to establish a warranty breach. Second, the goods in a bundle usually are homogenous, so the buyer can prove damages by extrapolating the loss on sampled goods to the whole. In contrast, the MBS in a portfolio usually are heterogeneous: the loans have different face values, and the individual obligors have paid different sums before defaulting. Hence, the

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originator must prove damages contract by contract. For these reasons, it would have been too costly for an originator to prove breach and damages.

The originator, however, sold the MBS portfolio to the large bank, remaking the unenforceable local-bank warranties that had been made to them. The large bank then remade the warranties to the public-investment vehicles. These vehicles were even less able than the originators to enforce the best-practice warranties. Hence, no one could—and no one did—enforce an MBS-portfolio contract as it was written.

Anticipating this result, the originating local banks reduced pre-loan screening of potential borrowers. This increased the number of marginal borrowers with two results: (i) many borrowers defaulted because they could not pay, and (ii) some borrowers who could pay defaulted strategically because they believed that the large number of defaulters overwhelmed a portfolio buyer's capacity to pursue them.

Anecdotal data indicate that market agents today continue to sell MBS portfolios under similar unenforceable contracts. A material fall in housing prices thus could yield macroeconomic consequences similar to those experienced in the Great Recession.

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Introduction

We begin with three widely accepted facts.

First, in the period leading up to the Great Recession, banks made many mortgage-backed home loans (herein sometimes "MBS") to borrowers who would not have previously qualified for the loans. Second, the banks (herein "local banks" or "originating banks") securitized the home loans: that is, a local bank would sell the loans it originated to a second financial intermediary. Through a distribution chain described immediately below, public investors ultimately came to own the loans. Third, during the Great Recession, defaults on home loans greatly exceeded their historical average, with disastrous macroeconomic effects. Commentators assume that these three facts are related; securitization in some way created incentives for the local banks to make loans to borrowers who were unlikely to repay. When economic distress became widespread, many risky borrowers could not withstand the pressure to default.

This stylized story raises two questions. First, how did securitization increase a bank's incentive to make risky loans? Second, why did sophisticated profit-maximizing firms create and sell MBS through a distribution channel that increased the probability of defaults? These questions are relevant today because financial firms continue to use essentially the same distribution channel.[1] Thus, another substantial economic shock could cause a second unfortunate spike in defaults.

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[1] *See* Matt Phillips, *Wall Street Loves These Risky Loans. The Rest of Us Should Be Wary.*, N.Y. TIMES (Oct. 19, 2018), https://www.nytimes.com/2018/10/19/business/economy/clo-corporate-loans.html [https://perma.cc/Q7TC-EHWN]:

> A financial assembly line that went haywire a decade ago and contributed to an economic crisis is gearing up again on Wall Street.
>
> Back then, one of the products the banks churned out—bond like investments based on thousands of mortgages—proved far riskier than most banks, investors and regulators had expected when many borrowers couldn't pay. The banking system froze, a financial panic ensued and the country experienced its worst recession in decades.
>
> This time around, a similar kind of investment, called C.L.O.s, for collateralized loan obligations, are at the heart of the boom. And that's not the only parallel: The loans are being made to risky borrowers. Lending standards are dropping fast, and regulators are easing the rules.

No-down-payment loans, or loans in which the seller financed the down payment, were among the riskiest loans during the Great Recession and were later prohibited. The Federal Housing Administration, however, now is working with private nonprofits to subsidize down payments for borrowers who lack the resources to make down payments. These subsidies are classified as second loans on the property. *See* Ben Eisen & Laura Kusisto, *Home Buyers Get Government Help with Down Payments*, WALL ST. J. (June 16, 2019), https://www.wsj.com/articles/home-buyers-get-government-

We approach these questions in two ways. First, we offer a novel and plausible theory to explain why securitization incentivizes local banks to make risky home loans. Second, we set out an original, comprehensive explanation for why sophisticated agents created and continue to use the inefficient MBS-distribution channel.

This Introduction begins by sketching a typical MBS-distribution channel. We then introduce our theory of why securitization worsened bank incentives and explain why sophisticated actors distributed, and continue to distribute, MBS in the same questionable way. The Article then expands on our arguments and offers further supporting evidence.

A. Distribution Chains

In a "short intermediation chain," individuals lend money to a local bank through deposits, and the bank then relends the money in the form of home loans supported by mortgages. Because the bank holds the loans and accompanying mortgages from creation to maturity, it internalizes the costs and realizes the gains from efficiently screening potential borrowers for their ability to repay and efficiently monitoring loans in response to default. Short intermediation chains, however, no longer govern home finance.

Instead, MBS during the Great Recession were distributed through "long intermediation chains," and this practice continues today. Such a chain begins when a local bank sells the loans it creates to an entity called an "originator." The local bank does not sell one loan at a time but rather bundles the loans into a "portfolio." Portfolio sales from the local bank to the originator are characterized by asymmetric information: notably, the originator cannot observe the originating local bank's practice in making loans or the "quality" of the individual borrowers. In a case like this, when a seller is better informed about a new product than the buyer, the seller customarily warrants product quality. Local banks thus made warranties to the originators regarding the quality of loans they created.

An originator—the first MBS-portfolio purchaser—can be an independent firm or a subsidiary of a large bank. In either event, the originator would buy MBS portfolios from several local banks and sell the portfolios to a larger bank. Again, because these were sales, the originator, when selling portfolios to

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help-with-down-payments-11560677400 [https://perma.cc/ME53-78CS]. More formally, a recent paper refers to "the revival of the structured finance market with over $3.10 trillion in securities issuance between January 2010 and June 2015." Jordan Nickerson & John M. Griffin, *Debt Correlations in the Wake of the Financial Crisis: What Are Appropriate Default Correlations for Structured Products?*, 125 J. FIN. ECON. 454, 455 (2017).

large banks, would remake the warranties regarding loan quality that the local bank had made to it. The large bank, commonly called a "seller," then would resell the portfolio, pursuant to a "Mortgage Loan Purchase Agreement," to another financial intermediary, called a "purchaser." The seller would remake the warranties the originator made to it to the purchaser, oftentimes a trust.[2]

The parties to the Mortgage Loan Purchase Agreement also would make an accompanying contract, the "Pooling and Servicing Agreement." The Mortgage Loan Purchase Agreement required the purchaser to deposit the mortgage loans into a mortgage pool comprising the trust fund. The trust fund would be evidenced by "a single series of 'mortgage pass-through certificates' [which] will consist of... classes of certificates. The Certificates will be issued pursuant to a Pooling and Servicing Agreement."[3] The parties to the related Pooling and Servicing Agreement were (i) the seller under the Loan Purchase Agreement, now called the "depositor"; (ii) an entity called the "servicer," whose task was to service the loans; and (iii) the trustee.

Finally, the trust would sell the certificates it held to public investors. A public investor thus became a partial owner of the relevant MBS portfolio. As such, the investor bore the purchase risk: it was entitled to the payments that the ultimate obligors—the home buyers—had to make, but it bore the loss when those payments shrank or stopped.

The servicer was the trust's agent. A typical Pooling and Servicing Agreement would provide that:

> The servicer shall service and administer the Mortgage Loans and shall have full power and authority... to do any and all things which it may deem necessary or desirable in connection with such servicing and administering, all in accordance with Accepted Servicing Practices....[T]he Servicer may allow a modification

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[2] These agreements took a standard form. As an example, one such contract provided:

> The Seller agrees to sell, and the Purchaser agrees to purchase, on or before February 28, 2007 (The "Closing Date"), certain conventional mortgage loans (the "Mortgage Loans") originated by Opteum Financial Series LLC ("Opteum" or the "Originator") having an aggregate principal balance as of the close of business on February 1, 2007, of $603,341,258.09 . . . . The Seller will prepare or cause to be prepared on or prior to the Closing Date a final schedule (the "Closing Schedule") that together shall describe such Mortgage Loans and set forth all of the Mortgage Loans to be purchased under this Agreement. The Closing Schedule will conform to the requirements set forth in this Agreement and to the definition of "Mortgage Loan Schedule" under the Pooling and Servicing Agreement.

Mortgage Loan Purchase Agreement Between Citigroup Global Markets Realty Corp. and Citigroup Mortgage Loan Trust § 1 (Feb. 15, 2007). Many, many similar contracts could be quoted.

[3] *Id.* Though the MBS in a single sale sometimes were originated in the same period, the loans were for different face values, and the individual obligors defaulted at different stages of their repayment schedules.

> with respect to a Mortgage Loan if the Servicer would take such action in the ordinary course of its business if it were the owner of the Mortgage Loan. . . .[4]

The Pooling and Servicing Agreements also contained a limitation of liability term providing that neither the servicer, the depositor, the seller, nor the Trust:

> shall be under any liability to... the Trust Fund or the Certificate Holders for any action taken or from the refraining of any action taken in good faith pursuant to this Agreement or for errors in judgment; *provided that* this provision shall not protect any Protected Party [the purchaser, seller, etc.] against any breach of representations or warranties made by it herein . . . .[5]

As said, each MBS-portfolio seller made representations and warranties: that the mortgage loans were not in default at the time of sale; that the loans were made in the ordinary course of the seller's business; that the sales would be structured to minimize tax liabilities; and so forth. Relevant to this Article, sellers customarily warranted that "[t]he origination, collection and servicing practices used by the Seller, any Originator and Prior Servicers, *with respect to each Mortgage Note and Mortgage* have been legal and in accordance with applicable laws and regulations, and in all material respects proper and prudent in the mortgage origination and servicing business."[6]

The key takeaway from this schematic description is that commercial parties traded MBS portfolios in a highly impoverished information environment.[7] Namely, there were four sale levels: from originating local bank to originator, from originator to larger bank, from larger bank to trust, and from trust to public investors who were ultimately the certificate holders. None of these buyers observed, or could observe, the local originating banks' lending practices or the quality of the individual borrowers. The point of securitization, however, was to make MBS informationally opaque: the buyers were supposed to treat an MBS as they would treat money. People do not ask what backs money; they just accept money. Similarly here, portfolio buyers and public-trust investors were not supposed to ask what backed the MBS securities; they were just supposed to take the securities.[8]

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[4] *CFLX 2007-2 Trust* § 5.01; *Flow Mortgage Loan Purchase, Warranties and Servicing Agreement* § 8.03 (2005). Servicers sometimes were restricted to modifying a subset of portfolio loans. For an extensive description of the servicing function, see Adam J. Levitin & Tara Twomey, *Mortgage Servicing*, 28 YALE J. ON REG. 1 (2011).

[5] *Pooling and Servicing Agreement in Connection with BSABS 2005-SD1 Trust* § 7.04 (emphasis added). This is a typical term. In an alternative-distribution form, the party that buys from the originator would assign the mortgages to the trust, pursuant to an "Assignment and Recognition Agreement." These assignment contracts also made warranties and limited liabilities, just as the "Mortgage Loan Purchase Agreements" did.

[6] *J.P. Morgan Mortgage Acquisition Corp. Purchaser and Chase Manhattan Mortgage Corporation Seller and Servicer* § 301.h (Jan. 1, 2004) (emphasis added). We quote similar warranties from other contracts in note 18 *infra*.

[7] The text describes the distribution channel for private-label loans, which are loans that a federal agency does not guarantee. Because the portfolios went through several hands, the channel is called a long intermediation chain. This was a large market. In 2006, private-label loans constituted 56% of real-estate MBS issuance and 21% of total mortgages outstanding by dollar amount. 2 INSIDE MORTG. FIN., THE 2010 MORTGAGE MARKET STATISTICAL ANNUAL 9-10 (2010); *see also* James J. Dow, Jr., *Mortgage Origination During 2002-2007 as an Example of an Evolutionary Market*, 26 J. EVOLUTIONARY ECON. 1007, 1017 (2016) ("In fact, towards the end of the boom in 2005 and 2006, the

When everyone acted in this way, credit to finance home purchases would be maximized. An implicit premise of this system, however, was that the MBS themselves were efficiently created, even if not every loan would perform. This premise, in turn, relied on the loan-quality warranties that every portfolio seller made to every portfolio buyer to induce efficient underwriting practices and efficient postdefault salvage practices. These premises are what we contest in our explanation for the poor performance of securitization markets.[9]

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private-label market was securing more mortgages than [government-agency-sponsored loans]."); Robert M. Mooradian & Pegaret Pichler, *Servicer Contracts and the Design of Mortgage-Backed Security Pools*, 46 REAL ESTATE ECON. 698, 701 (2018) ("[B]y 2007 nearly 20% of outstanding mortgage credit is through nonagency securitization, without guarantees against default risk."). For an extensive discussion of the economics and structure of long intermediation chains for various consumer contracts, including mortgages and credit cards, see Gary Gorton & Andrew Metrick, *Securitization*, *in* HANDBOOK OF THE ECONOMICS OF FINANCE 1 (2013). Particularly relevant to this Article, these authors remark, "The contractual nature of securitization also needs more attention . . . . Nothing is known about servicers of securitized portfolios or about the contractual arrangements with servicers." *Id.* at 63, 64. We describe these contracts here and show *infra* how the servicers performed.

[8] Many of the MBS portfolios were organized in tranches. A Pooling and Servicing Agreement would create senior and junior classes of certificate holders (i.e., the public investors). There could be as many as twenty-one classes in a single public offering. Certificate holders were paid in order of seniority. Because poorly performing portfolios generated some cash, the most senior certificate holders, rated AAA, did much better than junior certificate holders, whose certificates were rated as low as BBB. Over one trillion AAA-rated tranches defaulted on their claims, however. *See* Nickerson & Griffin, *supra* note 1, at 454. Our concern is the relation of securitization to the default rate, so we do not analyze the tranching process itself.

[9] Two prominent commentators claimed that securitization "transforms illiquid, low-grade loans into publicly traded assets of high quality." BENGT HOLMSTROM & JEAN TIROLE, INSIDE AND OUTSIDE LIQUIDITY 8 (2011). When loans are bundled into a portfolio, the portfolio holder can sell interests in the portfolio because buyers are protected by the law of large numbers: the many good loans offset the few bad ones. Securitization, as Holmstrom and Tirole claim, thus transforms illiquid loans into liquid investment securities. On the other hand, a low-quality loan—a bad loan—cannot become a good loan just because the originating bank sells the loan to another intermediary. The sale does not change the individual obligor's risk profile. It follows that selling a hundred bad loans must produce a hundred-member portfolio of bad loans. Holmstrom and Tirole's claim that the *loan portfolio* is "of high quality" thus must rest on the implicit premise that the originating bank optimally pre-screened the individual borrowers. As such, portfolio-default rates would be the product of circumstance: i.e., some loans inevitably fail, rather than also be a function of improvident loans to high-risk borrowers.

B. Overview

We introduce our theory explaining contract failure in securitization markets in four steps.

Step One: The originator could not enforce the local bank's warranty of loan quality for two related reasons: (i) the local bank did not warrant loan performance—an output—but rather warranted underwriting-practice quality—an input; and (ii) the local bank warranted the quality of *each loan*.[10] To enforce the local bank's warranties, the originator thus would have had to identify each nonperforming loan and show that *that particular loan* was improperly created. This would have been an almost impossible burden for the originator to bear because the originator could not observe the input—the quality of the local bank's underwriting practice—in connection with each individual loan. Further, as shown, the originator would resell the loans and remake the local bank's warranties. This next buyer—the depositor/seller—was even further removed from the originating context than the originator. Hence, depositors/sellers could not have enforced the warranties at all had they ultimately held the loans. But instead of holding the loans, they marketed the loans to trusts, remaking the warranties that had been made to them. The trust was even further away from the originating context than the seller bank.

Step Two: *To the extent* that local banks realized that they would not be sued on the warranties they made, they would have an incentive to relax lending standards because lending costs fall as borrower-screening costs fall.

Step Three: Lax screening by local banks would reduce the quality of the loan pool—that is, more loans would be made to unqualified borrowers. This would increase the number of "necessary" defaults: defaults by borrowers who could not pay.

Step Four: *To the extent* that individual borrowers realized that a greater-than-usual number of borrowers was defaulting, an individual borrower who could pay would have an incentive to default strategically, believing that the probability of being punished for default would fall as the relevant servicer's ability to enforce loans became more strained. The increasing number of poorly performing loans traceable (at least in considerable part) to the unenforceable warranties thus also could produce a "contagion effect"; there would be both necessary *and strategic* defaults, with an increase in the former contributing to an increase in the latter.

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[10] *See supra* note 6 and accompanying text; and *infra* note 17-18 and accompanying text (elaborating on warranties).

Our theory yields a simple answer to the first question we posed: securitization increased the number of bad loans, and hence the number of defaults, because no bank in the distribution chain could be held liable for making bad loans.[11] We next introduce evidence that supports our four-step theory and summarize the legal and economic reasons why sophisticated commercial parties traded hundreds of billions of dollars of MBS under unenforceable contracts. The Article then expands on these claims.

Our argument in "Step One" begins by contrasting the typical contract to sell goods with the MBS-portfolio contract that local banks made with originators.[12] The typical goods seller warrants its "output": the goods will perform as promised.[13] Such output warranties take three forms:

(i) the seller promises that the goods meet specifications, such as size or color;

(ii) the sale is "by description," i.e., the seller of a widget agrees that the product will do what widgets commonly do;[14]

(iii) the seller
  (a) guarantees that the product is free from defects in materials and workmanship; and
  (b) promises that the seller will repair or replace defective parts or systems.[15]

Form (iii)(a) warrants aspects of the seller's performance, but the seller's liability is triggered by the good's nonperformance. Thus, the buyer need not show which defective part or system caused the product to fail. Rather, the seller must fix the problem.

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[11] Our explanation is not exclusive. Some commentators have traced the increase in bad loans in the 2005-2007 period to increased pressure that senior bank officials put on lending officers. *See, e.g.*, Simon Sepe, *Regulating Risk and Governance in Banks: A Contractarian Perspective*, 62 EMORY L. REV. 327 (2012). We claim only that when a seller knows that she will not be liable on the promises she makes, she is less likely to keep those promises. The Article's novelty is its showing that the warranties sellers made in connection with MBS sales were unenforceable.

[12] Classifying contracts by subject matter, there are (i) contracts to sell goods; (ii) contracts to sell services; (iii) contracts to sell a single contract; and (iv) contracts to sell numerous contracts (the MBS portfolio). Categories i and ii are familiar to lawyers and economists. Category iii may be less familiar, but several statutes and a large scholarly literature concern it. *See, e.g.*, U.C.C. arts. 3, 4 (AM. LAW INST. & UNIF. LAW COMM'N 2017). This contract form includes assignments of contract rights and the negotiation of financial instruments. *See, e.g.*, Clayton P. Gillette, Alan Schwartz & Robert E. Scott, PAYMENT SYSTEMS AND CREDIT INSTRUMENTS (1996). We analyze category iv contracts, whose properties, we claim, lawyers and commentators have largely overlooked.

[13] For illustrative purposes, we focus on the difference between the contract to sell contracts and the contract to sell goods. Contracts to sell services are similar to contracts to sell goods in relevant respects.

[14] Section 2-314(2)(a) of the U.C.C. provides that goods are merchantable if they "pass without objection in the trade under the contract description." U.C.C. § 2-314(2)(a) (AM. LAW INST. & UNIF. LAW COMM'N 2017). Section 2-314(2)(c) of the U.C.C. similarly requires goods to "be fit for the ordinary purposes for which such goods are used."

[15] This is the standard warranty for sales of hard goods, such as machines.

In contrast, the originating local bank *did not* warrant its output—that the MBS portfolio the local bank created would perform—in its sale to the originator.[16] Rather, the bank warranted its "input": that the bank created *each portfolio contract* appropriately. The originating bank thus warranted that it made each loan in accordance with customary lending standards; it conducted each home appraisal appropriately;[17] each borrower lived in her home—i.e., the borrower was not a speculator; and so forth.[18]

To understand the operational difference between the goods-output warranty and the MBS-input warranty, suppose that a buyer purchased a $10,000 machine but that defects reduced the machine's efficiency by 30%. If the buyer accepted the machine, it could reduce the price by $3,000.[19] Now let an originating bank sell a portfolio of a hundred loans, each of face value $100,000. If a 1% default rate is acceptable, the market would value the portfolio at $9,900,000 (discounted to present value). But suppose the default rate turned out to be 30%. The portfolio buyer could not sue the originating bank for $2,900,000, the unanticipated decline in portfolio value. Rather, because the local bank warranted its input, the originator would have to identify each nonperforming loan and show that the originating bank did not write *that loan* in accordance with standard underwriting practice.[20]

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[16] A portfolio would perform if the individual borrowers, or most of them, paid off their loans.

[17] Trust plaintiffs alleged that originating banks failed to conduct appraisals in accordance with standard appraisal practice. *See* Nomura Home Equity Loan, Inc. v. Nomura Credit & Capital, Inc., 29 N.Y.3d 992 (2017).

[18] *See, e.g.*, *Assignment and Recognition Agreement Among Citigroup Global Markets Reality Corp., Citigroup Mortgage Loan Trust, Inc. and WMC Mortgage Corp.*, at xxii (Jan. 31, 2006) (emphasis added) ("The origination and collection practices used with respect to *each Mortgage Note and Mortgage* have been in all respects legal, proper, prudent and customary in the mortgage origination industry."); *Flow Mortgage Loan Purchase, Warranties and Servicing Agreement, Between JP Morgan Mortgage Acquisition Corp. (Purchaser) and Chase Manhattan Mortgage Corporation* § 3.01q (stating that the Mortgage Loan complies with all the terms, conditions and requirements of the Seller's Underwriting Guidelines in effect at the time of origination of such Mortgage Loan); *Mortgage Loan Purchase Agreement Between Citigroup Mortgage Loan Trust Inc. and Citigroup Global Markets Reality Corp.*, at xxi (Feb. 15, 2007) (stating that the origination, servicing and collection practices used by the Originator with respect to each Mortgage Note and Mortgage have been in all respects legal, proper, prudent and customary in the mortgage origination and servicing industry); *Mortgage Loan Purchase Agreement Between EMC Mortgage Corporation and Structured Asset Mortgage Investment II Inc.*, at xvii (Jul. 29, 2005) ("*Each Mortgage Loan* was originated . . . in conformity with the underwriting standards of and purchased by a subsequent mortgagee that was either a savings and loan association, savings bank, commercial bank . . . .") (emphasis added). Additionally, the RMBS Trust Settlement Agreement between JP Morgan Chase & Co. (a portfolio seller) and institutional investors in several-hundred trusts provided, in one of the introductory recitals: "WHEREAS, the Institutional Investors have alleged that *certain Mortgage Loans* held by the trusts in breach of representations and warranties contained in the Governing Agreements, cause the Investors in such Trusts to seek to compel the trustee" to take legal action. *RMBS Trust Settlement Agreement* (Nov. 15, 2013) (emphasis added). Many more such examples are available.

[19] U.C.C. § 2-714(2) (AM. LAW INST. & UNIF. LAW COMM'N 2017) ("The measure of damages for breach of warranty is the difference at the time and place of acceptance between the value of the goods accepted and the value they would have had if they had been as warranted . . . .").

The MBS-portfolio contracts were not enforceable largely because no portfolio buyer could observe—at acceptable cost—how the originating bank created the constituent portfolio loans. In contrast, the goods buyer can observe a warranty breach directly: the washing machine does not clean; the dish washer does not wash; the car does not run. If a buyer purchases a bundle of goods, he can establish breach by taking a sample because the goods in a bundle usually are identical: they are all washing machines. In contrast, the portfolio buyer would have to "get behind" the portfolio to observe how *each* nonperforming loan to learn how it was made: did the originating bank check the borrower's income and job status? Where she lived? What her credit rating was? Because the MBS portfolios that originators purchased contained hundreds or thousands of loans, it was not economical for them to check how each defaulting loan was made.

In addition, the goods buyer usually can establish causation easily. For example, a well-made washing machine cleans, and the seller warranted performance. Hence, courts find prima facie that the seller breached its quality warranty if the machine does not clean. It is more difficult for the loan buyer to establish causation because a portfolio can underperform for three reasons:

(i) exogenous events, such as a recession or a natural disaster, caused many portfolio borrowers to default;

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[20] Regarding remedies:

> If the Seller or originator . . . does not cure such . . . [warranty] breach in all material respects, the Trustee shall enforce the obligations of the related Originator . . . and then, to the extent that the related Originator fails to cure such defect or breach, the related Originator or the Seller, as the case may, [shall] repurchase *that Mortgage Loan* from the Trust Fund at the Purchase Price . . . .

Pooling and Servicing Contract JPALT 2005-A § 2.5(a) (emphasis added). Additionally, "to the extent that the related Originator fails to cure such defect or breach . . . the related Originator or the Seller . . . as the case may be, [shall] repurchase *that Mortgage Loan* from the Trust Fund at the Purchase Price." *Pooling and Servicing Contract JPALT 2006-A1* § 2.5(a) (emphasis added). The repurchase price would be the unpaid loan balance, plus unpaid accrued interest plus costs, less "Monthly Advances and advances paid to the purchaser of the Mortgage Loan (if any)." *Pooling and Servicing Agreement Governing the Structured Asset Mortgage Investments II Trust 2007-AR4*, at 41 (Aug. 1, 2007) (defining "Repurchase Price"). Some courts have held that a warranty breach is actionable if it materially reduced the value of a particular loan; in other words, the buyer need not show that the loan was in default. *See, e.g.*, Homeward Residential, Inc. v. Sand Canyon Corp., 298 F.R.D. 116 (S.D.N.Y. 2014); Assured Guar. Mun. Corp. v. Flagstar Bank, F.S.B., 892 F. Supp. 2d 596 (S.D.N.Y. 2012). Because a loan is not performing in ordinary usage if it falls materially in value or defaults, this Article uses the phrase "nonperforming" to refer to both default types.

(ii) an atypically large set of defaulters would have received loans even if the originating bank had appropriately investigated;

(iii) a different set of defaulters *would not* have been extended loans had the originating bank appropriately investigated.

The originator could only recover damages for loans in the third category; it would have to exclude defaults in categories (i) and (ii).

Finally, it is less costly to prove damages for breach of a goods warranty than for breach of the MBS warranty because goods usually are identical, but mortgages are not. For example, let a merchant purchase 1,000 washing machines, which it values at v each, sample fifty, and find that (a) all fifty were defective; and (b) the defects reduced the value of each machine by 20%. A court will award the buyer damages of $0.2v$ times 1,000. Damages for breach of a warranty that a loan was efficiently originated are the difference between the face value of the loan and the payments the borrower made before defaulting.[21] Suppose, then, that the buyer purchased a portfolio of 1,000 mortgage loans, and the face value of *one identified loan* was $250,000, on which the borrower had paid $60,000 before defaulting. A court will not (and courts have not) permitted the buyer to establish damages by multiplying $190,000—the sample defaulted sum—by the number of nonperforming portfolio loans. This is because portfolio loans commonly have different face values (i.e., they are for different amounts), and borrowers default after paying off different portions of their loans. Therefore, the portfolio buyer must prove damages loan by loan.

As a result of these difficulties, there was an "unenforcement cascade." The trusts, suing on behalf of the certificate holders, could not enforce the warranties that the depositor/seller banks made to them. The depositor/seller banks, not being liable, had no standing to sue the originators, and the originators, not being liable, had no standing to sue the local banks. Consistent with this analysis, no selling bank has been held liable on the warranties it made to a trust. And so far as appears, neither the originators nor the local banks have been sued directly on their warranties at all.

Steps Two and Three: There is substantial evidence that local originating banks reduced lending costs by suboptimally screening potential borrowers.[22]

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[21] U.C.C. § 2-714(2) (AM. LAW INST. & UNIF. LAW COMM'N 2017).

[22] Scholars have found that securitization led to suboptimal screening. Benjamin J. Keys, et al., *Did Securitization Lead to Lax Screening?: Evidence from Subprime Loans*, 125 Q.J. ECON. 307 (2010); *see also* Dong Beom Choi & Jung-Eun Kim, *Securitization and Screening Incentives: Evidence from Mortgage Processing Time* (Aug. 11, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3135292 [https://perma.cc/RE4N-YF6Y] (finding that banks invested less time in screening borrowers when they securitized the loans); Dow, *supra* note 7, at 1018 (summarizing the literature regarding lax originator screening); Patricia A. McCoy & Susan Wachter, *Representations and Warranties: Why They Did Not Stop the Crises*, in EVIDENCE AND

Two factors suggest that the banks were incentivized to reduce screening because they recognized that they would not be held liable for making poor loans. First, while some warranty breaches would be apparent on a contract's face—that the loan had a balloon payment, for example—other breaches could be proved only by reconstructing the bank's lending practices *in connection with individual loans*. A local bank would understand, more than any other market actor, how impossible a burden this would be for a trust or public investor to meet. Second, a local bank would know that some of its borrowers were defaulting but would also know that no one was suing it. Hence, a bank that relaxed its lending standards, or was contemplating doing so, would not anticipate being sued. For these reasons, which are consistent with the evidence, we claim that the inability of portfolio buyers to enforce the MBS contracts governing their trades materially facilitated the moral hazard—the making of improvident loans—that characterized the long securitization chains.[23]

Secondly, there are four reasons why sophisticated commercial actors made, and continue to make, unenforceable MBS-portfolio contracts.[24] Initially, though local banks had good reason to recognize that they would not be held liable for poor underwriting practices, this knowledge did not percolate into the wider marketplace. Put simply, from 2005 through 2007, people did not widely recognize that input warranties are extremely difficult to enforce. Nor is that fact widely recognized today. For example, before the Crisis, rating agencies refused to rate senior tranches of loan portfolios highly *unless* the originating banks warranted the quality of their loans to the buyers. However, the agencies, then and now, *require the banks to warrant an input*: that the

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INNOVATION IN HOUSING LAW AND POLICY 289, 311 (L. Fennel & B. Keys eds. 2017) ("During the credit expansion leading up to 2008, representations and warranties contributed to the overheating of the cycle by giving false assurances to investors while failing to deter the race to the bottom in lending standards."); Amiyatosh Purnanandam, *Originate-to-Distribute Model and the Subprime Mortgage Crisis*, 24 REV. FIN. STUD. 1881 (2011).

Additionally, an early paper found:

> [D]efault rates increase[d] significantly more from 2005 to 2007 in ZIP codes that experience[d] an increase in the fraction of mortgages sold in private securitizations or to noncommercial bank finance companies from 2002 to 2005. This result hints at moral hazard on behalf of originators as a factor contributing to the expansion in credit supply, although we believe more research is need on this precise mechanism.

Atif Mian & Amir Sufi, *The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis*, 124 Q.J. ECON. 1449, 1454 (2009) (citation omitted).

[23] We put off Step Four—that MBS markets experienced a contagion effect—until Section II.C *infra*.

[24] Part III, *infra*, below provides further explanatory detail.

originating bank made each loan in accordance with standard-underwriting practice.[25]

Second, characterizing the efficient *portfolio contract* is an unsolved problem for lawyers and economists. Two related public-goods problems may prevent contract innovation. Initially, a single bank or buyer firm that solves the problem by creating an efficient portfolio contract would incur the solution costs. However, because the firm could not prevent other firms from copying its contract form, the innovating firm would realize a trivial portion of the social gain. Copying, however, may be less serious than the coordination problem. There are many firms on several distribution levels in securitization markets. An innovative contract form would be unlikely to catch on unless many of these firms could be persuaded to use it. The innovating firm thus would have to coordinate the behavior of numerous buyers and sellers, which again would create costs that likely would exceed a single firm's coordinating gain. These two reasons suggest that individual contract innovators would not (and in fact did not) emerge.

Third, an efficient portfolio contract would make the local bank liable to the originator for borrower default in order to induce the bank to write efficient loans. In commercial law, a loan buyer who can put a loan back to the lender if the loan does not perform is considered *a creditor* of the lender.[26] For example, if a retailer attempted to sell loans, rather than borrow on the strength of its accounts receivable, and then became insolvent, the "buyer" would have to participate in the retailer's bankruptcy if the buyer had the right to require the retailer to take nonperforming receivables back. Applying this law to the MBS context, if a local bank had *warranted the output* of portfolio performance in its contract with the originator, the law probably would have required the originator to participate in the local bank's insolvency. An originator *who remade that warranty* would have created a material risk that the larger bank to whom it sold the portfolio would also have been a creditor. And given the warranty chain, the public investors could not value their securities *without assessing* the solvency prospects of the local banks. But the public investors knew nothing about these banks and could not easily have found out. Therefore, had an originating bank made an output warranty—guaranteed portfolio performance—a trust certificate or a special purpose vehicle (SPV) bond would have been an unattractive security for a public investor to hold. Even today, it thus is considered good securitization practice to shield public investors from an originating bank's insolvency.[27] The input warranties created such a shield.

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[25] Rating agencies condition their ratings on the originating bank warranting the quality of its loans. The "baseline R&W" (representations and warranties) must recite that (i) there was no fraud in the origination of each mortgage loan; (ii) the originator *complied with its underwriting guidelines* and all applicable laws during the loan origination process; (iii) the property appraiser had no conflict of interest; and (iv) the borrower occupied her home. *See* THOMAS P. LEMKE, GERALD T. LINS & MARIE E. PICARD, MORTGAGE BACKED SECURITIES § 11:10 (2019).

[26] *See* JAMES J. WHITE & G. ERIC BRUNSTAD JR., SECURED TRANSACTIONS: TEACHING MATERIALS 86-87 (4th ed. 2013). Because the commercial effect of a loan and a purchase was identical, there once was a question whether the ostensible buyer had to give public notice of its interest in such contracts. In 1998, the U.C.C. was amended to make clear that such a buyer need not give public notice of the sale. *See* U.C.C. § 9-309(4) (AM. LAW INST. & UNIF. LAW COMM'N 2017). In 1993, a privately operated mortgage-registry system, the Mortgage Electronic Registration System (MERS), was created. Both MERS and the amended U.C.C. facilitated securitization by reducing its costs; recording with MERS is cheaper than recording under traditional recording systems. For an explanation of how these two recording regimes function, and suggestions as to how better to harmonize them, see Adam J. Levitin, *The Paper Chase: Securitization, Foreclosure, and the Uncertainty of Mortgage Title*, 63 DUKE L.J. 637 (2013).

Finally, under the accounting rules that governed transactions when securitization became widely popular (and still govern today), if the value of a portfolio guarantee is reasonably estimable, the portfolio seller must either take a material charge against current income or amortize the risk over time.[28] Either practice would reduce an originating bank's current reported profits. In contrast, when the portfolio seller warrants inputs to loan performance, it can book the entire revenue from the sale in the current year.

Before reaching law-reform implications, we note that servicers administered the portfolio loans as agents of the trusts. The servicers also lacked local knowledge and, as we show, had neither the capacity nor the liquidity to make efficient salvage decisions. As a result, loans were foreclosed that should have been renegotiated.

In addition to the concerns just mentioned, borrowers had heightened incentives to default strategically. We thus establish—this is "Step Four"—the existence of a "contagion effect." Because banks (and their servicer agents) have a limited capacity to monitor defaulters, at least in the short run, the likelihood that a bank or servicer will proceed against a particular defaulter is decreasing in the number of defaulters there are. Hence, a borrower who can repay has an incentive to ask whether other borrowers "like her" will probably default. When borrowers think other borrowers are defaulting, a borrower's expected payoff from defaulting can exceed her payoff from repaying. As a result, the population of defaulters should include many "won't pays," as well as many "can't pays." We are the first, as far as we know, to show that such a contagion effect likely increased the default rate in MBS markets.

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[27] For bonds or trust certificates to receive a high rating, "the rating agencies require that certificate holders or bondholders be insulated from the effects of an issuer bankruptcy." LEMKE, LINS & PICARD, *supra* note 25.

[28] Contemporaneous accounting requirements are described in MATTHEW J. BARRETT & DAVID R. HERWITZ, ACCOUNTING FOR LAWYERS 771-91, 855-56 (2006); and LAWRENCE A. CUNNINGHAM, LAW AND ACCOUNTING 100-26 (2006). The current rules are described in SCOTT A. TAUB, REVENUE RECOGNITION GUIDE (2018).

Turning to law reform, we argue that Dodd-Frank command-and-control regulation cannot cure the incentive problem that unenforceable MBS contracts create for originating banks. Rather, the MBS contract itself should be improved. Because creating an efficient contract is a problem the private market may not solve (and has not solved), structural reforms appear necessary. To that end, the Federal Reserve Board or the U.C.C. Permanent Editorial Board could create a task force to draft sample solutions. In addition, the legal and accounting obstacles to improving MBS contracts' efficiency should be removed. In particular, the bankruptcy rules should change. In Europe, for example, an originating bank can sell bonds on the portfolios it originates because the law guarantees "bankruptcy remote" status to the public investors. There is almost no market for such "covered bonds" here because the originating bank would bear the payment risk. Thus, the bond buyers would be considered creditors of the bank and then have to participate in the bank's insolvency proceeding.[29] Also, the revenue-recognition rules should change so that an originating bank, which bears the payment risk, can book the portfolio-sale price in the current year if the bank discloses its contingent liability. Finally, we suggest that the state should stand behind—i.e., guarantee or refinance—weak loans when a serious contagion effect materializes.

We end this Introduction with three remarks. First, there are several explanations for why so many MBS performed poorly: borrower fraud and misrepresentation,[30] local bank fraud and misrepresentation, and conflicts of interest among portfolio sellers and between sellers and rating agencies. We do not adjudicate among these causes. Rather, we argue that the resultant problems would have been materially ameliorated had portfolio sellers made enforceable warranties regarding portfolio performance. If so, a buyer, especially a public investor, would not have cared whether the originating bank wrote loans in accordance with good underwriting practice or misrepresented the quality of its due diligence. The buyer would just have enforced the warranty, in the same way that the goods buyer does not care whether product failure was the result of seller negligence because the goods buyer can enforce the warranty made to her. Enforceable contracts thus would have offset, or partly deterred, the mortgage market's bad behavior. Therefore, to the extent that the Great Recession was worsened by market participants coming to lack confidence in the soundness of mortgage-backed debt, we claim that confidence would have been strengthened had this debt been sold under enforceable contracts.[31] Second, the combination of (i) a recession, and (ii) a low-quality borrower pool, partly traceable to the MBS inefficiency, caused mortgage-loan defaults to spike.[32] The similarity of current contracts to past ones thus suggests that a substantial shock to the financial system could cause the securitization market to perform as badly as it did the last time. Third, market professionals understood that trading huge loan portfolios along long intermediation chains created systemic risk. If an unexpected exogenous shock did present, such as a recession, there would be insufficient liquidity in the system to rescue every holder of a poorly performing portfolio or every foreclosed-on borrower.[33] But it was not widely known that the entire system rested on a false premise: that the originating banks made efficient loans.

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[29] We discuss covered bonds further in Part V *infra*. Hyun Song Shin was perhaps the earliest to recognize that covered bonds could respond effectively to securitization-market concerns. Hyun Song Shin, *Financial Intermediation and the Post-Crisis Financial System* (BIS Working Paper No. 304, Mar. 2010); *see also Frequently Asked Questions About Covered Bonds*, MORRISON & FOERSTER LLP, https://media2.mofo.com/documents/faqscoveredbonds.pdf [https://perma.cc/YKY4-D5W8] (providing an extensive description of covered bonds); Daphne Heant, Sophie Vermielle & Yan Coatanlam, *Higher Quality Securitization*, *in* FINANCIAL REGULATION IN THE EU: FROM RESILIENCE TO GROWTH 405 (Raphaël Douady, Clément Goulet & Pierre-Charles Pradier eds., 2017) (describing general European regulation of securitization markets).

[30] Brent W. Ambrose, James Conklin & Jiro Yoshida, *Credit Rationing, Income Exaggeration and Adverse Selection in the Mortgage Market*, 71 J. FIN. 2637 (2016) (finding that low-income borrowers exaggerated income); Wei Jiang, Ashlyn Aiko Nelson & Edward Vytlacil, *Liar's Loan?: Effects of Origination Channel and Information Falsification on Mortgage Delinquency*, 96 REV. ECON. & STAT. 1 (2014) (coming to similar conclusions as Ambrose et al.); Atif Mian & Amir Sufi, *Fraudulent Income Overstatement on Mortgage Applications During the Credit Expansion of 2002-2005*, 30 REV. FIN. STUD. 1831 (2017) (finding substantial over-reporting of income in certain zip codes).

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[31] Currently, there is a debate as to whether the Recession's underlying cause was financial-market deregulation, organic changes in financial markets, or a combination of the two. Paul G. Mahoney is the latest major scholar to enter the debate. *See* Paul G. Mahoney, *Deregulation and the Subprime Crisis*, 104 VA. L. REV. 235 (2018) (arguing that deregulation was not responsible). Mahoney's article and the entire debate have been thoughtfully reviewed by Kathryn Judge. *See* Kathryn Judge, *Regulation and Deregulation: The Baseline Challenge*, 104 VA. L. REV. ONLINE 101 (2018) (arguing that both deregulation and economic changes were probably both responsible).

[32] *See* Martino Ricci & Patrizio Tirelli, *Subprime Mortgages and Banking in a DSGE Model* 10 (Dems Working Paper Series No. 366, June 2017) (finding that the default rate in the subprime market increased from about 6% to over 16% during the Great Recession, and claiming that many defaults were strategic). Similarly, the number of loans in foreclosure in a specific quarter as a percent of total loans rose from roughly 1% before 2006 to 4.6% in 2010. Jeffrey P. Cohen, Cletus C. Coughlin & Vincent W. Yao, *Sales of Distressed Residential Property: What Have We Learned from Recent Research?*, FED. RES. SAINT LOUIS REV. 159, 164 (2016); *see also* Steven Laufer, *Equity Extraction and Mortgage Default*, 28 REV. ECON. DYNAMICS 1 (2018) ("When house prices peaked and began to decline sharply in 2006, mortgage delinquencies surged, with the fraction of losses in some stage of foreclosure reaching 4 percent in 2010, almost eight times its historical average.").

[33] For a general discussion, see Adriano A. Rampini & S. Viswanathan, *Financial Intermediary Capital*, 86 REV. ECON. STUD. 413 (2019).

Rather, the contracting failure embodied in MBS-portfolio agreements incentivized banks to reduce their investments in loan quality materially.

The Article proceeds as follows. Part I considers the initial-originating-bank/borrower context. It creates a model that shows what efficient screening and post-loan monitoring require, demonstrates the existence of a possible contagion effect, and illustrates how selling a loan portfolio could create or worsen contagion. Part II develops in detail the costly enforcement problem that an MBS contract that makes input warranties creates. Perhaps the best evidence that the costs are prohibitively high, Section II.B shows, is that the ultimate trust buyers, who had billions of dollars at stake, did not attempt to enforce the input warranties as written—that is, loan by loan. Rather, the trusts pursued indirect litigation strategies, such as portfolio sampling and portfolio-value focused approaches. The courts have consistently rejected these strategies. Part III provides a more complete explanation of why sophisticated market participants traded loan portfolios under inefficient contracts, and Part IV asks whether parties would use an efficient MBS contract if the state facilitated its use. Part V discusses two categories of law reforms: command-and-control regulation—the Dodd-Frank model—and creating efficient contracts for securitization markets. We support the contract solution.

I. Optimal Loan Origination and Securitization

To understand what went wrong, it is helpful to understand what should have gone right. We begin by explaining how an originating bank would make loans if it did not plan to resell them. The bank would make contracts with borrowers that maximize borrower surplus, subject to the constraint that the bank will break even when it invests optimally in pre-loan screening *and* in creating the capacity to monitor and foreclose defaulting loans. The bank's incentive to make efficient loans should not change when the bank bundles the loans into a portfolio and sells them. This is because, ideally, the bank would warrant the soundness of its loans, and the portfolio buyer would enforce the warranty.

Local banks, however, made unenforceable input warranties. Hence, after setting out the model, we show how the inability of later portfolio buyers to enforce the warranties reduced the local bank's incentive to screen optimally and caused the loans to be held by agents—the servicers—whose structure and incentives inclined them to make suboptimal foreclosure and modification decisions. Part I's analysis makes two contributions: (i) it helps to explain why there were excessive foreclosures; and (ii) it shows that loan defaults not only were the product of improvident loans, but likely also were the product of *strategic behavior*: borrowers who could pay breached instead because they believed that the payoff from defaulting was higher. This is the contagion effect.

A. A Model of the Short Intermediation Chain

A bank invests the sum I to screen a potential-borrower pool and issues loans to the borrowers who pass. The financial soundness of the homeowners who get loans is increasing in I. The bank also creates capacity K^m to monitor defaulting borrowers. In the model of the short intermediation chain, to monitor is to discover defaulters and to foreclose against them.[34] The bank's capacity, K^m, determines the number of defaulters it can monitor. Each borrower realizes the gross benefit Y from her loan, the value she places on home ownership. The bank does not observe Y, which varies across borrowers.[35] The bank requires borrowers to repay the sum R (including interest), which covers the bank's cost of screening borrowers and monitoring defaulters. A borrower who repays her loan realizes the return $Y - R$, and the bank realizes R. Importantly, the bank creates sufficient monitoring capacity to monitor every borrower who defaults. The bank, therefore, always forecloses so that defaulters receive a return of zero. We assume that borrowers (i) are rational and risk neutral; (ii) know what their mortgage contracts say, and thus know that foreclosure is a possible consequence of default; and (iii) know the approximate probability with which they will be monitored.[36]

The bank's contract with borrowers thus is a function of the bank's investment in a screening and monitoring program (i.e., I and K^m), the borrower's type (her realized value and the likelihood of being monitored), and the required repayment (R). Under this contract, the borrower automatically defaults if the contract requires her to repay more than her realized return:

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[34] In the long intermediation chain, to monitor is to decide whether a loan is salvageable under renegotiated terms or must be foreclosed.

[35] More precisely, borrower returns are distributed on $Y \in [\underline{Y}, \overline{Y}]$. The distribution of borrowers is assumed to be $F(Y \mid I) = Unif\,f[\underline{Y}(I), \overline{Y}(I)]$. This notation says that there is a distribution of borrower types whose realized values range from low to high, with each value being equally probable, and that the quality of the borrower pool is a function of the bank's investment in pre-loan screening. The assumption of uniform values—equal probabilities—is made for convenience. The same analysis also applies to other distributions, such as the bell curve, or normal distribution.

[36] It is widely believed that some borrowers were irrationally optimistic about future housing prices: Marginal borrowers required, and assumed that there would be, an increase in future home prices so that the borrowers could refinance their mortgages. We do not analyze cognitive error, but we note that the inefficient-MBS contract worsens the optimism problem because it creates an incentive for local banks to reduce screening, and thus to lend to more borrowers who believe they can pay but who have objectively poor repayment prospects. We motivate the assumption that borrowers know (approximately) the probability with which banks monitor *infra*.

$R > Y$.[37] Conversely, the borrower repays if $R \le Y$, to avoid foreclosure and a zero return.

Figure 1 illustrates how the bank's low investment I_L and its high investment I_H affect the distribution of borrower' types. A low investment produces a disperse distribution of borrower types, reflected by the large difference between the highest percentile borrower types, $\underline{Y}(I_L)$, and the lowest percentile borrowers types, $\bar{Y}(I_L)$, on the vertical axis. In contrast, higher investment compresses the distribution function, yielding a correspondingly tighter distribution of returns, reflected by the comparatively small distance between $\underline{Y}(I_H)$ and $\bar{Y}(I_H)$. Importantly here, higher investment reduces the number of low-return borrowers, who are in most danger of defaulting.

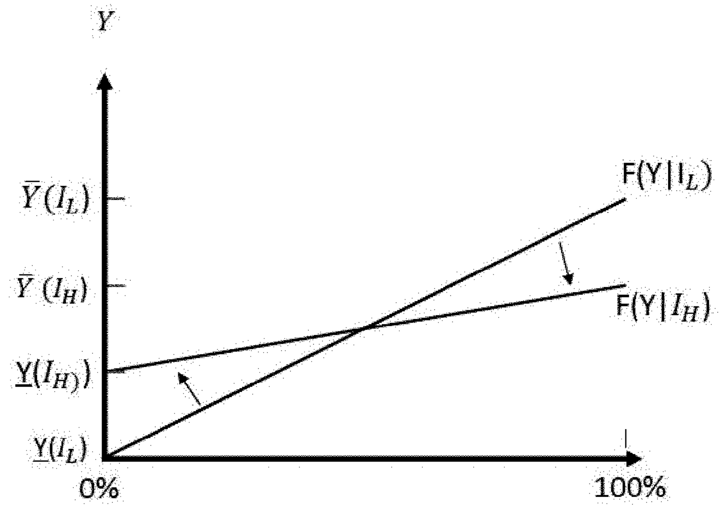

Figure 1

Figures 2a and 2b below illustrate a bank's optimal contract with borrowers when the bank chooses a low I_L or high I_H investment in screening, respectively. In both cases, the bank selects the variables I, K^m, and R to maximize the net surplus of the borrowers and to cover the costs of the loans, including the costs of investment in borrower quality and bank-monitoring capacity. The percentile distribution of borrower types, $F(Y \mid I)$, corresponds to low and high screening investments—I_L and I_H—and appears on the horizontal axis, graphed as a function of the return Y, which itself appears on the vertical axis. We normalize the population size to one.[38] The required repayment, R, separates the types who default from the types who repay. The lighter-colored areas (bottom) represent the repayments that cover lending and screening costs, and the darker-colored areas (top) represent the borrowers' net surplus after repayment. The unshaded areas between the dotted line and the horizontal axis represent the deadweight loss that occurs when borrowers are unable to repay. Here, the loan contracts are formed and efficiently enforced, given the costs of investment and enforcement.

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[37] Ex ante, a person will not borrow if she expects to have a lower valuation for her home than the required repayment. Hence, borrowers become automatic defaulters when their ex-post valuations fall materially below their ex-ante valuations. This could occur because housing prices fall, a possibility considered in Part I.C *infra*, or because a borrower's relative utility from home versus other consumption changes.

In Figure 2a, the bank chooses a high investment level to minimize the likelihood of borrower default. As a result, low-risk borrowers are screened out, leaving only creditworthy borrowers, who can repay their mortgage in full. In the case depicted, the repayment, R, is sufficient to cover the bank's cost of loan origination and is small enough to preclude defaults.[39] In Figure 2b, the bank does not invest in the creditworthiness of its borrowers. This reduces the bank's loan-origination cost but, compared to the case in Figure 2a, results in defaulting borrowers. Each defaulting borrower causes a deadweight loss of R, because she does not repay the loan.[40]

Comparing the total surpluses generated by the high-investment and low-investment banks in Figure 2a and 2b, respectively, reveals that when borrowers are carefully screened there are fewer defaults, thus generating greater returns to loan origination. In the next Section, we argue that originating banks were dissuaded from investing optimally in borrower screening for two reasons. First, competition between originating banks to sell their loan repayments to the market made prime mortgages a luxury good that many commercial banks were unwilling to buy. Second, and critically here, originating banks would not be liable for breaching loan-quality warranties, and so would not be penalized for reducing screening.

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[38] In normal language, this means that there are many potential borrowers.

[39] Cases where no defaults occur are rare. We illustrate such a case here just to show how careful screening limits defaults.

[40] This—where the bank cannot resell mortgages in the relevant period after foreclosure—is also a polar case. We later relax this assumption.

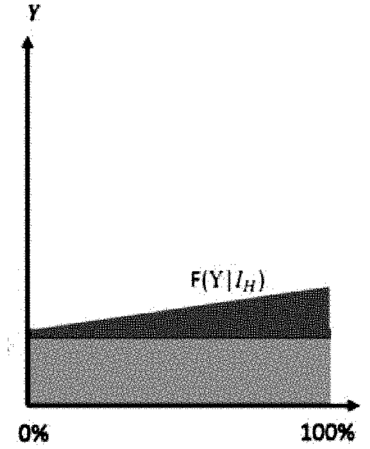

Figure 2a

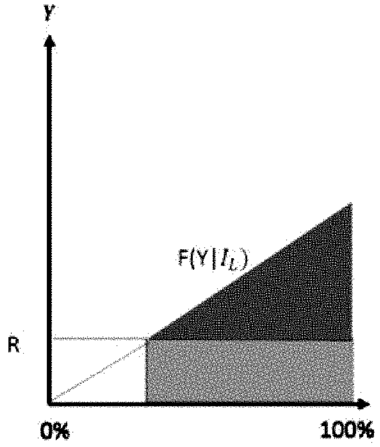

Figure 2b

B. The Long Intermediation Chain

A bank's loan-origination practice is efficient when the intermediation chain is short, but then individual deposits would be the banks' only source of funds. Increasing demand for securities from money-market funds and other entities induced many banks to enter the credit market and seek funds from public investors. To enter the credit market, the banks increased their scale of operations and created portfolios to sell to other financial intermediaries. The originating local banks thereby became the initial links in long intermediation chains.[41]

To illustrate how these longer chains should and did function, we return to our short-chain example. In a competitive credit market, each bank provides borrowers with an expected surplus, which is the borrower's return less the required repayment. In our example, the bank chooses the amount to invest in prescreening borrowers (I), the repayment amount (R), and the bank's monitoring capacity (K^m) to minimize its costs of supplying good quality loans to borrowers at prices the borrowers will pay. The bank's revenue from borrowers must cover the cost of these activities. This constraint requires the cost of the money that the bank lends, plus the bank's pre-loan investment and post-loan monitoring costs, to equal or be less than the sum of the bank's return from repaying borrowers and the bank's return from foreclosing against or renegotiating with borrowers that it does not immediately monitor.

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[41] It was recognized that individual deposits could not meet traditional banks' financing needs. *See* Markus Brunnermeier et al., *The Fundamental Principles of Financial Regulation*, *in* 11 GENEVA REPORT ON THE WORLD ECONOMY 17-18 (2009) ("Even for traditional deposit-taking banks, their marginal source of funding has been the capital markets . . . .This is because the traditional source of funding such as retail deposits are usually insufficiently flexible to fund expansions of lending.").

When a local bank bundles loans into a portfolio and sells the portfolio to a financial intermediary, the bank's capital, which allows it efficiently to originate loans, now comes from the price that the portfolio buyer pays. The price of the socially optimal contract would reflect the local bank's cost of efficient origination and the portfolio buyer's expected cost of monitoring efficiently originated loans. Suppose, however, that an originating bank warranted its input—that the bank engaged in efficient screening for *each loan*. As the Introduction summarized, and as Part II later details, the intermediary buyer could not prove breach. Anticipating this inability, we argue, the bank would reduce its investment in screening so it could earn positive profits.

Reducing screening would have two effects. First, the quality of the homeowners receiving loans would decline. Therefore, more borrowers would be in the automatic-default market segment (i.e., $R > Y$). To understand the second effect, recall that the efficient contracts in the short intermediation chain permitted the local bank to monitor, and thus foreclose against, every defaulter. But now, the monitoring responsibility lies with the *portfolio buyer*. If this buyer's monitoring capacity *equaled* that of the originating bank in the short intermediation chain example, the buyer still *could not monitor every defaulter*, because reduced screening increases the number of defaulters. As a result, the probability that a borrower is monitored will fall below one. To illustrate, the probability that a defaulting borrower is monitored is $P = K^m/D$, where K^m is the number of defaulters the bank (or its transferee) can monitor in a period, and D is the number of defaulters. Holding K^m constant, the probability that a borrower is monitored must fall below one when the number of defaulters, D, exceeds the bank's monitoring capacity K^m.[42] But additionally, intermediary portfolio buyers seldom have *the same* monitoring ability as the local banks: they do not have "local knowledge," such as who the borrowers are or what the gains from foreclosure in specific markets would be. Moreover, the buyers commonly hold larger portfolios. Thus, the second effect of reduced screening is to create the possibility of strategic defaults. A borrower for whom $R < Y$

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[42] As an example, let the population of defaulters be D = 20% of the borrowing population, and suppose that the bank (or its transferee) has the capacity K^m to monitor 15% of the borrower population. Thus, $P = K^m/D$, the probability that a defaulter is monitored, is 15%/20% = 75%.

(i.e., she could repay), and who is not immediately monitored (and foreclosed against) can stay in her home for a positive period. Because this borrower can pay when her default is discovered, she will attempt to renegotiate with the bank (or the servicer) to stay in her home.[43] We capture these possibilities by letting a defaulting borrower who is not immediately monitored and foreclosed against retain $0 < \mu < 1$ of her return from the loan. The borrower thus does better defaulting than immediately repaying when:

$$\mu Y(1-P) > Y - R$$

The left-hand side of this expression is the defaulting borrower's expected return: the fraction of home value she can keep (μY) times the probability that she is not immediately monitored ($1 - P$). The right-hand side is the borrowers' net return from repaying the loan. Because the monitoring probability, P, now is less than one, strategic default can pay off.[44]

In the actual Recession and during its lead-up, from 2005 to 2008, few initial portfolio buyers and their transferees renegotiated loans. They delegated this responsibility to servicers. The servicers' capacity to monitor individual loans was slight relative to the total number of loans they held, and they too lacked the local knowledge and monitoring capacity required to renegotiate effectively.[45] In addition, a servicer who forecloses is paid immediately, while a servicer who modifies is repaid out of the borrower's monthly payments.[46]

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[43] Mortgage modifications include interest-rate reductions, term extensions, and principal write-downs. A borrower whose loan is modified likely will repay a larger total sum than she would have paid had she not defaulted, but her payments in each period would be reduced to an amount she could meet.

[44] To clarify, when $P = 1$ (i.e., the bank monitors every defaulter immediately), the left-hand side of the inequality is 0. Because the right-hand side is positive by assumption (i.e., the borrower can pay), the inequality cannot be satisfied. In other words, every borrower who can pay does. Now let P fall below one. Then the left-hand side becomes positive. So if P falls enough, the left-hand side will exceed the right-hand side, meaning strategic default would pay.

[45] During and after the Great Recession, servicers renegotiated relatively few defaults. In response, the government created a home-mortgage modification program, called the Home Affordable Modification Program (HAMP). A recent study of the program reported that HAMP led to some increase in modifications but fewer than expected. Sumit Agarwal et al., *Policy Intervention in Debt Renegotiation: Evidence from the Home Affordable Modification Program*, 125 J. POL. ECON. 654, 657 (2017) (describing results). Relevantly here, the study reported that "servicer-specific factors—*which seem to be related to their preexisting organizational capabilities*—are responsible for differences in preprogram renegotiation activity." *Id.* at 659 (emphasis added). In our terms, the servicers' monitoring capacity, K^m, was insufficient to the task. For additional data, see Diane E. Thompson, *Why Servicers Foreclose When They Should Modify and Other Puzzles of Servicer Behavior: Servicer Compensation and Its Consequences*, NATIONAL CONSUMER LAW CENTER, INC., at viii, 30 (Oct. 2009), https://www.nclc.org/images/pdf/pr-reports/report-servicers-modify.pdf [https://perma.cc/F2TD-HUE7].

[46] *See* Sumit Agarwal & Yunqi Zhang, *Effects of Government Bailouts on Mortgage Modification*, 93 J. BANKING & FIN. 54, 56 (2017).

Hence, unless foreclosure returns are materially lower than renegotiation returns, a servicer's best response is to foreclose on defaulters.

To summarize, securitization can increase strategic default, an effect we consider immediately below.

C. The Possibility of Contagion

Contagion effects require strategic complementarity among relevant agents. Complementarity exists when the value of an action available to an agent is increasing in the number of other agents who perform the action. The most familiar example in the financial context is a bank run. There, if a depositor expects other depositors to withdraw funds, the depositor does better by withdrawing her funds. Refraining could leave her with nothing. More similar to our context, an agent has an incentive to repay a loan voluntarily because doing so increases the probability that she can borrow again from the same lender. If the borrower expects other borrowers not to repay, however, she realizes that the lender may run out of funds. This eliminates the incentive to repay in order to borrow again and so makes default more attractive. The payoff to default thus is increasing in the number of other borrowers that the borrower expects to default. Such "borrower runs" on lenders are a danger when a lender is itself liquidity constrained, as in the microfinance context.[47]

Contagion presents differently in the MBS context, particularly when housing prices experience a shock. Recall from Sections I.A and I.B *supra* that when loans are securitized, a fraction of borrowers automatically defaults, another fraction automatically repays, and a third fraction can choose whether to default strategically. To see whether a strategic borrower will exercise her option, let the borrower believe that many borrowers will default. Now consider the three variables in the model above: the borrower's type (the value Y she derives from her home); the fraction of value μ a defaulting borrower who is not monitored can retain; and the probability P, the borrower's perceived likelihood of being monitored.[48]

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[47] *See* Philip Bond & Ashok S. Rai, *Borrower Runs*, 88 J. DEV. ECON. 185 (2009).

[48] A defaulting borrower is actually breaking a promise, and breaking promises can be costly psychologically. This internal sanction is commonly referred to as "stigma," and is thought to reduce the probability of strategic default. We do not model the stigma motive here, but we note that when many agents perform an action, people are more likely to attribute an agent's action to circumstance, rather than character. *Cf.* Bertram F. Malle, *The Actor-Observer Asymmetry in Attribution: A (Surprising) Meta-Analysis*, 132 PSYCH. BULL. 895, 914 (2006) (finding only weak evidence for the fundamental attribution error generally, but strong evidence when actors were portrayed as highly idiosyncratic). A borrower who defaults in a contagion context thus is less likely to experience stigma.

Beginning with the second factor, the borrower's incentive to default is increasing in μ because default is less consequential for her. In turn, μ is increasing in the number of defaulters, because foreclosure is less profitable to the bank in a falling housing market; in such markets, the bank/servicer will be more willing to yield value to keep a borrower in her home.[49] A borrower who believes that many other borrowers are defaulting therefore likely believes that she herself will not be punished severely for defaulting.

Regarding the third factor—the probability of being monitored—hold the servicer's capacity to monitor fixed in the short run. Then, a borrower's probability of being monitored falls below one as the number of defaulters exceeds this capacity. Hence, a borrower who believes that many other borrowers are defaulting will also believe that P is low, meaning that she believes that she can likely escape monitoring for a considerable amount of time.

Turning to the first factor Y, the value that the borrower derives from her home is partly a function of housing prices. When the economy experiences a negative shock, the supply of houses is increasing because of foreclosures while the demand for houses is falling, which implies lower house prices. The more borrowers that a representative borrower believes are defaulting, the lower the borrower believes housing prices, including her own, are likely to be. And as the market price falls, the likely utility gain from staying put also falls.[50]

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[49] Recalling the inequality above, we assume here that the monitoring probability, P, is less than one. If $\mu = 1$, the left-hand side must exceed the right-hand side; intuitively, when defaulting borrowers can retain their homes' full value, every borrower defaults. Hence, as μ approaches one—i.e., a servicer makes more favorable modifications—the probability of strategic default increases.

[50] A defaulting borrower may be thought to have an incentive to default when the value of her home falls below the present value of her mortgage payments, but this incentive is weak. By revealed preference, a borrower with a mortgage prefers to live in a home. Hence, the strategy of defaulting on the first home loan in favor of buying another home at the current low price with a second home loan would only pay if the borrower could get a second home loan. But walking away from the first home loan would make lenders reluctant to extend a second. Data also suggest that underwater home prices were not a leading cause of default during the past recession. *See* Neil Bhutta, Jane Dokko & Hui Shan, *Consumer Ruthlessness and Mortgage Default During the 2007 to 2009 Housing Bust*, 72 J. FIN. 2433, 2433-34 (2017) ("We find that home equity has to turn deeply negative before most homeowners will exercise their default 'option' . . . . In particular, we estimate that the median borrower in our sample does not exercise the default option until his housing equity drops to -74% . . . which equates to a loan balance . . . of \$348,000 on a \$200,000 house."). Also, in the 1990-1991 recession, only 6.4% of Massachusetts borrowers defaulted when they had negative equity. *See* Christopher L. Foote, Kristopher Gerardi & Paul S. Willen, *Negative Equity and Foreclosure: Theory and Evidence*, 64 J. URBAN ECON. 234, 234 (2008) (examining mortgage defaults in Q4 of 1991). Theoretical reviews are also consistent with this evidence. *See* John Y. Campbell & João F. Cocco, *A Model of Mortgage Default*, 70 J. FIN. 1495 (2015).

On this analysis, contagion is likely to occur in the MBS context as borrowers come to believe that other borrowers are defaulting in substantial numbers. This belief, in turn, becomes better grounded as the economy—particularly the housing market—worsens. For instance, a representative borrower may observe an unusually large number of "homes for sale" signs in her neighborhood, reduced home upkeep (i.e., unmowed lawns), increasing foreclosures,[51] and declining housing prices. Also, because housing commonly is a person's major investment, borrowers generally follow the macroeconomic conditions that affect housing markets. Among these is the unemployment rate, which increases—with visible effects—in hard times. Knowing all these factors, borrowers are likely to believe that borrowers like them are defaulting at increasing rates during serious housing downturns. This belief makes contagion more likely.

To illustrate the effect, suppose that in the short intermediation chain, there are one-million borrowers whose types—the Y values—are uniformly distributed between \$0 and \$300,000. The required loan repayment R is \$30,000. The bank can monitor 10% of the borrowers. Finally, borrowers expect that if they are not immediately monitored (and foreclosed), a borrower can retain a positive fraction μ of her house value. Under normal conditions, 10% of the borrowers, unable to repay R, automatically default. There are just enough resources to monitor every "cannot pay" borrower, so a borrower who defaults expects to be monitored with probability P=1. Then, no borrowers strategically default.

Next, consider the long intermediation chain, when the local originating bank has invested suboptimally in screening the borrower pool because it expects to sell its loans under an unenforceable contract. Now, the distribution of borrower types worsens: there are fewer high-return types because the bank has a lowered incentive to lend to them, and a higher percentage of low-return types because screening is looser. As a result, a greater portion of borrowers cannot repay and automatically default. Because the servicers, who now must monitor the defaulters, operate independently of the local banks, they lack the incentive and the knowledge to acquire more monitoring capacity than

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[51] *See* Charles Towe & Chad Lawley, *The Contagion Effect of Neighboring Foreclosures*, 5 AM. ECON. J.: ECON. POL'Y 313, 314, 327 (2013) ("In this paper, we . . . find strong evidence that social interactions influence the decision to default by homeowners who observe a nearby neighbor in foreclosure . . . . A one-unit increase in neighboring foreclosures increases the hazard of foreclosure by as much as 28 percent."). Xun Bian et al., *Foreclosure Externalities and Home Liquidity*, REAL ESTATE ECON. (forthcoming 2020), find that nearby foreclosures increase the time a house for sale is on the market. This can suggest to sellers and other homeowners that defaults are increasing.

$K^m = 0.10$.[52] When the fraction of automatic defaulters exceeds the fraction that a servicer can monitor immediately, borrowers who can pay will observe the unmonitored defaults and expect there to be more such defaults. A default contagion thus arises: as defaults increase, borrowers expect the probability of being monitored to decrease, which induces more borrowers to default strategically, thereby further lowering the monitoring probability, and so forth. Without more structure around just how servicers monitor and renegotiate with defaulters, it may be difficult to predict if and when contagion may stop. Still, evidence suggests that strategic defaults occurred.[53]

In summary, the long-chain intermediary process did not replicate the loan-repayment process that was supported by the short-chain intermediation of traditional, depositor-funded mortgage-bank originators. Rather, originating banks sold mortgage portfolios under unenforceable contracts, and this contract failure induced the banks to reduce screening of potential borrowers. This in turn worsened borrower-pool quality and produced more defaults, both necessary and strategic.

II. Warranties, Asymmetric Information, and the Enforcement Difficulty

In this Part, we show why the MBS-portfolio contract is much more difficult to enforce than the ordinary contract to sell goods. It is this difficulty that facilitated the defaults, both necessary and strategic, that Part I just analyzed. Part III then asks why market agents traded unenforceable contracts.

A helpful way to explain why the portfolio contract was difficult to enforce is to ask why goods sellers warrant outputs—that the goods comply with contract requirements. The standard answer is that an agent will not agree to condition his contractual payoff on unobservable or unverifiable information.[54] As an example, the widget buyer will not condition his obligation to pay the contract price on the seller investing optimally in producing quality widgets; the buyer seldom can observe the seller's production process and may lack the expertise to distinguish investments that are likely to produce high-quality widgets from investments that are not. Consequently, if the seller delivered low-quality widgets, proving breach would require an expensive trial for the buyer. The buyer would likely have to introduce expert and narrative testimony, tests of the seller's production process, and similar evidence. The high trial cost may prevent the buyer from contesting breach, or reduce the buyer's chance of winning when he does. Anticipating the buyer's difficulties, the seller has an incentive to save costs by making a suboptimal investment in widget quality. In brief, a contract that would condition the price on information that the buyer seldom could verify, such as inputs to production, would create moral hazard for the seller. Hence, sales contracts for goods condition the price on verifiable outputs, such as the widgets satisfying a specified-performance standard. Because a buyer can conveniently establish the breach of such standards, the seller has an incentive to invest optimally to satisfy them.[55]

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[52] Servicers did not expand their monitoring capacities in time to respond efficiently to default. *See supra* note 46 and accompanying text.

[53] *See supra* note 11 and accompanying text; *infra* note 71. Contagion is unlikely in the credit-card market because there are very many obligors. An individual credit-card borrower thus cannot form expectations about what other borrowers will do. The incentive of card originators to relax screening exists, however, when the debt is securitized.

[54] Alan Schwartz, *Relational Contracts in the Courts: An Analysis of Incomplete Agreement and Judicial Strategies*, 21 J.L. STUD. 271 (1992) (introducing the effect of unobservable and unverifiable information on contracting practice to a legal audience). For a general analysis, see PATRICK BOLTON & MATHIAS DEWATRIPONT, CONTRACT THEORY 172-73, 553-600 (2005).

In contrast, the MBS-portfolio contract conditions the price on information that the buyer *cannot observe or verify*. This information is the local bank's investment in screening potential borrowers. Section II.A sets out the difficulties a portfolio buyer would have if it attempted to enforce the contract's input warranties as written. Section II.B offers additional evidence in support of our "inability to enforce" claim, showing that *the trust portfolio buyers never attempted to enforce* the portfolio contracts as written. Proving a breach loan by loan would have been too costly. Instead, the trusts attempted to persuade courts—so far unsuccessfully—that the contracts actually guaranteed portfolio performance. Finally, Section II.C links the analysis to the contagion effect.

A. Verification Difficulties

A portfolio buyer who could prove a warranty breach must also prove causation: that the breach, rather than exogenous factors, caused the buyer's loss. Contract law places this burden on the buyer because warranties are supposed to induce the seller to invest efficiently in contract compliance.

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[55] We note a possible qualification to the claim that breach is easier to prove when the buyer purchases a goods bundle. When defects are latent, defective and compliant goods bundles look the same at the time of sale. The merchant/goods buyer, however, will be able conveniently to identify breaches because defects ultimately will present to all buyers (i.e., consumers who bought defective goods complain and thus inform prospective buyers about defective goods). In contrast, loan bundles are never ultimately disaggregated into individual loans that individual buyers hold. Rather, the last buyers—the capital-market investors—buy whole shares in the undivided portfolio. Thus, the initial financial-intermediary buyer cannot learn which loans the originating bank breached from customer complaints.

Because efficient investment could not have prevented exogenous factors from affecting a seller's ability to comply, the seller is not liable for exogenously caused losses.[56]

Continuing with our illustrative contrast between goods bundles and contract bundles, a goods buyer can more easily distinguish endogenous from exogenous causes. Proving breach of a contract to sell goods usually *also* establishes causation because courts plausibly assume that the seller is responsible when a new product does not perform as warranted.

To see why establishing causation is harder than this for contract sales, consider these possibilities. A borrower defaulted because:

(a) he incurred excessive credit card debt and had to default on an obligation; or
(b) he lost his job because
  (i) he was fired for incompetence; or
  (ii) he was laid off because of a recession in his industry; or
  (iii) he was laid off because his employer was losing money and reduced its workforce; or
  (iv) he was made redundant by a merger; or
(c) he incurred unanticipated medical expenses for himself or for his family; or
(d) he was liquidity constrained because of
  (i) a divorce; or
  (ii) a property tax bill.[57]

Each of these factors could cause the borrower to default, but the originating bank did not warrant against all of these causes. For example, a customary screen probably would have uncovered a potential borrower's credit record or marital status. Hence, if the originating bank extended a loan to this borrower, and the borrower defaulted for either of these reasons, the bank would have breached its warranty. On the other hand, a customary screen would not have uncovered the likelihood that the borrower would be fired after a merger. Hence, if the borrower defaulted for that reason, the bank likely would not be found to have breached its warranty. Therefore, to enforce the originating bank's input warranty, the portfolio buyer would have to establish *for each nonperforming loan* the cause of default and would also have to show that the customary screen would have uncovered that cause. Thus, litigating causation for large MBS portfolios would have been very costly.[58]

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[56] While a buyer must show that its damages from breach were material, the seller can respond that damages were the product of exogenous causes. For example, non-delivery is a breach, but the seller is excused if exogenous events prevented its performance. *See* U.C.C. § 2-615 (AM. LAW INST. & UNIF. LAW COMM'N 2017). Some New York lower courts also have held that, in a sale of services, if the promisee proves that breach caused a material part of its loss, the burden shifts to the promisor to establish exogenous factors that contributed to or caused all of that loss. *See* Special Prod. Mfg., Inc. v. Douglass, 169 A.D.2d. 891, 893 (N.Y. App. Div. 1991); Haven Assoc. v. Donro Realty Corp., 121 A.D.2d 504, 508 (N.Y. App. Div. 1986).

[57] Regarding these causes, a recent study suggested "that households experiencing an unemployment shock or a divorce have a three and two percentage point higher probability of deep [rather than shallow] default [which commonly leads to complete failure], respectively." Robert Kelly & Fergal McCann, *Some Defaults Are Deeper than Others: Understanding Long-Term Mortgage Arrears*, 72 J. BANKING & FIN. 15 (2016) (studying a large sample of Irish households). Also, "a one-standard-deviation increase in non-mortgage debts" materially increases the default probability. *Id.* at 16.

Finally, damages are easier to establish for breach of a goods warranty than for breach of the standard portfolio-contract warranty. For a goods warranty, a disappointed promisee who expected to buy $N > 1$ units usually can calculate her damages by multiplying her loss from one breached unit by N. In contrast, for a portfolio-contract warranty, a disappointed promisee cannot establish damages by multiplying her loss from one nonperforming loan by N. Instead, she must prove her loss contract by contract. We proceed to show how the goods-damages remedy functions and then demonstrate how the MBS-damages remedy functions in contrast.

For goods, a promisee can prove damages by multiplying her one-unit loss by N when three conditions hold:

(i) The buyer's value per unit is constant, i.e., invariant to how many units she buys. This condition holds when the buyer is purchasing items as inputs to a production process or, usually, when he buys to resell.

(ii) A buyer can replace every unit that the seller failed to deliver at the same market price. This condition holds when there is a unit market price, and the buyer's demand is too small to move that unit price (e.g., the price per bushel of wheat).

(iii) Breach affects each unit in a goods bundle identically. This condition usually holds when the goods are homogeneous, as a manufacturing or design defect would affect the performance of each unit in the same way.[59]

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[58] Courts particularly struggle with establishing causation when, as in some of the examples above, a default may have several causes. Doctrinal uncertainties make establishing causation difficult when multiple possible causative factors might have affected performance in a goods sale. Daniel P. O'Gorman, *Contracts, Causation, and Clarity*, 78 U. PITT. L. REV. 273 (2017) (describing factors extensively). Because there are few cases construing the portfolio contract, the doctrinal uncertainties around multiple performance-affecting causes are even greater in this context.

[59] There is a manufacturing defect when the goods fail to satisfy the seller's warranty; there is a design defect when a product that functions as warranted creates an unreasonable risk of harm. Sellers commonly warrant only against manufacturing defects, but for design defects, courts have made

To see how the first two conditions function, suppose that a farmer sells N bushels of wheat to an intermediary wholesaler. The wholesaler values each bushel at v. This value cannot vary with the number of units the wholesaler purchases because v is the price he will charge to a flour company. The contract price per unit is p_k, so the wholesaler expects to realize its net gain per bushel times N, or $N(v - p_k)$. When wheat is not delivered, the wholesaler would purchase N bushels of wheat on the market at the current market price per bushel of p_m in order to comply with its flour-company contract. The wholesaler's profit from the new purchase is the difference between his value for wheat and the higher price he had to pay. Therefore, *with damages* the buyer realizes the net gain of:

$$N[(v - p_m) + (p_m - p_k)] = N(v - p_k).$$

The first term in brackets, $v - p_m$, is the wholesaler's gain on repurchase, and the second term, $p_m - p_k$, is damages. The buyer can prove expectation damages by multiplying the one-unit loss by N because his value per unit does not change when he purchases N units, and the unit-replacement price also does not change. Therefore, multiplying a single-unit damage recovery by N is compensatory for *any* value of N from one to infinity.

Turning to the third condition, consider the washing machines in the Introduction's example. In such an example, the legal damages for a warranty breach are the difference between the value of the machine if it had been as warranted, and the value of the breached machine, denoted v_b.[60] Hence, the buyer's payoff for a breach of warranty on one unit is the net value as delivered, plus damages, or:

$$(v_b - p_k) + (v - v_b) = v - p_k.$$

The first left-hand-side term is the net value of the delivered machine, and the second term is contract damages. If a warranty breach would reduce the value of every unit in a goods bundle by the same amount, as with the washing machines, the buyer's damages from breach when it purchases N machines would then be $N(v - p_k)$, which is the buyer's expectation.[61]

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liability strict, despite sellers' lack of warranties. For a general discussion, see Michael J. Toke, *Restatement (Third) of Torts and Design Defectiveness in American Products Liability Law*, 5 CORNELL J.L. & PUB. POL'Y 239 (1996).

[60] U.C.C. § 2-714 (AM. LAW INST. & UNIF. LAW COMM'N 2017).

[61] Damages do not always "scale" in this way. To see such a case, let some washing machines in a sale bundle have defective spin cycles, while others have defective heating coils.

This brief review of contract damages helps illustrate the difficulty that a portfolio buyer under the MBS-portfolio contract has in proving his loss. That contract authorizes the buyer to recover the difference between the face value of each breached loan in the portfolio and the payments the borrower made on that loan.[62] However, two of the necessary conditions for establishing damages by multiplying a promisee's one-unit loss by N do not hold: now the portfolio buyer values the units—i.e., loans—differently, and breach affects individual units differently.

To illustrate these differences, we posit the smallest possible portfolio: $N = 2$. Let an originator buyer pay Z for the portfolio, so the contract price per unit is $Z/2 = p_k$. Denoting one loan f_i (which is the required repayment, or face value) and the other loan f_j, the buyer expects to realize the face value of the two loans less the portfolio price, or $\Sigma\ (f - Z)$. Let the f_i borrower make x_i payments on loan f_i before defaulting. The buyer's payoff on that loan would be:

$$x_i + (f - x_i) - p_k = f_i - p_k,$$

where the first term on the left-hand side is the borrower's made payments, and the second term is the damages. The damages measure thus protects the buyer's expectation for loan f_i—but *only for* f_i. The portfolio buyer expects to realize $f_i + f_j - Z = \pi$ on the little two-loan portfolio. But $2(f_i - x_i)Z \neq \pi$ unless $f_j - f_i = x_j - x_i$.

Described qualitatively, the portfolio buyer could establish his loss by multiplying the damages on one portfolio loan by two *only if* the difference in the face value of the two loans *exactly equaled* the difference between the payments the two borrowers actually made on each of their loans. This condition is extremely difficult to satisfy for a portfolio with two loans and impossible for a portfolio with many. The difficulty exists because each portfolio loan is written on a different home with a different borrower, and each borrower likely defaults at a different point in the repayment schedule. As a

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Damages will not scale here because one of these defects is likely more costly to fix than the other. Scaling is common when the seller bundles identical goods because it is improbable that some of the items would have one defect and others would have another.

[62] This is the U.C.C. equivalent to damages for breach of warranty Actual sellers wrote this damage measure into MBS contracts and made it the portfolio buyer's exclusive remedy. *See supra* note 20. Courts have rejected plaintiff trusts' claims for "general contract damages," restricting them to individual loan-repurchase damages. *See* Deutsche Alt-A Securities Mortgage Loan Trust v. DB Structured Products, Inc., 958 F. Supp. 2d 488 (S.D.N.Y. 2013); Nomura Home Equity Loan, Inc. v. Nomura Credit & Capital Inc., 29 N.Y.3d 992 (2017) .

consequence, the portfolio buyer under the MBS-portfolio contract must establish damages individually, contract by contract.[63]

To summarize, the burden of proof in a warranty action is on the buyer. Buyers under the standard contract for MBS portfolios thus had to establish breach, causation, and damages. We show here that the MBS buyers could not perform any of these tasks at acceptable cost.[64] We next show that actual portfolio buyers *did not try*.

B. Trust Litigation Strategies

Perhaps the best evidence that an MBS-portfolio contract warranting inputs to loan creation is unenforceable is that the trusts and other buyers in the long intermediation chains *did not* attempt to enforce them: that is, they did not attempt to establish warranty breaches *for individual loans*. Rather, as this Section will show, these buyers pursued litigation strategies that would only have been apt had the agents guaranteed portfolio performance, showing they recognized that the contracts' warranties were unenforceable. We should stress the trusts' behavior: they had purchased loan portfolios worth many billions in face value. When the portfolios began to perform poorly, the trusts looked to their legal rights. When they did so, the trusts then recognized that, under a literal, or four corners, interpretation of the MBS-portfolio contracts that governed their purchases, *they had no effective legal rights*; the cost of enforcing the contracts as written—i.e., loan by loan—were prohibitive. In response, the trusts pursued two "indirect," and ultimately unsuccessful, litigating strategies in their suits against the portfolio sellers.[65]

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[63] Both difficulties with establishing damages can present in the same case. Thus, mortgage contracts require the borrower to live in her home, and best practice requires the originating bank to check. Suppose an originator did not check and lent both to borrowers who lived in their homes and those that did not. By not checking, the originator breached the best-practice warranty it made to the portfolio buyer as to all borrowers, but the breach could not cause the default of borrowers who lived in their homes. Thus, the portfolio buyer's damages *from the warranty breach* on such a loan would be zero. Calculating the portfolio buyer's total damages by multiplying zero by N (the total number of portfolio loans) would undercompensate the buyer, however, because some borrowers probably did default in consequence of not living in the homes they bought. Illustratively, a speculator is more likely than a borrower living in the house to abandon a home when a mortgage is underwater. Turning to such a speculator's defaulted loan, the portfolio buyer's damages would be the difference between the payments the speculator made and the loan's face value. But multiplying these damages by the number of loans in the portfolio would overcompensate the portfolio buyer, because some defaulting borrowers did live in their homes.

[64] Consistent with our analysis, two commentators recently explained:

> Other [warranty] breaches are harder to substantiate and subject to dispute. The facts may require further investigation into hard-to-obtain documents outside of the purchaser's possession . . . . The cases alleging false loan-to-value ratios or appraised values require reconstructing the actual appraised value at origination, which is subject to debate and difficult to do. . . . Buyback disputes over loans that supposedly were allowed to depart from underwriting standards due to compensating factors can be particularly messy to litigate.

McCoy & Wachter, *supra* note 22, at 19.

The first strategy, sampling, represented a trust's attempt to remain as faithful as was possible to the contracts the parties wrote. Under sampling, a trust selects what it believes is a representative subset of portfolio loans and fully evaluates each of them. Let the evaluation reveal that the seller breached best practice warranties on $\eta\%$ of the sample loans. A court, the trust argues, therefore should conclude that the originating bank breached these warranties on $\eta\%$ of loans in the full portfolio.[66]

Some courts permitted a sampling cause of action to defeat a defendant's motion to dismiss, but no court has found for a trust in a final disposition. This is because, the courts say, the contracts preclude a sampling claim.[67] The MBS-portfolio contract requires a trust purchaser to identify a defective loan so that the portfolio seller could take the loan back. Even if a court grants that a portfolio contains $\eta\%$ of breached loans if a representative sample contained $\eta\%$, the seller's obligation under the contract was nevertheless to buy back *each breached loan* in the portfolio for face value, less payments made.[68] Sampling could not reveal *which* of the loans in the larger universe had been created defectively or *whether* warranty compliance would have prevented those particular loans from being made. Put another way, sampling can prove breach for contracts that sell bundles of goods, because the goods are identical in relevant respects. But sampling cannot prove breach for the portfolio contract to sell MBS contracts because the constitutive contracts are significantly different.

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[65] The second author on this Article was retained in three cases that trusts brought against the depositor banks who sold them MBS portfolios. The issue he consulted on was whether the trusts should accept settlement offers from the banks. In his consulting capacity, the author attended numerous meetings of trust counsel, who were nationally prominent litigators. The consensus in every meeting was that the trusts could not enforce the banks' warranties as written, i.e., loan by loan.

[66] The sampling strategy is extensively described in *Assured Guaranty Municipal Corp. v. Flagstar Bank, FSB*, 920 F. Supp. 2d 475, 486-90 (S.D.N.Y. 2013). Every portfolio seller remade the warranties that it received. Thus, the ultimate claim that sampling is relevant to is whether the local bank breached best-practice warranties on $\eta\%$ of each portfolio that it created.

[67] Courts recite that the portfolio buyer must establish breach loan by loan. *See* Retirement Bd. of the Policemen's Annuity and Benefit Fund of the City of Chicago v. Bank of N.Y. Mellon, 775 F.3d 154, 162 (2d Cir. 2014) (writing that breaches "must be proved loan-by-loan"); Blackrock Allocation Target Shares: Series S. Portfolio v. Wells Fargo Bank Nat'l Assoc., 247 F. Supp. 3d 377, 389 (S.D.N.Y. 2017); Blackrock Core Bond Portfolio v. U.S. Bank Nat'l Assoc., 165 F. Supp. 3d 80 (S.D.N.Y. 2016); U.S. Bank Nat'l Assoc. v. UBS Real Estate Sec. Inc., 205 F. Supp. 3d 386, 424 (S.D.N.Y. 2016) (noting that the repurchase protocol establishes a "loan-specific" remedy that "appl[ies] to breaches on an individualized, loan by loan basis"). Some portfolio buyers have sued on the individual breached loans that its sampling revealed, but the sampled loans were a small portion of the total portfolios.

[68] *See supra* note 20 and accompanying text.

The trusts' second litigation strategy was to focus on portfolio value. To understand the second strategy, suppose that a trust purchased a portfolio with face value L. Let an unobservable endogenous factor, if present when the portfolio was created, reduce portfolio value below face by $\delta < 1$, so that the portfolio's actual value when traded is $(1 - \delta)L$. If, suppose, an observable, exogenous factor later presented when the portfolio was held by a trust, it would reduce portfolio value by a further factor $\omega < 1$. Hence, the portfolio's ex post value is $L[(1 - \delta)(1 - \omega)] = \hat{L}$. If neither the endogenous nor the exogenous factor occurred, $L = \hat{L}$.But suppose that actual portfolio value was $\hat{L} < L$. A court would know that $\hat{L}$ should equal $L(1 - \omega)$ if the exogenous factor alone presented. But suppose that portfolio value was even lower than that. Because L, $\hat{L}$ and ω are observable, the court could then solve for δ. For example, if $L = 100$ and $\omega = .2$, the portfolio should equal $.8L$. If $\hat{L}$ actually equaled $.6L$, then δ would also have been present to reduce portfolio by a further 25%.

Under the trust's second litigation strategy, the endogenous unobservable factor δ was assumed to be the local bank's breach of its best-practice warranties and the exogenous observable factor was the Great Recession. In the example above, actual portfolio value was $.6L$, and experts would estimate that the value would have been $.8L$ if there were no warranty breaches. Hence, the portfolio buyer's damages should be $.2L$, or 20. Notice that the strategy implicitly defines endogenous risk—the originating bank's warranty breaches—as *every unexplained and unverifiable factor* that could cause a portfolio to lose value. This strategy, in effect, treats the *portfolio* as the product the parties traded and asks a court to award standard contract damages.

There are two difficulties with this method. First, the strategy contravened the actual contracts' wording, which recited that the local bank and the originator traded *individual loans*, not loan portfolios.[69] Second, there is no authority for treating an unexplained residual as the consequence of a warranty breach.

To summarize, the two portfolio-litigation strategies that the trusts employed in suits against portfolio sellers constitute strong evidence that the MBS-portfolio contracts were unenforceable as written. This is because the trusts did not attempt to enforce the seller's input warranties on individual loans. Rather, the trusts sought to enforce the contracts using litigation strategies that were premised on the sellers having warranted the output of portfolio performance, rather than the input of portfolio creation.[70]

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[69] Similarly, the distinction between individual loans and loan portfolios surfaced again in another MBS-contract provision. The portfolio contract has an "material-adverse event" (MAE) term, akin to that in a standard acquisition agreement. With such a clause, the buyer is excused from performance if a MAE occurs. The MBS contract's MAE terms applied to individual loans, rather than to the portfolio as a whole, however.

C. Contagion Revisited

When parties trade goods bundles, there usually is one buyer and one seller, and the goods are inanimate. These conditions mean contagion cannot occur. In contrast, when parties trade MBS portfolio bundles, there also is one buyer and one seller, but the "goods" are promises from actual people to repay their loans. As we show, a particular borrower's expected payoff from default is an important function of the probability that she believes other borrowers from the same seller will default. Borrower payoffs are linked in this way because correlated defaults against the same originating bank stress the bank's monitoring capacity. Generalizing this principle, every portfolio buyer faces a contagion risk when they purchase portfolios whose constituent contracts were originated by the same seller, i.e., when multiple individual promisors are aware of their strategic situation.

A potential objection is that the distinction between goods and contracts is imperfect because a contagion effect could arise when a single buyer sources goods from many sellers. The objection, however, is weak. Each seller may be aware of the behavior of other sellers, but a goods seller profits only when she performs. The loan obligor—the borrower—may profit by not performing. Also, a goods seller may realize a higher return by offering to perform when other sellers breach, because the buyer may order more goods from her or offer her better terms. The loan obligor, in contrast, does better breaching when other obligors breach. Contagion thus poses a serious danger in sales of portfolio contracts but is negligible for goods bundles.[71]

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[70] In the category of unlearned lessons, commercial buyers of large home portfolios now use "drive by" appraisals by real-estate agents or Google-Earth appraisals done by workers in India to estimate home values. The proponents of these large-portfolio sales say that "when pooling thousands of houses in an investment vehicle, individual valuations that are too high or low tend to balance out." *See* Ryan Dezember & Peter Rudegeair, *What's a House Worth? Wall Street Turns to Drive-By 'Appraisals,'* WALL ST. J. (Jan. 22, 2018 8:59 AM ET), https://www.wsj.com/articles/whats-a-house-worth-wall-street-turns-to-drive-by-appraisals-1516536001 [https://perma.cc/JP4Z-KGJ7]; *see also* Eisen & Kusisto, *supra* note 1 (reporting on government subsidies for borrowers who cannot afford down payments); Nickerson & Griffin, *supra* note 1 (finding a revival in the structured finance market); Phillips, *supra* note 1 (describing how market actors are repeating other failed strategies).

[71] A buyer who defaults strategically has committed a willful breach, but a court finding of willfulness will not further worsen her situation; she can be foreclosed against whether her breach is willful or not. The rule in many states—that an individual borrower is not liable for the difference between the sum the creditor raises on foreclosure and the full debt—is not conditioned on whether the borrower defaults willfully.

III. Why the Standard MBS-Portfolio Contract Exists

Part III sets out in further detail our explanation for why sophisticated, profit-maximizing firms made unenforceable contracts to sell MBS portfolios. Our explanation is in four parts. First, we show in Section III.A that current contract law cannot regulate the MBS-portfolio contract because the law assumes that parties trade one unit or *N* identical units, while an MBS portfolio contains heterogeneous units. Second, we show that creating an efficient contract to sell contracts—an efficient MBS-portfolio contract—poses a nontrivial contract-innovation problem. Third, we argue that common-law adjudication cannot be expected to solve this problem, such that a proactive state response is needed. Finally, we identify two constraints—bankruptcy remoteness and the revenue-recognition rules—that would have to be removed before market agents would use a state-supplied portfolio contract.

A. Current Contract Law

No contract law defaults exist for parties who make contracts to sell bundles of contracts. The U.C.C. defaults assume that when parties trade good bundles, the underlying goods are homogenous. To see how the U.C.C. defaults function,[72] damages for nondelivery are the difference between the contract price and the goods' market price when the buyer learned of the breach.[73] Because the statute is in the plural voice, it assumes that the units in a goods bundle are identical. Similarly, the buyer can get specific performance under Section 2-716 of the U.C.C. "where *the goods* are unique," which implies that all of them must be unique in the same way.[74] And under Section 2-714, when the buyer accepts goods, his damages for breach of warranty are the difference "between the value of the goods accepted and the value they would have had if they had been as warranted."[75] This remedy also is in the plural voice and so implies that an actionable warranty breach is assumed to affect all units identically, an interpretation that is confirmed by the accompanying comment's reference in the singular to "*the* non-conformity."[76]

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[72] RESTATEMENT (SECOND) OF CONTRACTS §§ 344(a), 347 (AM. LAW INST. 1981) describes defaults that are identical in the relevant respects.

[73] U.C.C. § 2-713 (AM. LAW INST. & UNIF. LAW COMM'N 2017).

[74] *Id.* § 2-716 (emphasis added).

[75] *Id.* § 2-714.

[76] *Id.* § 2-714 cmt. (emphasis added) ("The 'non-conformity' referred to in subsection (1) includes not only breaches of warranties but also any failure of the seller to perform according to his obligations under the contract. In the case of such non-conformity, the buyer is permitted to recover for his loss 'in any manner which is reasonable.'").

Finally, installment sales are regulated under Section 2-612 of the U.C.C., which provides, in Subsection 2-612(3), that when there is a "default with respect to one or more installments [that] substantially impairs the value of the whole contract there is a breach of the whole."[77] The comment explicitly rejects the interpretation that there is breach if the buyer can infer from an installment default that the seller is generally unreliable.[78] Hence, a default with respect to an installment could "substantially impair the value of the whole contract" only if the parties contracted to trade one product, parts of which were to be delivered in installments, or the parties intended to trade identical goods, which would be delivered in installments. The contract to sell a portfolio of contracts thus differs materially from the goods contracts that contract law contemplates.[79] When parties created the MBS-portfolio contracts, they had to start from zero.

B. Creating an Efficient MBS-Portfolio Contract

An efficient MBS-portfolio contract (in contrast to the ones that now exist) must solve two problems. As our analysis of the U.C.C. suggests, the contract must account for unit heterogeneity: the individual MBS are for different face amounts and the collateral—the houses—differs in value from contract to contract. Further, a portfolio contract must account for changes in the value of the portfolio over time.

An MBS contract could take heterogeneity into account in two ways. First, it could warrant that the originating bank followed best practices when creating the portfolio, rather than when creating each portfolio loan. In some goods sales, the contract permits the buyer to reject an entire batch if a specified percent of items is defective. This is a relatively simple solution if the batch is homogenous: when every item is supposed to perform the same function, a substantial fraction of failures suggests that the whole contains too many defective items. Portfolio loans, however, are not homogenous in this way. How to specify the percent of "defective" loans that would justify buyer rejection therefore is not obvious. Should deviations be measured by the number of affected loans? Or measured by the dollar value of those loans? How material would deviations from either measure have to be to constitute a breach?

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[77] *Id.* § 2-612(3).

[78] *Id.* § 2-612 cmt. 6.

[79] Contract theory is similar to contract law in embracing the homogeneity assumption. Theoretical analyses commonly assume that parties trade one unit or a set of homogenous units. *See generally* BOLTON & DEWATRIPONT, *supra* note 54.

A second possible solution would be to use relative-performance evaluation: did the portfolio at issue underperform similar portfolios by some prespecified percent? This measure is more promising, though aspects such as how to establish similarity and how to specify the percent require additional thought.

Regarding the second problem, the value of a goods bundle seldom changes materially in the interval between contract creation and performance, but the value of a debt contracts bundle can vary materially. The interval between making a contract to sell goods and delivery usually is too short for the goods' value to change.[80] In contrast, a portfolio seller who guaranteed portfolio performance would be on the hook until the portfolio loans were paid off. Because portfolio loans are long term, there is a long interval between making a contract to sell a portfolio of loans and the portfolio's complete performance.[81] The value of a portfolio can change materially in this long interval because its value is partly a function of interest rates[82] and housing prices. Because interest rates and housing prices can vary substantially over time, portfolio value also can vary. On the other hand, portfolio value also depends on the initial conditions, including the care with which the loans were made. A portfolio with weak loans will have more defaults when economic conditions worsen than a portfolio with strong loans.

Therefore, that a portfolio has fallen materially in value at some time *T* cannot itself constitute a breach of a warranty that guaranteed portfolio performance. The value decline could have been largely a function of interest-rate or housing-price changes, both of which are factors a local bank could not affect and so would not warrant against. The value decline, however, could also have been a function of a high-default rate, which a more efficient local-bank screen over potential borrowers would have prevented. Thus, a useful portfolio guarantee would have to distinguish between value-affecting factors that are within the guarantee and those that are not. Creating a contract that would allow courts to do this—isolate the endogenous factors triggering the contract's guarantee—is a nontrivial challenge.

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[80] An exception is commodity contracts, because many commodities are short-term volatile. *See* Robert S. Pindyck, *Volatility and Commodity Price Dynamics*, 24 J. FUTURES MKTS. 1029, 1029 (2004).

[81] Consumer mortgages commonly are supposed to pay off over fifteen or thirty years. *Cf. U.S. 30-Year, 15-Year Mortgage Rates Fall to Lowest Since Nov. 2016: Freddie Mac*, REUTERS (Aug. 22, 2019 10:41 AM), https://www.reuters.com/article/us-usa-mortgages-freddiemac/u-s-30-year-15-year-mortgage-rates-fall-to-lowest-since-nov-2016-freddie-mac-idUSKCN1VC1QY [https://perma.cc/C2MQ-CHCN].

[82] The present value of a fifteen or thirty-year mortgage can be approximated as the value of a perpetuity with the same specified annual payments: $V_P = x/r$, where V_P is the present value, x is the annual payment, and r is the current interest rate. Because interest rates change over time, portfolio value must change.

Creating a quality warranty for a portfolio of contracts, such as the MBS portfolios, is a problem that has not been solved. And if a particular bank did solve it, the bank could not exclude other banks from copying. The bank thus would internalize only a fraction of the social gain that its solution produces. But as the Introduction suggested, copying is only one problem. Today, portfolio bundles are traded under contracts that vary little from deal to deal. Participants in the securitization market thus have coordinated on a single contract form. This reduces trading costs materially, because a buyer and seller can just fill in the blanks by describing the new loans and the portfolio price. A new contract form, even if more efficient than the old, would have to pervade the market, but widespread adoption requires a "contract entrepreneur." In this extensively populated market, the costs of being such an entrepreneur seem too high for any one bank or set of banks to incur. Private solutions to the MBS contract inefficiency thus may not emerge.

C. Inadequacy of Default Rules

Courts develop default rules in the context of common-law adjudication, but litigation cannot help here. The process of default-rule creation runs from innovation to rule rather than the reverse:[83] there are often ambiguities and gaps in new contract forms, and these spur litigation. Judges, in the course of resolving disputes, create rules; these have staying power if the new contract form solves a contracting problem that many parties face.[84] But adjudication has not worked in this way in the securitization market. The MBS-portfolio contract is not ambiguous and has no relevant gap: the contract clearly makes *input warranties* that a portfolio buyer must enforce loan by loan. Courts have responded by reading the contract literally.[85] Hence, in the current situation, courts cannot help unless the private parties innovate, but the private parties will not innovate without help. A nonjudicial public response is necessary.

D. Paving the Way for an Efficient Contract—Revenue-Recognition Rules and

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[83] For thoughtful descriptions of how this process proceeds in other contexts, see Ronald J. Gilson, Charles F. Sable & Robert E. Scott, *Contract and Innovation: The Limited Role of Generalist Courts in the Evolution of Novel Contractual Forms*, 88 N.Y.U. L. Rev. 170 (2013); Ronald J. Gilson, Charles F. Sable & Robert E. Scott, *Text and Context: Contract Interpretation as Contract Design*, 100 CORNELL L. REV. 23 (2014).

[84] *See* Alan Schwartz & Robert E. Scott, *The Common Law of Contract and the Default Rule Project*, 102 VA. L. REV. 1523 (2016).

[85] *See supra* note 67.

Bankruptcy Remoteness

Any such response must confront two additional features that prevent private parties from creating a better MBS contract. The first is the portfolio contracts' accounting treatment. Under current accounting rules, an originating bank can book a portfolio sale as current revenue when it makes the current MBS contract. Input warranties boosted banks' accounting profits by facilitating this current-revenue booking. In contract, if the bank were to guarantee the portfolio itself, the bank either would have to incur a current charge against income in the amount of the expected warranty liability or record a contingent liability on its books that would be amortized as the portfolio performed. Either practice would reduce a bank's current income.[86] The commercial parties to long securitization chains thus have been reluctant to make contracts that guarantee portfolio performance.

There also is a bankruptcy reason for the inefficient MBS contract. Retailers that sell goods on credit combine the contracts—commonly called "accounts receivable"—into portfolios. In commercial law, a firm that lends money to a retailer and takes a security interest in the retailer's portfolio of receivables is a creditor in the retailer's bankruptcy. But a firm that "bought" the portfolio would not be a creditor any more than a buyer of goods would be a creditor in her seller's bankruptcy. If an accounts sale is "with recourse," however, courts treat the buyer as if it were a creditor in the seller's bankruptcy. In a recourse sale, when the obligor—the consumer—does not pay, the retailer must buy back the receivable from the financer. The retailer thus bears the payment risk, just as it would if it borrowed on the strength of its receivables rather than "sold" them.[87] Parties to these contracts thus face a tradeoff: the greater the recourse share is—i.e., the more contracts the retailer must repurchase—the stronger the incentive is for the retailer to screen potential-consumer buyers' creditworthiness. On the other hand, the greater the recourse share is, the more likely courts are to characterize the entire transaction *as a loan* from the financial-portfolio buyer to the retailer. This characterization would be apt because, in a lending arrangement, the retailer must pay back the financer when the consumer obligors—here, the goods buyers—default.

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[86] *See supra* text accompanying note 28.

[87] How the law decides whether a receivables financing is a sale or a loan is unclear:

> Whether something is a "sale" as opposed to a "loan" is often a function of the transaction. If there is full recourse, the transaction is a loan . . . regardless of what the parties call it. If there is none, it is a sale. Whether one ounce, a quart, or a gallon of recourse is enough to cause the transaction to cross the line from sale to loan cannot be predicted with certainty . . . .

WHITE & BRUNSTAD, *supra* note 26, at 365-66.

Turning to the MBS context, an originator who bought a contracts bundle from a local bank under a warranty of portfolio quality would be at risk of being treated as a creditor in the local bank's insolvency, just as the retail financer is at risk when the recourse share is large. Thus, courts would likely classify the portfolio transaction as a *loan* from the originator to the local bank. When the originator sells the loan to a large bank, that bank also would assume creditor status.[88] And when the large bank sells the loan to a trust, the trust would assume that status as well. In financing language, the buyer of an MBS-portfolio contract would not be "bankruptcy remote." In the absence of remoteness, the purchasers of trust certificates or portfolio bonds would be local-bank creditors, and so would want to know how sound the originating local bank was. But the public investors could not find this out. Without bankruptcy-remote status, a public investor thus would bear risk if it held a trust certificate or a SPV bond. To increase the marketability of MBS, the financial intermediaries that trade loan portfolios thus will not guarantee them.

Perhaps a better way to put this concern is that the SPV bond or the trust certificate is supposed to be an informationally insensitive financial instrument. The buyer does not need to know anything about the quality of the underlying contracts: the instrument just pays off. The analogy is to money: an agent who exchanges goods for money does not need to look behind money to see if it is sound: money just is its face value. Without bankruptcy remoteness, the publicly held securities would be informationally sensitive. It is well known that achieving bankruptcy remoteness (by removing risk from originating banks) makes the public securities more "money like," and so induces public investors to hold them. But it is less well known that achieving bankruptcy remoteness reduces the quality of the underlying debt.[89]

To summarize, local banks warranted inputs to loan creation rather than outputs for three reasons. First, in contract law, legal defaults do not apply to the portfolio contract. Second, in commercial and bankruptcy law, the rules that define when the acquirer of a contract (or of a portfolio of contracts) is legally a "buyer" of the contracts or a "lender" to the originator of the contracts do apply to securitization contracts. Third, in securities law, the accounting rules that determine in which accounting period the seller of a set of contracts is entitled to recognize revenue from the sale require sellers not to incur large contingent liabilities. The contracts literature does not discuss the need for creating new defaults that would facilitate the emergence of efficient MBS-portfolio contracts. The commercial and securities literatures discuss how bankruptcy remoteness and the revenue-recognition rules reduce the price of loans to individual borrowers when the source of financing home mortgages has become the capital market. However, these literatures do not discuss how the rules induce banks and other agents to trade loan portfolios under the inefficient MBS-portfolio contract. Thus, there is little wisdom on how best to change this contract.

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[88] Under contract law, a transferee assumes the status of its transferor. *See* RESTATEMENT (SECOND) OF CONTRACTS § 317(1) (AM. LAW INST. 1981) ("An assignment of a right is a manifestation of the assignor's intention to transfer it . . .and the assignee acquires a right to such performance.").

[89] An earlier literature discussed efficiency rationales for bankruptcy remoteness. The literature is summarized in Kenneth Ayotte & Stav Gaon, *Asset-Backed Securities: Costs and Benefits of 'Bankruptcy Remoteness,'* 24 REV. FIN. STUD. 1299 (2011), which also argued that removing assets from a firm that originated accounts receivable—through a "sale" of the accounts—would prevent inefficient continuance if the firm became insolvent. Another paper argued that removing assets from such a firm would permit it to concentrate on monitoring the remaining assets. Edward M. Iaccobacci & Ralph A. Winter, *Asset Securitization and Asymmetric Information*, 34 J. LEGAL STUD. 161 (2005). These and earlier papers are irrelevant to the moral-hazard concern that we analyze because the papers assume that "the cash flows that are securitized are relatively insensitive to managerial effort." *Id.* at 171. The contracts that we consider are sensitive to managerial effort because their value falls as bank managers relax their screening of borrowers.

IV. Would Reform Help?

Part III argued that contract innovation—creating an efficient MBS-portfolio contract—is difficult, partly because the securitization market has already coordinated on another contract. Still, would the market adopt a more efficient contract? Another way to put this question is to ask whether banks and trusts would use an MBS contract that warranted the output of portfolio performance if the underlying reasons for parties warranting inputs were eliminated. Part IV takes up this admittedly speculative question as a prelude to making reform suggestions.

To pursue the question, we temporarily assume that the state supplies efficient MBS-contract defaults and that the bankruptcy and revenue-recognition rules have been appropriately revised. When the originating bank warrants inputs, we denote its contract as the MBS contract; when the bank warrants *portfolio performance*, we denote its contract as the MBS* contract. Would originating banks and their buyers prefer the less efficient contract if the more efficient contract were available?

The answer seemingly lies in the possibility of strategic interactions among the portfolio buyers. These interactions could produce an outcome in which everyone preferred the inefficient MBS contract to the efficient MBS* contract. To see why buyers could hold this preference we assume:

A_1: Originating banks (and trusts) make contracts independently of the choices of other purchasers but *with awareness* of the others' choices

A_2: Originating banks will supply more portfolios under the MBS contract.

A_3: The portfolio buyers experience economies of scale in selling certificates in trusts or selling the bonds of SPVs.

A_4: The MBS contract imposes greater risks on portfolio buyers and trusts than the MBS* contract.

A_5: Market participants expect the economy to be strong.

Rational market participants could make these assumptions.

A_1 is implied by the large number of portfolio purchasers. A_2 follows from originating banks being able to degrade lending standards and having relatively few repurchase obligations under the MBS contract. A_3 rests on the premise that portfolio buyers, including trusts, incur large fixed costs to set up a portfolio-trading business but incur low marginal costs when trading particular portfolios. Thus, buyers' gains are increasing in the number and size of the portfolios that they sell.[90] Consistent with this assumption, buyers' actual market portfolios were very large. A_4 holds because originating banks relax screening when they do not expect to be liable for breach. Finally, A_5 is a "domain assumption," describing how market participants from 2000 through 2007 may have understood their world.

To see what the five assumptions imply, suppose that originators are purchasing portfolios under the efficient MBS* contract. A particular buyer would have an incentive to switch to buying portfolios under the inefficient MBS contract because A_2 implies that it could buy more portfolios, and A_3 implies that it could make more money selling them. Regarding A_5, in the model above, borrowers repay when $Y > R$, where Y is the value the borrower derives from her house, and R is the required repayment. Borrowers believe, ex ante, that they will be able to satisfy this inequality. A borrower necessarily defaults when she suffers an exogenous shock after borrowing that reduces Y to below R. The more marginal the borrower is, the smaller the shock needed to push her below the required repayment. When houses prices rise and borrowers can make payments without slighting other obligations, Y is likely to be large relative to R, which increases a borrower's "cushion" against exogenous shocks. A portfolio buyer therefore can expect more marginal borrowers to repay in better times, and this partly offsets the increased number of marginal borrowers that result from relaxed screening. Hence, a portfolio buyer has an incentive to switch to the MBS contract when other buyers are using the MBS* contract. But because every portfolio buyer can reason in this way, a market outcome in which *every buyer* uses the MBS* contract may be unstable.

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[90] Further to A_3, portfolios were sold under prospectuses and contracts, but these documents came to assume standard forms. Hence, once the forms were set, a seller had primarily to change the numbers when selling another portfolio. Also, because the cost to a salesperson of selling a two-thousand-loan portfolio were not much lower than the cost of selling a ten-thousand-loan portfolio, a salesperson should thus be given large portfolios to sell.

But now let every portfolio buyer purchase portfolios under the MBS contract. The *same conditions* that would induce a buyer to switch *away* from the all MBS*-contract outcome could keep the buyer from *switching to* the MBS* contract. In particular, a buyer who switched from the MBS contract to the MBS* contract would purchase fewer portfolios at higher prices but still face a low default risk. Defection from the inefficient MBS contract thus may not pay. Therefore, market participants can be "trapped" into using inefficient MBS contracts, even if a better contract were available.[91]

This analysis supports two reflections. First, although circumstances exist in which parties would reject the efficient MBS* contract, the state still should facilitate its emergence. When the economy is declining, marginal borrowers will have less of a cushion between how much they value their home and the required repayment. As the model in Part I showed, the factors that induce default and may produce contagion could present strongly when this cushion shrinks. The analysis in Part IV thus shows that the MBS inefficiency may not be serious when the economy is booming but can be, and actually was, quite serious when the economy tanks.

Second, a slightly better understanding of the securitization markets of 2004 through 2007 and today is possible. The economy in general, and housing prices in particular, were strong in the years just preceding the Recession. These factors probably made the MBS contract marketable despite its risks. But when the economy and the housing market worsened, the weak borrower pool that emerged under the MBS contract produced many necessary and strategic defaults. The broken loans could not be fixed in real time, nor could they be refinanced in consequence of the credit crunch that later occurred. Put another way, the emanant implications of the MBS contract ultimately came to light: the originating-bank warranties never were enforceable, but it took the crash to teach portfolio buyers that they were without a contract remedy for breach. Even so, Part IV suggests that parties may prefer to trade loan portfolios under the inefficient MBS in bullish states of the world. Indeed, the current strong

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[59] The argument in text is a "network switching argument." These arguments are used to explain why agents sometimes choose inferior networks; it is individually rational for single agents to switch to the inferior network if they mistakenly think they are the only ones to switch. Having switched, however, the agents who have made the switch—here, used the MBS contract—realize that it is not individually rational to switch back to the superior network, i.e., use the MBS* contract. A similar argument has been used to explain why it may be justifiable to prevent debtors from choosing which bankruptcy chapter to use in the debt contract. Antonio E. Bernardo, Alan Schwartz & Ivo Welch, *Contracting Externalities and Mandatory Menus in the US Corporate Bankruptcy Code*, 32 J.L., ECON. & ORG. 395 (2015).

economy may partly explain why the inefficient contract is seemingly in vogue again.[92] This possibility suggests a need for regulation, because bad states may occur and lead to widespread borrower defaults with systemic consequences.

V. Policy Implications and Reforms

There are two ways to cure MBS-portfolio pathologies: to regulate the contract or to facilitate the creation of a more efficient contract (the MBS* contract in Part IV). Dodd-Frank regulates portfolio contracts in two ways. First, it prohibits an originating local bank from making a mortgage loan unless the bank has reason to believe that the borrower can repay. Second, it requires the bank to retain five percent of each portfolio that it sells, under the logic that the five-percent holdback induces the bank to make careful loans. We begin Part V by arguing that these reforms are ineffective. Part V then considers how the state could improve the MBS-portfolio contract. Finally, we suggest rescuing borrowers if a crisis occurs again.

A. Rejecting Dodd-Frank

Dodd-Frank prohibits a lender from extending a secured home loan unless the lender reasonably believes that the borrower can repay the loan.[93] This prohibition makes the originating local bank liable for civil penalties under the Truth in Lending Law, and because the bank warrants that its loans are legal to make, the bank also would be liable to the originator. This reform is unlikely to increase the incentive of local banks to make good loans. Portfolio buyers are the likely plaintiffs to hold banks accountable, but a buyer could prevail only if it could ascertain that the local bank, ex ante, should have realized that a particular borrower could not repay. But to do this, the portfolio buyer would have to establish the lending practices that the bank used for that borrower *and then* show that the most likely conclusion that a bank, which pursued those practices, would draw is that the borrower was unlikely to repay. Because portfolio buyers, we have seen, cannot take the first step of proving the bank's practice loan by loan, a portfolio buyer could not take the second step at all.[94] Nor could public enforcement make up for the lack of an effective private remedy; the cost of observing and verifying bad lending practices would not fall when a state agency is the plaintiff. Thus, regulators cannot effectively enforce the prohibition, unless they devote unthinkable public resources to the task. Hence, the reason-to-know requirement is unlikely to change originating-bank behavior.[95]

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[92] *See* Eisen & Kusisto, *supra* note 1; Nickerson & Griffin, *supra* note 1; Phillips, *supra* note 1.

[93] 15 U.S.C. § 1639c(a)(1) (2018) ("[N]o creditor may make a residential mortgage loan unless the creditor makes a reasonable and good faith determination based on verified and documented information that, at the time the loan is consummated, the consumer has a reasonable ability to repay the loan . . . ."). Bank loans are exempted from this requirement if the consumer's debt-to-income (DTI) ratio is below 43% per month, and the Consumer Financial Protection Bureau also has exempted loans because they are eligible to be purchased by the Government Sponsored Agencies. A recent study found that the reason to pay reform materially reduced credit in the large loan market. Anthony A. DeFusco et al., Regulating Household Leverage 4 (Aug. 2, 2019) (unpublished manuscript) (on file with author) ("[W]e estimate that the policy eliminated 15 percent of the high-DTI jumbo market in the year that it was implemented . . . ."). The exemption for low-DTI loans will expire in 2021. Its nonrenewal "would imply a reduction of roughly $12 billion in total mortgage originations" a year. *Id.* at 5.

Dodd-Frank also requires originating banks to retain five percent of their loans on their books.[96] This makes the banks residual claimants, to the extent they retain the securities. This reform too is unlikely to be effective because it runs into the bankruptcy-remoteness constraint. Prior to the Recession, the market did require some originating banks to retain a small percent of the portfolios they sold, but that fraction did not prevent widespread bad behavior.[97] The market nevertheless did not require a larger percentage because parties likely thought that courts would define a sale with a much larger holdback as a sale with recourse. Such a sale would make the originating bank a "borrower" and the portfolio buyer a "creditor." Consequently, the buyer's transferees, including public investors, would not have bankruptcy-remote status.[98]

To be sure, no one believes that the Dodd-Frank holdback would lead to this result. But there is also no reason to believe that a five-percent holdback is large enough to materially affect local banks' behavior. Repealing the five-percent requirement and creating an efficient MBS contract—which entails changing the bankruptcy-remoteness rules—would be better than the current scheme. Under such a regime, private parties could choose between (i) a contract with input warranties, which requires the originating bank to hold back a significant portion of portfolio loans, and (ii) a contract with an output warranty, guaranteeing portfolio performance. In other words, reforming the MBS contract would let the market decide which contract form should dominate.

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[94] Dodd-Frank, in § 1639c(a)(2), sets out the basis on which a creditor must form its belief, which is the basis that the portfolio buyer must establish in order to recover. 15 U.S.C. § 1639c(a)(2) (2018) ("A determination under this subsection of a consumer's ability to repay a residential mortgage loan shall include consideration of the consumer's credit history, current income, expected income the consumer is reasonably assured of receiving, current obligations, debt-to-income ratio or the residual income the consumer will have after paying non-mortgage debt . . . , employment status, and other financial resources . . . ."). Critically, these factors overlap with the factors in the MBS-portfolio contract's best-practices warranties, and they are *equally unverifiable* by portfolio buyers.

[95] We note that Section 101 of the Economic Growth, Regulatory Relief, and Consumer Protection Act exempts small banks from the reason-to-know requirement if a bank *retains* the loan portfolios it originates. Pub. L. No. 115-174, § 101(F)(ii)(1)(aa), 132 Stat. 1296, 1298 (2018) (amending 15 U.S.C. § 1639c(b)(2)). While the purpose of the exemption is to reduce the lending costs of the banks, the exemption also implicitly confirms the model in Part I above. When the intermediation chain is short—only borrowers and the originating bank—the bank will invest optimally in screening on its own.

[96] Pub. L. No. 111-203, § 15G(c)(1)(B)(i), 124 Stat. 1375, 1891-92 (2010) (codified at 15 U.S.C. § 78o-11 (2018)).

[97] The evidence suggests that originators reduced pre-loan screening despite these holdbacks. *See* Choi & Kim, *supra* note 22; Dow, *supra* note 22; Keys, *supra* note 22; McCoy & Wachter, *supra* note 22; Mian & Sufi, *supra* note 22; Purnanandam, *supra* note 22.

[98] *See* WHITE & BRUNSTAD, *supra* note 26, at 81.

B. Creating an Efficient MBS Contract

Our most significant suggestion is procedural. The analysis in Part III argued that creating a new contract form is a public good. The state has responded to analogous public-goods problems by creating new contact forms itself. For instance, a corporation is commonly described as a nexus of contracts and, illustratively, the Delaware Corporate Code supplies to potential businesses a variety of corporate-contract forms: the public corporation, the close corporation, the limited liability corporation, the business trust, and so on. On the institutional front, several candidates could develop an efficient MBS-portfolio contract, including the Federal Reserve Board, the Securities and Exchange Commission, the Permanent Editorial Board of the Uniform Commercial Code, the National Conference of Commissioners on Uniform State Laws, and the American Law Institute.

To suggest a possible direction for creating an efficient MBS contract, the subject of sale should be *the portfolio*, not the separate contracts that constitute the portfolio. Three legal terms may be part of a more efficient MBS contract. First, there could be an implied warranty of portfolio quality, similar to the implied warranty of goods quality.[99] To use the U.C.C. phrase, a portfolio should "pass without objection in the trade."[100] Under such a portfolio warranty, the buyer would *not* have to establish breach by comparing how the originating bank made each individual loan to best-practice underwriting standards. Rather, the warranty would be conditioned on some output measure. As suggested above, the precise measure would be hard to create, but there is evidence that general portfolio performance could support some form of relative-performance evaluation—our second suggestion. Such a scheme would facilitate damages calculations. For example, suppose that the default rate for the mortgages in the buyer's portfolio was twice the default rate for similar mortgages in other portfolios. This would reduce the value of the buyer's portfolio relative to the value of the average portfolio, and the buyer's damages could be this value difference. The third proposed legal term would specify when a portfolio seller's poor performance is excused. The term ideally would give courts some guidance regarding how to distinguish interest-rate and housing-price-caused reductions in portfolio value from endogenous causes, such as poor mortgage underwriting.

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[99] *See* U.C.C. § 2-314 (AM. LAW INST. & UNIF. LAW COMM'N 2017) ("[A] warranty that the goods shall be merchantable is implied in a contract for their sale if the seller is a merchant with respect to goods of that kind.").

[100] *Id.* § 3-314(2).

The suggested warranty, damage, and excuse terms would be standards that courts would develop over the course of litigation. Parties often contract out of legal standards,[101] but commonly do so in favor of settled private-contract models. Here, no such models exist, so parties may accept the defaults or use them to tailor more efficient portfolio contracts. We emphasize that the state should create *defaults*. Parties may still contract out of the state-supplied defaults in favor of the current input-warranty contract, but if they do, they would likely be more aware of the attendant costs.

Supplying the parties with an efficient MBS contract, however, would be insufficient. In good economic times, parties may not use the contract. Other incentives for parties to stay with the inefficient contract would also remain. Those incentives, recall, are to ensure bankruptcy remoteness and favorable revenue-recognition treatment for portfolio sales.

Bankruptcy remoteness could be preserved in two related ways. First, the Bankruptcy Code could be amended to provide that public investors in contract portfolios cannot be made creditors in an originating local bank's bankruptcy. This would eliminate the incentive of the commercial parties to write the inefficient MBS contract in order to protect those investors. Second, the United States could facilitate the creation of a covered-bond market. In Europe, originating banks can create portfolios and sell bonds on the portfolios directly to public investors.[102] The repayment risk remains with the originating bank, so the intermediation chain effectively ends with it. Critically, however, European statutes give bankruptcy-remote status to bond purchasers. Under this financing structure, the originating bank remains a residual claimant (which is efficient), but individual borrowers can access the public credit market (which also is efficient). Perhaps as a consequence of these virtues, covered bonds account for about a fifth of the European fixed-income market.[103] In the United States, there is almost no market for covered bonds, nor will there be without such a statute.

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[101] Parties, however, may accept at least the proposed warranty and damage terms because they are "transcontextual," i.e., the terms require a court just to compare two verifiable numbers—the standard default rate, and the contract portfolio's default rate—rather than launch an inquiry into local conditions. The terms thus could be applied to any portfolio. *See* Schwartz & Scott, *supra* note 84.

[102] *See supra* note 29 and accompanying text.

Finally, accounting practice should change to permit originating banks to count the price from a portfolio sale as revenue in the period in which the sale occurs. Under current practice, originating banks can fully recognize revenue when they warrant individual units in a portfolio, but could not fully recognize revenue if they warranted the portfolio itself. The apparent point of this distinction reinforces our theme. A firm that counted the portfolio price as realized revenue would mislead investors if a significant contingent liability (that many defaults later could occur) attended the sale. But investors could be misled only if the input warranties were enforceable. The implicit premise of the recognition rules then is that an originator which makes *only* input warranties regarding individual loans does not expose itself to a significant contingent liability. Originators have no contingent liability, however, just because the individual loan warranties are *unenforceable*. Accounting practice and the litigation strategies of the portfolio buyers described in Section II.B above both support our argument: an MBS-portfolio contract that makes input-quality warranties is a contract that makes no quality warranties at all. In light of this result, the disclosure goal underpinning accounting practice should be pursued in other ways, as with footnotes to a balance sheet or a paragraph in a quarterly report. Therefore, a portfolio seller should be permitted to book revenue in a current accounting period, provided that it appropriately notifies investors that the sale comes with an attendant contingent liability.[104]

C. Rescuing Homeowners in Hard Times

There is a constructive role for the state beyond creating the efficient MBS contract. We suggest two remedies when a contagion effect is possible. First, in particularly hard times, the state should guarantee the loans of borrowers that are most likely to default. This would cause the remaining population to contain a larger fraction of borrowers who escape the necessary default category (for them $Y > R$). Also, a guarantee would increase the probability that defaulting borrowers are monitored, because it would free up a bank (or servicer's) monitoring capacity.[105] A guarantee thus would reduce strategic defaults in two related ways. First, our model shows that the higher the monitoring probability is, the less likely strategic default is to pay. Second, a guarantee would reduce strategic default by changing borrower expectations. Eliminating default by the weakest borrowers and lowering the expected-default payoff of discretionary defaulters would cause a representative borrower to believe that many other borrowers will repay. Potential strategic defaulters with this expectation are more likely to repay themselves.[106]

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[103] Petri Sulku & Heidi Falkenbach, *Pricing Models of Covered Bonds: A Nordic Study*, 15 INT'L J. STRATEGIC PROP. MGMT. 1, 1 (2011). There also have been materially fewer MBS-portfolio defaults in Europe, which is consistent with our claim that putting risk on originating banks would improve the borrower pool. *See* Heant et al., *supra* note 29, at 407 ("AAA-rated U.S. securitized instruments backed by residential mortgages (RMBS) reached default rates of 16% (subprime) and 3% (prime). By contrast, default rates of EU RMBS never rose above 0.1%.").

[104] There is concern that putting risk on local banks would create adverse selection. The bank would hold good loans and sell bad ones; anticipating this, intermediaries would be reluctant to purchase. The warranty, remedy, and excuse reforms suggested here for portfolio contracts would ameliorate this concern. Similar rules solve adverse selection problems in other markets.

Alternatively, the state could put a floor under foreclosure prices. When prices are too low, a state agent could enter to bid. This would have three effects: it would increase foreclosure prices; it would increase the probability that the servicer would reject steep modifications (which encourage strategic default); and it would increase borrower quality because borrowers would realize more from loans. These three effects also would reduce the contagion effect for two reasons. First, the payoff from pursuing defaulting borrowers would increase so the probability of pursuit would increase, and, relatedly, default would be less attractive to borrowers. Second, as these effects manifest, the probability that borrowers assign to other borrowers defaulting will fall, making widespread default less likely.

The government neither guaranteed mortgage loans nor put a floor under foreclosure prices during and after the Great Recession. While it is difficult to reconstruct the exact reasons why not, the government's reticence is consistent with a very persistent pattern of late or nonexistent responses to financial crises. The government is initially slow to bail out banks,[107] though a bailout could prevent disaster because of the moral-hazard concern; governments do not want to appear to encourage future bad bank behavior by not punishing present bad behavior. When it becomes apparent that some form of bailout is economically necessary, it is too late: the crisis is occurring.[108] The lack of a government response after 2008 thus may have been partly due to the frequent complaints by the press and political figures that no one has been punished and that the big banks have gotten away with it. Put another way, the United States acted as it always has acted. On the other hand, the government did implement the Home Affordable Refinance Program to reduce foreclosures. Perhaps this, and the disastrous consequences of the failure to do more in the Great Recession, will be a lesson for future governments.

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[105] From the model in Part I, the probability of monitoring is the originating bank's monitoring capacity over the number of defaulters ($P = K^m/D$). The guarantee would reduce D, while leaving K^m unchanged, thereby increasing P.

Consistent with this claim, a recent study showed that the HAMP mortgage modification program—which reduces borrower-mortgage payments, described *supra* note 45, reduced the monthly default hazard rate by forty-eight percent to sixty-two percent. Kadiri Karamon, Douglas McManus & Jun Zhu, *Refinance and Mortgage Default: A Regression Discontinuity Analysis of HARP's Impact on Default Rates*, 55 J. REAL ESTATE FIN. ECON. 457, 457 (2017).

[107] Every financial crisis is triggered by a bank run. In 2007 and 2008, the run was against "nonbank banks," such as money-market funds. Guaranteeing mortgages or putting a floor under foreclosure prices in effect bails out banks and nonbank banks by ensuring that they will be partly or fully repaid.

Finally, regarding commercial parties' possible preference for the inefficient MBS contract in some states of the world, the best remedy would be for the state not to enforce the contract in those states. Recall, though, that the inefficient-contract equilibrium requires large economies of scale in portfolio size, together with macro conditions that greatly reduce the risk of default. It may take an administrative agency, such as the Federal Reserve Board, to identify expeditiously when those conditions have materialized in order for the government to intervene effectively.

Conclusion

The state enforces contracts to spur promisors to make credible promises to perform. An implication is that the promises must be based on verifiable information: if the seller promises to deliver ten widgets, the buyer must be able to verify to a court, at acceptable cost, that the seller failed to tender ten compliant widgets. If the buyer could not verify the seller's defective tender in a cost justified litigation, the seller's promise to deliver would not be credible because the buyer could not hold the seller to account. In this circumstance, rational buyers would not promise to pay for widgets. But if somehow buyers did promise to pay, sellers likely would anticipate the buyers' inability to prove breach and would then save costs by degrading widget quality.

This reasoning surprisingly did not apply in the market for MBS that we analyze here. Rather, banks and similar entities originated and sold portfolios of mortgages to financial intermediaries, who ultimately resold them to public-investment vehicles, such as trusts and special-purpose vehicles. These trades were initiated under inefficient contracts between originating local banks and intermediary purchasers. In the contracts, the originating banks and their transferees warranted inputs to efficient loan creation: that the originators created *each portfolio loan* in accordance with current best underwriting practices. Such warranties promised, for example, that individual borrowers lived in their homes, that they were employed, that real estate appraisals were conducted properly and so forth. A portfolio buyer, however, could not verify compliance with these and similar warranties because loan-by-loan verification would have been too costly. Hence, in this "market for contracts," buyers bought products—the portfolios—on the basis of *unverifiable* originating-bank promises. The local banks responded as would be expected: they degraded lending standards. In addition, the inefficient MBS contract put the risk of correctly created nonperforming loans, or loans whose noncompliance with warranties could not be verified, initially on the financial-intermediary buyers and ultimately on the servicers, as agents of the public investment vehicles. These parties could not monitor or renegotiate loans efficiently. The apparently obvious solution would have been for the local banks to have warranted outputs: that *the loan portfolio*, rather than the individual portfolio loans, would perform as would an efficiently created portfolio.

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[108] *See* GARY B. GORTON, MISUNDERSTANDING FINANCIAL CRISIS: WHY WE DON'T SEE THEM COMING 165-66 (2012).

The MBS-portfolio contract is a relatively new contract form, however. How to make efficient output warranties for this contract form apparently is an unsolved contracting problem. We argue here that this is a problem the private market is unlikely to solve. Creating an efficient MBS contract and then coordinating the behavior of enough market participants to make the contract viable are public goods. Thus, we argue, a state agency should create an efficient MBS contract, as the state creates other business contracts, such as the varieties of corporate forms. But even if the state provided the efficient contract, there are disincentives for parties to use it—namely bankruptcy and accounting reasons. Bankruptcy-remoteness concerns caused parties to make contracts that only warranted inputs to loan creation; with such contracts, parties could ensure that the public investors would not be involved in an originating bank's insolvency. Accounting motivations were also in play, as these contracts allowed the originating bank to recognize revenue from a portfolio sale contemporaneously with the sale.

Recognizing the difference between a contract to sell contracts—such as the MBS-portfolio contract—and goods contracts has several law-reform implications. First, as said, the state should create an efficient version of the MBS contract. Second, the accounting revenue-recognition rules should be reformed, and an amendment to the bankruptcy code should provide that public investors cannot be involved in a remote local bank's bankruptcy. Third, and as an alternative or a supplement to amending the bankruptcy code, the state should create a covered-bond market, where originating banks can issue debt directly to the public and still remain remote from a bank's insolvency. The current rules regarding revenue recognition and bankruptcy remoteness create an externality—i.e., creating bad loans—that always loomed large and, in the Great Recession, materialized with catastrophic consequences. Fourth, Congress should repeal Dodd-Frank's command-and-control regulation of originating-bank behavior. Increasing contracting efficiency in the securitization market is a better solution. Finally, when widespread default is a possibility, the state should consider guaranteeing the loans that are least likely to perform. This would permit portfolio buyers to concentrate on pursuing other borrowers and may cause these borrowers to repay because they will come to believe that many other borrowers would repay.

We conclude with two comments. First, MBS are not the only instruments that are securitized today. Credit-card receivables, automobile receivables, student and peer-to-peer loans are other examples. Scholars and regulators should inquire into the enforceability of the portfolio contracts that sell these instruments. Second, we recognize that our law-reform proposals are more suggestive than developed. This partly is because we have identified the key function that the contract between the originator of the contracts in a portfolio and the portfolio buyer should perform—i.e., to put risk on the originator—but we have not fully characterized that contract itself. Hence, our principal contribution in this Article is to identify the portfolio contract as a new contract type that governs many sizeable transactions and show that past and continued neglect of this contract's special features caused, and may continue to cause, serious social and economic harm.