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Economic Insights

Banking Trends: Measuring Cov-Lite Right

Investing in Elm Street: What Happens When Firms Buy Up Houses?



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Banking Trends: Measuring Cov-Lite Right

More business loans today lack traditional restrictions on borrowers, raising concern among bank regulators and others. **Edison Yu** investigates whether omitting such covenants actually leaves lenders more exposed to default.

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Investing in Elm Street: What Happens When Firms Buy Up Houses?

Institutional investment in single-family homes is rising sharply. Lauren Lambie-Hanson, Wenli Li, and Michael Slonkosky examine the impact on house prices, homeownership rates, household financial well-being, and the overall economy.

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The views expressed by the authors are not necessarily those of the Federal Reserve.

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About the Cover

The \$100 bill is all about Philadelphia—and the founding of our nation. On its face is Benjamin Franklin, whose arrival in Philadelphia from Boston at age 17 helped change the course of history. On the reverse is the engraving adapted for our cover image of Independence Hall, where the Declaration of Independence and Constitution were debated and signed. Two blocks north on Sixth Street is the current home of the Federal Reserve Bank of Philadelphia, founded after the Federal Reserve Act of 1913 authorized the issuance of Federal Reserve notes such as the \$100 bill. To see how the look of the \$100 bill has evolved since 1914, go to:

https://www.uscurrency.gov/denominations/100.

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Banking Trends:

Measuring Cov-Lite Right

More business loans today lack traditional covenants governing borrowers. Does that leave banks with fewer tools to ward off default?

Edison Yu is a senior economist at the Federal Reserve Bank of Philadelphia. The views expressed in this article are not necessarily those of the Federal Reserve.

BY EDISON YU

Syndicated loans, in which multiple lenders put up the money for a single large loan, are a major funding source for large U.S. firms, and since the financial crisis, their use has soared (Figure 1). Accompanying this rise in syndicated loans has been a large increase in loans that lack traditional financial covenants designed to prevent default. A financial covenant clause in a syndicated loan contract typically requires the borrower to pass regular financial fitness tests. Because the financial industry considers loan covenants a major device by which

lenders can monitor loan repayment performance, many see this rise in covenant-lite lending as evidence of a decline in credit standards.

Since lower lending standards in the home mortgage market set off the events that led to the financial

crisis, this development in the syndicated loan market has drawn much concern from regulators and other market participants.¹ One analysis suggests that covenant-lite loans now account for the majority of leveraged—or higher-risk²—syndicated loans and argues that the lack of financial covenants means investors will recover less of their money in the event of default.³ Concern has also been expressed that covenant-lite leveraged loans have become the norm in the leveraged loan market and that traditional covenant protection is even viewed as a stigma, a sign that the borrower is very risky.⁴ Regulators' concerns about declining credit standards in the leveraged loan market prompted them to note that covenant-lite loans "may have a place in the overall leveraged lending product set; however, the agencies recognize the additional risk in these structures"⁵ and to subsequently suggest that "loans with relatively few or weak loan covenants should have other

mitigating factors to ensure appropriate credit quality."⁶

However, before we can conclude that covenant-lite is an indicator of declining credit standards, we need to know that we are measuring "covenant-liteness" correctly. Increasingly, a significant share of a firm's

leveraged loans is being held by nonbank *institutional* lenders. In another departure from traditional syndicated loans, in which all the lenders hold essentially the same types of loans, the institutional members of the syndicate tend to specialize in a different type of loan than the bank members do.

As I will show, this growth and specialization of nonbank lenders in the syndicated loan market means that the surge in covenant-lite loans tells only part of the credit standards story. It means we need to measure the prevalence of covenant-lite

FIGURE 1

A Typical Syndicated Loan Model

A syndicated loan package often consists of a **revolving line of credit**, similar to a credit card, and **term loans**, with an amortization schedule.



The surge in covenant-lite

loans tells only part of the

credit standards story.



Source: Theleadleft.com, https://www.theleadleft.com/leveraged-loan-insight-analysis-732017/. Note: Horizontal axis shows six-month intervals.

loans at the borrower level, rather than at the level of the individual loan, by taking into account all the syndicated loans that a business is taking out or has outstanding. Then we can gain a clearer picture of whether borrowers are still meaningfully constrained by these financial clauses and whether lenders, especially banks, still have the contractual muscle to act when a borrower's financial performance starts to deteriorate.

To achieve this clearer picture, this article will show what I think is a more accurate way to measure covenant-liteness and to weigh concerns about declining loan standards. First, I show how big the rise in covenant-lite loans has been and why that has raised some red flags regarding financial stability.

Rise of Syndicated and Cov-Lite Loans

Syndicated loans are the source of much of the money that U.S. corporations rely on to fund their expansion and day-to-day operations. The outstanding portfolio of syndicated loans worth \$20 million or more rose from about \$2.7 trillion in 1993 to \$4.7 trillion in 2017.⁷ Although syndicated loan issuance slowed after the financial crisis hit in 2007, it resumed rising in 2010. In the first half of 2017, about \$1.2 trillion in syndicated loans were issued, up from \$250 billion in the second half of 2009, their lowest point during the financial crisis (Figure 2).

Since 2000, syndicated loans have

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increasingly been held by institutional investors such as pension funds and mutual funds, either directly or through collateralized loan obligations (CLOS).⁸ Institutional investors' holding of syndicated loans is concentrated in the leveraged

loan market. Institutional investors' contribution to the leveraged loan market has risen

See **"Example** → of a Financial Covenant."

from less than \$40 billion in 2009 to approximately \$300 billion in the years following the financial crisis (Figure 3).

As syndicated loans have risen, so have covenant-lite loans. The contracts on these syndicated loans lack the traditional clauses that require borrowers to meet regular performance tests. The fraction of outstanding leveraged loans that are covenant-lite rose from about 16 percent in 2010 to about 45 percent in 2013, surpassing the precrisis peak in 2007 (Figure 4).⁹

In loans with traditional financial covenants, borrowers are required to report their pertinent accounting information to the *agent* bank, which usually holds the largest share of the loan and administers it on behalf of the other lenders in the syndicate. Failure to comply with a financial covenant constitutes default. This threat of default provides lenders with the means to enforce or renegotiate the loan contract as soon as the borrower's financial performance starts to decline. Although covenant violations often indicate that the firm is financially distressed, they do not usually lead to default or bankruptcy; lenders waive most covenant violations after renegotiating with the borrower. However, violations do have real consequences for the borrowing firm. In return for having the violation waived, the borrower must agree to stricter loan terms such as a higher interest rate and reductions in the amount of debt it may issue, money it may invest, and dividends it may pay out to its shareholders.¹⁰ In this way, the regular reporting required by financial covenants and the tougher restrictions imposed in the event the covenants are violated give banks tools to curtail borrowers' risky behavior.¹¹

Since the financial crisis, regulators have been concerned that lower credit standards can destabilize the financial system. The rise of covenant-lite loans was among the reasons that federal regulators cited for tightening their guidelines on high-risk lending in their Interagency Guidance on Leveraged Lending of 2013. So, should we be concerned with this rise in covenant-lite loans? Our answer has to begin with ensuring that we are correctly measuring the rise.

Cov-Liteness: Loan- vs. Firm-Level Evidence

While it is true that covenant-lite loans have increased, our evidence shows that virtually all borrowing firms are subject to some form of financial covenant. What causes this discrepancy? Firms usually take out multiple syndicated loans at once or have multiple syndicated loans

Example of a Financial Covenant

A covenant might require the borrower to maintain a minimum interest coverage ratio, the ratio of the firm's cash flow to its required interest payments. Typically, the covenant becomes tighter over the life of the loan. For example:

§ 7.11. Certain Financial Covenants. (a) Interest Coverage Ratio. The Borrower will not permit the Interest Coverage Ratio on any date to be less than the ratio set forth below opposite the period during which such date falls:

Period	Ratio
From the second restatement effective date through December 31, 2005.	1.60 to 1
From January 1, 2006, through December 31, 2007.	1.75 to 1
From January 1, 2008, and at all times thereafter.	1.90 to 1

Source: Loan agreement from an SEC filing between JP Morgan Chase Bank as administrative agent and Sinclair Broadcast Group, May 12, 2005.

outstanding at the same time, a revolving line of credit, and one or more term loans. Recall that the syndicated loan market has become specialized. In a typical loan package, or *deal*, taken out by a firm, nonbank institutional lenders now often hold nearly all of the firm's *term loans*, while banks retain only the firm's *revolving line of credit*. A revolving line of credit is like a credit card for a firm. The bank allows the borrower to incrementally take out

See "Today's Syndicated Loan Structure."

and repay sums of money up to a specified total amount at any time for as long as the credit line remains active. In a term loan, by contrast, the firm takes out the whole amount all at once at the time the loan is issued and repays it over a specified period. Once the term loan is

repaid, the money is no longer available for the borrower to draw on again.

There is some disagreement about the precise reasons for this evolution in the syndicated loan market, but it is consistent with the theory that banks have a comparative advantage in providing liquidity funding in the form of lines of credit because of their liquidity reserve and its natural synergy with deposit-taking activities. That is, as long as depositors are a steady source of funding, banks have an advantage over other types of intermediaries in providing borrowing firms with funds on demand.¹² In contrast, institutional investors can hold term loans more cheaply than banks can because institutional investors do not bear the cost of capital requirements and other regulations.

This new structure of syndicated loans holds the key to the discrepancy between the rise of covenant-lite loans and the lack of covenant-lite firms. It turns out that almost all contracts for revolving lines of credit contain financial covenants.¹³ Furthermore, many contracts include both a revolving line of credit and a term loan governed by the same covenants, but the line of credit lenders—the banks—have the exclusive right to renegotiate or waive the financial covenants.¹⁴ When a firm has multiple loan contracts but only the revolving line of credit includes a financial covenant, or when a firm has a single loan contract and the bank has the unilateral right to renegotiate or waive the financial covenant, we have termed this new contract structure as having *split control rights*.¹⁵ We say the control rights have been split because, for reasons I will discuss, the banks have been given the right to exercise unilateral control over the firm by monitoring its compliance with the covenants and holding the power to waive or renegotiate the covenants.

When aggregated to the firm level to take into account all the loans a firm had taken out, the proportion with a covenant-lite term loan rose from nearly

FIGURE 3

Rise of Institutional Lenders in Syndicated Market

U.S. leveraged loan issuance, annual. \$, billions, 2000–2017

500



Source: s&P Global Market Intelligence Leveraged Commentary & Data via leveragedloan.com, http://www.leveragedloan.com/ wp-content/uploads/2012/01/annual-us-leveraged-loanissuance-4.jpg.

FIGURE 4

Rise of No-Covenant Leveraged Loans

Share of outstanding loans that are covenant-lite. Percent, 2004–2013 50%



Source: S&P Capital LCD via www.creditwritedowns.com, https://pro.creditwritedowns.com/2013/11/covenant-light-loansare-on-the-rise.html.

Today's Syndicated Loan Structure

Increasingly, firms are obtaining very large loans not from a single lender but from many. One example is a \$1.2 billion syndicated loan arranged by Citibank, JP Morgan, Morgan Stanley, and Wells Fargo. It consisted of a \$500 million revolving line of credit and a \$700 million term loan. Ten banks held the revolving line of credit, and institutional investors funded most of the term loan. By December 2014, more than 100 collateralized loan obligations (CLOS) owned about \$260 million of the term loan.

FIGURE 5

Syndicated Loan Example Total: \$1.2 Billion

\$700 million	\$500 million	
Term loan R	evolving line of credit	

Source: Loan agreement from an SEC filing between Citibank as administrative agent and Time, Inc., April 2014.

FIGURE 6

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Almost All Borrowing Firms Are Bound by Covenants

Fraction of firms under no loan covenants vs. fraction with covenant-lite term loan. Percent, 2005–2014



zero in 2005 to close to 40 percent in 2014. By contrast, the proportion of firms with no financial covenants in any of their loans remained below 4 percent throughout the period. This means that almost all firms borrowing through syndicated loans were constrained by financial covenants in at least one of their loans, usually the line of credit (Figure 6).¹⁶

But if the revolving line of credit has a covenant and the term loan doesn't, does this mean that the term lenders are not protected by the covenant? No, because loan contracts usually have default clauses stipulating that violating any covenant in any loan contracts, including the revolving line of credit contract, also constitutes default in the term loan, even if it lacks financial covenants.¹⁷

Various Explanations for the Rise of Cov-Lite

Is this distinction between the proliferation of covenant-lite term loans and the dearth of covenant-lite borrowers important? To answer this question, we need to figure out why the use of covenant-lite term loans has risen while revolving lines of credit have continued to carry traditional covenants. There is not yet a consensus as to why covenant-lite lending is rising, but the research literature so far proposes a few explanations.

Lower Credit Standards

Some studies find a connection between loans marketed to institutional lenders and less monitoring of borrowers and lower lending standards. Some researchers see an analogy with credit problems in the securitized housing market, arguing that banks that originate loans and then sell off their exposure to the borrowers have less incentive to monitor them. For example, banks that securitized a large share of the loans they originated before the crisis, so-called securitization active banks,18 were found to have imposed less restrictive financial covenants and subsequently suffered worse loan performance. However, another study showed that loans securitized before 2005 performed no worse than comparable unsecuritized loans originated by the same bank during the financial crisis.19

Conflicting Interests

Costs and incentives for institutional investors can differ from and even conflict with those of banks. Depending on the degree of conflict, the optimal contract design may be one without financial covenants. In one model of contract design, borrowers may take excessive risks, and thus lenders would like to impose financial covenants to reduce risk-taking.20 Banks have a comparative advantage in monitoring borrower risk but face higher lending costs than institutional investors do because of capital requirements. So it is optimal for banks to monitor and enforce covenant violations on behalf of all lenders, as long as bank lending costs are not too high. In this model, however, banks and institutional lenders also have conflicting interests regarding when to enforce versus when to waive a covenant. While the institutional lender cares only about its payoff from the single loan, the bank also earns relationship rents stemming from the ongoing nature of its revolving loan. That is, the bank's ability to continue to profit from this relationship depends on the borrower being allowed to continue to operate and borrow, so the bank may choose not to strictly enforce the covenant and induce default, even if that would be the best action for the firm's other lenders. The conflicting interests between the relationship lender and other lenders are greatest when the bank's share of the deal is small-because lending costs are high owing to high capital requirements-so its share of any financial losses is small.

The model predicts that when the bank's share of a loan is very small, this conflict of interest becomes so severe that it is best to eliminate covenants entirely and issue covenant-lite loans. Of course, without covenants, lenders lose the ability to actively control borrower risk-taking, so they demand a higher interest rate as compensation for accepting more risk. The study's authors provide some empirical evidence for their model's predictions from a sample of syndicated loans. However, their results are subject to question insofar as they may have measured covenant-lite incorrectly by not taking into account all of the firm's loans.²¹

Bargaining Frictions

There is evidence that lenders have turned to the new contract structure to reduce *bargaining frictions*, or the costly time and effort of negotiating. Syndicated loans used to be held exclusively by banks and had fewer lenders in the syndicate. However, the arrival of institutional investors in the market has increased both the number and types of lenders in the loan syndicate, which complicates renegotiating the loan contract. For example, changing the financial covenants typically requires the consent of a majority of lenders in the syndicate. The larger and more diverse the syndicate, the harder it is for lenders to agree on a change such as waiving a covenant. Each lender or each type of lender might face different funding situations that create more or less of an incentive to waive a covenant. For example, during the financial crisis, some lenders were under more financial distress than others, and the more distressed a lender is, the less willing it may be to waive a covenant. Reaching agreement also may be difficult because each institutional lender holds a small share of the loan and does not find it profitable to bear the cost of investigating a borrower's financial situation in order to reach an informed opinion about how to deal with a covenant violation. Disagreement could also arise because of conflicting interests, such as those mentioned previously, or simply because lenders disagree about a firm's prospects.

Looking at term loans only, one study finds no evidence that rising demand for syndicated loans lowers credit standards.²² Rather, it finds evidence that the new contract structure is designed to reduce bargaining costs. Specifically, it finds that lenders that participate in syndicated loans omit financial covenants from contracts when there are many–and different types of– institutional lenders. According to this study, dispensing with financial covenants eliminates the need to renegotiate terms with the borrower when a covenant is violated because there are no covenants to violate in the first place. This suggests that covenant-lite loans are being used as a way to avoid the costs of renegotiation. A direct implication of this interpretation is that covenant violations should be occurring less frequently in real-world business lending, but we do not find that in our research, as I discuss below.²³

While the research by my coauthors and me supports the view that bargaining frictions are the underlying cause of the contractual innovations in the leveraged loan market, recall that we find that borrowers are still bound by financial covenants. What has changed is that the new type of loan contracts gives lenders that extend revolving lines of credit the right to unilaterally renegotiate covenant terms with these borrowers; that is, nonbank lenders have delegated the task of monitoring borrowers to the banks, which, as I noted earlier, may have a comparative advantage in this regard. Indeed, we find evidence that borrowers continue to be monitored, in that covenant breaches are about as prevalent among loans that include split control rights as among traditional loans. Furthermore, evidence from the Shared National Credit Program shows that the line of credit commitment size is similar between loans with and without split control rights and that agent banks continue to retain substantial exposure to their syndicated borrowers, such as holding a larger share of the loan commitment, evidence that they have the incentive

to monitor, since they retain significant exposure to loss if the firm defaults.

There are additional reasons to believe that bargaining frictions are driving the covenant-lite trend. When institutional lenders are part of the lending syndicate, the use of other contract clauses to simplify renegotiation greatly increases. Syndicates that include institutional lenders are much more likely to permit contractual changes without agreement from all lenders. While traditional loan contracts require unanimous agreement to change the maturity or rate, many contracts now permit a fraction of the lenders to agree to such changes on their own contracts.²⁴ The share of loan contracts with clauses that facilitate renegotiation increased dramatically after the crisis, and the rise is most noticeable among loans in which institutional investors participate (Figure 7). Furthermore, split control rights are much more likely to appear in contracts that have these other clauses.

FIGURE 7





Conclusion

Our observations—that the large increase in covenant-lite syndicated loans in recent years has been driven almost entirely by the rise in covenant-lite term loans and that revolving lines of credit almost always retain financial covenants—should address at least some of the concern that covenant-lite is evidence of declining credit standards. Borrowers are still constrained by regular financial tests for at least one of their loans. Recent research also provides some evidence that the new contract structure is designed to lower renegotiation costs, and our results are consistent with continued monitoring by banks and provide no evidence of declining credit standards.

Nevertheless, it will take time to see whether the recovery rate on defaulted loans is lower for those with split control rights. In the meantime, it remains unclear just how much protection this new contract design provides to term loan lenders. Therefore, it is too early to say definitively that credit standards have not declined.

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Notes

1 See the paper by Guido Lorenzoni for evidence that banks may have incentives to make too many loans. The paper by Robin Greenwood and Samuel Hanson provides evidence that rapid growth in credit to risky borrowers is a sign of an overheating market.

2 A leveraged loan is a syndicated loan made to a riskier borrower, much as the junk bond market is the portion of the corporate bond market for riskier bond issuers. Although definitions vary on what constitutes "risky," Loan Pricing Corporation defines a leveraged loan as one that is either unrated or rated BB+ or lower with an interest rate spread exceeding 150 basis points.

3 See the research note from Moody's Investors Service.

4 See the 2017 *Bloomberg* article.

5 See the 2013 interagency guidance. On October 19, 2017, the Government Accountability Office ruled that the leveraged lending guidance should be subject to the requirements of the Congressional Review Act and thus required the guidance to be approved by both houses of Congress. The decision means regulators must now decide whether to reissue the guidance through the rule-setting procedures of Congress, revise it, or let it drop entirely.

6 See the interagency FAQs from 2014.

7 Shared National Credit Program, August 2017, Office of the Comptroller of the Currency, Federal Reserve System, Federal Deposit Insurance Corporation, https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20170802a1.pdf. The sNc portfolio covers all syndicated loans of \$20 million or more that are shared by three or more regulated institutions in the U.S.

8 Collateralized loan obligations in the syndicated loan market are a form of securitization in which payments from different loans are pooled and distributed among the CLO's owners.

9 According to S&P Global Market Intelligence Leveraged Commentary & Data, as reported in a November 4, 2013, blog post on Credit Writedowns Pro by Sober Look, https://pro.creditwritedowns.com/2013/11/covenant-light-loans-are-on-the-rise.html.

10 See my working paper for a review of the empirical and theoretical evidence on the effects of covenant violations.

11 Although they do not contain financial *maintenance covenants*, which are monitored on a regular basis for early warning signs of credit problems, covenant-lite contracts do contain *incurrence covenants* that restrict some actions by the borrower. For example, a borrower might not be allowed to borrow more money or make investments above some minimum amount without the term lenders' agreement.

12 See the papers by Anil Kashyap, Raghuram Rajan, and Jeremy Stein; by Evan Gatev and Philip Strahan; and by Greg Nini for examples.

13 Please refer to my paper with Mitchell Berlin and Greg Nini for details on how we collected the contract-level data that revealed the inclusion of covenants in revolving credit contracts.

14 Bank lenders usually charge a fee to waive covenant violations.

15 In our sample, split control rights are implemented by separate contracts 30 percent of the time and through a single contract that gives the bank unilateral control rights 70 percent of the time.

16 Another factor that might be partly driving the rising trend in the fraction of firms bound by covenants shown in Figure 6 is that firms may be shifting their source of funding away from corporate bonds toward syndicated loans. Corporate bonds are often issued by large publicly held firms and do not usually have financial covenants. If firms are switching from bonds to syndicated loans, that might suggest that regulators have less reason for concern about declining credit standards because almost all loan borrowers in our sample are constrained by financial covenants, and loan borrowers have higher seniority in asset claims in the event of borrower default.

17 Other research has used the number of financial covenants as a measure for monitoring intensity. In this article, I show that most firms are still constrained by at least one financial covenant, which is consistent with the view that banks are still monitoring their borrowers for default risk. However, the presence of a financial covenant is no guarantee that monitoring has not declined. This issue warrants future research on the exact magnitude of the change in monitoring intensity.

18 See the work of Yihui Wang and Han Xia. They rank banks according to the share of securitized loans in the total number of loans they originate in a year. Those with shares above the median are termed securitization active.

19 See the study by Efraim Benmelech and his coauthors.

20 See the study by Matt Billett and his coauthors.

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21 Billett and his coauthors argue that the term lender is not protected by covenants when bank lenders have the unilateral right to monitor covenants. Our evidence—cited below—is inconsistent with their view. However, the extent to which conflicts between banks and institutional lenders undermine the value of bank monitoring remains an open question that will require more years' worth of data to fully answer.

22 See the work of Bo Becker and Victoria Ivashina.

23 Recall that even covenant-lite contracts still contain incurrence covenants that restrict some actions by the borrower.

24 An amend-and-extend provision allows a borrower to extend the maturity of a portion of a loan without having to obtain the consent of all lenders at the time of the extension. A refinancing provision permits the borrower to add a new loan tranche using an existing credit agreement without the consent of all lenders, provided that the proceeds are used to refinance a portion of the existing loan.

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Investing in Elm Street: What Happens When Firms Buy Up Houses?

BY LAUREN LAMBIE-HANSON, WENLI LI, AND MICHAEL SLONKOSKY

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ince the onset of the mortgage crisis in 2007, a much larger than normal share of single-family houses listed for sale in the U.S. each year has been purchased by institutional investors-Wall Street firms, real estate trusts, international funds, and so on. This phenomenon has been easing since 2013, but investor activity remains widespread and is particularly prevalent in high-foreclosure areas such as Las Vegas and Atlanta, where prices had soared during the housing bubble and, after the crash, severe house price downturns occurred. This trend is also growing in areas of the country where real estate is highly priced such as Miami and New York City. In some cities, investors have bought more than a quarter of the houses sold since the early 2000s, far more than the less than 5 percent purchased by investors prior to the crisis. Meanwhile, the growing proportion of singlefamily houses being turned into rentals comes amid a steady decline in the nation's homeownership rate since the mortgage crisis. In 2004, 69 percent of the nation's households owned their primary residence. By 2016, this number had dropped to 63 percent. Although the homeownership rate recovered a bit in 2017, it remained below 64 percent (Figure 1).

What is behind this steep rise in institutional investment in the single-family housing market? Are these investors crowding out local homebuyers and contributing to the general decline in homeownership? What impact are investors having on house prices? Are they helping or hurting local housing markets and the financial welfare of households, particularly when it comes to wealth inequality? Does this phenomenon have implications for the overall U.S. economy? Although economists are still investigating the effects of this trend, some answers to these questions are starting to emerge.

The Rise of Institutional Investor-Owned Houses

By institutional investor, we refer to any buyer or seller of residential real estate that is not an individual. These institutions include corporations, limited liability companies (LLCs), limited liability partnerships (LLPs), real estate investment trusts (REITs), nonprofit organizations, or other entities. Although individuals, for privacy or legal reasons, can also set up an LLC to purchase their primary residence, such occurrences are rare. It is, therefore, safe to regard virtually all institutional purchases of houses as being for the purpose of investment, either for renovating and flipping to another buyer for capital gains or for renting out to receive dividends in the form of rental income. Note that this definition excludes individual investorspeople who buy a house under their own name as a personal investment.

In 2000, institutional investors made only 6 percent of total house purchases on average across 20 major U.S. metropolitan areas. But starting in 2007, as the mortgage crisis unfolded, the market share of institutional investors in single-family house sales shot up, reaching almost 14 percent in 2013 before easing somewhat to roughly 12 percent in 2014 (Figure 2A).¹ This jump in residential investment by institutions contrasts with the nation's experience during the housing-boom years leading up to the crisis. As a number of researchers have documented,² prior to 2007, it was noninstitutional investors—that is, individuals instead of companies—who accounted for the increase in the share of houses purchased as investments.

Not surprisingly, institutional investors have been particularly active since the crisis as buyers in the distressed market, accounting for 24 percent

FIGURE 1 Homeownership Rate Declines

Source: Census Bureau/ Haver Analytics.



Sources: CoreLogic Solutions, authors' calculations, and Haver Analytics.

Notes: The 20 metropolitan statistical areas covered by the s&P/Case-Shiller index are Atlanta, Boston, Charlotte, Chicago, Cleveland, Dallas, Denver, Detroit, Las Vegas, Los Angeles, Miami, Minneapolis, New York, Phoenix, Portland, San Diego, San Francisco, Seattle, Tampa, and Washington, D.C. Regular refers to nonforeclosure sales. Distressed refers to foreclosure sales.



Sources: CoreLogic Solutions, authors' calculations, and Haver Analytics.

Notes: Not to scale. The 20 MSAs are those covered by the s&P/Case-Shiller 20-City Composite Home Price Index.

Federal Reserve Bank of Philadelphia Research Department of the foreclosure sales in 2014. But their presence in the regular market is also prominent, reaching 11 percent of total sales in 2014 (Figures 2A and 2B). As sellers, institutions' share had been decreasing leading up to the boom and topped out at the peak of the crisis before declining (Figures 2C and 2D). By definition, all foreclosure sales are by institutions, banks in particular.

Considerable media attention has been devoted to the emergence of large-scale investors backed by Wall Street firms in the single-family housing market,³ raising concern that these large firms may exert market power and set the prices for ordinary buyers and sellers. But contrary to this general perception, the vast majority of institutional investors are not affiliated with large financial firms and do not purchase large numbers of houses. Interestingly, only a handful of large institutional investors affiliated with big financial firms are active in a few cities such as Atlanta and Miami, which have seen steady rent increases. Small LLCs are by far the most common type of institutional investor in the single-family housing market. In some cities, such as San Diego, trusts are also active.

In terms of location, investors have been buying up houses in certain cities far more than in others. Overall, Miami had the largest increase in sales by institutional buyers, followed by Atlanta, Tampa, and San Diego. Excluding foreclosure sales, Miami, Atlanta, Los Angeles, Tampa, and Las Vegas had the greatest increase in the presence of institutional buyers, while Minneapolis, Denver, Boston, and Detroit had the least. In Figure 3, we chart changes in percent of institutionally purchased properties by zip code in 20 cities between 2000 and 2012. As can be seen, during this period, institutional investors became much more important in Las Vegas, Los Angeles, and parts of Miami, Phoenix, Seattle, and Tampa.

Another important observation is that, on average, institutional investors hold their properties for shorter periods than ordinary homeowners do. However, over time, institutions have been holding houses for longer periods. For example, among all housing market transactions from 2000 to 2014 in which the buyer ended up holding the property for one to three years, the share accounted for by institutional owners rose from a little over 5 percent to close to 20 percent.

With more institutions buying up single-family houses, homeownership rates, not surprisingly, declined. In all 20 cities, between 2005 and 2014, homeownership rates fell between 0.2 percentage point, as in Boston, and over 10 percentage points, as in Miami (Figure 4).

What Is Driving Investment in Single-Family Houses?

While institutional investment in multifamily housing is the norm, the traditional culture of the single-family housing market has been one of an individual or couple buying a house in which to live and raise a family. What financial or other forces have converged to alter this longstanding ownership pattern?

Tighter standards for mortgage underwriting, stagnating household income, investors seeking higher returns in a low interest rate environment, and international capital inflows are all driving the surge in institutional investors in the U.S. single-family housing market.

Lenders tightened their mortgage qualification standards substantially after the crisis, especially in areas with high foreclosure rates, making it more difficult for individuals to purchase houses. According to the Federal Reserve Senior Loan Officer Opinion Survey, the net percentage of banks reporting tightening mortgage lending standards to households went from -9 percent in 2006 to almost 80 percent in 2008 (Figure 5). That is, the majority of banks surveyed reported that they had tightened their mortgage lending standards to households during the crisis. Research has associated these tighter standards with about a 16 percent decline in high interest rate loans, a proxy for risky borrowing.4

Furthermore, in 2010, the passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act imposed additional regulatory constraints on U.S. banks, especially large ones, including heightened oversight as well as higher liquidity and capital requirements. These tighter regulations have driven up mortgage denial rates for nonconforming mortgages, making it harder, or more expensive, for households that borrow more than the

FIGURE 4

All 20 Cities Experienced Declines in Homeownership Rates

Changes in homeownership rates for 20 major cities.

Percentage points, 2005-2014



FIGURE 5

80%

Qualifying for a Mortgage Became Harder After the Crisis

Net percent of banks reporting tightening mortgage lending standards to households. Percent, 2000–2014



Source: Federal Reserve Senior Loan Officer Opinion Survey.

conforming mortgage limit and cannot afford a 20 percent down payment to get credit. As regulations on traditional banks have tightened since the crisis, more mortgage lending has shifted to socalled shadow banks—lenders that operate outside the regulatory framework. Their share of the mortgage market nearly tripled from 2007 to 2015, rising especially among less creditworthy borrowers and for mortgage refinancings and high interest rate mortgages, according to a 2017 study.⁵

To make things worse, personal income stagnated. Between 2007 and 2010, disposable income grew at a dismal 0.94 percent in real terms.

Another important development during this time was extremely accommodative monetary policy. In an effort to stimulate the economy following the crisis, the Federal Reserve brought down market interest rates by requiring banks to increase their reserves. As a result, as shown in Figure 6, the total corporate bond index fell sharply between 2004 and 2009. Although the total bond index did rebound after 2009, this development may have still prompted investors in fixed-income assets to search for higher returns in real estate investments. As can be seen in the same figure, rents generally held up well during the crisis and took off in 2010.⁶ Single-family housing rents have also risen strongly since 2009, especially for lower-rent homes (ones that rent for less than 75 percent of the median rent in the area).⁷

Finally, rising wealth in emerging economies such as China has been a factor in the growing presence of institutional investors. Attracted in part by the transparency and sound legal system of the U.S. housing market, most foreign buyers, especially nonresident buyers, set up companies with which to conduct their U.S. housing transactions, for liability and privacy reasons. The National Association of Realtors estimates that, from April 2013 through March 2014, sales to international buyers accounted for about 7 percent of the total sales of U.S. existing homes.⁸

FIGURE 6

Corporate Bond Index and House Prices Fell After the Crisis, While Rent Continued to Grow

Dow Jones Equal Weight U.S. Issued Corporate Bond Index and Zillow's Home Value Index and Rent Index. 2000–2015 Note that these sales included some by individuals buying personal vacation homes in the U.S. These international buyers of U.S. properties came from across the globe, but five countries–Canada, China, Mexico, India, and the United Kingdom–accounted for 54 percent of the reported transactions.⁹

A Good Thing or a Bad Thing?

Increased institutional-investor activity in the single-family housing market brings with it both benefits and costs for local housing markets and the overall U.S. economy.

The Cost Side

Institutional investors, because of their deep pockets and easy access to mortgage finance, can easily out-compete ordinary families looking to buy a home. Additionally, institutional investors may be better able to find and "snap up" houses on the market before individuals can. Such "crowding out" may exacerbate wealth inequality by robbing families of their chance to accumulate home equity, a form of wealth-building that historically has been a mainstay of middle-class well-being and financial security. When investor purchases raise local house prices, it benefits older and richer people because they are more likely to own their homes, while younger and poorer people get priced out.

The nation's homeownership rates have been on a steady decline since the mortgage crisis, particularly in areas that experienced severe house price corrections that resulted in large numbers of foreclosures. In the short run, a large share of institutional investors in a market leads to a lower homeownership rate in that area.¹⁰ Additionally, while institutional investors on average tend to hold their properties for shorter periods than individual homeowners do, many institutional buyers hold their properties for longer than two years (an average homeowner stays in his or her home for about six years). This suggests that homeownership rates in those areas may remain depressed for several years.



Sources: Wall Street Journal and Dow Jones/Haver Analytics; data acquired from Zillow.com in 2017 and 2018. Aggregated data on this page is made freely available by Zillow for noncommercial use. Note: The corporate bond index is normalized to 100 for December 31, 1996.

Cities with large concentrations of institutional investors are more exposed to financial risk. Should these institutions suffer financial stress, they may be forced to sell their real estate holdings all at once or cut maintenance expenditures, which could severely lower house prices in the area. Additionally, cities with a large share of house sales to foreign nonresidents become exposed to the political and policy risks of the home countries of these foreign buyers.

From a national perspective, should foreign ownership of U.S. assets in general keep accelerating, it has been argued that the U.S. may have more to lose than its creditors do, as this trend may give creditors potential leverage over U.S. policy. The reason is that indebtedness limits America's ability to influence creditor countries' policies through, for example, sanctions and loans.ⁿ

The Benefit Side

Institutional investors have helped local house prices recover from the housing crisis and the Great Recession. Analysis that we have conducted indicates that a 1 percentage point increase in the share of sales by institutional buyers led to a 20 basis point increase in the growth rate of real house prices. In addition, the magnitude of the increase was much larger in markets with large concentrations of distressed properties.¹²

Additionally, an increase in rental houses in a traditional singlefamily neighborhood means that people who lack the means to obtain a mortgage can nevertheless live in these neighborhoods and consume their typically superior local amenities, such as good schools. The higher house prices that result from the presence of institutional buyers also boost the revenue from a given tax rate for local governments and school districts, which rely heavily on property taxes.

Finally, as many others have argued,¹³ U.S. government policies such as the federal income tax deduction for mortgage interest payments have greatly encouraged homeownership, beyond perhaps what is optimal. As a result of such policies, home equity is the dominant form of wealth for the majority of households.

Notes

1 Also see Figure 1 in Raven Molloy and Rebecca Zarutskie's 2013 research note.

2 See the research by Andrew Haughwout, Donghoon Lee, Joseph Tracy, and Wilbert van der Klaauw (2011), Patrick Bayer, Kyle Magnum, and James Roberts (2016), Alex Chinco and Christopher Mayer (2016), Zhenyu Gao, Michael Sockin, and Wei Xiong (2017), as well as Wenli Li's work with Zhenyu Gao (2015).

3 See, for example, the articles by Antoine Gara (2017) and Ben Hallman (2017).

4 See the paper by Cindy Vojtech, Benjamin Kay, and John C. Driscoll (2016).

Yet, it is not clear that households are better able to bear house price risks than institutions are, as we have learned from the financial crisis. Put another way, from the perspective of individual household welfare, it is not clear that the current decline in the homeownership rate is entirely bad, especially in the current environment in which households have much easier access than they had in the past to other investment channels such as the stock market.¹⁴

Conclusions

Compared with recoveries from prior recessions, the U.S. housing market's recovery from the Great Recession has been marked by a unique feature: the rising share of institutional investors. This phenomenon was prompted by both tightened mortgage lending conditions in response to the mortgage crisis and additional regulatory constraints. Reaching for yield was also a motivation from the lenders' perspective. In the short run, although this rising share of institutional investors has dampened homeownership rates, it did help local housing markets recover from the worst decline in house prices since the 1930s.

Although investors have moderated their home-purchasing activities since 2013, it remains to be seen whether they will drop back to their level of participation prior to the crisis or even completely exit the market. If investors decide to remain in the single-family housing market, there will be much for future research to answer: What are the long-run implications for local house prices, rents, and economies? And if they exit the market, should we expect this phenomenon to recur in the next boom and bust?

5 See the working paper by Greg Buchak, Gregor Matvos, Tomasz Piskorski, and Amit Seru (2017).

6 See also Figure 1 of the forthcoming article by Pedro Gete and Michael Reher.

7 See Stijn Van Nieuwerburgh's lecture notes.

8 See Lawrence Yun, Jed Smith, and Gay Cororaton's (2014) article. The association began conducting surveys on international home buying activity in 2007, after the start of the mortgage crisis.

9 Although in the many articles cited here, researchers have been able to demonstrate that these different channels played a role in the rise of institutional buying in the housing market, they have not been able to systematically quantify the relative importance of each factor.

10 See, among others, the article by Mills, Molloy, and Zarutskie and our manuscript, "Leaving Households Behind: Institutional Investors and the U.S. Housing Recovery."

11 Brad Setser makes this argument in his report on sovereign wealth and sovereign power.

12 Other researchers who have studied local housing markets have reached similar conclusions, including Alan Mallach (2013), Frank Ford and his coauthors (2013), Christopher Herbert and his coauthors (2013), and Dan Immergluck (2013).

13 See the *Business Review* articles by Satyajit Chatterjee and by Li and Yang.

14 Li and Yang (2010) compare the two investment strategies in their *Business Review* article.

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Federal Reserve Bank of Philadelphia Research Department Investing in Elm Street: What Happens When Firms Buy Up Houses? 2018 Q3

Research Update

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Land-Use Regulations, Property Values, and Rents: Decomposing the Effects of the California Coastal Act

Land-use regulations can lower real estate prices by imposing costs on property owners but may raise prices by restricting supply and generating amenities. We study the effects of the California Coastal Act, one of the nation's most stringent land-use regulations, on the price and rental income of multifamily housing. The Coastal Act applies to a narrow section of the California coast, allowing us to compare properties on either side of the jurisdictional boundary. The Coastal Act offers several advantages for measuring the effects of land-use regulations, including plausible exogeneity of the boundary location, which we confirm using historical data on boundary placement, and orthogonality of the boundary to other jurisdictional divisions. Extending previous studies, we decompose the effects of the regulation into a local effect, the net price effect of restrictions on the subject property and its immediate neighbors, and an external effect, the value of amenities generated by restrictions on all properties within the regulated area. Data on rental

income are used to isolate the effect of restrictions on adjacent properties (the neighbor effect). Our analysis of multifamily housing prices reveals local and external effects of approximately +6% and +13%, respectively. The rent analysis indicates a zero neighbor effect. Together with the positive local effect on price, this suggests that the protections the Coastal Act affords property owners from undesirable development on adjacent properties have not yet resulted in material differences, but are expected to in the future. This interpretation is supported by additional evidence on building ages and assessed building and land values, and emphasizes important dynamic effects of land-use regulation.

Working Paper 17–33 Revised. Christopher Severen, Federal Reserve Bank of Philadelphia Research Department; Andrew J. Plantinga, University of California–Santa Barbara.

Do Fintech Lenders Penetrate Areas That Are Underserved by Traditional Banks?

Fintech has been playing an increasing role in shaping financial and banking landscapes. In this paper, we use account-level data from LendingClub and Y-14M data reported by U.S. banks with assets over \$50 billion to examine whether the fintech lending platform could expand credit access to consumers. We find that Lending-Club's consumer lending activities have penetrated areas that may be underserved by traditional banks, such as in highly concentrated markets and in areas that have fewer bank branches per capita. We also find that the portion of LendingClub loans increases in areas where the local economy is not performing well.

Supersedes Working Paper 17–17.

Working Paper 18–13. Julapa Jagtiani, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit; Catharine Lemieux, Federal Reserve Bank of Chicago.

Commuting, Labor, and Housing Market Effects of Mass Transportation: Welfare and Identification

This paper studies the effects of Los Angeles Metro Rail on the spatial distribution of people and prices. Using a panel of bilateral commuting flows, I estimate a quantitative spatial general equilibrium model to quantify the welfare benefits of urban rail transit and distinguish the benefits of reduced commuting frictions from other channels. The subway causes a 7%-13% increase in commuting between pairs of connected tracts; I select plausible control pairs using proposed subway and historical streetcar lines to identify this effect. The structural parameters of the model are also estimated and are identified using a novel strategy that interacts tract-specific labor demand shocks with the spatial configuration of the city. These parameters indicate people are relatively unresponsive to changes in local prices and characteristics, implying that the commuting response corresponds to a large utility gain. The welfare benefits by 2000 are significant: LA Metro Rail increases aggregate welfare by \$246 million annually. However, these benefits are only about one-third of annualized costs. While benefits did not outweigh costs by 2000, I employ more recent data to show that there are dynamic effects: Commuting continues to increase between connected locations.

Working Paper 18–14. Christopher Severen, Federal Reserve Bank of Philadelphia Research Department.

The Roles of Alternative Data and Machine Learning in Fintech Lending: Evidence from the LendingClub Consumer Platform

Fintech has been playing an increasing role in shaping financial and banking landscapes. There have been concerns about the use of alternative data sources by fintech lenders and the impact on financial inclusion. We compare loans made by a large fintech lender and similar loans that were originated through traditional banking channels. Specifically, we use account-level data from LendingClub and Y-14M data reported by bank holding companies with total assets of \$50 billion or more. We find a high correlation with interest rate spreads, LendingClub rating grades, and loan performance. Interestingly, the correlations between the rating grades and FICO scores have declined from about 80 percent (for loans that were originated in 2007) to only about 35 percent for recent vintages (originated in 2014–2015), indicating that nontraditional alternative data have been increasingly used by fintech lenders.

Furthermore, we find that the rating grades (assigned based on alternative data) perform well in predicting loan performance over the two years after origination. The use of alternative data has allowed some borrowers who would have been classified as subprime by traditional criteria to be slotted into "better" loan grades, which allowed them to get lower-priced credit. In addition, for the same risk of default, consumers pay smaller spreads on loans from LendingClub than from credit card borrowing.

Supersedes Working Paper 17-17.

Working Paper 18–15. Julapa Jagtiani, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit; Catharine Lemieux, Federal Reserve Bank of Chicago.

Regulating a Model

We study a situation in which a regulator relies on risk models that banks produce in order to regulate them. A bank can generate more than one model and choose which models to reveal to the regulator. The regulator can find out the other models by monitoring the bank, but in equilibrium, monitoring induces the bank to produce less information. We show that a high level of monitoring is desirable when the bank's private gain from producing more information is either sufficiently high or sufficiently low. When public models are more precise, banks produce more information, but the regulator may end up monitoring more.

Working Paper 16-31 Revised. Yaron Leitner, Federal Reserve Bank of Philadelphia Research Department; Bilge Yilmaz, Wharton School, University of Pennsylvania.

Stress Tests and Information Disclosure

We study an optimal disclosure policy of a regulator that has information about banks (e.g., from conducting stress tests). In our model, disclosure can destroy risk-sharing opportunities for banks (the Hirshleifer effect). Yet, in some cases, some level of disclosure is necessary for risk sharing to occur. We provide conditions under which optimal disclosure takes a simple form (e.g., full disclosure, no disclosure, or a cutoff rule). We also show that, in some cases, optimal disclosure takes a more complicated form (e.g., multiple cutoffs or nonmonotone rules), which we characterize. We relate our results to the Bayesian persuasion literature.

Supersedes Working Paper 15-10/R. Working Paper 17-28 Revised. Itay Goldstein, Wharton School, University of Pennsylvania; Yaron Leitner, Federal Reserve Bank of Philadelphia Research Department.

Does the Relative Income of Peers Cause Financial Distress? Evidence from Lottery Winners and Neighboring Bankruptcies

We examine whether relative income differences among peers can generate financial distress. Using lottery winnings as plausibly exogenous variations in the relative income of peers, we find that the dollar magnitude of a lottery win of one neighbor increases subsequent borrowing and bankruptcies among other neighbors. We also examine which factors may mitigate lenders' bankruptcy risk in these neighborhoods. We show that bankruptcy filers can obtain secured but not unsecured debt, and lenders provide secured credit to low-risk but not high-risk debtors. In addition, we find evidence consistent with local lenders reducing bankruptcy risk using soft information.

Supersedes Working Paper 16-04/R. Working Paper 18-16. Sumit Agarwal, Georgetown University; Vyacheslav Mikhed, Federal Reserve Bank of Philadelphia Payment Cards Center; Barry Scholnick, University of Alberta.

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