

Rehypothecation*

BY CYRIL MONNET

How would you feel if even though you were making regular monthly payments, your mortgage bank sold your house? This may seem like an odd question, but this type of situation happens every day in financial markets in a practice known as rehypothecation. Although such practices may be hard for nontraders to understand, rehypothecation is widespread in financial markets. Following the crisis of 2007-2009, the Dodd-Frank Act put restrictions on rehypothecation for derivatives. To understand the scope of these restrictions, we need to understand the role of rehypothecation in financial trades. In this article, Cyril Monnet discusses questions such as: Which party to a financial trade does rehypothecation benefit? Are there limits to its advantages? And how should it be regulated? There are no hard and fast answers to the last question, but the author notes that we can make a more informed decision about the pros and cons of various forms of regulation if we understand the underlying economics.

as collateral to a lender, and the lender sells the security to a third party, a practice known as *rehypothecation*. Although such practices may be hard for nontraders to understand, nonetheless, rehypothecation is widespread in financial markets.

It is easy to understand why a secured lender — a lender whose loans have been collateralized with a security — would want to put the security (that is, the collateral) to a profitable use. After all, if the borrower repays his loan, the lender could always use the proceeds to re-purchase the security and transfer it back to the borrower. And if the borrower defaults, the lender simply keeps the security. It is more difficult to see why a borrower would consent to this practice: The borrower must take into account the risk that the lender will not return his collateral when the borrower repays his loan. This risk is amplified when the borrower has consented to rehypothecation.

Following the crisis of 2007-2009, the Dodd-Frank Act, which was passed by Congress in July 2010, put restrictions on rehypothecation for derivatives. To understand the scope of these restrictions, we need to understand the role of rehypothecation in financial trades. Which party to a financial trade does it benefit? Are there limits to the advantages of rehypothecation? And, in the end, how should it be regulated? There are no hard and fast answers to the last question, but we can make a more informed decision about the pros and cons of various forms of regulations if we understand the underlying economics.



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How would you feel if even though you were making regular monthly payments, your mortgage bank sold your house? This may seem like an odd question, but this type of situation happens every day in financial markets: A borrower pledges a security

*The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

COUNTERPARTY RISK AND COLLATERAL

To understand the use of rehypothecation in financial markets and its consequences, it is first important to understand why and how trades are collateralized.

Traders demand collateral to insure against *counterparty risk* — the risk that the party they are trading with (their counterparty) defaults. Counterparty risk is more acute for long-term contractual obligations such as commodity futures or forward contracts — obligations to deliver a given quantity of a commodity (pork-bellies, soybeans, oil, etc.) at a fixed price, on a given date in the future.¹ In this article I will focus on commodity contracts just for concreteness, but the arguments also apply more generally.

Broadly, default comes in two types. First, traders may not fulfill their promises if it is not in their best interest to do so. This type of default is called *strategic default*. Second, the creditworthiness of each party to the trade can deteriorate over time, the results of poor market conditions or bad investments. If a trader defaults because it is insolvent, we say that this is a *nonstrategic default*. To illustrate, suppose that an onion farmer who wants to insure against the fluctuation of onion prices signs a forward contract with a merchant promising to deliver 100 onions at \$1 each on May 1, 2011. If the crops are bad, the farmer may be unable to deliver 100 onions. There is not much traders can do to limit this default event because it is nonstrategic. Alternatively, price movements can trigger a strategic default: If the price of onions on May 1 is \$2, the farmer has a strong incentive to renege on

¹A forward contract differs from a futures contract in that it is traded over-the-counter, i.e., traders negotiate the terms of the contract between themselves, while a futures contract is traded on a centralized exchange.

his promise and sell his 100 onions elsewhere for \$2 each. More generally, if the price goes down, the buyer has a strong incentive to renege on its promises to pay the (higher) contract price, while if the price goes up, the seller has a strong incentive to renege on its promise to deliver the good at the (lower) contract price.

As a general rule, price fluctuations are very likely over time and creditworthiness is more likely to deteriorate over a longer time horizon.

Traders demand collateral to insure against *counterparty risk* — the risk that the party they are trading with (their counterparty) defaults.

So contracts with a long maturity date, that is, contracts with settlement dates far in the future, are more prone to default by one of the traders, be it strategic or nonstrategic.

Requiring collateral is a nearly universal contractual way to address these risks of default. When traders carry out their business on an organized exchange, such as the Chicago Mercantile Exchange (CME), the exchange's clearing agent handles collateral requirements (CME Clearing, in the case of the CME), and there is little traders can do to modify these requirements. However, many other contracts, such as forward contracts, are traded over-the-counter and not on an organized exchange. In over-the-counter markets, traders directly negotiate bilateral contracts, including collateral requirements.

The amount of required collateral typically depends on the observable creditworthiness of the counterparty (for example, their credit rating), as well as overall market conditions, to control for strategic default. For

example, if the price of onions falls between the day the contract is signed and the delivery date, the merchant may have to pledge more collateral; if the price increases, the farmer may have to pledge more collateral. Notice that the requirement to pledge collateral may switch from one party to the next, depending on how the price of onions moves. As a consequence, it is hard to predict who will need to pledge collateral at the time traders agree to a trade. To avoid confusion,

I will refer to the trader who receives the collateral as the *receiver* and the one who offers the collateral as the *pledgor*. In our example, the pledgor will be the merchant if the price of onions goes down or the farmer if the price of onions goes up. Notice also that collateral requirements serve two distinct functions. First, collateral limits the receiver's losses in the event of default, whether strategic or nonstrategic. Second, collateral actually reduces strategic default by raising the pledgor's costs of defaulting.

The failure to pledge the required collateral generally triggers a default event that can terminate the trade.² However, posting collateral is costly, since traders have to keep assets, including cash, in reserve, for the sole purpose of securing their positions if need be, and they have to forgo the potential benefits of investing the

² When a trade is terminated, the obligations are cancelled and the collateral is returned to its owner.

assets somewhere else. Thus, traders have strong incentives to develop ways to conserve collateral. This is where rehypothecation plays a role.

REHYPOTHECATION, OR HOW TO SAVE ON COLLATERAL

Before explaining how rehypothecation works, let me define what it is precisely. There are two notions of rehypothecation. The first (narrow) notion of rehypothecation relates to how *broker-dealers*³ (and no other market participants) should handle the securities of their customers: If they can use their customers' securities as they see fit, we say that broker-dealers enjoy a rehypothecation right. The second notion, as proposed by the International Swaps and Derivatives Association (ISDA), applies to any secured lender, not only to broker-dealers: The right of rehypothecation refers to the right of a *secured party* to sell, pledge, rehypothecate (in its narrow definition above), assign, invest, use, commingle, or otherwise dispose of posted collateral. In what follows, I will use the broader definition of rehypothecation, which, simply put, says that a lender with collateral can use it as if it was his own asset.

Now, picture yourself as a trader on an over-the-counter market. If business is good, you will be involved in many repeated interactions with traders at other firms. You will have

³ Under the Securities Exchange Act of 1934, a "broker" is defined as "any person engaged in the business of effecting transactions in securities for the account of others." A "dealer" is defined as "any person engaged in the business of buying and selling securities for [his] own account, through a broker or otherwise." If the person performs these functions on a private basis and not as a business, he is considered a trader. Depending on the securities traded, a significant proportion of trades can be conducted by broker-dealers.

to take thousands of positions during a typical day. So you can see that negotiating every aspect of each contract will be costly and very inefficient, since it would slow down your trading activity and others'. So, in order to speed things up, market participants typically transact under standardized contractual terms known as a *Master Agreement*.

To complement its Master Agreement, the ISDA provides three standard templates for handling collateral, known as the ISDA Credit Support Annexes.

Three Types of Master Agreements. A Master Agreement is a standardized form that specifies not only the terms of a trade, such as the price and the assets to be delivered, but also what constitutes events of default and termination events. These Master Agreements reduce legal uncertainty about how disputes will be resolved. The precise terms have evolved over time through the resolution of past disputes. Now, when two traders choose a Master Agreement, there is a body of case law that tells the contracting parties what the terms actually mean, how judges will interpret them, and so forth. In particular, a Master Agreement will specify the rights of the parties to a trade regarding the use of collateral in protecting their exposures. The most common Master Agreement is the ISDA Master Agreement.

To complement its Master Agreement, the ISDA provides three standard templates for handling collateral, known as the ISDA Credit Support Annexes. There are three types of Credit Support Annexes, and legally, they treat the handling of

collateral very differently. Under the *English Credit Support Deed (CSD)* the pledgor remains the owner of the asset, and the receiver must open a segregated account in which the collateral cannot be combined with his own property. So the English CSD simply prohibits the reuse of collateral.

This is not the case under the *New York Credit Support Annex (CSA)*.

Although the pledgor remains the owner of the asset, the receiver gains broad rights to use the collateral. In particular, the receiver can rehypothecate any posted collateral it holds. By using the New York CSA and agreeing to rehypothecation, the pledgor gives up his right of redemption, that is, the pledgor loses his right to reclaim his collateral in case the receiver's exposure to the pledgor declines. Giving the pledgor an open-ended right to redeem collateral whenever the receiver's exposure changes would make it nearly impossible for the receiver to use the collateral in another transaction; after all, prices are constantly changing. Traders can choose to amend the New York CSA to disengage the provisions that make rehypothecation possible. However, we will see that this does not seem to happen in practice.

Finally, under the *English CSA*, the pledgor loses ownership over the pledged asset, and instead, the receiver gains full legal ownership of the collateral. However, and contrary to the New York CSA, the receiver has the obligation to return "equivalent"

property when the pledgor's exposure is reduced. To provide additional flexibility, traders can define the meaning of "equivalent" in the English CSA.

Why Choose One Type Over Another? There are reasons traders might prefer the New York CSA over the English CSA or vice versa. It is clear that the receiver enjoys more flexibility under the English CSA, since the receiver can return any type of collateral as long as it is judged equivalent. However, this flexibility imposes legal risk on the pledgor, who may not agree with either the receiver or a court that the collateral provided is truly equivalent. Then, why would the pledgor accept the English CSA? When negotiating the terms of trades, the pledgor may still accept this type of agreement if he gets a better price in exchange for the additional risk. Unfortunately, there are no data on the relative use of English versus New York CSAs, so it is difficult to check whether the price terms actually reflect this flexibility-risk tradeoff.

However, actual contracting practices strongly suggest that rehypothecation is useful. Traders could choose to prohibit rehypothecation, either by using an English CSD or by amending a New York CSA. But, interestingly, a high proportion of large traders choose to allow rehypothecation. From the 2010 ISDA margin survey, 44 percent of all respondents to the survey and 93 percent of large dealers report rehypothecating collateral. To put these numbers in some perspective, the survey was conducted after one of the most serious disturbances to financial markets in decades. As I will discuss later, the risk that a pledgor would be unable to recover his collateral became very real during the financial disturbances of 2008. Nonetheless, just over a year later, significant fractions of traders were willing to bear these

risks again. Given that traders have a choice, rehypothecation appears to be useful. But how?

Rehypothecation Increases Market Liquidity When Collateral Is Scarce. Rehypothecation lowers traders' *funding liquidity needs*, the ease with which a trader can obtain funding. This is quite intuitive. When traders use rehypothecation, the receiver can again pledge collateral to borrow cash. Thus, the same collateral can be used to support more than one transaction, making it (more) liquid. So rehypothecation allows the receiver to fund his activity easily, rather than having to scramble for cash or to mobilize other assets on his balance sheet. For example, suppose that in addition to the onion futures, our merchant also bought apple futures for \$2 and received \$1 of collateral for them. Now suppose onion prices fall to 50 cents but there is no change in apple prices. It is then very likely that the onion farmer will demand more collateral, and in this case, our merchant could use the \$1 pledged by the apple farmer to satisfy this added collateral requirement rather than use his own reserves.

Lowering traders' funding liquidity needs is important because it has market-wide effects. Funding liquidity affects *market liquidity*, the ease with which a trader finds a suitable counterparty. When it becomes easier to secure funding, traders are willing to take on some positions that would otherwise require too much capital. This improves market liquidity by increasing the number of traders willing to take positions (see the article by Markus Brunnermeier and Lasse Pedersen and the one by Ronel Elul). And a higher degree of market liquidity is usually associated with a higher level of social welfare.

Clearly, the receiver benefits from rehypothecation. But why should

the pledgor agree to rehypothecation if the receiver is the real beneficiary while the pledgor bears more risk?

While a more liquid market benefits everyone, individual traders capture only a small share of the total benefits that all traders receive from enhanced liquidity. However, the receiver's flexibility to reuse collateral could and should be reflected in more favorable terms of trade, at least in a competitive market. For example, if the pledgor uses cash collateral, the receiver could agree to pay a higher interest rate on this cash. Or perhaps the pledgor might be required to post less collateral if the receiver can reuse it.

That said, the amount of compensation traders must receive for allowing their counterparties to repledge their collateral will depend on various factors. One of these is market structure. Large dealers may be able to exploit their position in order to extract more profit from their customers. This is consistent with the evidence that large dealers use collateral rehypothecation relatively more than others. Also, according to Christian Johnson's article, traders (including dealers) may refuse to trade if they cannot rehypothecate the collateral. His account is consistent with a market in which large dealers simply make a take-it-or-leave-it offer to all other traders. The two-sided nature of the default risk is another factor. Recall that traders can end up as pledgor or receiver, depending on market conditions. In this case, *both* traders have an incentive to accept rehypothecation, since it lowers their funding costs if they turn out to be the receiver. As of yet, there is no formal empirical evidence on the relationship between rehypothecation and other contractual terms, and so it is difficult to evaluate the relative importance of these factors.

REHYPOTHECATION AMPLIFIES MARKET STRAINS

When market conditions deteriorate, rehypothecation can amplify market strains. Simply put, rehypothecation re-introduces counterparty risk in case a trader fails. This makes traders wary about agreeing to rehypothecation when conditions deteriorate. As a consequence, funding liquidity needs can increase, thus amplifying market strains. In this section, I describe each step in detail.

Rehypothecation Introduces Counterparty Risk. First, consider what happens if a trader fails. For example, suppose our merchant goes bust having rehypothecated the farmer's collateral. Legitimately, the farmer will want to recover his collateral. But since the merchant used it to secure another of his transactions, the farmer will not find it easy to get his collateral back.

Legally, several scenarios are possible. If the merchant has pledged the collateral to a third party, this third party has the right to seize the collateral to cover the merchant's obligations. In this case, the farmer loses his collateral. A second possible scenario is when the farmer owes a debt to the merchant; for example, the merchant has made an early partial payment to the onion farmer on the total due. In this case, the value of the farmer's collateral can be deducted from his debt. However, the law would treat the farmer as an unsecured creditor if the value of the collateral exceeds the value of his debt. As an unsecured creditor, the farmer will typically receive only a piece of the value of the collateral. In both scenarios, the farmer who pledged collateral ends up losing when the merchant fails.

So rehypothecation lowers the trader's coverage against counterparty

risk. And in an interlinked market with rehypothecation, the actual amount of collateral in the market can be much lower than the amount of collateral that has been contractually committed. Think of a number of dealers linked in a chain of trades. In an extreme case, each dealer in the chain may find that he isn't collateralized at all, even if contracts fully collateralize traders' exposure! For example, suppose that the apple producer is \$100 in debt to the merchant, who contracted a debt of \$100 with the onion farmer, who himself owes a debt of \$100 to the apple producer. If they all rehypothecate the collateral, then the trades do not look collateralized at all. If the onion farmer defaults, no collateral can really be seized, and it is as if no collateral had been pledged. Although this is an extreme example, it illustrates how rehypothecation can undo the beneficial effects of collateral. More realistically, rehypothecation can lead to chains of traders who are much less protected than they thought they were. The bottom line is that rehypothecation increases the same counterparty risk that the collateral requirement was supposed to tame. Note that if rehypothecation was prohibited or not used, the total available collateral would always equal the collateral that has been contractually committed, and each trader would recover his collateral in the event of default.

Thinking about chains of traders also helps to see another effect of rehypothecation: Rehypothecation increases the linkages between traders. In our example, the onion farmer and the third party who received collateral from the merchant had no formal contractual agreement at all. If you asked the onion farmer, he would say he had an agreement only with the merchant. Nonetheless,

the merchant's ability to pledge the collateral means that the onion farmer and the third party are also interlinked. In this type of market, individual traders are potentially exposed to large numbers of participants with whom they have no formal agreement. Note, this effect is in addition to the liquidity effects I have already discussed.

Rehypothecation Amplifies Market Strains When Traders Become Nervous. When traders grow anxious about the possibility of a counterparty's default, they will tend to deny rehypothecation rights. In a time of crisis, the financial health of market participants can change by the hour. As dealers grow unsure of the quality of their counterparty, they prefer to take precautionary measures regarding their collateral. So it is natural that in a time of crisis, dealers become reluctant to agree to rehypothecation, to ensure that they know where their collateral is.

Unfortunately, dealers do not take into account the effects of their behavior on other traders, and this reversal in collateral policy makes funding pressures more severe. Other dealers might then scramble for collateral to secure the loans necessary for their business. If collateral becomes so scarce that dealers are unable to place orders to buy securities, the market can freeze.⁴ Note that although every individual trader may be making the best possible decision for himself or herself, traders might act quite differently if they could all make a collective decision to continue to accept rehypothecation agreements. The freeze can be *inefficient* if traders are financially sound but lack the necessary liquid assets. In our simple

⁴ See Yaron Leitner's *Business Review* article on market freezes.

example, while everyone would be better off if the (financially sound) merchant actually buys a forward contract from the onion farmer, the merchant's inability to pledge collateral means that he will have to buy onions on the *spot market* at a higher price⁵ and will have to charge his clients more. This is inefficient, since the farmer, the merchant, and the merchant's customers would have preferred that a forward contract be written before buying and selling on the onion market revealed the actual spot price. So a sudden change in a trader's willingness to accept rehypothecation amplifies market strains and makes (inefficient) market freezes more likely.

Unfortunately, a sudden reduction in the practice of rehypothecation is not just a theoretical possibility, since it happened during the financial crisis of 2008-2009. In their 2010 article, Manmohan Singh and James Aitken show that rehypothecation declined rapidly after Lehman Brothers failed on September 14, 2008. The total collateral pledged that could be reused declined from \$4.5 trillion at the end of 2007 to \$2.1 trillion at the end of 2009. In their 2009 article, Singh and Aitken show that the total amount of assets available as collateral decreased by up to \$5 trillion as a result of reduced rehypothecation and collateral hoarding. At the same time, credit markets seized up.

During the height of the crisis, dealers found it difficult to conduct their business, since they could

⁵ A spot market is a market in which goods or securities are traded for cash, and each transaction is settled immediately.

⁶ A haircut is a percentage that is subtracted from the value of the collateral. Hence, only collateral worth more than \$100 will be accepted to secure a \$90 loan with a 10 percent haircut.

not find proper counterparties that would lend to them without stringent contractual guarantees. For example, counterparties would accept only Treasury securities as collateral, and they would apply large collateral *haircuts*.⁶ The Federal Reserve System (and other government agencies) viewed this market freeze as inefficient and felt that intervention was justified

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to "bolster market liquidity and promote orderly market functioning. Liquid, well-functioning markets are essential for the promotion of economic growth."⁷ To ease large dealers' funding needs, the Federal Reserve put in place a back-stop facility for dealers, the Primary Dealer Credit Facility (PDCF). Under this program, large dealers could borrow from the Federal Reserve's discount window using as collateral a broad set of securities (with appropriate haircuts), not only Treasury securities. As described in the article by Tobias

⁷ From the March 16, 2008 press release from the Federal Reserve Board announcing the creation of the Primary Dealer Credit Facility (PDCF).

Adrian, Christopher Burke, and James McAndrews, PDCF usage immediately spiked to \$40 billion before receding progressively, as conditions in the financing markets improved and the pricing of the PDCF became less attractive. As tensions from the Bear Stearns bailout abated, use of the PDCF stopped altogether in mid-July 2008. But then came the failure of Lehman Brothers on September 15. Perceiving that Lehman Brothers' difficulties could contaminate other dealers, lenders imposed higher haircuts and accepted only high-quality securities as collateral. As a result, dealers struggled to obtain funding. As a preventive policy, the Fed expanded the types of PDCF-eligible collateral on September 14. As a result, PDCF usage exploded to \$59.7 billion on Wednesday, September 17, from no activity during the previous week. Eventually, PDCF borrowing reached more than \$140 billion in October 2008. Adrian, Burke, and McAndrews conclude that in this instance, the PDCF fulfilled one of the purposes for which it was intended: to be available in the event that a failure of a primary dealer led to severe funding disruptions for the surviving dealers.

SHOULD REHYPOTHECATION BE PROHIBITED?

The possibility that (the lack of) rehypothecation can amplify

⁸ The act stipulates that (A) "a futures commission merchant shall treat and deal with all money, securities, and property of any swaps customer received to margin, guarantee or secure a swap cleared by or through a derivatives clearing organization as belonging to the swaps customer," and (B) "Money, securities, and property of a swaps customer described in (A) shall be separately accounted for and shall not be commingled with the funds of the future commission merchant or be used to margin, secure or guarantee any trades or contracts of any swaps customer or person other than the person for whom the same are held."

market strains and lead to inefficient market freezes provides a partial rationale for the Dodd-Frank Act's prohibition against rehypothecation for many derivative transactions. Precisely, the Dodd-Frank Act limits rehypothecation by requiring that most swap contracts be cleared by a derivatives clearing organization, such as a central counterparty, and that the collateral pledged be held in a segregated account with no possibility of rehypothecation.⁸ These provisions of the Dodd-Frank Act will limit rehypothecation because a central counterparty imposes collateral requirements to clear trades and holds the collateral on behalf of the traders.⁹ Therefore, the central counterparty is the sole receiver of the collateral, and it will not be rehypothecated. Other contracts that are not considered swap contracts under the act are not (yet) subject to these requirements (for example, commodity futures or some security futures). While a limit to rehypothecation will make trading safer for those market participants who need to pledge collateral, there may be significant costs to limiting this market practice for most derivatives contracts: The cost of pledging collateral may increase, funding liquidity needs may become more severe, and overall market liquidity may deteriorate.

During the financial crisis, in spite of increased counterparty risk, derivatives traders still agreed to rehypothecation (although at a lower level than before the crisis) and continued to do so after the crisis receded, as shown by Singh and Aitken in their 2010 article. This use of rehypothecation even under adverse conditions might suggest that traders

⁹ See my earlier *Business Review* article or my working paper with Thorsten Koepl for more details on central counterparty clearing.

view rehypothecation as valuable in itself. If traders did not find the benefits of rehypothecation greater than the costs, they did have means for preventing its practice. Traders could prohibit rehypothecation by, for instance, amending the New York CSA.¹⁰ A second option is to use an English CSD. This option is rather inexpensive and guarantees that the pledgor will get his collateral back. The fact that some traders did not rely on either option suggests that they may have seen value in the practice, and that limiting rehypothecation via regulation may impose costs.

Alternatively, we can't rule out the possibility that the practice occurred because some participants were able to exploit their market power to impose rehypothecation on other traders.

Alternatively, we can't rule out the possibility that the practice occurred because some participants were able to exploit their market power to impose rehypothecation on other traders. If the receiver has a monopoly over the provision of some securities, he can cut out any trader who refuses the rehypothecation of his collateral. In this case, we would also observe that market participants use rehypothecation during moments of stress, not because they want to but because they have to. In this case, limiting rehypothecation is an indirect way of addressing abusive positions in financial markets.


¹⁰ It is true that this option is costly, since traders who want to amend a CSA would need to agree on the content of the amendment. Because negotiation takes time, adding an amendment in itself might defeat the whole purpose of using a Master Agreement, and, in fact, it seems that the credit annexes are rarely amended.

In light of the evidence of the use of rehypothecation, both theories are plausible, although they have very different implications for regulators. Unfortunately, without more micro-level data on the use of rehypothecation, it is difficult to know which of the two theories is correct.

CONCLUSION

Before the enactment of the Dodd-Frank bill, rehypothecation was widely used by market participants. In this article, I have tried to explain why this is so while also highlighting some of the drawbacks to individual

traders and to the market as a whole. In a nutshell, rehypothecation reduces the cost of pledging collateral, it reduces funding liquidity needs, and it improves market liquidity. However, rehypothecation carries problems of its own, since it seemingly has the potential to introduce market-wide counterparty risks that are difficult for a single trader to control and can amplify market strains.

While, at this stage, it is not clear if rehypothecation should be encouraged or limited, the Dodd-Frank Act took the stance that the uncertainties in cases of default were too strong to leave current rehypothecation and clearing practices in place. Although central counterparty clearing is desirable for standardized contracts, it remains to be seen how prohibiting rehypothecation will affect the derivatives markets. 

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