Would this derivatives market reform provide the silver bullet for systemic risk?

The Clearinghouse Cure

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Credit Default Swaps (CDSs) are casting an enormous shadow over the world's crisis-plagued financial markets — as in $50 trillion-plus enormous (although the exact meaning of this oft-quoted figure is somewhat contentious). CDSs were not the source of the ongoing financial crisis (that dubious honor largely goes to complex collateralized debt obligations backed by home mortgages, especially subprime mortgages), but financial markets are filled with fear that a default by a large CDS trader would rip through the financial system, causing a cascade of defaults by other firms. The Federal Reserve and the Treasury Department have responded by bailing out big, financially troubled swaps dealers, including Bear Stearns and AIG, that had large CDS positions, and regret their decision not to bail out another large dealer, Lehman Brothers.

The dread prospect that massive defaults on CDSs could crater the world financial system has led to numerous calls for CDS market reform and regulation. Regulators on both sides of the Atlantic and many market participants have seized on the idea of a clearinghouse for these contracts as the way to make the market more secure and protect the broader banking and capital markets from the prospect of CDS contagion. The Federal Reserve Bank of New York has held numerous meetings with major market participants and has put substantial pressure on them to create a CDS clearinghouse. Five exchanges have presented proposals to this effect. In Europe, European commissioner for the Internal Market Charlie McCreevy has publicly called for the formation of a clearinghouse to mitigate risks in the CDS market.

Advocates of clearing of "over-the-counter" derivatives (that is, derivatives that are not listed on exchanges) like CDS contracts have pointed out many virtues of central clearing and pointed to the longstanding importance of clearinghouses in organized futures markets. Those advantages cannot be gainsaid, but the testimonials beg an important question: If the benefits of centralized clearing are so great, why haven't CDS market participants embraced the concept before now, and then only under regulatory pressure? Consideration of this question, and a serious analysis of the economics of clearing as applied to CDSs and other exotic products, demonstrate that these products and, perhaps more importantly, the kind of firms that trade them pose grave challenges to centralized

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clearing. As a result, clearing CDS products is likely far costlier than clearing "vanilla" instruments such as exchange-traded futures contracts. The additional costs can make it uneconomic to utilize central clearing.

Put differently, clearing is not a one-size-fits-all proposition, because not all derivatives are alike. In particular, an institution that works well for standardized products traded on liquid markets by relatively simple financial intermediaries works much less well for more heterogeneous products traded in relatively illiquid markets by complex financial firms.

This conclusion follows from a consideration of the economics of risk sharing and insurance. Central clearing is essentially a risk-sharing — an insurance — arrangement. The members of the clearinghouse share the costs when another member defaults on its obligations. Sharing risks is often economically efficient, but the costs and benefits of risk sharing depend crucially on informational considerations. To ensure an efficient allocation of risks, and to ensure that the insured face proper incentives to control risks, it is essential to price the insurance correctly. Incorrect pricing can induce the insured to take on too much (or too little) risk.

Pricing insurance properly depends crucially on information. In particular, pricing is particularly difficult when information about risks is asymmetric, especially when the insured have better information that the insurer. This can lead to adverse selection and moral hazard problems. Those problems create real costs that reduce the benefits of risk sharing. Moreover, if those problems are not appropriately addressed in pricing, the insurance mechanism can create perverse incentives that can lead to financial disasters; the savings-and-loan crisis of the 1970s and 1980s was in large part caused by inefficient pricing of deposit insurance.

The complexity of CDS contracts and the financial firms that trade them give rise to potentially severe asymmetric information problems, problems that are more severe than for standardized futures products. Participants in the CDS market and other over-the-counter derivatives markets recognize those problems and have taken measures to mitigate them in their bilateral dealings. A comparative analysis suggests that those measures may well be more efficient than sharing default risks through a clearinghouse. Hence, it is certainly plausible that the absence of a CDS clearinghouse heretofore reflects an efficient market outcome, and that a hasty imposition of a clearinghouse could actually be inefficient.

Moreover, it is by no means clear that the formation of a clearinghouse will internalize externalities that are the source of systemic risks. Systemic risks plausibly arise because large financial firms do not take into account the effect that their failure has on the stability of the financial markets and the efficient operation of the payments system. A clearinghouse does not internalize that externality.

The nature of this analysis is inherently qualitative. It is difficult for anyone, be they academics, market participants, or regulators, to determine definitively whether a clearinghouse would improve the efficiency of the CDS market. I certainly do not claim to possess such definitive knowledge. It is troubling, however, that basic considerations relating to the economics of risk sharing and information have been almost completely absent in the public discourse over CDS clearinghouses. It is also troubling that the potential pitfalls have not been fully aired. Nor has there been an extensive comparative analysis of alternative risk-sharing mechanisms. Therefore, at the very least, this article aims to raise the quality of the debate by identifying crucial issues that have been largely ignored until now, and to challenge a consensus that threatens to engineer a fundamental transformation of the financial markets without proper regard for fundamental economic issues. Moreover, the considerations identified herein should be kept in mind when designing a CDS clearinghouse to ensure that information problems do not make this prescription worse than the disease it is intended to cure.

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HOW DOES A CLEARINGHOUSE WORK?

Clearinghouses have been a part of the derivatives landscape for well over a century. The Minneapolis Grain Exchange established the first modern clearinghouse for futures in 1891, and other futures exchanges in the United States adopted clearing in the years between 1891 and 1925.

A modern futures clearinghouse is a "central counterparty" (CCP). That is, the clearinghouse becomes the buyer to every seller, and the seller to every buyer, through a process sometimes known as "novation." Here's how it works:

Trader S sells a contract to Buyer B. In a standard bilater-

al contracting relationship — like those in over-the-counter markets — this contractual relationship endures. If B defaults on his obligation, as might occur if the losses on the contract explode because of a large and rapid decline in its price, S suffers a loss because of B's default. S had expected to receive a payment from B, but receives less than she was owed because of B's failure to perform.

Things are different in a CCP. Once the details of the contract between S and B are confirmed by the clearinghouse, the clearinghouse creates a contract to buy from S and a contract to sell to B. S still has a contract to sell, and B has a contract to buy, but the clearinghouse is substituted as the counterparty to each contract. With clearing, if B defaults, the CCP bears the loss. It draws on its financial resources to pay S what he is owed. In effect, the clearinghouse guarantees performance on the contracts it clears.

Clearinghouses almost always have members who are large trading firms, including brokerages and banks. The clearinghouse's guarantee extends only to its members; non-member customers have to trade through members, who guarantee the contracts. The clearing members provide the financial resources for the clearinghouse to cover the losses that result from a default of another member.

The members of a clearinghouse invest capital that the clearinghouse can use to cover default losses. If the members' initial investment is insufficient to cover the costs of a default, CCPs can typically require their members to contribute additional funds to cover the loss arising from a default. Thus, a CCP is a mechanism whereby financial intermediaries share default risks. It is analogous to a mutual insurance company. Default risks don't disappear, but are distributed among the other members of the clearinghouse.

COLLATERAL Insurance companies, including mutual insurance companies, charge premiums to the customers they insure. CCPs do not price risk explicitly through premiums. Instead, they require CCP members to post collateral, called margins, with the clearinghouse. The CCP can seize the margins to cover at least a part of the cost of a default. The collateral amounts reflect the risk of the members' trading positions.

Members holding riskier positions must post more collateral. The CCP effectively prices risk through the risk-sensitive margin levels. Ideally, margins are set so that the expected default cost (default risk in excess of the collateral posted) is the same for each member. In this way, the default cost each member imposes on the others is equal to the default costs the other members impose on him. There are no wealth transfers among members if collateral is set in this fashion.

In order to make sure that collateral reflects current market conditions, clearinghouses mark positions to market. That is, they require members to post additional margin when the price moves against them. Buyers must post more margin when prices decline, to offset the risk that a buyer might walk away from a futures contract in which the agreed-upon price now seems too high; sellers must post more when prices rise to offset the risk that the seller might walk away from an agreed-upon price that now seems too low. In this way, losses cannot accumulate, and default losses are limited to the additional amount that can be lost (in excess of margin) because of price changes that occur before the next marking-to-market.

Positions are marked to market at least daily, and usually several times each day, which sharply limits the amount of time that losses can accumulate. For this process to work effectively, it is imperative that the CCP have reliable and timely information about market prices.

DEFAULT RISK Default risks arise from two sources. The first is the risk of the positions that the trader holds. Those positions can make or lose money, and if the losses experienced by a member are bigger than the collateral held by the clearinghouse, the member may default. If the member has other financial resources, however, he can draw upon those resources to make good the additional amount owed. Thus, a default occurs only if the losses on a member's positions are larger than his capital.

But this capital is risky too. The financial intermediaries who are clearinghouse members invest in other risky assets, and they may default if the losses on the other assets on their balance sheets are sufficiently great to make it impossible for them to cover their obligations to the clearinghouse. This is the second source of default risk. I will refer to the two risks that determine overall default risk as "position risk" and "balance sheet risk."

It should be noted that existing futures clearinghouses, like that of the Chicago Mercantile Exchange, take great care to set margins that reflect position risk. They have developed sophisticated models to assess the risks in every member's position, and use this assessment when setting margins. Importantly, however, futures CCPs do not explicitly vary collateral to reflect potential differences in the balance sheet risks posed by different members. Although clearinghouses require members to hold minimum capital levels, the levels are typically set equal to a multiple of the member's collateral at the CCP. The levels do not depend on the riskiness of the member's capital, only on the riskiness of its positions in cleared contracts.

DEFAULT RISK SHARING IN OVER-THE-COUNTER MARKETS

It is often overlooked, but essential to remember, that default risks are also shared in "bilateral" over-the-counter markets. The large financial intermediaries — large commercial banks, investment banks, and insurance companies — that make markets in over-the-counter derivatives, including CDS contracts, trade with one another. If one of those dealers defaults, other dealers will be on the opposite side of a large fraction of the positions held by the defaulting dealer. In this way, the losses that arise from the default of one dealer are spread among the other dealers that he trades with. Indeed, financial regulators' fears that the default of one dealer would trigger the default of others were largely attributable to their understanding of the extent of inter-dealer trade.

Over-the-counter market participants often require their counterparties to post collateral. Moreover, they mark positions to market and often adjust collateral levels to reflect market gains and losses, but they usually do not do so according to a rigid formula in the way that clearinghouses do. Impor-

tantly, however, dealer firms usually adjust their collateral demands to reflect their assessment of both the position and balance sheet risks of their counterparties. For instance, a dealer may demand additional collateral from a counterparty — who may be another dealer — if he determines that the counterparty's financial condition has eroded. Indeed, one of the factors that brought the Lehman Brothers crisis to a head was the decision of J.P. Morgan Chase to demand an additional $5 billion in collateral based on its appraisal of Lehman's deteriorating financial condition; J. P. Morgan's demand for collateral from Merrill Lynch was reportedly the catalyst for Merrill's sale to Bank of America.

It is typically the case that the margining process in over-the-counter markets is less mechanically rule driven than at clearinghouses. Counterparties have some discretion whether to call for additional margin, and they often do not mark to market and adjust collateral as frequently as CCPs. Moreover, those collateral adjustments are often the subject of heated negotiations between counterparties

Thus, the choice between centrally cleared and bilateral markets is not that risks are shared in one, but not the other, or that one uses collateral and the other does not. These are effectively different ways of doing the same things, namely sharing default risks and pricing them through collateral.

Given the sums at stake, it is doubtful that the choice between mechanisms is accidental. Therefore, to understand the presence of clearing for some products and its absence for others, it is necessary to understand the costs and benefits of clearing, and how the costs and benefits may vary across products and the market participants who trade them. This requires a comparative analysis based on an understanding of the economics of risk sharing and pricing.

BENEFITS OF CLEARING

Clearing offers several important benefits relative to bilateral markets. The most notable benefit is economizing on collateral. In bilateral markets, dealers often buy and sell the same contract with different counterparties. For example, Goldman Sachs may buy a particular CDS from Citi, and sell the same type of contract to Morgan Stanley. Typically, Goldman will have to post collateral on each of the positions, even though their market risks offset (because the gain on one is exactly equal in magnitude to the loss on the other). A CCP, in contrast, would net the trades; purchase and sale of the same cleared product results in no net position — and hence in no collateral requirement. Because collateral is expensive (cash and cash-like instruments used as collateral yield lower returns than other investments), reducing collateral generates savings. Given the magnitude of the positions that large dealers hold, the savings can be substantial.

Netting can confer another benefit to the members of a CCP, but it is important to recognize that this benefit comes at the expense of dealers' other creditors. This benefit is referred to as a reduction in "replacement" losses in the event of a default. Specifically, without netting, if a dealer goes bankrupt, it defaults on all of its counterparties whose derivative positions with the dealer are profitable to them (and hence are losing positions for the dealer given the zero-sum nature of derivatives). Although the counterparties can replace the defaulted positions, they lose the gains that they would have realized if the dealer had performed. Importantly, without netting, the replacement losses are suffered on the dealer's gross position. In contrast, with netting, only the net position in the counterparties' winning (and the dealer's losing) positions suffer the replacement losses. Since the net position is smaller than the gross position, replacement losses that derivatives counterparties suffer are smaller with netting.

This redounds to the benefit of the dealer's derivatives counterparties, but it is not a social benefit. Instead, it represents a transfer from the dealer's other creditors. If the dealer's net position is smaller than its gross position, it necessarily has some contracts on which it has made money even if its overall derivatives position has lost money. These contracts are an asset to the dealer. Without netting, a defaulting dealer's derivatives counterparties and other creditors have a claim on this asset. Netting eliminates this asset, while simultaneously reducing the dealer's liabilities to other derivatives counterparties by the same amount. In the event of bankruptcy, other creditors cannot share in this asset to satisfy their claims. Thus, netting effectively gives derivatives counterparties a priority claim on one of the dealer's assets — its winning derivatives positions. This priority shifts wealth from other creditors to these counterparties, and hence is not a social benefit, but a transfer.

Clearing can also improve information. A clearinghouse sees all the positions in cleared products held by its members. In contrast, in a bilateral market, Goldman knows how much it has traded with Citi, but does not know how much Citi has traded with other dealers and customers. Thus, the CCP typically has a better picture of each member's overall position risk than any dealer in a bilateral market possesses. That reduces uncertainty, which in turn can lead to lower collateral requirements, better prices for market participants, and higher trading volumes. Moreover, the absence of information about the derivatives exposures of troubled financial institutions has complicated private and government responses to the incipient failure of the firms. Regulators had only a poor understanding of the magnitude of the potential default risks in over-the-counter markets and the firms that would be affected by a dealer's default. Thus, centralizing information about risk exposures reduces the operational burdens and risks of identifying and responding to the financial distress of a large intermediary.

It is important to note that many of the benefits of clearing are captured by the members of a clearinghouse. The member firms benefit from declines in the amount of collateral they must hold, reductions in replacement costs, and improvements in the terms of trade and reductions in collateral that result from increases in the amount of information available. Thus, the benefits of a clearinghouse are largely private, and profit-motivated firms have an incentive to take them into account when deciding whether to form a clearinghouse.

COSTS OF DEFAULT RISK SHARING

The quality and distribution of information about risks affect the costs of sharing them. In particular, it has long been known

that information asymmetries increase the costs of risk sharing. If the insured know more about the risk than the insurer, the former will be able to identify risks that are underpriced, take on excessive risk, and impose losses on the insurer. To mitigate this "adverse selection" problem, insurers must raise rates above the actuarially fair level, which distorts the amount of insurance purchased and sometimes also distorts the amount of the underlying risky activity that is undertaken.

In the context of financial instruments, it is evident that the potential for information asymmetries can vary substantially by instrument and by the type and nature of firms that trade it. A consideration of the nature of credit derivatives and the firms that trade them demonstrates that the potential for information asymmetries is particularly acute for those products. In particular, it is highly likely that dealer firms have far better information on the risks and values of CDSs than a clearinghouse, and also have better information on the balance sheet risks that they impose on the clearinghouse. Several of the sources of information asymmetry are discussed below.

PRODUCT COMPLEXITY Credit derivatives are complicated products. As a result of that complexity, it is difficult to assess their risks and to value them. It is particularly difficult to evaluate the riskiness of portfolios of credit derivatives (as a CCP must) because of the complexities of evaluating the dependencies between defaults and recovery rates across different derivatives. Dealer firms use "rocket science" quantitative models to assess risks and value derivatives. The dealers have a strong incentive to develop accurate models because the models enable the dealers to quantify and manage their market risk more effectively, price their derivatives more accurately and earn trading profits as a result, and evaluate the default risk posed by their customers.

A CCP could develop its own models for the purpose of evaluating risk, but since it does not trade to earn a profit, nor does it need to manage market risk (only default risk), it realizes smaller benefits from a better model than a dealer does. It therefore has a weaker incentive to develop a better model. Moreover, any benefit to the development of a better model redounds to all of the CCP's members. There is thus a public goods problem that weakens the CCP's incentive to create a good model. In contrast, complicated modeling is not as vital for more traditional futures contracts. The risks of those products are more readily quantified using standard, off-the-shelf models.

Thus, dealers are likely to have a substantial information advantage over the CCP in assessing the risks associated with CDSs (and other exotic derivatives), but only a small or nonexistent advantage in assessing the risks of standard futures products. Because all dealers invest in models for valuing CDS contracts, information about risks and value is relatively symmetrically distributed between them. These considerations imply that adverse selection costs for complex products are smaller in bilateral markets than in centrally cleared ones, but are similar for standardized products.

It should be noted that the dealers' models need not be accurate in some absolute sense. And indeed, many dealers' models have proved deficient. The relevant issue is whether the dealer has a better model than a CCP. It is relative quality that matters. The one-eyed man is king in the land of the blind, and that man is more likely to be the dealer than the CCP. This gives rise to an information asymmetry.

PRICE INFORMATION Products traded on futures markets are standardized and traded in large volumes. For the most actively traded contracts (and hence the contracts for which positions are biggest), many transactions take place every minute that the market is open. It is therefore trivially costly for the CCP to calculate current market prices and use that information to adjust margins. In contrast, there is a plethora of CDS products, many of which trade infrequently. Moreover, there is no centralized price discovery in CDS markets.

Given the lack of trading activity in many CDS products, determination of market values for the purpose of updating margins is not a trivial task. Indeed, many products have to be "marked to model" rather than marked to market, because of the lack of market prices. Given their superior modeling expertise, dealers are likely to have better information than a clearinghouse about current values, and hence can establish whether collateral levels are too high or too low, and trade accordingly to the detriment of the CCP.

BALANCE SHEET RISK CDS dealer firms are large commercial banks, investment banks, and insurance companies. Those firms specialize in supplying information-intensive intermediation in the form of loans and trading. As a result of the information intensity of their activities, their balance sheets tend to be opaque, meaning that it is hard for outsiders to determine the value of the assets on the intermediary's balance sheet. For instance, a bank lending money to a customer generates information about the economic prospects of the borrower, information that an outsider is unlikely to possess. Therefore, the bank can value the loan more accurately than an outsider. Information-intensive financial intermediaries have substantially better information about the risks on their balance sheets than outsiders. In particular, they have better information than a CCP could obtain.

This has important implications. Recall that futures CCPs do not explicitly price member balance sheet risks. This reflects the prohibitive information costs that they incur to do so, and the strains that any attempt to discriminate between members would place on a cooperative organization. CCP members do not pay a cost for adding balance sheet risk, which creates an incentive to take on additional amounts of such risk. This creates a potential moral hazard that reduces the benefits of sharing risks.

In contrast, dealers that supply information-intensive intermediation have a comparative advantage in appraising the balance sheet risks of their counterparties. Dealer firms expend considerable effort and money to determine and manage counterparty risk, including that of other dealer firms they trade with. Recall, moreover, that dealers do adjust collateral levels to reflect their estimates of counterparty balance sheet risks.

In sum, complicated products traded by complex, infor-

mation-intensive intermediaries pose serious challenges to central clearing. If the members of a CCP for CDS products are large, information-intensive dealer firms, it is almost certain that they will possess substantial information advantages over the clearinghouse. The information asymmetries reduce the benefits of sharing risk through a clearinghouse, and indeed can be so large as to exceed the benefits discussed above. In contrast, information asymmetries between dealers are not as acute. Thus, although bilateral trading structures are more costly in terms of collateral, they mitigate information asymmetries. The mitigation is greatest for complex products.

This analysis implies that the more complex the product, and the more complex the intermediary that trades them, the greater the cost of sharing a risk through a CCP relative to the cost of sharing risk through the mechanisms of the over-the-counter market. Thus, there is a good economic explanation as to why relatively simple products traded by relatively simple intermediaries (futures contracts) are typically centrally cleared, but complex products traded predominately by very complex, information-intensive intermediaries are not.

This analysis in turn implies that creation of a CDS clearinghouse can be ill-advised. Market participants internalize crucial benefits of a CCP — most notably, more efficient use of collateral and lower replacement costs. So why haven't they? The foregoing strongly suggests that there are substantial costs of doing so, and those costs exceed the benefits. In this case, precipitate action to coerce or cajole dealers into a CCP would be self-defeating. Higher costs from adverse selection and moral hazard would outweigh the benefits.

Put differently, default risk-sharing mechanisms in derivatives markets are not one-size-fits-all. Futures are different than CDS contracts. Just because clearing works well for futures does not mean that it will work well for CDS products or other exotic derivatives, because the differences between those instruments give rise to differences in the cost of sharing default risks through a CCP.

SYSTEMIC RISK

Advocates of CDS clearing argue that it is necessary to reduce systemic risk, that is, the risk that the failure of a large dealer will threaten the stability of the wider financial system. Over-the-counter derivatives dealers are so interconnected, the argument goes, that the failure of one can trigger the failure of many others. Multiple failures would jeopardize the payment system and create economic chaos. The threat to the payment system is an externality, which provides a justification for regulatory intervention to reduce systemic risk.

If interconnectedness among big financial institutions is the source of a systemic risk problem, creating a central counterparty is an odd way to "solve" it. After all, a CCP is a formalized interconnection among big financial institutions. "Interconnection" is a synonym for "risk sharing mechanism," and as noted above, bilateral markets and a CCP are just different ways of sharing that risk.

Consider the following thought experiment: What would have happened if, in September 2008, credit derivatives had been cleared and AIG was a member of the clearinghouse, or was not a member but had all its positions guaranteed by members? When the firm suffered losses on its CDS positions that threatened its viability, the government swooped in and imposed a bailout package. How would clearing have made any difference? An AIG default would have imposed huge losses on the clearinghouse, and hence on its members — other big financial intermediaries. Such a large default would have threatened the viability of the clearinghouse and its members, and government intervention would almost certainly have occurred. Given the size of its positions, a clearinghouse would have changed the channel by which the costs of AIG's default were propagated to other market participants, and perhaps the exact distribution of those costs across market participants, but not the aggregate magnitude of the costs.

The reduction in replacement losses incurred by derivatives counterparties incurred in the event of a dealer default as the result of netting is widely touted as a source of reduced systemic risk. Derivatives counterparties, including other dealers, certainly suffer fewer default losses with netting, but recall that this is due to the fact that netting transfers wealth in the event of a default from the bankrupt dealer's other creditors. These include the dealer's other lenders, who are likely to be other financial institutions, and may include other dealers. Thus, dealers are interconnected with their lenders as well as other dealers, and a dealer default imposes losses on its lenders that could jeopardize their financial condition. Some of the lenders could also be systemically important, in that their financial distress could spread to their creditors. This means that a dealer default could cause widespread contagion even in the presence of a CCP. Given the size of the dealer's derivatives positions, the existence of a CCP does not affect the total losses from a default, but just the distribution of those losses. The systemic effect of this redistribution is ambiguous.

Thus, interconnection is not the issue. For centralized

The members of a clearinghouse for complex credit default swaps would possess substantial information advantages over the clearinghouse.

clearing to mitigate systemic risk, it must somehow affect the magnitude of the positions that the CCP members hold as compared to their positions in the absence of a CCP, and the likelihood of default on those positions. This, in turn, requires that the CCP do a better job of pricing the default risks that the members impose on one another than is currently the case in the over-the-counter market. But the considerations discussed above raise serious doubts that the CCP will price risks appropriately. Indeed, the lack of pricing of balance sheet risks in CCPs (in contrast to the fact that such risks are priced in over-the-counter markets) creates a moral hazard that encourages greater risk taking in a cleared market than in a bilateral one. Moreover, reductions in collateral that would likely accompany the formation of a clearinghouse would actually tend to encourage firms to trade more, as with a clearinghouse the netting of positions saves collateral, allowing a larger scale of trading activity for a given amount of liquid capital. Thus, the support for the view that a clearinghouse would reduce systemic risk is shaky, at best.

This skepticism is strengthened if an externality arising from threats to the payment system is the source of concern about systemic risk arising from defaults on derivatives. If such an externality exists under over-the-counter bilateral contracting, it is highly likely to exist with a CCP as well, because there is no mechanism by which the CCP or its members internalize the externality. Indeed, since the formation of a CCP forces a greater portion of the losses arising from a default to fall on non-members, its members' incentive to control systemic risks are arguably weakened. As a result, there is no incentive for the CCP to take this externality into account when pricing default risks. Its incentive is to take into account the default costs that its members incur, not the costs that default imposes on the broader economy (via the payments system channel or some other mechanism.)

BALANCE SHEET RISKS AND REGULATION OF FINANCIAL FIRM STRUCTURE

Balance sheet risks are a matter of particular concern in evaluating the pros and cons of clearing of credit derivatives. Each major dealer firm in the CDS market is part hedge fund, part derivatives market maker. The hedge fund part of those businesses (which engages in speculative trading and intermediation activities) generates substantial balance sheet risk, as recent events illustrate. Lehman Brothers and Bear Stearns did not implode because of losses on their CDS market-making activities; they imploded because of losses on their investments in complex mortgage securities. Those losses, in turn, created the potential for defaults on the firms' CDS (and other derivative) positions. Under the prevailing bilateral market structure, most of the default losses were borne by other dealer firms; if they had instead been members of a clearinghouse, they would have borne the costs in their role as members of the CCP. If, as I argue above, participants in bilateral markets can evaluate and price the balance sheet risks better than a CCP (and recall that CCPs typically do not price balance sheet risks at all), the default losses caused by balance sheet risks in a CCP would exceed the default losses caused by those risks under the prevailing bilateral over-the-counter structure.

This should give serious pause to those advocating a CCP "solution" for CDS markets, because it means that a CCP could make things worse, rather than better. Many financial disasters in history (such as the savings-and-loan mess) were caused by mispricing of insurance (e.g., deposit insurance, reserve requirements) for balance sheet risks. An ill-designed CCP that does not price balance sheet risks is a recipe for another such disaster.

This problem could be mitigated by splitting the hedge fund part of complex intermediaries from their market-making part. Splitting the simpler market-making business from the complex "hedgie" part would reduce the balance sheet risks of the former and, more importantly, reduce the information asymmetry between the market-making business and outsiders (as it is the hedge fund part of the complex financial firms that is the primary source of information asymmetry). A CDS clearinghouse with members that specialize in market making and eschew information-intensive intermediation would reduce the balance sheet risk information asymmetries that could wreak havoc on the CCP.

This proposal begs a question, however: Why do big commercial banks and investment banks engage in both activities? That is, why haven't boutique dealers specializing in making markets developed in the markets for CDS and other exotic derivatives, let alone come to dominate them? The dominance of integrated intermediaries that perform both functions suggests the existence of scope economies.

There are plausible sources of such economies, particularly for credit derivatives. Deposit banks and investment banks specialize in evaluating creditworthiness, and the skills and information used to do this can be applied to both lending activities and CDS trading. The banks can use those skills to value credit derivatives, appraise their risks, and, importantly, evaluate the balance sheet risks of their derivatives-trading counterparties. Furthermore, the quantitative and modeling skills that are essential to valuing and managing the risk of CDS positions can be applied to a bank's lending and asset risk management activities.

Severing the derivatives market-making part of dealer firms from their other intermediation activities would sacrifice those scope economies. The survivor principle suggests that such scope economies exist. Compulsory separation of market-making activities from the other forms of intermediation performed by big financial institutions could only be justified by the existence of some externality from joining them together that imposes social costs that exceed the private scope economies. The payment system externality discussed above could justify the separation of market-making and information-intensive financing functions.

CONCLUSION

Central clearing of complex financial derivatives, including credit derivatives, has considerable allure in these times of acute financial distress. Central clearing has worked effectively in futures and listed-options markets for decades, and futures and options exchanges proudly tout the records of

their clearinghouses in protecting customers from default. The over-the-counter markets, which lack central clearing of credit derivatives and many other products, have been shaken to their foundations by the collapse of major dealers and the fear that those failures could touch off a chain reaction of defaults that would jeopardize the safety of the entire financial system. So, why not utilize in the over-the-counter markets an institution for sharing default risk that has worked so well in futures and options markets?

An analysis of the economics of default risk sharing strongly suggests that this allure is largely superficial. Not all derivatives are alike, and treating them so is extremely problematic. Credit default swaps and other relatively exotic instruments traded in the over-the-counter market are almost certainly far more costly to clear than standardized futures and options contracts. The additional costs reflect greater informational asymmetries inherent in the nature of these instruments and the firms that trade them.

Clearing is a mechanism for sharing default risk, and information asymmetries create costs in any risk-sharing arrangement. The asymmetries make it harder to price risk properly, and failures to price properly create perverse incentives that give rise to distortions.

CDS contracts are complicated to value. Many trade infrequently, so that accurate market price information is not readily available. Moreover, the firms that trade them have advantages in valuing the contracts. The firms are complex financial institutions that undertake a variety of risky activities, and are hard to value because of the information-intense nature of their activities. As a result of all these factors, major dealer firms are almost certain to have information advantages over a CDS clearinghouse — information advantages that are more severe than for standardized futures contracts traded frequently on risky markets, and that pose challenges to a centralized default risk sharing mechanism.

Furthermore, over-the-counter CDS dealers already share default risks. They have undertaken a variety of measures to mitigate information asymmetries and to price default risks in a more discriminating fashion than a clearinghouse could. As a result, even though the market has been staggered by the failure of major dealers, it does not necessarily follow that circumstances would have been improved had a clearinghouse been in place. Indeed, because of a CCP's acute disadvantages in pricing default risks for complex products traded by complex institutions, as bad as things are, a CCP could have made them worse. That is, because our major source of concern should be that default risks are priced correctly, and because a CCP faces greater difficulties in pricing those risks than sophisticated dealer firms, then creation of a CCP for credit derivatives will likely worsen incentives to manage default risks efficiently.

Just forming a CCP dominated by big financial firms as they are currently structured is especially problematic. The large commercial banks and investment banks bring big balance sheet risks to a clearinghouse as a result of their vast and complex trading and financing activities. CCPs typically do not price those risks, though over-the-counter market participants typically attempt to do so. To mitigate that problem, it may be necessary to separate the derivatives market-making activities of these firms from their other trading and lending activities. This likely would sacrifice some scope economies, which could be justified if and only if the combination of those activities is inefficient because of the existence of an externality to the broader financial and payment system.

Moreover, regulators and market participants should not look to the formation of a CDS clearinghouse as a silver bullet that would slay the monster of systemic risk. Systemic risk is a matter of regulatory concern only if there is an externality that leads market participants to ignore the effects of their risk-taking activities on the safety and stability of the broad financial system. A CCP will not magically eliminate this externality. Therefore, if the externality is the concern, other methods must be used to address it. Indeed, because a CDS clearinghouse may worsen the efficiency of the pricing of default risk while not affecting the externality by which the risk of default on derivatives positions can create systemic problems, creation of such an institution plausibly creates additional systemic risks.

It is said that fools rush in where angels fear to tread. There is clearly a rush among regulators in the United States and Europe to create a clearinghouse for credit derivatives. Their arguments supporting this creation do not address salient issues relating to the pricing of default risk, how the accuracy of such prices may depend on the natures of the instruments in question or the firms that trade them, or whether a CCP addresses the underlying source of systemic risk. As a result, there is room for considerable concern that this regulatory "fix" may be something that requires a further "fix" in the future. And given that systemic crises seem to be the way that we identify what needs to be fixed, the cost of finding that out may be expensive indeed.

I hope that regulators and market participants step back and undertake a careful examination of the suitability of credit derivatives for clearing before rushing ahead. There is another phrase that is worth remembering when contemplating the marriage of financial firms to create a CCP: marry in haste, repent at leisure. R

Readings

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