

IMF Working Paper

“Puts” in the Shadow

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Abstract

In the aftermath of the Lehman crisis, payouts (i.e., taxpayer bailouts) in various forms were provided by governments to a variety of financial institutions and markets that were outside the regulatory perimeter—the “shadow” banking system. Although recent regulatory proposals attempt to reduce these “puts”, we provide examples from non-banking activities within a bank, money market funds, Triparty repo, OTC derivatives market, collateral with central banks, and issuance of floating rate notes etc., that these risks remain. We suggest that a regulatory environment where puts are not ambiguous will likely lower the cost of bail-outs after a crisis.

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Contents	Page
I. Introduction	4
II. Shadows <i>within</i> a bank and <i>around</i> a bank	7
III. MMFs, CCPs and Tri-party Repo—in the Shadows?	10
A. Money Market Funds	10
B. Qualified Financial Contracts (QFCs)	11
IV. Floating Rate Note “Puts”—Are they Forthcoming?.....	15
V. Some Puts will Exist Anyway—Example from Collateral Market.....	17
VI. Conclusion.....	18
Table	
1. Under-collateralization in the OTC Derivatives Space	12
Figure	
1. Put—An Example From The Housing Market.....	6
2. Deposit/Asset Ratio of SIFIs in U.S. and Europe	7
3. Depository and Non Depository base of SIBs and the Shadow Banking Sector	8
4. The Nonbank/Bank Nexus—Key Institutions and Markets in the Shadows	10
5. Ratio of T-Bills/Total Debt Issued and Spread of 10 Year Minus 6 Month U.S. Treasuries .	15
References	20

I. INTRODUCTION

In finance, puts are the right to sell an item at a fixed price for a specified period of time. The buyer of a put pays a price to obtain the option or “insurance” to get the fixed price. The seller of the put, in exchange for the price received, takes the responsibility for buying the item at the specified price if and when the buyer’s option is exercised (which the buyer will do when price from option is less than actual price). Simple puts have been traded in commodities and securities markets for many centuries and both the breadth and complexity of options markets has expanded over time. Nevertheless, the basic idea is rather simple and the average consumer encounters puts on a daily basis. Any offer to refund the consumer’s money in full within a specified period of time, say 30 days, can be conceptualized as a put. That is, the consumer is given the option to “sell” the product back to the store at the purchase price within a 30 day period.

Another important put provided in everyday financial markets is deposit insurance, in the United States provided by the Federal Deposit Insurance Corporation (FDIC). The FDIC provides depositors the option to insure their bank deposits (up to a certain limit) for cash at par regardless of their bank’s ability to do so. In exchange for providing this put to bank clients, depository institutions participating in the program are assessed a fee by the FDIC. The incidence of this fee is passed on to bank shareholders and depositors in the form of lower rates of return on their investment. In normal times, the cost of insurance is rather imperceptible to the depositor but in the current “zero” interest rate environment (in most advanced economies, including U.S.) it has become material. In the past, this put was largely ignored but at zero interest rates the insurance premium imposed by FDIC on bank deposits is material. Another relevant example was the Transaction Account Guarantee extension in August, 2009, whereby FDIC stipulated that for those opting for (extended) deposit insurance would have to pay between 15 bps-25 bps.² Certain depositories, such as the Bank of New York, are now charging large depositors or clients to maintain balances, that is, depositors are effectively paid negative interest rates.³

Options have been traded for many decades; governments have openly provided them in the guise of deposit insurance for over 75 years (the FDIC was established in 1934). Since the average consumer was familiar with them before the 2008 financial crisis—albeit probably not under the technical term of “put”—it is legitimate to ask why this paper is being written now. We have several reasons.

The first is reflected in the title of the paper. During the crisis, puts in various forms were provided by governments to a variety of financial institutions and markets that were not previously subject to prudential regulation—the “shadow” banking system. One consequence of this was that the size of the government provided puts expanded enormously and there is serious doubt as to whether even now the major financial systems could withstand a widespread withdrawal of these options. That the scope of government intervention has expanded can be witnessed in the new vocabulary of the

² <http://www.fdic.gov/news/news/financial/2009/fil09048.html>

³ <http://www.ft.com/intl/cms/s/0/bd97ee02-beaf-11e0-a36b-00144feabdc0.html#axzz1owTdW18t>

FDIC (under Dodd Frank Act) allows temporary unlimited deposit insurance till end-2012 on non-interest bearing transaction accounts.

crisis. To the already well established concept of institutions “too big to fail” (TBTF), recently FSB has drawn a list of global SIFIs (systemically important financial institutions). The recent crisis post-Lehman saw several puts—Fed’s Commercial Paper Facility, Citibank and Wachovia loan bundle guarantees, MMF guarantee, Fed’s TALF (Term Asset-Backed Securities Loan Facility), FDIC expansion etc. These were all puts to activities *outside* the banking sector.

A second, related, reason to be examining this issue now is that the size and nature of the puts provided to the regulated financial institutions has also expanded enormously. Some of the puts provided to the regulated financial sector were associated with their connections to shadow affiliates and might therefore be described as coming out of “nowhere”. Nevertheless it was largely a surprise especially when after the US savings and loan crisis of the late 1980s a regulatory doctrine known as “prompt corrective action” was introduced that was designed to limit the size of the assistance that would have to be provided to regulated institutions. This was envisaged to limit the exposure of the FDIC to losses. In a nutshell, prompt corrective action was designed to alter the behavior of institutions at an early stage in the deterioration of their capital base so that—should it become necessary—the institution could be placed under receivership, sold, or otherwise resolved before its capital cushion was to be completely eroded. However the recent crisis shows the extent and suddenness of the deterioration of market liquidity combined with precipitous declines in what was believed to be “safe” asset prices led to the necessity of sizable puts.⁴

The third reason relates to our belief that the crisis has revealed a general under pricing of puts and, of most concern, the puts provided by government were priced at zero! To a certain extent this is obvious. Institutions in the shadows were provided puts at just the moment they were needed and when no private sector participant would have provided them at any price. This is akin to a homeowner without fire insurance being provided a conventional policy just as the flames from a neighbor’s burning house touch the homeowner’s house. Furthermore, as will be discussed in the next sections, the revealed volatility of financial prices during the past four years has changed the parameters of options pricing, implying directly that *puts are more valuable than had previously been thought*. All of these considerations are important when considering to whom, at what price and to what extent puts should be offered to financial market participants.

Although shadow banking is generally associated with entities outside the regulated banking perimeter, Section II draws attention to shadows within the ‘bank holding company’. Section III focuses on some of the obvious puts in the shadow banking literature—money market funds, central counterparties (CCPs) that will inherit OTC derivatives from SIFIs, and the tri-party repo entities in the U.S. In Section IV we show that demand for puts continue and the official sector often obliges and provides puts even before a crisis—we take the case of the U.S. Treasury’s proposal to issue floating rate notes to make our point. Section V shows that despite efforts to remove or minimize puts, there will still remain some bailouts—as is taking place in the collateral markets at present under various acronyms. Section VI concludes by suggesting that removing the ambiguity about puts will likely lower the cost of bail-outs after a crisis.

⁴ It also led to some emergence from the shadows of institutions who rapidly obtained banking licenses to obtain access to the assistance that was directly available only to regulated institutions.

Box 1. Options Pricing, Volatility and Moral Hazard

Theoretically, the value of options is determined by five variables. A put is a function of the difference between the current asset price and the strike price (the price at which the option may be exercised), the duration of the contract, a risk-free rate, and the anticipated volatility of the price of the asset. Asset price volatility is the most important parameter. The more volatile the asset price, the more likely it is that the asset price will fall below the strike price during any given time period and thereby make the put worth exercising.

A more important put that many individuals in certain US legal jurisdictions encounter—albeit often unknowingly—is the option to default on their home mortgage without providing creditors recourse to their other assets. That is, they are effectively provided a put to sell their home back to the lender for the amount remaining owed on their home. Approximately 11 million US homeowners are currently estimated to have negative equity in their homes amounting in aggregate to approximately \$750 billion. If they live in jurisdictions where creditors cannot obtain their other assets, they can effectively sell their home back to the lender for the value of the principal owed which exceeds the market value of their homes. In as much as few lenders and borrowers foresaw the broad-based decline in home prices it can be safely assumed that lenders did not charge an adequate premium for the option they had bundled with the loan.^{1/} The value of the put was related to the down-payment (i.e., the difference between the asset price or home value, and the strike price or loan value)—Figure 1. The lower the down-payment, the closer the asset price is to the strike price, and the higher the probability—everything else equal—that the asset price would fall below the strike price. The greater the volatility of the asset price (home prices) the greater the probability that the asset price would fall and the greater the likelihood that the option would be able to be profitably exercised.

Figure 1: Put—An Example From The Housing Market



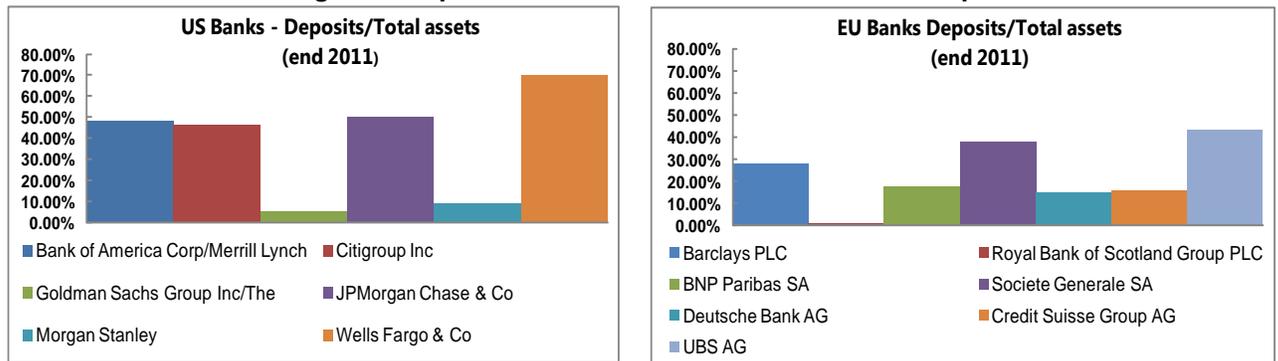
Developments in the U.S. housing market in the 2000s led to a lethal combination of lower down payments, reduced underwriting standards, slower pay-downs of principal and rising prices which fueled expectations of further price rises. While the first three factors should have led to higher premia being charged for the put, the last factor dominated, that is, in an environment of eternally rising prices, puts are never exercised as the asset price always exceeds the strike price. In practice, the theoretical volatility considerations are proxied by the past behavior of asset prices. However they turned out *not* to be reflective of actual probability distribution.

^{1/}In a similar vein, one might consider the concept of limited liability as a put provided by the legal construct of a corporation or LLC (i.e., limited liability company). Corporate shareholders are liable for the corporation's debts only up to the amount of their equity. This is similar to having an option to liquidate all assets at a price equal to all liabilities. Some have argued that the transformation of investment bank partnerships into corporations fostered increased risk-taking owing to the limited liability put.

II. SHADOWS WITHIN A BANK AND AROUND A BANK

The problem of “puts” arises due to non-banking activities within a bank, and also due to close ties of shadow banking activities with SIFIs. Bank SIFIs (here, also called SIBs) are comprised of a “depository” part and a “non-depository part”, typically under a bank holding company (BHC). The overall BHC may be supervised by one regulator (for example, in the U.S. by the Fed) while the depository part may be supervised or insured by another regulator (FDIC in the U.S.). The taxpayer is on the hook for the BHC. However, from any insurer’s perspective there may still be an incentive for the BHC to move business units to the depository part of the BHC. Thus, FSB’s first list of 29 SIBs does not distinguish between the depository and non-depository parts but acknowledges the overall BHC is systemic, even if deposits are a low percentage relative to the overall assets of the BHC. In other words, the regulators extend the “put” to the overall BHC (see figure 2).⁵ Recently, the banking arm of some of the U.S. banks have significantly increased their deposits—from near zero—by “sweeping” excess client cash from broker-dealer accounts; such deposits are insured by the US Federal Deposit Insurance Corp.⁶

Figure 2: Deposit/Asset Ratio of SIFIs in U.S. and Europe ^{1/}



^{1/}Deposits are those that are backed by a depository insurance company (like FDIC or national insurers in Europe). Line items that are not insured such as “Payables to Customers and Counterparties” or similar items that may show up under “Deposits” database (e.g., Bloomberg) are not considered
Source: Bankscope.

The access to the insurer provides incentives to move risks within the SIBs to exploit funding efficiencies within the BHC (Kane, 2012). For example, in the U.S., after Bank of America (BoA) and Merrill Lynch (ML) merged, the OTC derivatives book of ML was “moved” under the depository part of the merged BoA-ML.⁷ This created regulatory challenges and conflicts. Although the depository part is regulated and supervised by FDIC (the depository insurer), the holding company is supervised by the Fed (which is responsible for supervising not only the BHC, but

⁵ Banks active in repo, derivatives and collateral space include Goldman Sachs, Morgan Stanley, JP Morgan, Bank of America-Merrill Lynch and Citibank in the U.S., and Deutsche Bank, UBS, Barclays, Credit Suisse, Société Generale, BNP Paribas, Royal Bank of Scotland in Europe. These are all classified as SIFIs by the FSB.

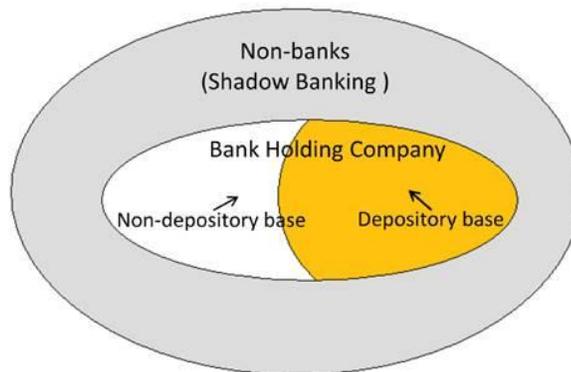
⁶ It is interesting to note that these banks (e.g., Goldman, Morgan Stanley etc) which did not start off as wholesale banks attracting deposits (but as a broker/dealer), view such funding to be lower-cost and “stickier” than financing sourced from more skittish wholesale markets.

⁷ For completeness, JP Morgan, HSBC, Citibank and BoA always kept their OTC derivatives under the “bank”.

everything else within the holding company).⁸ The FDIC would have preferred the move to the non-depository part of the merged BoA-ML entity, but was overruled by the Fed. Thus, taxpayer now backstops what used to be ML—a former broker-dealer—derivative positions. Since then, key US banks active in OTC derivatives have moved much of their positions to the “bank” part of the overall holding company. Some of the recent members of the ‘banking community’ (e.g., Goldman Sachs and Morgan Stanley), have also moved much of their derivatives books in the “bank”. Although the BHC is backstopped by the taxpayer, these internal maneuvers reduce the overall funding cost to the BHC (since with OTC derivatives move to the depository base reduces overall risk to the BHC).

Aside from the puts within a BHC, the nonbank/bank nexus is another area that may give birth to puts. Although nonbanks (such as hedge funds, MMFs, insurers, pension funds, CCPs etc.) are not deposit taking they interact with SIBs in many key areas such as OTC derivatives, collateral re-use etc; these activities are generally discussed under the rubric of “shadow banking”.

Figure 3: Depository and Non Depository base of SIBs and the Shadow Banking Sector



An example of how such nonbank may have access to SIFI puts is through counterparty exposures. As an illustration, envisage a large insurer/asset manager, or group of hedge funds dealing with a SIB. The bank then suffers large losses. The bank is likely to be bailed out, especially if it is designated to be systemic. It is however also possible that a nonbank (i.e., hedge fund or insurer) runs the same loss-making position and having obtained financing from the SIB’s prime brokerage arm could easily magnify the threat to the bank if they are allowed to fail.⁹

Per se, hedge funds should not be bailed out. But if they have “attached” themselves to a SIFI/SIB in a way that makes the SIFI/SIB vulnerable, then the hedge funds may become systemically important by default (Duffie, 2011). Although work has been initiated in identifying systemically

⁸ In the US, the Fed supervises the bank holding company. The “bank” which is part of the BHC is supervised by the OCC if the bank has a national charter. If the bank has a state charter, it will be supervised by the Fed if the bank is a Fed member. If the bank has a state charter, but is not a Fed member, it will be supervised by the state and FDIC.

⁹ In jurisdictions like U.K., the regulator, FSA, has very good data via their bi-annual Hedge Fund Surveys of counterparty risk to banks from hedge funds. Such data is not yet available to U.S. regulators.

important SIFIs *ex-ante*, there is clear recognition that entities within the shadow banking space may get the taxpayer “put”, *ex-post*. To be fair, regulators are trying to minimize nonbanks extracting “puts” from the SIFIs. For example in the U.S., the single counterparty credit exposure limit of 25 percent under the Dodd Frank Act is now lowered to 10 percent. Another parallel effort is to define the ex-ante criteria to monitor and regulate nonbanks that may be systemic for the financial system (see Box 2).¹⁰ U.K. has also issued a (draft) financial sector resolution that addresses risk from nonbanks. Similarly, the proposed FSB regulatory agenda is likely to provide further insights.

The next section focuses on institutions/infrastructure *outside* the legal BHC. We show how due to the nonbank/bank nexus, these shadow banking entities may find access to the taxpayer puts. In this context we focus on money market funds, central counterparties and the tri-party repo system.

Box 2. Identifying Systemic Nonbanks and their Interconnectedness to Banks—U.S. example

After the 2007-2008 financial crisis, the Dodd-Frank Act created the Financial Stability Oversight Council (FSOC) to designate nonbank financial companies (“nonbanks”) that were systemic to the U.S. financial system. These nonbanks were not subject to the type of regulation and consolidated supervision applied to BHCs, nor were there mechanisms in place to resolve the largest and most interconnected of these nonbanks without causing further instability. FSOC is cognizant that these thresholds may not capture all types of nonbanks and/or the potential risks that a nonbank could pose to financial stability. The basic criteria suggests that a nonbank may be considered systemically important if it has at least \$50 billion in total consolidated assets and meets or exceeds *any one* of the following thresholds:

- \$30 billion in gross notional CDS outstanding for which the nonbank is the reference entity
- \$20 billion of total debt outstanding;
- \$3.5 billion in derivative liabilities;
- 15 to 1 leverage ratio, as measured by total consolidated assets to total equity; or
- 10 percent ratio of short-term debt (i.e., less than one year maturity) to total consolidated assets.

Based on the above thresholds, the FSOC has estimated that fewer than 50 nonbanks meet the nonbank definition.^{1/} There are other criteria, both quantitative and qualitative, after which certain nonbanks will be subject to supervision by the Federal Reserve and to enhanced prudential standards.

Lender of last resort rules for nonbanks have also been tightened with recent reforms in the United States. For example, lending to specific entities during a crisis is no longer available (and exceptions subject to approval by the U.S. Treasury secretary). In a parallel move, the Fed has proposed *single-counterparty credit limits* that targets mutual interconnectedness of the largest financial companies, each with assets exceeding \$500 billion; this limits credit risk between a company considered systemically important and counterparty to 10 percent. This (new) 10 percent credit risk limit is more restrictive than that contained in the Dodd-Frank financial overhaul law, which allowed for a 25 percent limit.^{2/}

1/<http://www.treasury.gov/press-center/press-releases/Pages/tg1580.aspx>

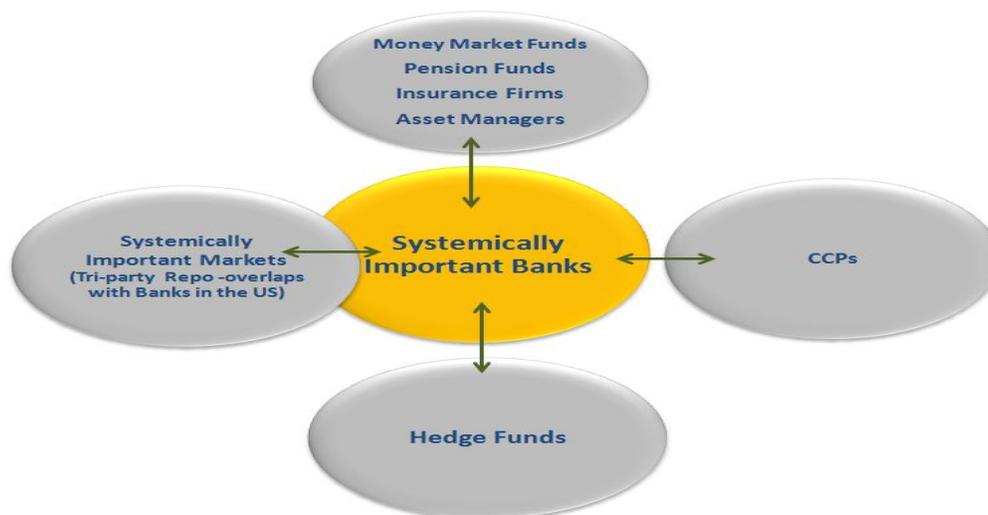
2/http://www.federalreserve.gov/reportforms/formsreview/RegYY_20120105_ifr.pdf

¹⁰This could lead to the migration of substantial amounts of SIFI risk to non-regulated financial entities through a complex network of relationships (e.g., via derivatives) that would be difficult to monitor or stress test.

III. MMFs, CCPs AND TRI-PARTY REPO—IN THE SHADOWS?

Some recent regulatory reform efforts aim to reduce the “puts” to the shadows, but care is needed to avoid merely reshuffling them. The risks from under-capitalization and implicit support still loom large in some areas such as money markets funds (MMF) and OTC derivatives and Tri-party repo complex. We discuss them since these markets and instruments always straddle the nonbank/bank landscape—but there are other puts out there!

Figure 4: The Nonbank/Bank Nexus—Key Institutions and Markets in the Shadows



A. Money Market Funds

The mechanics of the provision of on demand, at par instruments by money funds include stable net asset value (NAV) guarantees provided by bank-sponsors. These are a significant source of systemic risk: in the U.S., the government might (again) be forced to step in to limit the spillovers from a run as happened in 2008 (McCabe, 2011, and McCabe et al, 2012, ESRB 2012). Proposed solutions include the introduction of capital requirements for money market funds, floating NAVs, and two-class claims on assets, one redeemable at par and the other contingent on the NAV. Still, risks are likely to remain and for any plausible levels of capital, prime money funds may require official support or guarantees to be able to maintain a stable NAV in extreme, left tail events. Although some regulators have opined that rigorous stress test would benefit from understanding the left tail events (Rosenberg, 2012), unless the implicit put like the par NAV is removed, there will always remain ambiguity that will lead the common man to think MMF are like deposits.¹¹

Providing puts ex-ante for fear that the ex-post bailout may be even more expensive is a circular argument that encourages moral hazard and exploits regulatory arbitrage.¹² In fact, as documented

¹¹ Freddie and Fannie’s implicit put turned out to be real and expensive since the common man and the common investor (including international investors) always assumed, albeit erroneously, these had legal government backstops.

¹² For example some researchers argue that T-bills supply should increase to cater to the needs of MMFs since there is a shortage of safe assets. In this context, it is useful to recall that the U.S. Treasury discontinued 30 year bonds in the

(continued...)

by Duffee (1996), and updated by Greenwood, Hanson and Stein (2012), large investors are willing to pay a “premium,” i.e., accept a lower yield, for 1 month U.S. treasury bills as it provides a preferred combination of safety and liquidity. In fact, Duffee finds significant demand for 1 month T-Bills. Recently, given the flight to safety, investors have been willing to pay, rather than receive a return, for storing their cash safe. From debt issuance perspective, there are constraints of issuing T-bills when long tenor debt is free in nominal terms (Singh and Stella, 2012). The Treasury Borrowing Advisory Committee is looking at issuing T-Bills at negative yields to cater to the elastic demand at the very short end; some of the European short end curves have negative yields (Germany, Denmark, Sweden etc). Furthermore, the private sector is willing to provide safety—Bank of New York is offering to take unlimited deposits for a fee of 13 basis points.

B. Qualified Financial Contracts (QFCs)

QFCs generally refer to *derivatives* and *repos*; both these contracts are exempt in the US and the UK from “automatic stay” during bankruptcy.¹³ This means that when a dealer files for bankruptcy, its derivatives and repo liabilities “skip” the bankruptcy (i.e. their claims are not frozen) thereby reducing the pool of assets available for other creditors. So, although a corporate or SIFI may file for bankruptcy, any reduction in value of financial obligations (loans, bonds, equity etc) do not impact the derivative and repos transactions; they jump the bankruptcy “queue” and are prioritized and senior claims since they are deemed to be short-term, interconnected to financial markets, and thus disruptive to tinker under a bankruptcy. This reduces market discipline and increases the chance of a disorderly run on broker dealer by enabling dealers’ protected counterparties to withdraw rapidly at the last moment at low cost. The QFC structure subsidizes users at a cost to other creditors and the safety net. Recent academic studies highlight that the economics behind QFC’s “super senior” status is not justified (Bolton and Oehmke, 2011; Bliss and Kauffman, 2005; Duffie and Skeel, 2012). However, from a practical, resolution, and legal viewpoint there is very limited progress in the regulatory pipeline (e.g., Dodd Frank Act’s Title II).¹⁴ For example non-academics argues that regulatory proposals addressing QFCs such as Dodd Frank’s Title II will not change much (Summe,2011). We discuss the *relevant* derivatives and repos below:

The footprints of the **OTC derivatives market** straddle both the regulated SIFIs and shadow banking world. Recent regulatory efforts will result in moving OTC derivative contracts to central counterparties (CCPs). The U.S. Dodd-Frank Act allows the Federal Reserve to provide liquidity to

early 2000s—the Treasury did not factor in the demand for duration coming from pension funds and insurers. Due to the primary surplus in the Clinton years, the U.S. Treasury continued to largely embrace their debt issuance strategy of least cost financing. In fact, with no new 30 year bonds, pension/insurers were short on duration for a long time. So although at present some nonbank sectors continue to demand more T-Bills issuance, it is not clear why U.S. Treasury has to accommodate to such lobby. It should be noted that the role of government policy—in reshuffling debt issuance—is diminished when debt is high or capped due to political constraints (Greenwood, Hanson, Stein, 2011).

¹³ Traditionally, banks had equity, debt, and deposits. If a bank failed, the bank’s equity would be wiped out first, and then its debt; depositors were senior. Now, however, bank debts are being replaced with QFCs that cannot be touched. So, when a bank fails, the equity gets wiped out first and there’s little cushion before the depositors start losing money.

¹⁴ Other legal sources also confirm that markets are so dependent on the liquidity associated with QFCs that regulators will not temper with QFCs status quo.

key financial market infrastructure during times of crises; the EU via ECB also has similar provisions for its CCPs.¹⁵ Furthermore, regulators are likely to designate CCPs as SIFIs.

While a much cited figure, the notional value of contracts of about \$600 trillion is not relevant but nonetheless, the likely puts are large. More relevant are the “in-the-money” (or gross positive value) and “out-of-the money” (or gross negative value) derivative positions, which are further reduced by “netting” across/between products having the same underlying. From a policy perspective, under-collateralization is the more relevant metric (Singh 2011a). While typically collateral—both initial and variation margin—is posted by hedge funds, asset managers, and other clients, SIFIs may *not* have a 2-way margin agreement with some clients (e.g., sovereigns, quasi-sovereigns, supranational, large pension and insurers, AAA corporations, etc).¹⁶ Thus mark-to-market collateral may not be forthcoming when these clients are out of the money. As a quid pro quo, SIFIs often do not post collateral to such clients either.

At present, there is significant under-collateralization in the OTC derivatives market that is being reshuffled to the “shadows”—Table 1. In recent year, there is reported collateral need of about \$3 trillion to \$5 trillion, after netting, as per BIS (2012) and ISDA (2012). Even if we consider half of the total positions (i.e., when SIFIs are out-of-the-money) that are risks to taxpayers, there is a sizable collateral gap that needs to be filled. Furthermore, although BIS indicates about \$1.8 trillion of collateral is dedicated to towards this “gap”, this collateral is fungible and perhaps includes a re-use factor of about 3 (Singh, 2011b). Thus, dedicated collateral may be only around \$600 billion.

Table 1: Under-collateralization in the OTC Derivatives Space

Global OTC derivatives market - amounts outstanding, in billions of US dollars							
	Gross market value						
	H2 2008	H1 2009	H2 2009	H1 2010	H2 2010	H1 2011	H2 2011
GRAND TOTAL	35,281	25,314	21,542	24,673	21,296	19,518	27,285
A. Foreign exchange contracts	4,084	2,470	2,070	2,524	2,482	2,336	2,555
B. Interest rate contracts	20,087	15,478	14,020	17,533	14,746	13,244	20,001
C. Equity-linked contracts	1,112	879	708	706	648	708	679
D. Commodity contracts	955	682	545	457	526	471	487
E. Credit default swaps	5,116	2,987	1,801	1,666	1,351	1,345	1,586
F. Unallocated	3,927	2,817	2,398	1,788	1,543	1,414	1,977
GROSS CREDIT EXPOSURE*	5,005	3,744	3,521	3,578	3,480	2,971	3,912

*Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. Gross market values after taking into account legally enforceable bilateral netting agreements.

¹⁵ Not clear when liquidity stops and solvency starts. In the U.K., a CCP failure may entail some sort of bail-in or resolution regime for CCPs—this depends on how the draft resolution framework is finalized. Dealer owned CCPs, may have to pick up the tab in the U.K; this avoids taxpayer bailout and reduces moral hazard.

¹⁶ “One-way” ISDA margin agreements are also prevalent where certain clients of banks will take collateral when they are in the money, but *do not* post collateral to banks when they are out of the money.

Regulatory reforms will try to overcome the under-collateralization and are two-pronged: first is the move to CCPs that will require collateral to mark position to market and second, capital charges to SIFIs (for OTC derivatives that do not move to CCPs) via higher risk-weighted assets. However, collateral requirements (at CCPs) are not comparable to higher risk weights at banks for non-cleared OTC derivatives. This opens the door for regulatory arbitrage given the collateral constraints. Given the plethora of exemptions and the onerous demands for collateral, the shadowy aspects of under-collateralization are likely to remain. CCPs will likely garnish the SIFI status as they become the new “risk nodes” of the global financial system.¹⁷ The taxpayer is likely to be on the hook again for the “reshuffled” OTC derivative books that will reside with CCPs.

Another QFC that deserves discussion is the **tri-party repo (TPR)** market, a primary source of funding for banks in the U.S., was about \$1.8 trillion (July 2012; New York Federal). It provides cash on a secured basis, with the collateral being posted to lenders through one of two clearing banks, Bank of New York—Mellon (BoNY) and JP Morgan. Such pledged collateral is with custodians and generally not rehypothecable beyond the primary dealers. Still the intra-day exposure remains large and operationally difficult to reduce and the systemic importance of this market may preclude an unwinding of BoNY and JP Morgan. In continental Europe and London, TPR activity has increased in recent years to roughly €1.1 trillion, largely due to multinational/corporate treasuries keeping money overseas and also due to counterparty risk concerns regarding large banks; the key agents primarily are Euroclear and Clearstream.¹⁸ On the other hand, the bilateral pledged collateral market has no implicit or explicit put and is perhaps the only avenue for a market clearing price of collateral.¹⁹

The TPR system in the U.S. can generate systemic risks, however, posing financial stability challenges. Systemic risk originates primarily from the technical daily unwinding of all TPR operations, irrespective of tenor. Every morning, all collateral is returned to the dealers, and cash is credited to lenders’ accounts with the clearers; the repo is renewed at the end of the day. The intraday funding of the dealers (the latter do not repay cash against the collateral returned) is not subject to any liquidity buffer, or other regulatory safeguards. It is secured by a lien on the collateral returned, but typically with zero margin.²⁰ Any inability of a dealer to roll over its funding

¹⁷ The Dodd Frank Act generally defines a FMU as any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities (see FSOC’s definition in Box 2)

¹⁸ This section may be viewed as U.S. centric, in light of the U.S. tri-party resting on the shoulders of BoNY and JPMorgan, unlike in Europe where Euroclear and Clearstream do not generally take any exposure in their own name.

¹⁹ The bilateral pledged collateral market is not trivial. For example hedge funds (HF) are increasingly funding themselves via repo. HF repo is estimated (on average) at about \$750-\$900 billion (Singh 2012b) and this number can be split approx for —given that UK hedge funds are about 25 percent of the market—about \$600 billion for the US and the balance for the rest of the world. If the present size of the TPR is 1.8 trillion, and HF repo in U.S. is about \$600 billion, then without considering securities lending, TPR is about 70 percent of the repo market. However, securities lending is akin to repo (as legally they are very similar). Estimates of U.S. sec lending is about 800 billion; Europe is about 200 billion —source RMA. Thus the non-TPR market may be 40%-50% percent of the overall repo like activities (or \$1.4 trillion/\$3.2 trillion).

²⁰ The dealers benefit from a system, which releases the total stock of collateral to them, allowing substitution and arbitrage between securities, and overnight security lending activities.

would de facto transfer the risk to the clearer, which would either have to extend overnight credit to the dealer, or try to obtain and liquidate the collateral. From a risk standpoint, the market operates as a de facto overnight credit market, giving cash providers an illusion of liquidity which is not really compatible with funding security for the primary dealers. Indeed, the Fed introduced a special facility, the Primary Dealer Credit Facility (PDCF), to keep the system operating during the post-Lehman crisis and prevent a fire-sale of assets by TPR principals or their clearers.

Systemic risk may also arise from the concentration of the TPR market on two banks, BoNY and JP Morgan, which together account for the whole of the \$1.8 trillion TPR market (which was almost \$3 trillion in 2008). Owing to the magnitude of the exposures, a small decline in the market price of the collateral posted with a clearer could significantly undermine its capital in the absence of over-collateralization.²¹ This risk was amplified when Fed facilities like PDCF took the worst collateral out of the system owing partly to the implied *subsidy* stemming from the more accommodative haircuts in TPR (Copeland, Walker and Martin, 2010); this resulted in the most exotic types of collateral (lower credits that are below BBB, and fixtures such as plants and farms that do not have daily prices) finding its way to BoNY and JPM.

The Fed's involvement with the two clearers also allows substantial use of their systems for its operations to the extent it could not tolerate their failure.²² Furthermore, the clearers' ability to vary margins gives them a "life or death" right over the dealers, something neither regulators nor participants are happy about.²³ The magnitude of their exposure makes both BoNY and JPMorgan SIFIs, thus reducing incentives to "self-insure." However, the Fed needs to keep TPR clearers in business to meet the needs of its own operations, *particularly in light of the large liquidity draining operations that will eventually be needed when monetary policy is again tightened*. The dealers are used to the "subsidy" and do not want to change the status quo. Not surprisingly, the recent "white-paper" of the Fed did little to change the existing TPR system.²⁴

The next section does not look at existing shadows where the associated puts can be addressed. Instead it looks at potential shadows that may become puts and thus questions the underlying economics that will bring these future liabilities to taxpayers.

²¹ BoNY's equity is about \$34 billion; JPMorgan is at \$183 billion. Together their equity is about 12% of the overall TPR market (i.e., if there is a jump event that adversely impacts collateral by 12 percent, their equity can be wiped out).

²² Dealers are too reliant on ease of refinancing; cash lenders (e.g., money market funds) are too dependent on liquidity of their cash. In fact if regulations shrink the MMFs, it is likely that TPR will also shrink—so both "puts" can be addressed if say MMF put (e.g., par NAV) is removed. Dealers obviously like the TPR status quo.

²³ In setting the haircuts, the clearers face a trade-off. If margins were to be increased substantially following a rise in price volatility of the collateral used, a dealer could be put out of business, as it lacks capital or access to uncollateralized funding to compensate. Lowering haircuts would hurt clearers if there is a jump in collateral values.

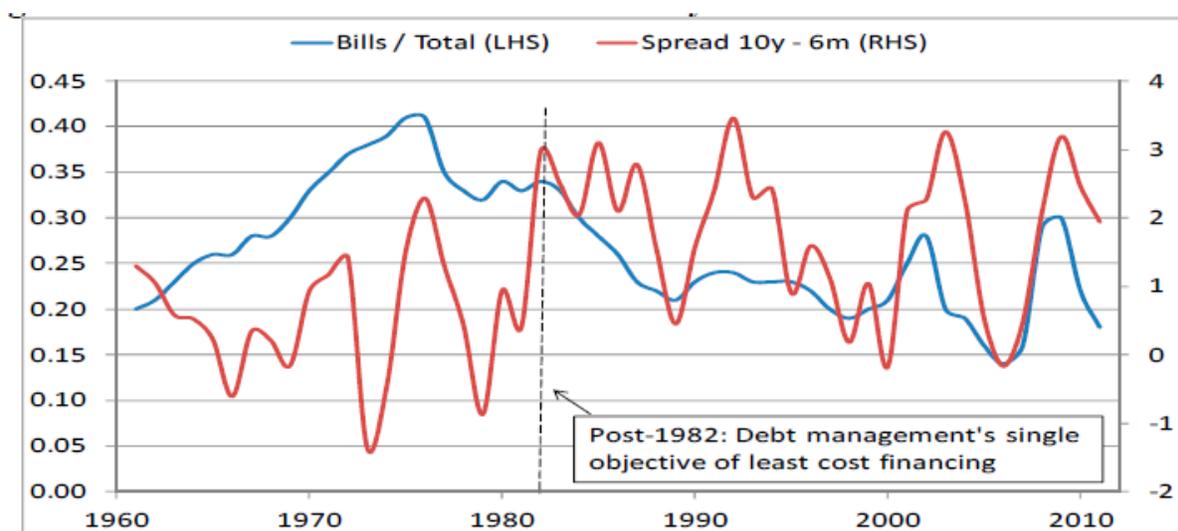
²⁴ Since borrowers nevertheless have financing needs during the day, a clearing bank extends to them overdrafts as unsecured exposures. In this context, a recent move by NY Fed on demanding collateral on overdrafts may be emulated. Fed minutes (June 19-20) inserted new language that may be relevant—"In addition, the Authorization was amended to include the authority to conduct intraday repurchase agreement (repo) transactions with foreign and international accounts to prevent daylight overdrafts in those accounts."

IV. FLOATING RATE NOTE “PUTS”—ARE THEY FORTHCOMING?

Around end-2011, the short term US Treasury yield curve was at 1 basis point (bp) at 1 month, 2 bps at 3 months, 6 bps at 6 month, and 12 bps at 12 month. They are now at 10 bps for 1 month, 11 bps for 3 months, 14 bps for 6 months, and 18 bps for 12 months—still below what the Fed is currently paying banks 25 bps on overnight deposits (i.e., interest on excess reserves). Clearly, no U.S. bank is going to bid in the T-bill auction for its own account and has not been doing so for a while now. This takes out quite a lot of demand. So for the market to be clearing at such low rates there must be sizable demand coming from somewhere—nonbanks (e.g., mutual funds). Nonbanks investors flush with liquidity and facing uncertainty, prefer fewer bonds and more T-bills. Cash rich nonbanks continue to suggest there remains a shortage of bills and lobby for more. However, the total volume of debt issuance is determined by US Treasury’s budgetary needs and financing options (long vs. short tenor). Also, related to this discussion is the recent research that highlights demand for “safe assets” that may have several definitions, including Gorton et al. (2012).

Prior to 1982, the U.S. Treasury had issued debt on a “tactical” basis that did not follow a predictable pattern and often caught investors off guard. The Treasury had sometimes announced other policy objectives in addition to least-cost financing. For example, in the 1960s, Treasury issuance would be influenced by the desire to increase (or maintain upward pressure) on short-term interest rates to prop up the value of the U.S. dollar. Thus there were too many policy objectives that did not result in least-cost financing (i.e. there is no discernible relationship between issuance of US T-Bills relative to total debt issuance and the cost of long-term/short-term funding) as per Figure 5. Since 1982, the U.S. Treasury’s ‘regular and predictable debt issuance strategy’ had a primary goal: issue at least cost and the Treasury is meeting its objective (Garbade, 2006).²⁵ Since 1982, the correlation between bills/total issuance and 10 year minus 6 month spread is over 0.6.

Figure 5. Ratio of T-Bills/Total Debt Issued and Spread of 10 year minus 6 month US Treasuries



²⁵ Chow Test shows a structural break in the time series since 1960 at 1982. Also Gurkaynak et al. (2006) highlight yield patterns in the U.S. debt issuance since 1961.

In this context, it is useful to quote from recent TBAC report (Jan 31, 2012)²⁶

“... ways to explore the viability of Treasury issuing floating rate notes (FRNs). In particular, the presentation [attached] assessed potential client demand, optimal maturity, reference index, and reset frequency. The structural decline in the stock of global high-quality government bonds, coupled with an increase in demand for non-volatile liquid assets, should make U.S. government issued FRNs extremely attractive. Pricing for a hypothetical two year FRN was estimated to be in the arena of 3 month Treasury bills plus 8 basis points.”

TBAC again discussed FRNs on July 31, 2012:

“.....was unanimous in its support for the introduction of an FRN program as soon as operationally possible. Members felt confident that there would be strong, broad-based demand for the product. A dialogue ensued about which floating rate index should be used. The Committee gravitated towards referencing treasury general collateral, in lieu of federal funds effective and T-bills.

Historically, at the time of the discussions leading up to the Fed-Treasury Accord of 1951 which ended an extended period of artificially suppressed interest rates on Treasury bonds, there was much internal debate about the potential deleterious impact on bondholders from a “surprise” rise in rates. There was also concern about a potential buyers strike and/or a fear that new market equilibrium would entail a sharp spike in rates. This discussion was conditioned by the similar situation faced by the U.S. Treasury in 1919 after it promised to stabilize bond prices during and after WWI. This policy caused conflict with certain Fed policymakers and the eventual losses on Liberty bonds were still remembered by Congress and the Treasury in 1951, 30 years later. As a consequence, at the time of the announcement of the Accord, buyback options were offered by the Treasury, that is the U.S. Treasury offered to swap the outstanding stock of long-term debt with new long-term debt with higher coupons (coupled with restrictions on sales before maturity). The idea was to cushion *the market* from capital losses—this was a subsidy upfront.

Might the U.S. Treasury go down a similar path again in conjunction with an eventual Fed exit strategy? In the current environment, markets have witnessed a 30 year secular decline in bond market yields (unlike the interval before 1951). Market will indeed have to adapt if there is rise in rates from near zero to a “neutral” fed funds rate of 400 bps and a "normal" 5 percent yield on 2-year U.S. Treasuries. The recent TBAC’s proposal for FRNs seems an obvious option to cushion the transition for the market. As an indication that the eventual unwinding and normalization of the yield curve will take time and inflict pain on holders of fixed income debt, the market appears already to be requesting such "puts". So FRNs is one likely way for Fed to absorb the market’s losses on long term bonds.

The case for FRN issuance would be strengthened to the extent that the Treasury has ‘private’ information that future rates will be lower than market expectations, or values insurance against rollover risk more than it costs for the private sector to offer it—but both these arguments are

²⁶ Report to the Secretary of the Treasury from the Treasury Borrowing Advisory Committee (TBAC) of the Securities Industry and Financial Markets Association, January 31, 2012.

weak.²⁷ A similar argument can be made that FRNs may help the government to commit to low inflation policies but the U.S. already have TIPS. Abstracting from the residual interest rate risk carried by FRNs (due to lags in indexation), and any differences in liquidity or clientele effects, T-Bills and FRNs provide the same payoff in all states of the world, except when debt rollover is at issue. Whereas the government holds the rollover risk of T-Bills, for FRNs, the rollover risk is transferred to bondholders.

Money market mutual funds (MMFs) are lobbying for FRNs issuance in response to an unfavorable regulatory environment and increasing loss of deposits to banks. The end of the unlimited deposit insurance provision under the Dodd-Frank Act, scheduled for end-2012, may bring the cost of safe bank deposits to 10-15 basis points (bps).²⁸ Spreads on T-Bills could even become negative, as is already the case with short Bunds and elsewhere in Europe, and the U.S. Treasury is mulling issuance at negative rates.

The next section highlights puts that were neither envisaged nor in the shadows.

V. SOME PUTS WILL EXIST ANYWAY—EXAMPLE FROM COLLATERAL MARKET

In the early phases of banking, merchants accepted gold deposits and issued private paper claims. These claims were then passed around, like collateral in the modern system. Because the chain of claims grew too long, and the volume of outstanding claims too large, we got bank panics analogous to the panic in the collateral world in 2008.²⁹ So the government stepped in, took the gold onto its own books, and provided banks with claims that were more reliable (Mehrling, 2010). This stabilized the chain of money claims (i.e., the banking system) and prevented the periodic credit droughts that caused depressions.³⁰ But once paper claims were backed by the full faith and credit of the government this removed the discipline on the banks, which no longer needed to hold gold (i.e., collateral/capital) to make their paper liabilities credible. Absent regulation, bank capital buffers tended toward zero.

Now, it seems that we have an echo of that sequence. Financial markets (i.e., banks and shadow banks) accepted securities as collateral rather than gold, swapping them for money (Ricks, 2011).³¹ They did this incautiously, so we got a panic in 2008. If central banks continue their unconventional efforts, then governments will step in, take the bad securities onto its own book, and provide the

²⁷ Since Fed is independent, Treasury has no more information than the market. Abrupt changes in rate cycle will be “put” to the taxpayer since FRNs with tenor of up to 5 years is also under consideration.

²⁸ See footnote 2. After end-2012, it is likely that depositors may continue to deposit –uninsured–with large “SIFI” banks as they are too-big-to-fail. So even if equity and debt holders of TBTF (or SIFIs) lose money, deposits at TBTF will be safe.

²⁹ It is interesting that the invention of money, fractional reserve banking, etc., led to higher trend growth (even something as simple as industrialization) but it shifted business cycle dynamics from being weather or agriculturally driven to leverage boom/bust related.

³⁰ The central banks are going into unconventional territory on the presumption that they can unwind whenever they want - in a way that the gold never did.

³¹ The state of private money supply and the stock and velocity of collateral can affect monetary policy transmission, with macroeconomic consequences.

markets with higher quality collateral or reserves (or money) backed by the full faith and credit of the public sector (Singh and Stella 2012).³² Again, this may prevent a permanent collapse in the collateral chain and avert depression. But where is the future discipline on the shadow banks?³³ Their counterparties who accepted collateral that has now gone bad might have experienced a loss, which would have given them a reason to impose larger haircuts in the future. Instead, the government takes the collateral, creating a system in which the stability of collateral chains is guaranteed by the taxpayer. Participants in these chains will face weaker incentives to be cautious. Absent regulation, shadow banks will follow banks in preferring that capital buffers tend to zero.

VI. CONCLUSION

It is been four years since Lehman went under. There have been important initiatives on the regulatory front to minimize taxpayer bailouts to the financial sector (although primarily aimed at the banking sector). There are a plethora of views on reducing systemic risks at banks, including reverting to the Glass Steagall Act that separates commercial banking (i.e., depository type of business) with the non-depository business. Intermediate solutions like the Vickers and Volcker Rule that insulate (or provide buffers) to the depository part of the banks, or push out riskier activities outside the BHC have gained momentum in various key jurisdictions.³⁴ However, proposed regulation (via Basel III, Dodd Frank Act etc), is unlikely to remove all the puts within the BHC, as it is one legal entity.³⁵ The recent FSB list of SIFIs acknowledges that the overall BHC is systemic.

The nonbank/bank nexus is an important part of financial system. However, nonbanks are entities outside a bank and thus the puts do not legally pass from the bank to the nonbank (and they shouldn't). There is sound economics behind the existence of nonbanks and these entities should not be driven *only* by regulatory arbitrage due to the puts. On non bank resolution, no country has a comprehensive regime for addressing non-bank SIFIs, mostly because until recently nonbanks were rarely considered systemic. Thus, resolution of non-banks has become an increasing priority aside

³² ECB's LTROs took in collateral (at subsidized haircuts, relative to the market) for money; Fed's QE1 and QE2 accepted US Treasuries and MBS for money. However, velocity of collateral is higher than velocity of money since "return on money" is lower in relative terms. From another angle, the opportunity cost of idle collateral is higher relative to money. Also cash has more optionality relative to collateral. Especially in times of stress markets would rather post bonds or stocks, and hold on to a pile of cash for investment opportunities, margin calls, etc.

³³ Bagehot (1873) said, lend freely at high interest rates against good collateral. In a zero interest rate environment, and as a parallel to Bagehot, if the collateral mess needs to be "moped up", sharp haircuts will be necessary when accepting bad collateral.

³⁴ In 1990, the Securities Industry Association (now SIFMA) proposed federal legislation that would permit separate investment banking subsidiaries to compete with traditional investment banks (or broker dealers), but with strong firewalls to prevent access to FDIC. The plan was never adopted by the Congress and history shows that the reverse took place---some broker/dealers became banks in the aftermath of Lehman's bankruptcy.

³⁵ The recent issues of JP Morgan BHC suggest that it is difficult to separate the depository from the non-depository activities---the investment office (non-depository part of JPMorgan) was investing 'excess deposits' of the depository part of the bank.

from the push for “living wills”. Regulators are starting to address this and the U.K.’s Treasury has recently published a consultation paper.³⁶ The EC intends to publish its own consultation.

A less ambiguous regulatory environment will lower moral hazard; this will likely reduce cost to taxpayer if/when bailing out the shadow banking system. However, by intent, or political/policy choice, or by limited foresight, if “puts” are not removed ex-ante a crisis, there will always be room for bailouts. An example of an intended (but implicit) put is the creation of CCPs—despite earnest efforts to reduce the size of SIFIs, the creation of new SIFIs (i.e. CCPs) is not clear. Another example is the political/policy choice not to explicitly remove the put from the MMFs industry in the U.S—it continues to offer par NAV with no capital supporting the business.³⁷ Similarly, an example of limited foresight is bailing out money-like collateral at subsidized haircuts—recall Fed’s PDCF, and the ECB’s LTROs and the respective Eurozone national bank’s ELA efforts.³⁸

There will always remain some (unintended) puts ex-post a crisis. However, the puts that can be removed ex-ante should be addressed; else “shadow banking” will continue to be a pejorative term.

³⁶ http://www.hm-treasury.gov.uk/consult_financial_sector_resolution_broadening_regime.htm

³⁷ Constant NAV in Europe is only allowed for short term MMFs (ESRB, 2012). In Europe, short term MMFs (STMMFs) operate with a very short WAM and WAL (weighted average maturity and life, respectively)—the logic is sound that anything beyond short term should not be constant or “par”.

³⁸ LTRO is the long-term repurchase operation that ECB initiated at the end of 2011. ELA is the Emergency Lending Assistance whereby national Central Banks in the EU like Banca d’Italia accept collateral (that is not eligible at the ECB) from within its jurisdiction at a discount.

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