CREDIT DEFAULT SWAPS, CONTRACT THEORY, PUBLIC DEBT, AND FIAT MONEY REGIMES: COMMENT ON POLLEIT AND MARIANO

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I. Introduction

IN THEIR PAPER "Credit Default Swaps from the Viewpoint of Libertarian Property Rights and Contract Theory," Thorsten Polleit and Jonathan Mariano attempt to show that credit default swaps (CDS) are legitimate and enforceable contracts under Murray Rothbard's conception of property rights and contract theories. They also try to demonstrate that "CDS are an efficient and effective instrument for putting an end to ever higher debt accumulation under fiat money regimes," and that "CDS (if not suppressed by government) put a limit to, or even erode, the viability of fiat money regimes." These propositions are supposed to explain why governments are interested in restricting or banning them.

In this paper, I will show that Polleit and Mariano are right in concluding that CDS are *per se* unobjectionable from Rothbard's perspective,

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but that they fail to derive these conclusions properly. I will outline the proper explanation. I will also show that though CDS trading can conceivably hurt the borrowers' interests in some circumstances, through increased speculation and "naked" CDS trading; CDS otherwise facilitate debt accumulation, including government debt accumulation. Finally, I want to briefly point out an alternative view of how the use of unhampered CDS markets can precipitate the collapse of fiat money regimes. An incidental goal of this analysis is to provide a better account than Polleit and Mariano of recent government interventions in and around CDS markets.

The paper is organized as follows. Section 2 explains the shortcomings of Polleit and Mariano's application of "Rothbardian Ethics," and the correct way to deduce the proper conclusions. Section 3 forms the heart of the paper. It deals with the central issues in the authors' attempt to demonstrate that CDS limit debt accumulation, and presents an alternative view with particular emphasis on government debt accumulation. The fourth section fleshes out the implications as far as the viability of fiat money regimes is concerned. A conclusion then summarizes the findings and, as a call for further research, introduces a missing element in Polleit and Mariano's picture: the idea that CDS help push back limitations on inflation, which further enhances the self-destructing tendencies of fiat money regimes.

II. CDS under Rothbard's Property Rights and Contract Theories

Definitional Quibbles

Polleit and Mariano define credit default swaps in the following way:

> A CDS is a contract that insures against the default of a credit (or bond, or *reference obligation*). The buyer of credit protection makes periodic payments to the seller of the credit protection until either the contract matures or a default event occurs during the maturity of the contract. In return for the periodic payments made by the buyer, the seller agrees to pay the buyer the difference between the face value (or *notional principle*) and the market value of the *reference obligation* (the underlying credit) if a credit event occurs. (2011, pp. 6-7; emphases in original)

For the sake of clarity, one should note that if a contract "insures" against default on a credit, or "transfers the credit exposure," as

conventionally stated,[1] this does not really mean that the buyer must actually be exposed to that default. This does not mean that he must hold the reference obligation. If he holds it, the CDS is referred to as "covered." Otherwise, it is "naked." Polleit and Mariano later mention this distinction (2011, p. 8). However, they can hardly be held responsible for introducing a discrepancy between a stated definition which seems to exclude naked CDS and the actual usage which includes it. This vagueness is standard practice.

When Polleit and Mariano (2011, p. 8) refer to this distinction between covered and naked instruments, they claim that the very possibility of a naked CDS is the consequence of CDS being structured as "tradable securities." This is what allows their buyers to "bet on rising market default concern, in which case the CDS would gain in value and can be sold at a profit in the market." However, existing CDS cannot be sold on a secondary market as bonds or shares can. As Bomfim puts it:

> Unwinding a CDS position involves agreement by both parties in the contract regarding the market value of the position. The party for whom the position has negative market value then compensates the other accordingly. Alternatively, a party may be able to close out its position by assigning it to a third party, but this generally requires mutual approval of both new counterparties. (2005, p. 70)

Another issue is that Polleit and Mariano's definition only fits what the established terminology calls "cash settled CDS." But cash settlement is not a necessary part of the definition under that terminology. If the contract specifies that the seller of protection will have to buy the reference bond from the buyer at face value in case of default, this is still a CDS. Polleit and Mariano later implicitly recognize this (2011, p. 8), but their definition does not conform to that subsequent use of the term. A definition which would reflect the terminological convention of practitioners would be for instance the following one:

> A credit default swap is used to transfer credit risk between two parties. The buyer of protection pays a regular premium or spread to the seller of protection. In return, the protection seller makes a contingent payment if a credit event occurs affecting the reference entity specified in the contract. (Chisholm, 2011, p. 75)[2]

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[1] See the glossary page of the International Swaps and Derivatives Association website: http://www.isda.org/c_and_a/oper_commit-dcg-glossary.html.

[2] How the "contingent payment" occurs is left to the parties to decide in this definition. It should also be noted that a credit event can refer to several reference

Definitional quibbles notwithstanding, there can hardly be any doubt that Polleit and Mariano are right in concluding that credit default swaps are "fully compatible with Rothbard's libertarian property rights and contract theory" (2011, p. 2). However, their explanation suffers from several shortcomings.

Conflation of Ethics and Economics

In order to explain that CDS are legal and enforceable in Rothbard's "contractual" or "free" society, it is only necessary to show two things. First, that no act involved in these deals necessarily implies trampling on anybody's rights as defined by Rothbard's property rights theory. Second, one has to show how CDS can meet Rothbard's legal criterion for enforceable contracts. This is indeed what Polleit and Mariano claim their article accomplishes. There are, however, two problems with their approach.

Though they provide the reader with the features of Rothbard's theory that are relevant to the problem at hand, they omit saying explicitly why CDS pass the Rothbardian test. Admittedly, the information provided is sufficient for the reader to guess, but Polleit and Mariano obscure the issue by conflating political philosophy with economics.

The first manifestation of this pattern appears in the introduction. The authors claim that "*sound economic analysis* reveals that CDS are fully compatible with the principles of the free market" (emphasis in original). Then, in the relevant section of the paper (section 3), after they discuss the basics of Rothbard's legal theories, the authors explain that to review CDS transactions "from the viewpoint of Rothbard's libertarian property rights theory and contract theory" they will examine first if the use of CDS "does justice to the freedom of contract" (Polleit and Mariano, 2011, p. 6). But it turns out that they simply assert that it does. They then elaborate on the facts that for such voluntary exchanges between buyers and sellers to take place, the parties must think they will benefit from them, the possibility that one party and/or the other might be disappointed ex post does not contradict this principle, and that there must be "inequality of subjective wants," as if they were still writing about the same topic (Polleit and Mariano, 2011, pp. 6-9).

Second, they want to show that CDS transactions respect the "physical integrity of private property" (by which they mean legitimate property rights, as conceived by Rothbard). However, they simply assert that CDS trading

entities. One then speaks of a "multi-name" or "portfolio" CDS, as opposed to a "single name" CDS.

does this. Again, they explain—as if it was proof of what they wanted to show—that the buyer and seller must value what they receive higher than what they abandon in order for the contract to exist, that restricting such contracts must result in opportunity losses, and that there will be third-party effects since the price of the bond the CDS refers to will be altered (Polleit and Mariano, 2011, pp. 9-10).

Third, they argue against a possible objection to unregulated CDS, according to which alteration of the price of the reference bond in a free market would justify intervention to stop it, by stating that Rothbard's property rights theory "does not apply to property value"[3] (Polleit and Mariano, 2011, p. 11). Finally, they argue, against the objection that CDS might create additional uncertainty, that there is always uncertainty as long as there is action, and that the scope of action and the scope of uncertainty cannot be mechanically related in such a simplistic fashion. In addition, they argue that attempts at restricting CDS will not reduce uncertainty, but will provoke attempts at circumventing the prohibitions thanks to second-best deals (Polleit and Mariano, 2011, pp. 11-12).

Clearly, all these explanations, except for the one on property value, belong to the field of economics, however correct they are.[4] But sound economics does not reveal that CDS are compatible with the free market. Only legal analysis can do that: if one endorses Rothbard's views, the investigations proceeds along the lines we have mentioned.[5] If uncertainty

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[3] It is puzzling that the authors would discuss such an objection in this way because it suggests that they are answering a Rothbardian who would have failed to understand that there cannot be property rights in the value of goods. For if the imaginary objection was not made by a Rothbardian, it would be absurd to simply answer it by saying that Rothbard would disagree, since this is hardly an answer. A general defense of Rothbard's property and contract theories would be required instead. Perhaps this passage is confusing because it does not tell us from where the objection is supposed to come.

[4] They are not all correct. When the authors refer to Rothbard's thesis that "no one has a right to protect the value of his property for that value is purely the reflection of what people are willing to pay for it," they err in claiming that "Value, it should be noted, is a purely *subjective* category of human action" (Polleit and Mariano, 2011, p. 11). In this context, Rothbard is not writing about "value" in the subjective sense. He is writing about the price of a good on the market.

[5] See Rothbard's classification of various types of scientific inquiries, including ethics and praxeology or economics, in Rothbard (2004, p. 74). Assessing the validity of Rothbard's views on ethics goes beyond the scope of this paper. I am only dealing here with their implications for CDS.

could be said to be higher under free market conditions, that would not change anything as far as Rothbard's legal criteria are concerned. That a double inequality of wants between a buyer and a seller is required for a voluntary exchange to take place is also irrelevant in this context, as well as the fact that the price of a bond would be different under CDS freedom than under CDS prohibition. As Hoppe puts it: "Ethics, or more specifically political philosophy, is the second pillar of the Rothbardian system, *strictly separated from economics*" (1998, p. xii; emphasis added).

Even the legal point on property value—which cannot be defended under Rothbard's property rights theory—is of limited use for the announced overall purpose of the analysis. It only tells the reader that if bond prices are different under free market conditions and under prohibition of CDS, this does not make CDS incompatible with the free market from Rothbard's point of view. It does not tell us why CDS should be considered as legitimate and enforceable in the Rothbardian framework. It is quite obvious that they should, but perhaps because of the almost trivial character of the explanation, the authors jump from Rothbard's theories and their definition of CDS to this conclusion, leaving a missing link at the last—small but decisive—step, while introducing economic reasoning where it does not belong.

Rothbard's Rights and Contract Theories Applied

The first missing explanation is that such a voluntary and conditional intertemporal exchange of goods (usually money and possibly the underlying bonds) does not require one party and/or the other to trample on the rights of others. This is opposed, say, to a deal between A and B that B will murder C in exchange for a certain amount of money paid by A. There is nothing in the above definitions of CDS which require any buyer or seller to disregard anybody else's "ownership of one's own self, ownership of the previously unused resources which one has occupied and transformed; and ownership of all titles derived from that basic ownership—either through voluntary exchanges or voluntary gifts," to use Rothbard's words (quoted in Polleit and Mariano, 2011, p. 3). The buyer or seller of a CDS could use stolen goods to make the transaction—money, bonds, or whatever deliverable goods have been specified in the contract—but he does not have to. This is the decisive point. Therefore, a CDS is as such unobjectionable from Rothbard's theory of property rights.

With regard to the enforceability criterion, as Polleit and Mariano correctly point out (2011, pp. 4-5), Rothbard explains[6] that it can only apply insofar as alienable property is involved, and that,

> A contract should only be enforceable when the failure to fulfill it is an implicit theft of property. But this can only be true if we hold that validly enforceable contracts only exist where title to property has already been transferred, and therefore where the failure to abide by the contract means that the other party's property is retained by the delinquent party, without the consent of the former (implicit theft). (Rothbard, 1998, p. 133)

The missing explanation in Polleit and Mariano's account is then the following. First, on each side of the transaction, only alienable goods are involved (money, the underlying bond, etc.) Second, since a CDS involves the payment of a price at inception (the so-called first "premium" or "spread" according to the practitioners' terminology) or in any case before default on the reference obligation might occur, failure of the seller to pay when he must would necessarily imply theft of property from the buyer (the premiums already paid). Therefore, from Rothbard's point of view, a CDS must be an enforceable contract once a first premium is paid. And it remains so until maturity, as long as the buyer pays the premiums.

III. Sovereign CDS and Government Indebtedness

Polleit and Mariano's Economic Thesis: CDS as Limitations on Debt

The essence of Polleit and Mariano's economic thesis is that credit default swaps do not make life easier for borrowers. More specifically, the thesis as stated in Section 3 is that restricting CDS helps borrowers by reducing their financing costs.[7] In other words, CDS permanently reduce the ability to borrow of the issuers of the reference bonds.

The price and quantity on the CDS market are determined by the demand schedule for and the supply schedule of protection, the intersection of the curves indicating an equilibrium price and quantity. The demand schedule for protection will vary according to people's expectations of default

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[6] See Rothbard (1998, pp. 133-147). This view is also known as the "Evers-Rothbard title-transfer theory of contracts" in reference to the article on which Rothbard draws. See Evers (1977). For some elaborations and revisions, see Kinsella (2003).

[7] Though it is a variation on the same theme, the argument turns out to be different in later sections. See below, especially footnote 23.

of the reference entity. The higher the perceived probability of default, the higher the demand schedule and the price will be, all else equal (Polleit and Mariano, 2011, pp. 7-8).[8] Now, for Polleit and Mariano, the relationship between the price of the CDS and the reference bond price is perfectly clear: "The higher (lower) the CDS premium is, the lower (higher) the bond price will be" (2011, p. 7). This is the key insight. For the lower (higher) the bond price is, the higher (lower) the yield, the more (less) expensive credit funding is for the reference entity issuing the bonds.

Also, it does not make a difference as far as CDS and bond prices are concerned if the CDS demanded are covered or naked.[9] Indeed, in the context of discussing the impact of restrictions on naked CDS, Polleit and Mariano seem to implicitly restate what they see as the essential relationship between CDS prices and bond prices:

> If naked CDS are restricted, or even banned, by government decree, the investor who wishes to engage in naked CDS (because he sees a higher probability of a credit event than other market agents) would be prevented from taking advantage of a (supposedly) profitable activity, causing him financial damage (in the form of an *opportunity loss*). The borrower who has issued the reference obligation can, in turn, (continue to) enjoy lower refinancing costs compared with a situation in which investors are free to engage in naked CDS positions. That said, restricting, or even banning, the use of naked (as well as covered) CDS effectively amounts to a *coercive redistribution of income* from the potential investor in naked CDS to the benefit of the issuer of credit. (2011, pp. 9-10; emphases in original)

This is a restatement of the previously mentioned relationship between CDS and bond prices in the following sense. If there is an effective ban, the price of a CDS is zero and the corresponding bond is available at the highest possible price. If there is a restriction on quantities sold through a forced-down demand schedule (either because the law imposes some form of quotas on buying, or because the total ban on buying is not effective, a lower black market demand schedule remaining in existence), the price of the CDS

[8] Polleit and Mariano focus on the demand schedule only, as far as shifts are concerned. They do not mention it, but there is no difficulty recognizing that the supply schedule should shift too with varying expectations of default on the part of suppliers, with the supply schedule falling (rising) when default is perceived as more (less) likely.

[9] Their graphical presentation displays a demand schedule for CDS which should then be considered as an aggregate of the demand for covered and naked CDS on the same reference bond. See Polleit and Mariano (2011, p. 8).

contract is lower and the bond price is higher than otherwise.[10] In any case—covered as well as naked CDS—the stricter the restriction, the more comfortable the borrower is, according to Polleit and Mariano. For he can issue bonds at a higher price which means he faces lower refinancing costs.

It follows that "sovereign credit default swaps"—the CDS for which the reference obligations are government bonds—put narrower limits on the government's capacity to borrow than would be the case absent the freedom to engage in such derivatives transactions.[11] Therefore, governments have an interest in restricting or even banning sovereign CDS markets, according to Polleit and Mariano.

The Relaxation of Debt Limitations through CDS

Polleit and Mariano's thesis is flawed in various ways. One problem is that the aforementioned relationship between bond prices and CDS prices lacks a satisfying justification. Why should it be the case that the bond price and the related CDS price are inversely related? For one thing, if restrictive measures consist in threatening CDS sellers, the supply schedule of CDS will be lower and their price higher than otherwise. If only sellers are threatened, this result will systematically occur. If buyers are threatened too, their demand schedules will also be lower. Depending on the specifics of the case,

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[10] This reconstruction of the argument is such that the above quote from Polleit and Mariano is made compatible with their previously stated rule according to which the lower the CDS premium is, the higher the bond price is. Remember, if the borrowers benefit from the restriction thanks to a higher bond price, this must be because the restriction made the CDS price lower, for the argument to be coherent with the aforementioned rule.

Unfortunately, Polleit and Mariano do not specify what kind of "restrictions" they are writing about. For the above quote to be compatible with their statement regarding the general relationship between CDS and bond prices, it is critically important that the type of restriction involved is the one we present here. Buyers must be the ones who are threatened with punishment so that the threat translates into a lower demand schedule and a lower CDS price. Otherwise, the supply is directly impacted and the relationship may not hold (a lower supply schedule being a factor of increase in the price). Polleit and Mariano would then be caught in a contradiction (see the next section for more details). Moreover, our interpretation is consistent with the authors' focus on demand as far as shifts are concerned.

[11] Polleit and Mariano (2011, pp. 14-15) do not use the term "sovereign credit default swaps" but this is clearly what they allude to when discussing the concerns of governments regarding their capacity to raise funds through debt.

the price will then be higher or lower. Now in all cases of restriction-induced higher CDS prices, would Polleit and Mariano maintain that restrictions on CDS make bond prices higher and refinancing costs lower, thereby negating their previously stated price relationship? Or would they maintain that CDS and bond prices are inversely related, implying that refinancing costs are higher and not lower? In any case, they cannot have it both ways.

In addition, their presentation does not feature demand and supply schedules for the reference bond and their determinants, so it is difficult to guess why the inverse relationship between prices must hold. The CDS price is determined by the demand and supply schedule for protection and a corresponding bond price is then somehow determined.[12] Yet Polleit and Mariano offer no explanation.[13]

Analyzing all the intricacies involved in the relation between CDS markets and their reference bond markets goes beyond the scope of this paper. However, one thing should be clear. Contra Polleit and Mariano, it cannot be the case as a general matter of fact that the existence of CDS markets is detrimental to the bond issuers—quite the contrary. To the extent that investors consider buying bonds and protections against default of the issuers as complementary purchases, their demand schedules for bonds tend to be higher than if they could not thereby "insure" themselves.[14] And a higher demand schedule for a bond implies a tendency for its price and the amount of funds lent to be higher. As Jarrow puts it, "the trading of CDS increases the supply of capital to the primary debt markets, thereby decreasing borrowing rates, and increasing aggregate investment" (2010, p. 11).[15]

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[12] Further, what about the quantity? A lower price can be obtained through an increased supply schedule or a reduced demand schedule. But certainly the quantity sold is not the same in both cases.

[13] It is true that Polleit and Mariano do not merely assert that "The higher (lower) the CDS premium is, the lower (higher) will be the bond price" (2011, p. 7). They immediately add that, "The CDS premium has a direct bearing on bond prices if and when the CDS premia (other things being equal) affect, or determine, the bond prices in the market place." This is hardly helpful though. For this amounts to claiming that "the CDS premium has a direct bearing on bond prices when the CDS premium has a direct bearing on bond prices."

[14] On complementary goods, see Rothbard (2004, pp. 285-287).

[15] Theoretical arguments along this line are often made in the literature. See Durbin (2011, p. 61) and Stulz (2010, p. 75). In contrast, econometric studies tend to give mixed results. See Ashcraft and Santos (2009) and Hirtle (2009). For the argument that

This is an outcome of specialization in uncertainty-bearing. In general, when Mr. A agrees to bear the specific uncertainty involved in some activity that Mr. B, a relatively "risk-averse" person, would have to bear alone otherwise, B will be more eager to participate in this endeavor in other capacities than uncertainty-bearer. For instance, a bond investor bears only the risk of default from the borrower and the risk attached to variations in the price of the bond if it is tradable. The lender deprives himself of possibilities of profits but he also hedges himself against some losses, as opposed to the shareholder who specializes further in uncertainty-bearing. Shielded to some extent from uncertainty, the lender tends to be more eager to advance funds for the productive process than if this channel was not available. In other words, he specializes further in his function of capitalist, which means cheaper and more abundant funds for the borrower.[16]

Now, what do the buyer and seller of a covered CDS do if not shift the risk of default from one to the other? Certainly the outcome is the same, the bond buyers tending to be more eager to buy bonds if complemented by the safety device that a CDS can be. It immediately follows that the existence of a CDS market tends to lower borrowing costs (and/or to improve other terms of lending). A further implication is: if one is allowed to buy sovereign CDS in addition to the corresponding government bonds, the demand schedule and price for these government bonds will tend to be higher than otherwise, to the benefit of the government.

Do Recent Restrictions Nevertheless Vindicate Polleit and Mariano's Thesis?

Polleit and Mariano (2011, pp. 14-15) claim that their view of CDS markets explains why governments are interested in restricting or banning them. For as we have seen, CDS markets permanently exert some "disciplinary pressure" on governments, according to them, and government operatives presumably know this. Polleit and Mariano would have us believe that as a consequence, the German government decided to prohibit naked CDS on Euro zone Government bonds in 2010. There is some *prima facie* plausibility to this scenario, if one finds Polleit and Mariano's theoretical insights convincing. A closer look reveals several problems, however.

First, if their view was shared by regulators, why would they particularly focus on naked CDS? No insight in Polleit and Mariano's thesis suggests

econometrics cannot validate or refute economic theory, see, for instance, Rothbard (1976) and the sources cited there.

[16] For more on specialization in uncertainty-bearing, see Méra (2013).

nakedness makes a qualitative difference for this problem. Second, that governments may be interested in hampering speculation by restricting CDS markets does not automatically mean they consider CDS as a particularly dangerous threat, the better to dispose of (a threat making things worse from a borrower's point of view than without CDS markets; that is, as in Polleit and Mariano's thesis). There could be various rationales for hampering CDS markets, so that the fact that governments do restrict them does not automatically illustrate Polleit and Mariano's thesis.

In that regard, it should be noted that since Polleit and Mariano's article was published, the European Parliament passed a regulation "on short selling and certain aspects of credit default swaps."[17] As its title indicates, the regulation does not single out CDS as a target for restrictions. It is downward speculation on governments' debts in general that the regulators intend to restrict in these times of sovereign debt crisis, as was the case with the German ban. Another motive than the one suggested by Polleit and Mariano might be at work then.[18]

In addition, it is clear in the recent European example that regulators are aware of their interest in keeping CDS markets alive in order to facilitate government funding, a fact which does not fit with Polleit and Mariano's scenario. As Russo (2011) summarizes, "CDS on sovereign debt that do not hedge exposure to the sovereign debt itself or to assets or liabilities whose value is correlated to the value of the sovereign debt will no longer be permitted."[19] However,

> A Member State may temporarily *suspend the ban on uncovered CDS* if it believes the ban causes "tension" in its sovereign markets and/or *increases its cost of funding* and satisfies one or more of the conditions set forth in the Regulation. These *conditions include rising interest rates on the sovereign debt*… (emphasis added)

In other words, the new "ban" recognizes that, in principle, exemption is justifiable whenever prohibition makes the prices and quantities of newly

[17] See European Parliament, European Council (2012).

[18] See Walker and Shah (2010).

[19] Except for "market making" actors and designated primary dealers in sovereign debt. Also, the regulation allows member States to take additional prohibition measures, even for covered sovereign CDS, in case of "a serious threat to financial stability or to market confidence in a Member State." This allowance for additional restrictions is clearly designed for emergency situations and is limited to a three months period.

issued government bonds lower than they could be,[20] which necessarily presupposes that restrictions can have such an impact. It should now be clear that if government operatives had shared Polleit and Mariano's view of the relationship between bond markets and their corresponding CDS markets, they would have had no reason whatsoever to insist on such a provision.[21]

Nevertheless, our own view of CDS favoring government debt does not seem to have much explanatory power regarding the recently established restrictions, except for the fact that regulators have not been eager to go all the way down the slope of full prohibition. To understand what other correct views could have motivated them, further exploration of the economics of CDS are required. This is our task for the next two sections.

Governments' Rationales for Restricting Sovereign CDS Markets: CDS as "Conveyors of Bad News"

It does not follow from our above explanation that governments cannot have any rightly-understood interest in restricting CDS markets at all. For it is true that if investors interpret rising premiums of CDS on these securities as valid new information regarding the likelihood of their issuers' default, they will tend to bid down the prices of these bonds.[22] It is also true that this information is made more readily available through CDS markets to the extent that CDS are more convenient means of expressing one's views on the likelihood of default than speculation in the spot markets, as Polleit and Mariano explain (2011, pp. 13-14).[23] In other words, while the very existence

[20] In addition, Pierre Canfin, the Parliament member who sponsored the regulation, explained at the news conference held after the vote that the European Securities and Markets Authority, which will be in charge of accepting or rejecting the requests from Member States to suspend the ban, "won't have any power to impose its decision"! Instead, "there will be political pressure and there will be judicial pressure if the framework is not respected." See EurActiv with Reuters (2011). As could be expected based on our theory, no genuine European ban seems to have been voted.

[21] Or, at least, they would have had no reason that Polleit and Mariano have identified.

[22] See Bagus (2010) on this and the related hypothetical scenario of a self-reinforcing spiral of distrust and falling prices. This is a common worry. See for instance International Monetary Fund (2013, p. 57)

[23] Their point is that CDS markets require less capital and that bond markets are likely to be less liquid. It seems the authors' economic case for CDS (in their fourth section and conclusion) relies on these considerations. It should be realized, however, that this is a different argument than the one presented in their third section, though they do

of a CDS market tends to favor government debt, as we have argued, it also facilitates speculation against that sovereign debt. CDS can help exert disciplinary pressure "in the short run" while favoring debt "in the long run," so to speak.[24]

There is a rationale for restricting CDS markets then, but it is narrow. For one thing, if CDS tend to favor government debt, the demand schedule for bonds, their price and quantity, albeit falling in these circumstances, are likely to end up at higher levels than they would have absent a CDS market, because they would fall from higher positions. Therefore, even if downward speculation on government bonds is facilitated by CDS, this is not sufficient to demonstrate that CDS are detrimental to the government's interests, not even in these circumstances. The amplification of the downward movement needs to be so sharp that it does more than compensate for the fact that they fall from a higher position, so as to end up at lower positions than would be the case absent a CDS market. In addition, that would be an important but not a permanent concern for enlightened government operatives, relative to circumstances such as the present sovereign debt crisis in Europe. Otherwise, CDS tend to favor government debt.

Insofar as government operatives would rather raise more money than less, they would like to obtain the full benefits of an unhampered CDS market for their bonds without being burdened by the possible threat of increased speculation against them. This is not possible, however. Therefore, well-informed government operatives must face two contradictory incentives. On the one hand they have an interest in restricting CDS-fed downward speculation on their bonds (as well as short selling on the corresponding spot markets), especially if it would make bond prices fall lower than they would absent a CDS market. On the other hand, they have an interest in keeping CDS markets free, to benefit from the advantages they normally provide in

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not make this clear. Here the question is: what is bound to translate a given change in the investors' views regarding the likelihood of default on some bonds into a more drastic variation of their prices, spot market speculation, or CDS market speculation? The answer is, CDS markets speculation. The question is no longer: what difference does it make to bonds prices if CDS markets are restricted or not? This question is more general and does not particularly focus on a change of expectations. In other words, the answer to the new question might help give an answer to the previous general question, but only for a particular set of circumstances. It is certainly problematic on the part of Polleit and Mariano to derive general conclusions from such an answer.

[24] Polleit and Mariano's point is not completely off the mark then.

easing debt financing (not to mention the extra advantage provided in the case of an upward speculation movement). Therefore, they must arbitrate.

Depending on the prevailing circumstances, they are likely to change priorities. The more urgent protection against downward speculation on their bonds becomes, the more they are ready to restrict both the spot and the CDS markets, even if it is detrimental in the long run. A permanent ban on CDS is unlikely though, since the movement to contain by its nature cannot be a permanent phenomenon, and since a genuine ban would sooner or later limit their ability to raise funds through debt. To minimize the disadvantages, the restrictions will typically be partial and temporary. Contrary to Polleit and Mariano's thesis, our explanation accounts for these features of the recent "bans."

Governments' Rationales for Restricting Sovereign CDS Markets: The Trouble with Naked CDS

Another characteristic of recent restrictions that needs to be taken into account is the focus on naked CDS. Why are covered CDS not equally restricted? Polleit and Mariano's thesis cannot offer a compelling explanation because it does not make a qualitative difference in their economic analysis if CDS are covered or naked. If it was true that CDS in general make life more difficult for borrowers, governments would have an incentive to permanently ban sovereign CDS, plain and simple.

It turns out that Polleit and Mariano's conclusions would have been better grounded if they had been applied to naked CDS especially: if they had recognized that naked CDS do make a difference, that is. For there exists a valid rationale for some restriction—valid from the point of view of the borrowers—though its scope is again limited and possibly very narrow.[25] What difference do naked CDS make then, as far as the impact on sovereign debt financing is concerned?

As argued above, the basic reason why CDS favor debt is that they allow would-be bond holders to get rid of the credit risk attached to the bonds insofar as they see CDS and their underliers as complementary goods. Being able to "insure" themselves against credit risk, their demand schedules for bonds tend to be higher. However, this holds strictly true only for

[25] A rationale would be that naked CDS can ease increased speculation against government bonds, as compared to a situation in which only covered CDS trading would be legal. But this comes down to the "information channel" explanation we have just discussed. This is not really another rationale. See the previous section.

covered CDS. By definition, the existence of a naked CDS implies that the underlying bonds were not bought by the "insured" in the first place, or that they have been sold since. In other words, an eagerness to hold a naked CDS position does not go hand in hand with a demand to hold the underlying bonds, or at least, that relationship is not straightforward or direct.

The implications are as follows. First, for some market participants, covered and naked CDS might be substitutes to some extent. Facing the prospects of different payoffs under "naked CDS freedom" than under a "covered CDS only" legislation, people who would otherwise be eager to hold bonds with a CDS protection might take a different course, their demand schedule to hold bonds being consequently lower and their demand schedule for CDS being higher.[26] Second, under total CDS freedom, the market demand schedule (covered plus naked CDS) is likely to be higher than under the "covered CDS only" rule, which is a factor in the increase of CDS prices and quantities.

In each case (and in any combination of both), the consequence is, for a given stock of CDS, that CDS protection for actually held underlying bonds is available in lower quantities at higher prices. Since bonds and covered CDS are complementary goods, this means that the demand schedules for bonds, their prices, quantities, and the amount of funds raised, tend to be lower under total CDS freedom than in a covered-CDS-only regime, for a given quantity of CDS protection.[27]

Now, there is of course no reason to expect the supply of CDS to be the same in both worlds. An increased demand schedule calls for an increased supply schedule, as the use of more resources becomes profitable in that branch. The question is whether the increase of the supply schedule is

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[26] On the other hand, the possibility for the buyer of covered CDS to sell the underlying bonds before maturity without having to unwind his CDS positions—under naked CDS prohibition, he could not get rid of the bonds only, since his covered CDS would then become naked CDS—implies that the bonds tend to be more attractive to him in that regard. This is a factor in increases in the demand schedule for bonds, to the advantage of their issuers.

[27] Not many papers suggest CDS might have a different qualitative effect on borrowing costs whether they are covered or naked, despite the common worry about naked CDS. Exceptions whose conclusions resemble our intermediary result are Che and Sethi (2012) and Darst and Refayet (2013). The latest introduces a model which unambiguously displays covered CDS as a factor of decrease and naked CDS as a factor of increase of costs. The reasoning behind the models in both papers is significantly different from ours though. See also Camera and Capponi (2012).

likely to be high enough to compensate for the adverse effect—from the point of view of the issuers of the underlying bonds—of increased competition on the demand side of the CDS market.

According to Duffie (2010) and Stulz (2010, p. 85), there is little doubt that the volume of transactions made possible thanks to naked CDS trading actually makes covered CDS more affordable in higher quantities, which must make things easier for borrowers. In other words, naked trading would allow for economies of scale in the CDS business so that CDS protection for bondholders would be made more available at cheaper prices, which in turn would boost the demand schedule for bonds.

However, this is an empirical question whose answer depends on contingent circumstances, i.e. technologies available, the relative and absolute sizes of covered and naked demand schedules, etc. It cannot be ruled out *a priori* that with a "covered only" CDS economy, the quantities and prices of the underlying bonds, including government bonds, might be higher, which would favor government funding.

In such a case though, borrowers would still be better off under total CDS freedom (covered and naked CDS allowed) than under strict prohibition, since the demand schedule for bonds would be lower, absent some opportunities to hedge against the related credit risks. In these circumstances, the first-best legal environment, from the point of view of government income maximization, would be a free market in covered CDS and a ban on naked CDS. The second best option would be CDS freedom (covered and naked). And the third-best or worst-case scenario would be a strict ban on CDS contracts.

Our general conclusion that the existence of an unhampered sovereign CDS market favors government debt as compared to a regime of prohibition remains true then.[28] But the possibility that debt financing would be easier with restrictions on naked CDS than under total freedom helps explain why government operatives might be interested in targeting naked CDS for restrictions, although hesitantly.[29] Another major feature of recent restrictions is thus accounted for.

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[28] Except for the special circumstance in which CDS-fed downward speculation on their bonds cancels the benefits for borrowers of an unhampered CDS market. See the previous section on CDS as "conveyors of bad news."

[29] This assumes again that they are aware of this view, or of some other explanation that reaches by and large the same conclusion.

IV. CDS and Fiat Money Regimes

Polleit and Mariano (2011, pp. 12-16) explain that CDS threaten the viability of fiat money regimes in various ways, and here too there must be some disagreements and qualified agreements, given our strictures on the impact of CDS on debt.

Again, since "CDS are an efficient and effective instrument for making a subjectively held view on a borrower's credit quality *tradable*," Polleit and Mariano claim that this "increases the disciplinary pressure on borrowers who are about to build up unsustainable debt levels, to consolidate," so that restrictions "hinder or halt the process of forcing borrowers to consolidate debt levels" (2011, pp. 14-15). This is the thesis that CDS help put a brake on debt accumulation. In addition, "it makes borrowers, who have become financially overstretched, go into default," so that CDS restrictions "hinder the process of forcing borrowers to go into default" and "would only perpetuate a fraudulent fiat money regime."

If Polleit and Mariano were right about CDS permanently putting a brake on debt accumulation, it is difficult to see how this would threaten fiat money regimes. On the contrary, that would be a factor in increasing their "life expectancy," so to speak, if unsustainable indebtedness must be fatal to these regimes. Now, since we have explained above why CDS help debt accumulation "in the long run," we must conclude that collapse is likely to come sooner with unhampered CDS markets than without. In other words, restrictions on CDS put relatively more pressure on borrowers to consolidate debt levels (unless the restrictions are specifically targeted at naked CDS when they ease indebtedness[30]).

For the related thesis that CDS markets precipitate the default of financially overstretched borrowers, Polleit and Mariano provide an explanation of how this relates to restrictions that would perpetuate fiat money regimes: the threat of speeding the process of default under CDS freedom could provoke "government sponsored central banks to take recourse to a policy of high inflation to prevent unduly leveraged borrowers from defaulting" (2011, p. 12). The authors do not further explain but presumably, they suggest that the regime would collapse in hyperinflation. It is possible that the collapse of the regime would be precipitated by large scale

[30] Naked CDS ease indebtedness as long as the increased market demand schedule (covered plus naked) allows for economies of scale in the CDS protection business, which are large enough to overcome the adverse impact for covered CDS buyers of increased competition on the demand side of the market. See the previous section.

money production to prevent massive defaults. But it could be the case, depending on contingent conditions, that such high inflation perpetuates the regime for some time, while it would have collapsed earlier without further fiat money production. All of this depends on the specifics of the case.

One thing is sure however, if our analysis is correct. For CDS to have a short term role in precipitating such a collapse (apart from having helped to build up unsustainable levels of indebtedness in the first place, that is), the downward pressure on bond prices via CDS speculation must be damaging enough that this effect prevails over the opposite permanent or long-run tendency to ease debt financing. One can hardly exclude this possibility. On the one hand, it might be the case, as we have explained, that even with an enhanced speculative downward pressure, borrowers can raise more money than they could, absent a CDS market. On the other hand, this might not be sufficient to raise enough funds to avoid the default of a financially overstretched firm, especially if it falls deeper into this situation in the first place thanks to previously-bought CDS.

Again, this is an empirical question whose answer depends on the specifics of the case. Nevertheless, this provides a clue as to why governments could be interested in temporarily restricting the CDS markets (as well as the short selling of the corresponding underliers) which affect the prices of bonds issued by key systemic risk companies, in addition to sovereign CDS markets.

V. Conclusion

We have now shown that CDS are licit and enforceable contracts under Rothbard's property rights and contract theories. Though we share Polleit and Mariano's conclusion in this regard, the proper way to deduce it was explained in this paper.

On the entirely different question of CDS narrowing or relaxing the limits on government accumulation of debts, we have largely parted ways with Polleit and Mariano, for it was explained that CDS normally help the issuers of the reference bonds get more abundant funds at better prices than would be the case absent any CDS market.

Nonetheless, we have explained that it is conceivable, under special circumstances such as the present sovereign debt crisis in Europe, that increased speculation through sovereign CDS markets could indirectly make government bonds' prices and quantities fall at lower levels than they would, absent CDS markets. Polleit and Mariano are then partially right that CDS put some disciplinary pressure on borrowers. The problem is that they see

only that effect while ignoring the specific circumstances which are required for it to overcome the opposite permanent tendency.

In addition, we have analytically disentangled the covered and naked components of a CDS demand schedule, explained their relationship with the underlying bond demand schedule, and pointed out that, as compared to a covered-CDS-only economy, naked CDS trading implies increased competition on the demand side of CDS markets. This is a factor in the increase of CDS prices and a factor in the decrease of covered CDS quantities. The demand schedule for the complementary bonds must then decrease, which makes things more difficult for borrowers, unless the extra size of the CDS market with naked instruments allows for some sufficient economies of scale.

These explanations put us in a position to provide a better account of the features of the present EU "ban" than the one found in Polleit and Mariano's analysis. For while these authors suggest that governments have an incentive to ban sovereign CDS plain and simple, we have shown why governments had reasons to act as they did. Namely, governments did not permanently but temporarily and partially restrict the market, focusing on naked CDS instead of CDS in general, restricted the related spot markets as well, and agreed on provisions to authorize trading again whenever it is felt that restrictions have an adverse effect on sovereign debt financing.

On the question of the impact of CDS markets on the sustainability of fiat money regimes, we must conclude with Polleit and Mariano that unhampered CDS markets are bound to shorten the life expectancy of a fiat money regime, as compared to a regime of CDS prohibition. However, this is not because they would help provide "healthy" checks on indebtedness in the present system, but because they exacerbate the tendency toward accumulation of debts which should ultimately lead to system collapse.

Finally, there is at least one more way the existence of a fiat money regime is put at greater risk through the use of CDS. A thorough explanation requires going beyond the limited scope of this paper. However, the outline of the argument runs as follows: it is a well known fact that, under current Basel regulatory arrangements,[31] CDS can be and have been used for regulatory arbitrage purposes, specifically to lower the minimum equity ratios of banks accepted by the regulators.[32] Since these ratios are limitations on

[31] See Basel Committee on Banking Supervision (2006).

[32] It is noticeable that this use seems to have been at the heart of the matter since the beginning. According to journalist Gillian Tett (2009), it was indeed one of the main

bank credit expansion, this use of CDS helps relax the limitations on fiat money production whenever regulatory reserve ratios are not a more effective limitation.[33] Again, this does not help advance the economic case for CDS, unless one's goal is to drive the present regime toward catastrophe as quickly as possible.

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motives for the development and industrialization of such financial products at J.P. Morgan in the mid-90s. A good review of this book, focusing on the origin of CDS, was written by John Lanchester for *The New Yorker* (June 1, 2009). Another promising field of inquiry is "creative accounting" with CDS to record fake profits which in turn might serve as a basis for further monetary expansion. See Dowd, Hutchinson, and Kerr (2012) and Kerr (2011). I am indebted to Sam Bowman for this last reference.

[33] This is clearly the case in the United Kingdom, since there is no legal reserve requirement there.

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