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CITYPERC  
City Political Economy Research Centre  
Department of International Politics  
City University London  
Northampton Square  
London EC1V 0HB  
Contact: [cityperc@city.ac.uk](mailto:cityperc@city.ac.uk)

# Financial Fragility in the Current European crisis.

Domenica Tropeano\*

## Abstract

*The paper argues that the European financial system in the years following the great financial crisis started in 2007 has become increasingly fragile. Minsky's notion of fragility, on which it is based, is related to history, policy and institutions. In the current European environment, fragility depends on the rise of shadow banks' assets, the expansion of derivatives and the changes in financial regulation. All these elements have jointly triggered several feedback loops. In Minsky's opinion, policies should have the scope of thwarting self-enforcing feedback loops. Yet the policies that have been implemented so far seem to have produced the opposite effects. They have created new feedback loops that nurture fragility again. This outcome, however, is not surprising for policies may change initial conditions and have unintended consequences, as Minsky has taught us since a long time.*

JEL classifications: E12, G21, G23, G38, F36.

Keywords: financial fragility, Minsky, European financial system, feedback loops, regulation, thwarting policies.

## 1 Introduction

The paper argues that the European financial system in the years following the great financial crisis started in 2007 has become increasingly fragile. The reasons that have led to that situation are different from those commonly mentioned as causes of the big crisis itself; they are grounded in the evolution of the system after the crisis and intertwined with the interventions aimed at improving financial stability. The notion of fragility used throughout the paper is linked to Minsky's, so is multifaceted. He asserted that fragility has systemic properties. Therefore, to establish how fragile a financial system is, it is necessary to study the evolution of both its structure and its institutions. Studying fragility requires looking at several dimensions; relying on simple metrics like the ratios of debt to equity and debt to total assets may be misleading.

The financial system before the crisis did not show any sign of a qualitative transformation towards a more unstable structure except for its international expansion. Firms and households had not changed their financing patterns and the pace of financial innovation was quite moderate in comparison to other areas of the world. The weight of shadow bank assets over total financial assets was negligible except for some particular countries like the UK and Luxembourg and even derivatives trading volume was not high. This notwithstanding, the European financial system was severely hit by the global financial crisis as the data on the cost of bank restructuring show. Now we have entered

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\* Domenica Tropeano, Dipartimento di Economia e Diritto, Via Crescimbeni 20, 62100 Macerata (Italy), email: [tropeano@unimc.it](mailto:tropeano@unimc.it). I thank Gary Dymksi and other participants to the PostKeynesian Conference in Dijon in December 2012 and to the Conference, Shadow Banking: a European Perspective in London 1-2 Februar 2013 for helpful comments.

in a phase called of deleveraging. Banks are engaged in shedding away assets and are shrinking. This is seen in the data on deleveraging. That deleveraging has mainly consisted of shedding cross border assets. In the last year cross border flows have fallen by many hundreds of billions dollars. Thus, since both the size of the banking system and its spatial interconnections have declined, the financial system should have become more resilient to crises. However, some troubling signs of increased fragility in the financial structure have recently emerged. The assets of the shadow banks have increased in comparison to the pre-financial crisis period, derivatives have been traded in new platforms, and new derivatives products have been launched. Probably, an incentive to all this has come from changes in regulation either implemented or announced, such as Basel III capital charges, the lack of restriction to proprietary trading, consolidation rules that differ across jurisdictions.

The structure of the paper is the following. The first section deals with the definition of financial fragility in Minsky, the second describes the state of the financial system in Europe before the global financial crisis and the third its evolution after the GFC. The fourth section explains why financial fragility has been rising in Europe during the current crisis until now; it argues that the interplay among shadow banking, derivatives expansion and regulation has created various feedback loops. The changes in policy that have been realized or announced have nurtured those feedback loops thus missing the main goal of thwarting the forces that lead away from equilibrium. In Minsky's view, as we shall see, policy should act as a thwarting force that hinders the explosion of the system. In the language of cybernetics, policy should reset the system. The conclusions will follow.

## **2 Financial fragility and financial structure in Minsky.**

Minsky's starting point is the instability of the economic system. In particular, he asks within which range of values or within which interval one can be confident that the system will go back to the original or the new equilibrium position after a disturbance. As Vercelli (2001) has noticed, this notion of stability is not simply dynamic but structural.<sup>1</sup> This means that parameters matter and if parameters tend to increase or decrease excessively the return to equilibrium never happens. This is also clear in the following sentence:

“We are discussing a system that is not globally stable. The economy is best analysed by assuming that exist more than one stable equilibrium for the system. We are interested in the determinants of the domain of stability around the various stable equilibriums. Our questions are of the form. What is the maximum displacement that can take place and still have the system return to a particular initial equilibrium point’ and “ Upon what does this maximum displacement depend?” (Minsky 1982 p.143)

The maximum displacement depends indeed upon the financial structure and linkages between the financial structure and real income (see Minsky 1982, p.143). Therefore, a certain type of financial structure may be responsible for the instability of the system. In fact he adds, “For not unusual events to trigger the unusual, the financial environment within which the potential triggering event occurs must have a sufficiently small domain of

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<sup>1</sup> Vercelli (2001) defines dynamic and structural instability (see also Tropeano 2010). Dynamic instability means that a system, after a disturbance, which will bring it beyond its equilibrium position, will tend either to go back to the initial point again or to reach another equilibrium configuration. Structural instability means that a small disturbance, even a very small one, may change the qualitative characteristics of the system's dynamic behavior (see Vercelli 2001).

stability.” The main determinants of the domain of stability are, according to Minsky, the extent to which a close articulation exists between the contractual and the customary cash flows from a unit and its various cash receipts and the weight in portfolio of those assets that in almost all circumstances can be sold at their book or face value.

He defined two aspects of the financial turmoil, the first is microeconomic and the second is, macroeconomic. Answers must be given to the questions: “how units get in distress ? “ and “how the problems of single economic units trigger a system wide crisis?”. He does not believe that macroeconomic entities are made up of a collection of microeconomic units. Therefore, it is not possible to find solutions for aggregate disturbances by addressing the problems of the single units in distress. The reason is that financial instability is a system characteristic.

“Financial instability as a system characteristic is compounded of two elements. How are units placed in financial distress and how does unit distress escalate into a system wide crisis?” ( Minsky, 1982, p.145)

In trying to explain the systemic element of the crisis, Minsky stresses the importance of the layering of financial relations:

“The layering of financial interrelations affects the total payments that must be made. To the extent that layering increases at a faster rate than income, over a prolonged boom, the payments/income ratio will rise. The closer the articulation by consumers and business firms of income receipts with payments due to financial contracts, the greater the potential for a financial crisis.”

“Each money payment is a money receipt. As layering increases, the importance of the uninterrupted flow of receipts increases. The inability of one unit to meet its payment commitments affects the ability of the would-be recipient unit to meet its payment commitments.” (Minsky, 1982,p.147.)

Minsky asserts that, in order to foresee the consequences of monetary policy, a good knowledge of the financial structure is required. However, after certain monetary measures have been implemented, it is likely that the financial structure itself changes; in fact, banks behave as any business enterprises and try to exploit the new profit opportunities that arise after the change in policy. In that way the effects of the measures that were thought under the assumption of an existing financial structure may be different from those previously foreseen. An example for this is the reaction of banks to the attempt by the Fed to contract the supply of credit by raising interest rates. He warned then of the danger linked to the evolution of the non-banking sector and of the problems that this could pose to the working of monetary policy.

“Hence the efficacy of any particular technique of monetary policy depends on the financial institutions and usages that exist. If financial institutions do not change significantly, then, once the efficacy of the various central bank operations is established, financial institutions can be ignored in discussions of monetary policy. However, if a period of rapid changes in the structure or in the mode of functioning of financial markets occurs, then the efficacy of central bank actions has to be re-examined.”(Minsky, 1982, p. 162)

Minsky also discusses the difference between changes in legislation and changes in the evolution of usages in the money market:

“Changes in financial institutions and money-market usages are the result of either legislation or evolution. Legislated changes typically are the result of some real or imagined malfunctioning of the monetary-financial system and hence they usually are accompanied by discussions of their impact. Evolutionary changes occur typically in response to some profit possibilities, which exist in the money

market. As the evolved changes often center around some technical detail of the money-market behaviour and as they usually start on a small scale, their significance for monetary policy is generally ignored at the time they first occur. Only if, at a later date, some malfunctioning of the financial system is imputed to such an evolved money-market institution, will it be discussed, and then the discussion usually occurs as a prelude to corrective legislation.” (Minsky 1982, p.162-3)

The instability of the system is linked to parameters shifts that depend on institutional evolution.

“Essentially, the relations upon which the monetary authorities base their operations are predicated upon the assumption that a given set of institutions and usages exists. If the operations of the authorities have side effects in that they induce changes in financial institutions and usages, then the relations “shift”. As a result, the effects of monetary policy can be very different from those desired.” (Minsky 1982, p.163)

The point raised in the last quotation has been further developed in another paper (see Ferri and Minsky 1991). They argued that the economic system, if left to market forces, would experience an endogenous tendency towards instability. If everyone acts in his /her own interest, it will not bring the economy as a whole to its optimum position. The pursuit of maximum profit by each agent will lead to macroeconomic instability. They claim to have discovered an Anti-Laissez Faire theorem. Economic policy has to put ceilings and floors to the economic fluctuations that occur because of individualistic profit-seeking behaviour.

Economic policy may be any type of policy rather than just the monetary or fiscal policies of the neoclassical synthesis. However, the inclusion of economic policy into the picture is not mechanical. They warned that economic policy depends upon the environment in which is implemented and upon the economic agents’ reactions to it. Policies that in the past have thwarted the instability properties of the laissez faire system could lose their beneficial role after a while if, in the meantime, circumstances have changed. Examples taken from different scenarios are used to corroborate that thesis.

“The thwarting forces change in time. They differ among economic systems. The thwarting systems are analogous to homeostatic mechanisms which may prevent a system from exploding. However, they are not mechanical. Policy makers and law makers need to interpret what is happening and need to understand how their actions can affect the behaviour of endogenous agents and thus the economy.” (Ferri and Minsky 1991 p.12)

The thwarting mechanisms that are listed and used as examples are the Piore-Sabel conjecture with respect to labour markets in the Us in the post war period, the uses of market power, and lender of last resort interventions by the central bank.

In this paper, these insights by Minsky will be applied to the present situation of the European financial system. While shadow banking in Europe before the global financial crisis was limited to the offshore and cross border activities of European banks, in the meantime, after the global financial crisis, the measures intended to make the system more stable have themselves caused a transformation that might increase the financial fragility. This has happened because of the tighter inter-relations between units due to the increased weight of derivatives-linked contracts. I am also arguing that in the new environment, traditional monetary policy measures may have counterintuitive effects.

### **3 Evolution of the financial structure in the European Union before the global financial crisis.**

The purpose of this section is to give a hint at how the European financial system has evolved before the global financial crisis. Scholarly debates on bank versus market based financial systems are focussed on whether the US system could still be described as a market based system and how it has changed in the last decade. Similarly, it could be asked whether the European financial system is still a bank-based system. Schmidt, Hackethal, Tyrell, (1999) have shown, that the financial systems of Great Britain, France and Germany had become less bank based than in the past. This phenomenon, however, took different shapes in each country. They have observed that French and German banks were increasingly disintermediated on the side of their liabilities; in fact, an increasing share of non-financial sectors assets was no more held as deposits in banks. Yet these financial systems were not moving towards a model, in which the capital market is as important as in Anglo-Saxon countries; what has happened is just that the role of banks as mobilizers of deposits has declined. On the liabilities side of their balance sheets the banks have increasingly more securities and other assets that must be sold on the market. Thus, they do depend on market conditions to finance themselves. This is more evident for the French financial system than for the German one. The disintermediation of banks goes hand in hand with the securitization process. Further, they observe that banks derive a greater part of their income from trading activities rather than from the margin of intermediation.

The US financial system too has passed through various stages of transformation in the last two decades. Banks have been heavily disintermediated on the side of both assets and liabilities. Many new non-bank financial institutions have arisen whose share of assets over the total has been continuously increasing. They were offering different products but had as common feature the need for financing themselves on the market, often through the issue of short term paper (See Poznar *et al.* 2010). Non-financial corporations have become net creditors rather than debtors, so they do not issue securities in the market any more to finance themselves. The same stock exchange has declined in importance as most exchanges are not carried out any more in public markets. Investors are increasingly channelling their funds to enterprises through hedge funds, mutual funds, private equity funds and the majority of these new institutions do not pass through the stock exchange. The European financial system then may be converging towards the most recent version of the Anglo-Saxon system rather than towards its classic model.

This notwithstanding, it is difficult to deny that banks in Europe are still the most important actors in the financial system. This is confirmed by the most recent data by the ECB report on Banking structures on the assets of banks relatively to those of non-bank financial institutions and by the ratio of bank assets to the gross domestic product of the euro area. Their assets on average are 75% of financial institutions assets' of the Eurozone. The corresponding figure for US banks in 2008 is 25% (see Nersiyasan and Wray 2010, Figure 3, p.8). The importance of banks is also witnessed by the growing ratio of their assets to gross domestic product in the euro area and in the European Union.

Table 1 below shows data on the debt of the main institutional sectors, households, the state, non-financial corporations respectively In the E.U. and in the U.S..

Table 1: Assets and liabilities of non-financial corporations and households in the US and in Eu.

Institutional sector	assets	liabilities
Households EU	Assets/households gross disposable income 299.8	Debt/gross disposable income 97.4
Nonfinancial corporations EU	Assets/GDP 182.9	Debt/GDP 118.3
State EU		Debt/GDP 79.1
Households US	Assets/households gross disposable income 399.9	Debt/gross disposable income 122.9
Nonfancial corporations US	Assets/GDP 118.3	Debt/GDP 77.2
State US		Debt/GDP 68.6

Source: Ecb Economics Statistics Pocket April 2011 (the data in the table are those of 2009).

We see that the ratio of the debt of non-financial corporations to GDP in the euro area is higher than that of U.S. non financial corporations. The same holds for the ratio of the assets of non financial corporations to gap. The net worth, that is the balance between assets and liabilities, is higher too. This however, does not justify any optimism on the financial health of the European business sector, as growing net worth may be compatible with growing financial fragility in presence of capital asset inflation (see Tymoigne 2011). The high indebtedness of households and firms confirms the growing relevance of banks in the financial system since most of these liabilities of the private sector are held towards banks. The banks so have increased their claims on the private sector. On other hand, also non financial corporations have continued to accumulate both liabilities and assets. Their dependence on banks for the financing of accumulation has not ceased. They have just raised much more funds than those needed to finance a very modest accumulation rate (investment is just 10% of gdp). The most probable thing is that they have raised loans to finance speculative asset purchases profiting from the increasing stock prices in the years before the financial crisis. In fact, both their asset and liabilities holdings show a marked increase in the period 2005-2007. Hartmann, Maddaloni and Manganelli (2003) argue that in terms of non financial corporations financing there has been no structural break with the past (see Hartmann et al. p.14). The same seems to hold at the time of writing too. The main break with the past is the extent to which those assets and liabilities are being accumulated beyond the amount needed to finance real investment.



So far, it does not seem that the financial system in Europe has changed a lot except for the unprecedented expansion of the assets of banks with respect to GDP and of the debts of households and non-financial corporations. The only feature of the current evolution of banks that could justify the claim of a convergence towards an Anglo-Saxon type of financial system is the growing ratio of securities over total liabilities in their balance sheets. This is reflected in their growing use of market instruments to finance themselves particularly the issue of bonds. This tendency, however, does not occur with the same strength in all countries. (see Schmidt, Hackethal and Tyrell 1999, Hartmann, Manganello and Maddaloni 2003). There has been also an increase in interbank cross border loans. Most banks in core countries have lent to banks in peripheral countries.

#### **4 The evolution of the European financial system through the global financial crisis.**

The European banking system contributed through its shadow banks, special investment vehicles and the like, to the credit intermediation process in the U.S.. As scholars of shadow banking in the U.S. have explained, this section of the financial sector actually fulfils the same functions as the banking system, as it performs maturity, credit and liquidity transformations. The shadow banks linked to European institutions were contributing to the supply of credit in the U.S. by raising short-term money in dollar and then investing it in the purchase of all products linked to the securitization of mortgages. The burst of the bubble in the U.S. meant that they have to repay their loans and could not sell their assets because the markets had disappeared. They needed to repay debts denominated in dollars and thus the dollar shortage emerged. The problem with dollars was solved by the intervention of the Federal Reserve, which was channelling to Europe through the ECB about seventy billions of dollars in 2008-09. Thus, the European shadow banking contributed to the excessive credit expansion in the US; In Europe too in some countries the rate of growth of credit was excessive, for example in Spain and Ireland, but credit intermediation was conducted along traditional methods. The shadow banking in the US contributed to the expansion of the credit supply in Europe too in so far as money market mutual funds purchased bonds issued by European banks. Both these links were being cut in the period after the great financial crisis. This is witnessed by the official figures on the fall in foreign banks' assets in the US. Shadow banking and all the activities associated to it has not been very important for credit intermediation in Europe. That notwithstanding the big financial crisis hit heavily the European banking system because of its international expansion. The volumes of securitized assets and derivatives traded in the European markets were quite limited before the global financial crisis. After the global financial crisis and the deleveraging by European banks (see Bis 2012, Molleker 2012) shadow banks' assets have increased relatively to those of banks (see FSB 2012 Exhibit 2-4 p.15). In the US, instead, the growth of shadow banking stems from the competition between banks and non-banks on both the liabilities and the assets side. Banks suffered from the competition by non-banks because the latter were allowed to offer higher interest rates on deposits-like assets. Banks were obliged by regulation Q to offer fixed low interest rates on deposits (see Rezende 2011, Kregel 2010). Thus in order to help them compete they were allowed to develop new products, mainly securities, on which regulation Q did not apply, and then slowly the Glass-Steagall Act was abolished. In Europe, there has been competition between banks and non-banks on the liabilities side but not on the

assets side.<sup>2</sup> In this regard, we cannot assume that shadow banking has had an active role in the credit intermediation process neither in the past nor in the present. The definition of shadow banking Pozsar et al. (2010) have used does not fit well in the European environment.<sup>3</sup> Thus, banks did not enter into shadow activities because suffered from an increased competition in the domestic loans market. They just wished to increase their return on equity, to distribute higher dividends and to pay higher bonuses to managers. Shadow banking in Europe arises from the imitation of an Us style of capitalism, there is no endogenous evolution of the market on the demand side. No big change in the demand for loans has happened anywhere. There has been a fall in the demand for deposits everywhere but with different intensity. It is however doubtful whether this fall could be related to a change in tastes and preferences by final consumers. Often, they did not decide freely to demand certain financial assets that replaced deposits; they were compelled to do so by pensions and health care entitlements reforms. This is no spontaneous evolution of the market on the demand side but it is the result of political decisions.<sup>4</sup>

## **5 The increase in fragility due to closer inter-relations: the role of shadow banking, derivatives and regulation.**

The purpose of this section is explaining how the financial fragility has increased despite the fact that the indebtedness of individual financial institutions has decreased.<sup>5</sup> The fragility of the financial system, as defined by Minsky (see section 1), may either increase or decrease when its size is reduced. Financial fragility for Minsky has to be measured with

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<sup>2</sup> There has been a proposal to split the financial system in two parts. The first would consist of narrow banks that would have only safe assets on their balance sheets and would enjoy both liquidity and solvency support by the state, the second of lending institutions that would finance themselves on the market without any state backing (see Kregel 2010). If that proposal were realized, a line would be traced between institutions that accept deposits but do not lend and institutions that do lend but are not allowed to accept deposits. This separation would not fit well in with the historical development of European banking. Banks in Europe have never given up the lending neither have they been challenged in this task by strong competitors.

<sup>3</sup> Pozsar et al. (2010) argue that shadow banks fulfill the same functions as banks, despite not having access to the liquidity provided by the central bank. They perform maturity, credit and liquidity transformations. In the U.S., shadow banks were financing themselves in the wholesale market by issuing short-term debt and then were buying long-term assets such as securitized mortgages. In Europe, even if, in some countries there was an excessive expansion of mortgage or consumer debt, it was just an excessive expansion of traditional bank credit. Corporations and small firms were still relying on bank debt to finance both their capital investment and their acquisitions of financial assets. The discussion on the difficulty of coming back to Glass-Steagall because going back would mean depriving the banks of profits and making them less competitive with respect to the rest of the system does not apply to Europe. In some countries, the separation between retail and investment banking has never been realized (see the case of Germany). In other countries, banks have learnt to profit from securities trading by selling investment fund shares and pension funds products to their depositors (see the case of Italy).

<sup>4</sup> Mehrling's definition of shadow banking activity as "acquisition of capital market assets financed through money market funding" does not apply to the European banks that use money market funding to finance loans. It applies instead to their trading desks activities and in particular to the activity of their foreign subsidiaries and branches.

<sup>5</sup> There is a wide recognition of the process of deleveraging occurring in the European banking system, see The Economist 2012, Pühr et al.2012.

flow variables rather than stocks. This point was emphasized by Tymoigne (2011) and Dymski (2010)<sup>6</sup>.

In fact, the process of debt reduction was associated with increased layering due to the greater weight of derivatives in the portfolios (see Mediobanca 2012). The range of stability of the financial system, as defined by Minsky, has narrowed. The connection between cash flows in and out is so increased. The growing use of derivatives by the European financial institutions has several causes. Among these are the volatility in the financial markets following the crisis of sovereign debt, uncertainty, changes in financial regulation (see Alloway 2012, Murphy 2012, Pollack 2012 and Tropeano 2011). Changes in financial regulation, executed or only announced, contributed to the development of some feedback mechanisms that once triggered automatically loop. The new version of the regulation of capital requirements for banks prepared by the Basel Committee and commonly known as Basel III still encourages the use of derivatives as a means to save capital. If the banks that have risky assets in their portfolio buy a credit default swap, they are compensated with discounts on regulatory capital. The increase in demand for protection has been followed by a corresponding increase in the supply of new products in the European financial markets that securitize existing loans of any issuer by using the same packaging method that was used in the U.S. to securitize housing loans. Further financial institutions have shown their interest to enlarge their derivatives trading platforms and to open new ones. The derivatives market Eurex managed by the Deutsche Börse has become the second biggest market in the world only slightly smaller than the one managed by the New York Stock Exchange (NYSE). The attempt by Deutsche Börse to buy the NYSE in order to build up the biggest derivatives market in the world has been stopped by the European authorities because it would have created a huge monopoly in that trading activity. This increase in the volume of trading has induced an U.S. institution leader in derivatives trading, the Chicago Mercantile Exchange CME, to make plans to expand into the London financial centre (see Il Sole 24 Ore, 2012).

Several feedback mechanisms are at work. The simplest has at its center the uncertainty. This mechanism has been unraveled in particular in the market for public debt. The increased demand for protection against default causes an increase in its price, the credit default premium. As this is seen as a sign of increased probability of default, the price of bonds falls and their yield rises. Uncertainty makes profitable speculative activities. This is exacerbated by the fact that all operators use models that define risk as depending upon volatility. If volatility rises, speculation is more profitable and the demand for protection rises too in a self-enforcing loop. In the market for sovereign bonds in the Eurozone such a feedback was based on the positive differential between CDS premium and bond yields spreads of the peripheral Eurozone countries bonds. Many empirical studies have found that the CDS premium increases first and the bond yield follows (see f.e. Coudert V. and Gex M. 2010, Arce, Ó., Mayordomo, S. and Peña, J. I., 2012). Coudert and Gex (2010) argue that, undoubtedly, the CDS premium leads the bond yield in the case of Southern European bonds markets while the same does not hold for core European countries low yield public bonds. Their interpretation of these findings is that the price discovery process in the market for Southern European bonds happens in the CDS market while in the core European countries it happens in the spot market. That Cds market leads the bonds market in a section of countries – the authors write -- is puzzling because the latter is

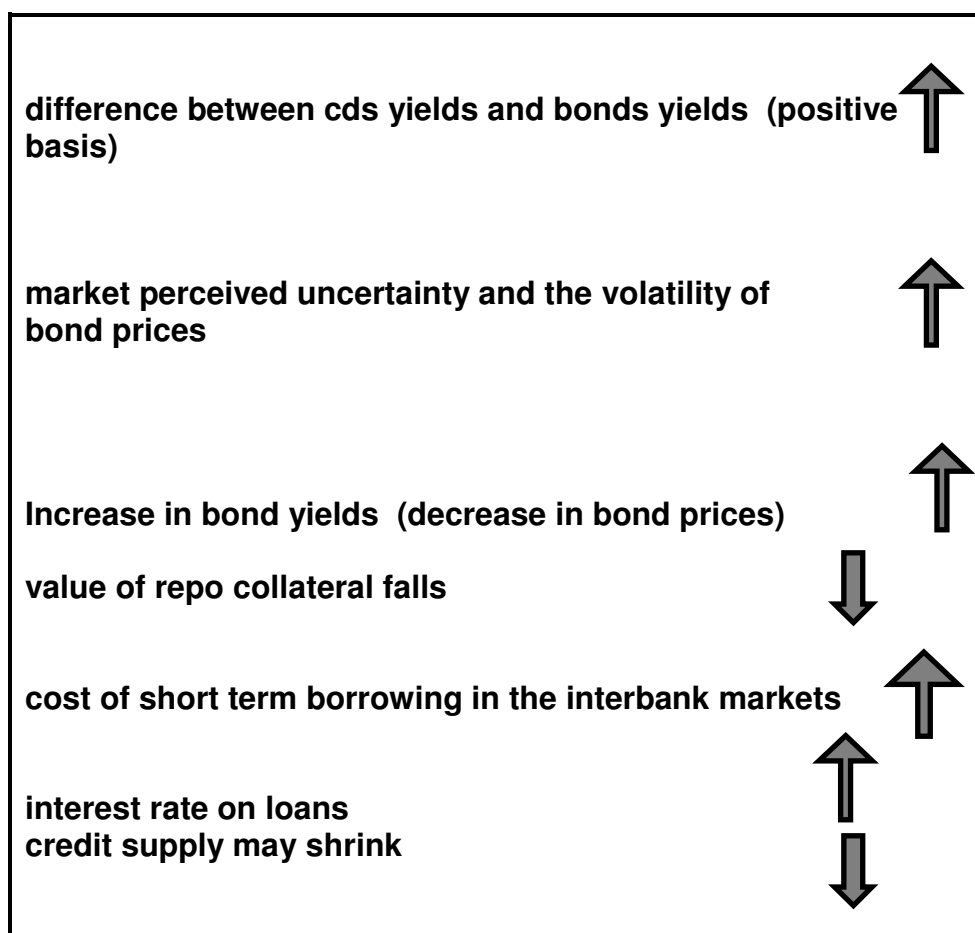
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<sup>6</sup> Dymski (2010) writes: "What remains invisible in Minsky's rendition of his model is his assumption that loan commitments become unsustainable because they generate negative cash-flows (they represent Ponzi finance, in his terminology), not because of the insolvency of the units involved." p.240.

much less liquid than the former. They had found the opposite in the Cds spread with respect to the bond spread in the market for corporate bonds and had justified that result with the observation that the cds market is more liquid than the bonds market.

If the feedback loop explanation matters, then it does not make sense to speak of price discovery process by the market for CDS. The cds market is not discovering earlier than the spot market the right price based on fundamentals but it is making it. The spot market will follow. Once the high yield on bonds has worsened the macroeconomic situation in southern countries, then fundamentals will adapt themselves to the new, previously determined in derivatives market, price. The process may take different routes. Surely, the increase in interest payments decreases domestic aggregate demand and gross national product thus increasing the debt to gdp ratio. Moreover, since bonds are used in repo funding between banks, the fall in the value of repos will cause liquidity problems and probably credit contractions or higher interest rates for clients.

*Table 2. Feedback loops*



In the European financial crisis, the public bonds of peripheral states used as collateral in repo transactions have the same role as, in the Us crisis, the ABS used as collateral in repo. The fall in the value of peripheral countries state bonds has caused the freezing of the European interbank market just as the distrust towards toxic bonds had caused the freezing of the U.S. market for short-term borrowing among financial institutions. The Federal Reserve, however, has bought the assets that were no more accepted as

collateral and swapped them with safe Treasuries by introducing new facilities directed to the shadow banks. On the contrary, the ECB was not allowed to buy public bonds in the primary market and has bought them in the secondary market only intermittently in the middle of a debate on whether this policy should be continued. Thus, the ECB has not succeeded so far in easing the safe collateral problem.

Another feedback loop is created by the interaction between the demand for IRS (interest rate swaps) and the demand for CDS (credit default swaps). This feedback loop is an example of how the expansion of the derivatives and the change in the regulation interact in increasing financial layering. There is a rule that obliges institutions that deal with derivatives to protect themselves with CDS when the counterparty does not post collateral (see Murphy 2012). So all derivatives trades involving sovereigns as counterparty automatically make the demand for CDS increase. Interest rate swaps by used by public debt management agencies for various reasons.<sup>7</sup> If the sovereigns do not post collateral, as is usual, their counterparties must hedge their positions by buying CDS, which in turn increases the premium on the CDS and via the uncertainty channel increases the bond rate too. On the other hand, if bond yield volatility increases, then the people will be more inclined to use the derivatives market for protection and so the demand for IRS rises again. The rising demand for CDS makes the demand for IRS increase and then the circle repeats itself without resting. To the extent that the markets for IRS and CDS have increased their traded volumes,<sup>8</sup> it is logical to argue that layering and interconnectedness have increased.

Another channel, through which the use of derivatives may contribute to fragility, is through liquidity problems on the balance sheets of financial institutions. Higher collateral charges, due to changes in the market valuation of derivatives, can cause unexpected outflows and turn speculative units into Ponzi. Changes in the valuations of derivatives may cause, in a mark to market to the market environment, liquidity pressures and in some case initiate a spreading of sales to get liquidity. Thus, the ratio of expected inflows to expected outflows may be heavily affected by the composition of the balance sheets. That regulation has also contributed to the safe collateral crunch and has made the yield of good collateral plunge to negative values in real terms. The specular side of that is the higher yield of the collateral considered unsafe. If this distinction is based on country risk rather than individual institutions' solvency estimates this means an enormous increase in the cost of financing and decrease in the availability of credit to firms and banks of the countries considered less safe.

Changes in the value of derivatives, due to mark-to-the-market accounting, may act in the same way as interest changes in Minsky's original formulation of the financial fragility hypothesis. Outflows may rise not only because a higher interest on debt is to be paid, but also because of changes in the valuation of assets or in the liquidity requirements of holding certain types of assets. The Basel III draft introduces two metrics linked to liquidity, the liquidity coverage ratio LCR, and the stable funding ratio SFR (see Tropeano 2011). Some recent episodes of financial distress confirm the view that the changes in the valuation of derivatives may cause serious liquidity problems to banks. For example, a too

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<sup>7</sup> According to Piga (2001), public debt managers have used interest rate swaps as a means to save interest costs and to change the duration of their portfolio. For example, they would prefer to issue long-term bonds and then use the swap to pay the short-term interest rate on them rather than the long-term interest on the bonds. He argues that public debt managers in most cases were variable rate payers in the swaps. He further warns that, by entering into the swaps, they have become exposed to both credit and counterparty risk.

<sup>8</sup> For the data see Bank for International Settlements, 2012.

big to fail bank, Dexia, has been jointly saved for the second time in three years by the government of France, Belgium and Luxembourg because of the losses in its portfolio of sovereign bonds reinforced rather than mitigated by its derivative positions. Dexia was losing both on the bonds portfolio and on the interest swap position allegedly built to protect the same portfolio <sup>9</sup>:

“Dexia's derivative positions put even more pressure on short-term funding. Dexia was long fixed rate assets and hedged its positions using interest rate swaps. Between June and September 2011, Dexia had to post EUR 15 billion cash collateral due the fall in interest rates.” (Acharya and Steffen 2012, p.17)

Acharya and Steffen (2012) argue that the case of Dexia is not an isolated phenomenon. Many European banks, they write, would have used the same carry trade in governments bonds to boost profits and similarly incurred in losses on their derivatives positions and in the necessity to restore impaired capital.<sup>10</sup> This point is confirmed by recent events. The fall in the Euribor rate during the year 2012 would have caused a worsening of the already low profitability of MPS bank's trading book, according to an interview given by its CEO to an Italian newspaper (see Greco 2013).

In the case of Dexia and Monte dei Paschi, the fall in the value of interest rate swaps for the buyers has caused liquidity pressures on banks' balance sheets, has made capital scarce and may have contributed to the credit crunch. In particular, lower interest rates may cause problems to financial firms that have on their balance sheets a high share of interest rate swaps and that pay fixed, being the fixed leg of the swap much higher than the current interest rate. In that case, losses in the valuation of derivatives could increase the need for capital. This would be particularly worrying for European periphery banking institutions that in any case would require more capital to write off bad loans. The percentage of bad loans in the periphery has greatly increased because of the fiscal retrenchment and its repercussions through the multiplier on aggregate demand.

Thus, the effects of economic policy, as Minsky repeatedly asserted, heavily depend on the structure of the financial system. Assume, for example, that many economic units in the financial system have a high share of interest rate swaps in their portfolio and are the fixed rate payers. In that case, a fall in the interest rate (f.e. Euribor) on which the floating rate payment is based would inflict a loss to their derivatives position without any improvement in the bonds portfolio. In such an environment, a lower interest rate could trigger a liquidity shortfall and cause a debt deflation process, if no other policy measures had been taken. In the current European crisis the European Central Bank has introduced

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<sup>9</sup> A fixed interest swap in its simplest form may be used to protect the value of a bond portfolio. In that case, the investor that is long on the bonds is supposed to buy an interest rate swap and to pay a fixed rate while the counterparty to the deal, the seller of the swap, will commit itself to paying a floating rate. The floating rate is linked to a benchmark interest rate, which for European interest rate swaps with long maturity is normally the Euribor rate, a rate charged on interbank unsecured loans among 44 European banks. The value of the swap for the buyer is inversely related to the interest rate while the opposite holds for the seller. From what is known for Dexia its losses were due to both a fall in the value of European states bonds and a fall in the value of the swap; the former was due to the increasing perceived risk of default of the issuing states and the latter was due to the fall in the Euribor interest rate. A lower interest rate may have unforeseen effects in a financial structure, in which derivatives constitute a large part of financial institutions' portfolios. A lower interest rate may cause liquidity problems.

<sup>10</sup> Both Dexia and Mps would be considered shadow banks if we adopt Mehrling's definition (see Mehrling 2013). The reason is that they used short-term money market funding to finance the acquisition of assets in the capital market, namely long maturity public bonds, profiting from the difference between the cost of repo (haircut) and the yield on bonds.

a new facility at the end of 2011, called LTRO, long term refinancing operation. This facility has mitigated the banks' liquidity problem by allowing them to borrow long term from the central bank against any type of collateral. Yet, the fiscal austerity policy, either imposed or voluntary, has opened another hole in their balance sheet due to higher provisions for bad loans. This in turn has made capital scarce. Then they have had to save capital (either through securitization or the use of derivatives) or alternatively to raise it in the middle of a bearish market. If both these routes were not feasible, the only way left would be cutting credit. Many banks have in fact chosen the latter alternative as the data on the negative rate of growth of the credit supply in the Eurozone show.

## Conclusions

Has the financial fragility in the European financial system increased after the Great financial crisis? This paper has answered that indeed it has. A further question has been why fragility has increased.

The answer to that second question has been given by looking at how Minsky defined fragility. The most important part of its theory has been the systemic nature of fragility and its link to interconnectedness. Fragility is also linked to evolution, history and policy.

The financial system has still remained a bank-based system as far as banks retain a dominant position with respect to other financial intermediaries. The European banks had contributed to the big financial crisis through the operations of their affiliates and subsidiaries abroad. Thus, they were involved in the crisis because of their international expansion. The more recent problems however go beyond that background. Fragility is now linked to the major use of old and new derivatives that depends on the imitation of the U.S. type of capitalism and on the incentives offered by regulation. So European banks have increasingly started to behave as shadow banks, to borrow in wholesale money markets in order to finance the acquisition of capital market assets. This is done by big banks, while small and medium sized banks keep giving loans to households and firms. While, in the U.S., the orientation of demand towards a certain type of products different from deposits may have fostered the rise of shadow banking, the same does not hold for Europe.

The paper shows how, although indebtedness by banks has fallen, fragility has increased. The reasons lie in the interplay among changes in markets and regulation that have triggered several self-enforcing feedback loops. The regulators seem to believe that their task is changing capital weights to adjust for the new risks and introducing liquidity and collateral requirements. However, if banks target a return on equity as high as possible, imposing more capital and collateral requirements on them causes only liquidity problems. A contraction in the credit supply to businesses may follow too. Their behavior is also justified by the certainty of being rescued in case of problems. As Minsky had warned, the pursuit of the maximum profit in a competitive space does not ensure the optimum for the society as a whole but on the contrary unleashes destabilizing forces.

The paper gives a few examples of the feedback loops that have been unraveled. It shows that, if prices are made in derivatives market, their repercussions on fundamentals and the real economy may generate further instability in financial markets. This has happened in the market for public bonds issued by Southern European countries. It also argues that the growing use of derivatives tools both to speculate and to avoid uncertainty has made the balance sheets of financial institutions more vulnerable to liquidity stops. In

particular, the need to find cash to fulfill payment obligations arising from margin calls on either derivatives or repo agreements is behind many recent episodes of banking distress.

Policies should have the scope of thwarting naturally occurring self-enforcing feedback loops in Minsky's opinion. Yet the policies that have been implemented after the great financial crisis seem to have produced the opposite effects. They have created new feedback loops that nurture fragility again. This outcome, however, is not surprising if, as Minsky did, we acknowledge that policy measures change initial conditions and may have unintended consequences.



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