



The FESSUD project is funded by the European Union under the 7th Research Framework programme (theme SSH) Grant Agreement nr 266800



FESSUD

FINANCIALISATION, ECONOMY, SOCIETY AND SUSTAINABLE DEVELOPMENT

Working Paper Series

No 5

The Shadow Banking System and the Financial Crisis:
A securities production function view

Photis Lysandrou and Anastasia Nesvetailova

ISSN 2052-8035

The Shadow Banking System and the Financial Crisis: A securities production function view

Photis Lysandrou and Anastasia Nesvetailova

Photis Lysandrou is Research Fellow at City University and Anastasia Nesvetailova is Reader in International Political Economy at City University.

Abstract

There is no doubt that the shadow banking system played an important role in the global financial crisis. What is in question is whether it played a causal or merely amplifying role. This paper argues in favour of the latter. Focusing specially on the process of the production of CDOs through the shadow banking system, we argue that it was non-bank financial institutions, most notably hedge funds but also pension and mutual funds and insurance companies, which had causal primacy in the financial crisis. The insatiable demand for assets exercised by these institutions compelled the shadow banks to accelerate the production of CDOs to a scale of sufficient proportions as to be able to cause the money and interbank markets to seize up in August 2007. The conclusion that follows from this argument is that tight regulation of the shadow banking system will not suffice to prevent a future financial crisis. For this objective to be met banking regulation needs to be accompanied by wider policy measures aimed at reducing the pressures on the banking system to create the type of toxic securities that triggered the last financial crisis.

Key words: shadow banking, securitisation, financial crisis, financial regulation

JEL Classification: G01; G21; G23

Contact details:

Photis.lysandrou.1@city.ac.uk

1 .Introduction

There is no doubt that the shadow banking system, usually defined as a complex network of credit intermediation outside the regulated banking sector, played an important role in the subprime crisis. The crisis that started off as a money and interbank market liquidity seizure was transformed into a international credit crunch and, ultimately, a crisis of the whole banking system whose lingering effects on real economies made it the worst general economic crisis since the Great Depression. What is in doubt is the precise nature of the role that shadow banking entities and functions played in the overall crisis dynamics. Was the shadow banking system the chief instigator of the subprime crisis or was it more the victim of that crisis whose collapse amplified the liquidity and credit crunch into a full scale banking crisis?

The answer to this question has clear policy implications for if the shadow banking system did have causal primacy in the subprime crisis then it follows that subjecting the system to tight regulation will be enough to prevent any future crisis of this type. If however, it was financial institutions outside of the shadow banking system that had causal primacy, with the system itself merely playing a facilitating and amplifying role, then it follows that regulation aimed at stripping the latter of its 'shadow' nature will not on its own be sufficient to prevent a future crisis of the subprime type.

Not all commentators on the shadow banking system directly address the question of its precise role in the financial crisis, but those who do tend to give the system causal primacy in the crisis. There are two main reasons for this. First, the shadow banking system was responsible for the creation of collateralized debt obligations (CDOs), the toxic securities that were at the epicenter of the crisis. Second, there is the tendency to treat the crisis as a single continuous historical episode that began in August 2007 following the announcement by BNP Paribas that it could not value the CDOs held by three of its hedge funds, and reached a culminating stage in September 2008 with the bankruptcy of Lehman

Brothers. Given that it was the August 2007 announcement that precipitated the collapse of the money markets and given that it was the same entities that had created the CDOs who occupied a central role in those markets, it follows that to take this announcement as the starting point of the financial crisis must also be to ascribe primacy to the shadow banking sector in causing the crisis.

In this paper we take a different position. We shall argue that it was non-bank financial institutions, most notably hedge funds but also pension and mutual funds and insurance companies, which had causal primacy in the financial crisis. It was primarily these institutions that forced the accelerated rate of production of CDOs to a scale of sufficient proportions as to be able to cause the money markets to go into cardiac arrest on August 9th, 2007. That day was indeed a defining moment, not because it represented the beginning of the financial crisis but rather, because it marked a tipping point in the unfolding meltdown, the point at which the total collapse of the CDO market following months of accumulating problems in that market raised the crisis onto a whole new level.

The paper is structured as follows. Section two provides an outline sketch of those parts of the shadow banking system directly involved in the CDO production process. Section three explains the primacy of CDO demand in the CDO growth story. Section four explains how the shadow banking system helped to transform the subprime crisis into a full scale banking crisis. Section five spells out some policy implications. Section six concludes.

2. The shadow banking system in outline

The shadow banking system had been growing for some time prior to the outbreak of the financial crisis in 2007, but it was only at this critical juncture that it came to be the object of sustained investigation and, indeed, to even acquire a name. That name has been widely endorsed because it neatly captures the aspect of inverse parallelism. Namely, the fact that certain activities conducted by the shadow banking sector in the pre-2007 period were both

similar to those conducted by the regular banking sector and at the same time distinct in that they fell outside the scope of regulatory supervision. Therefore when first introducing its discussion of the shadow banking system, the FSB was content to merely respect this inverse parallelism. To quote its opening definition: shadow banking is a “system of credit intermediation that involves entities and activities outside the regular banking system” . However, as not all entities and activities outside of the regular banking system pose the same level of risk to the latter, the FSB went on to give a second, narrower definition of shadow banking that includes only those areas of it that do pose a potentially substantial risk. To quote: “the portion of the shadow banking system that merits increased attention from authorities can be defined as ‘a system of credit intermediation that involves entities and activities outside the regular banking system and raises i) systemic risk concerns, in particular by maturity/liquidity transformation, leverage and flawed credit risk transfer, and/or ii) regulatory arbitrage concerns” .

This second definition, while possibly useful for policy purposes, is in our view, unsatisfactory in that it lacks explanatory power. Its central preoccupation is with the systemic effect of shadow banking activities when it should be with their specific function. When one defines a ‘car’ as a vehicle for transportation, one does not usually include in that definition the possibility that if a car is driven too fast or too carelessly it can cause death. Similarly, with shadow banking: the system may indeed, as has turned out to be the case, pose huge systemic risks by virtue of its unregulated nature, but its definition should nevertheless home in on its functionality, in other words, on the reasons behind the expansion of the system to the point where it could cause serious systemic damage. To this end we propose as an alternative definition of the shadow banking system the following: “the shadow banking system is a system of unregulated off-bank balance sheet credit intermediation and maturity and liquidity transformation activities conducted by bank owned or sponsored entities in the capital and money market domains for the primary purpose of expanding the rate of production of yield bearing debt securities required by the global investor community” . This definition is illustrated in figure 1.

Figure 1

Outline of the Commercial Bank-Shadow Bank Nexus
At the Time of the Sub-Prime Crisis

On Balance Sheet Banking : Regulated

Capital-Money Markets		Banks		Capital -Money Markets		
Sellers		Buyers	Assets	Liabilities	Sellers	Buyers
Governments	Securities		Cash	Share	Securities	Asset Managers
Corporations			T-Bills	Capital		Money Market Funds
Other Banks			T-Bonds	Market		Corporate Treasurers
Non-Bank Financial Institutions			Securities	Borrowing		
			Mortgage Loans	Bond Issues		
		Credit Loans	Deposits			

Off Balance Sheet Banking: Unregulated

Banks	Shadow Bank Entities		Capital-Money Markets
Sellers of Loans	Assets	Liabilities	Buyers of Securities
	SPEs: Conforming Loans Non-conforming Loans SIVs: ABS Conduits: ABS CDOs	SPEs: ABS ABCP Other Money Market Funding SIVs: CDOs ABCP Other Money Market Funding Conduits: ABCP	Asset Managers Other Shadow Bank Entities Money Market Funds Corporate Treasurers

The first difference between our definition and that of the FSB's centres on the distinction between on- and off-bank balance sheet entities and activities. There are instances, contemporary China is a case in point, where certain banks can engage in on-balance sheet credit intermediation activities that fall outside of the scope of official

regulation and can thus be classified as 'shadow' banks. However, as this type of shadow banking was not central to the financial crisis that unfolded in the US and West Europe we shall exclude it from the current discussion and focus exclusively on the unregulated off balance sheet entities and activities that were central to the crisis. The second substantive difference with the FSB's definition concerns the relationship between the banking sector on one hand, and the capital and money sectors on the other. In the regulated banking sphere, the credit intermediation and attendant maturity and liquidity transformation functions are usually performed by banks without recourse to any intermediary role on the part of the capital and money markets.

There is of course a close association between these sectors: on the asset side of banks' balance sheets the capital and money markets represent important sources of securities needed by the banks while on the liability side of banks' balance sheets these same markets represent important sources of demand for securities issued by the banks. However, the relation of mutual dependence between these sectors here is not one that subverts the clear distinction between the different types of activities taking place in them. By contrast, this is the case in the shadow banking realm where the capital and money markets are indispensable to the credit intermediation and maturity/ liquidity transformation functions performed by the special purpose entities (SPEs), structured investment vehicles (SIVs) and conduits. These three major types of off-balance sheet vehicles operating at the time of the subprime crisis constituted the central medium through which the basic banking activities of taking deposits and extending loans on one side of the equation were indissolubly mixed together with the basic capital and money activities of buying and selling securities on the other.

This last point about the creation and marketing of securities brings us to the third and most important difference between our definition of the shadow banking system and that of the FSB's. In the latter the credit intermediation and maturity/ liquidity transformation activities performed by the main shadow bank entities are approached solely from a 'flow' perspective, that is, activities are posited solely as 'processes'. In our

definition these same activities are also approached from a 'stock' perspective, that is, as activities that result in tangible 'products' whose use value to buyers is to serve as stores of value. This way of defining the shadow banking system to bring out its production function helps to delimit the boundaries that separate those entities operating at the core of the system from those operating at its periphery. This distinction between core and periphery is either absent or blurred in most other definitions of the shadow banking system because in keeping the focus of attention fixed on the flow dimension of activities in the system just about every linkage between every entity performing any type of credit intermediation and maturity/liquidity transformation role is placed on an equal par. This is why illustrations of the system often end up presenting it as something resembling a computer circuit board . The reality, as we see it, is that only the SPEs, SIVs and conduits constituted the core of the shadow banking system because only these three entities were the production factories supplying credit-based securities.

The securities supplied by the shadow banking system essentially fell into two categories, short term and long term. The predominant type of short term security was asset backed commercial paper (ABCP). From a flow perspective, ABCP merely represents a form of short term funding of the long term assets held by the conduits and SIVs, but from a stock perspective it represents an important type of value container demanded by short term investors and most notably by the money market funds (MMFs). These institutions began life in the US in the early 1970s as an alternative to bank deposits to get round regulatory ceilings to bank interest rates. Even though these ceilings have long been removed, MMFs have continued to grow in size, not only in the US but also in the UK and other major economies, because of the relatively attractive short term rates they offer to savers. Given the growth in the size of their client base, MMFs have accordingly had to find increasing amounts of short term investable instruments. This need was traditionally met by the issuance of certificates of deposit (CDs) by the commercial banks and by the issuance of commercial paper (CP) by large corporations. However, over the decade prior

to the subprime crisis it was the shadow banking entities that came to be among the leading suppliers of short term investable instruments including ABCP.

The same reasoning applies to the longer term asset-backed securities (ABS) and CDOs. While these credit instruments in one sense merely represent forms of capital market lending funded by money market borrowing, they also represented at the time of the crisis important supplements to the world's stocks of investable securities demanded by long term investors such as insurance companies and pension and mutual funds. In recent decades the institutional asset management industry has been transformed from a small cottage industry catering for the wealthy into a mass industry catering for the retirement and other welfare needs of large sections of the population. To meet the increasing demand made upon the asset management function, institutional investors require increasing amounts of yield bearing securities, including debt securities. While governments and corporations, including bank corporations, have traditionally met the bulk of this demand, the various shadow bank entities also came to play an important supplementary role in this regard in the pre-crisis era, the SPEs through their production and marketing of ABSs and the SIVs through their production and marketing of CDOs .

To view the shadow banking system as a system of production of both short and long term debt securities is to take a different view of the reasons for its sudden growth in the years immediately prior to the financial crisis. There is, of course, little question that the pervasive official ideology of 'light touch regulation', together with the rapid pace of financial innovation, constituted the main enabling factors behind the growth of shadow banking. On the one hand, given the costs to the commercial banks arising out of the regulatory constraints on their on-balance sheet activities, they were bound to shift increasing amounts of these activities off their balance sheets in order to conserve capital, while on the other hand the absence of any regulation of the off-balance sheet vehicles placed them in an advantageous position to exploit to the full the latest advances in financial technology. However, while 'regulatory arbitrage' and the drive for cost efficiency and financial innovation were clearly important to the growth of shadow banking, what is

less clear is how much of a motivating role they played as opposed to an enabling one . Were the banks themselves the chief instigators behind the growth of their off-balance sheet entities and activities, with other non-bank financial institutions merely being the passive recipients of the new financial products that resulted from these activities? Or was it the other round? Did the non-bank financial institutions pressure the commercial banks into expanding the shadow banking system as a means of expanding the rate of production of new yield bearing products? In the next section, we argue in favour of the second of these two positions and we do so by focusing attention on the US shadow banking sector, which was by far the world's largest at the time of the financial crisis of 2007-09.

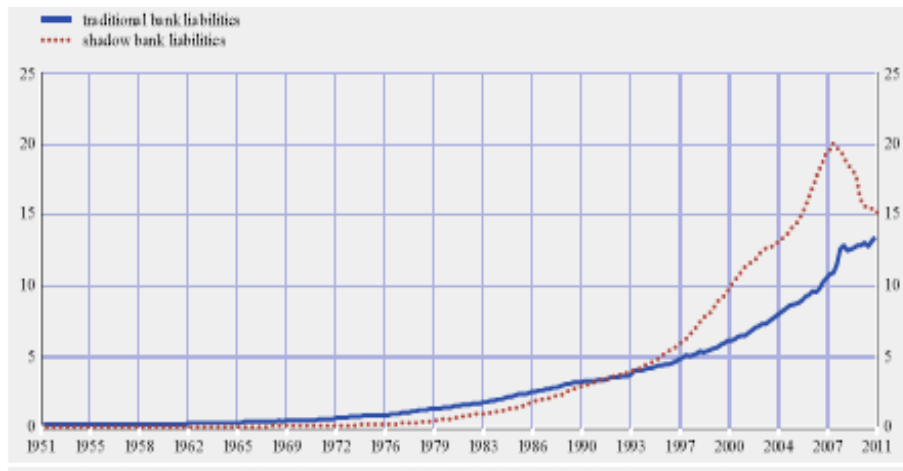
3. The primacy of demand in CDO growth.

The gross liabilities of a country's shadow banking system are usually taken as a measure of its size. In this frame, figure 2 shows that the rate of expansion of the US shadow banking system, while moderately steady from the early 1990s to the early 2000s, suddenly exploded between that point in time and the outbreak of the financial crisis. What has captured the attention of most commentators is the fact that in this immediate pre-crisis period the size of the US shadow banking system began to dominate that of the regular US banking system. This comparison is understandable given the usual angle of approach to the banking sector's financial role: if the main preoccupation is with the flow dimension of its credit intermediation and maturity/ liquidity transformation activities, then it makes sense to compare the volume of these activities performed by the shadow banks with the volume performed by their regular counterparts. However, if the angle of approach is one that also focuses on the stock dimension of these activities, that is, on the 'products' resulting from them, then the more relevant comparison is between developments in the US shadow banking system on the one hand and developments in the US bond markets on the other. As can be seen by comparing figure 2 with figure 3, there was a close correlation between the growth of US shadow banking between 2002 and 2007 and the unusually low

yields in the major US bond markets that persisted over this same period. This correlation was no mere coincidence but a direct reflection of the increasing demands made upon the US shadow banking sector to help resolve the increasingly pressing yield problem.

Figure 2.

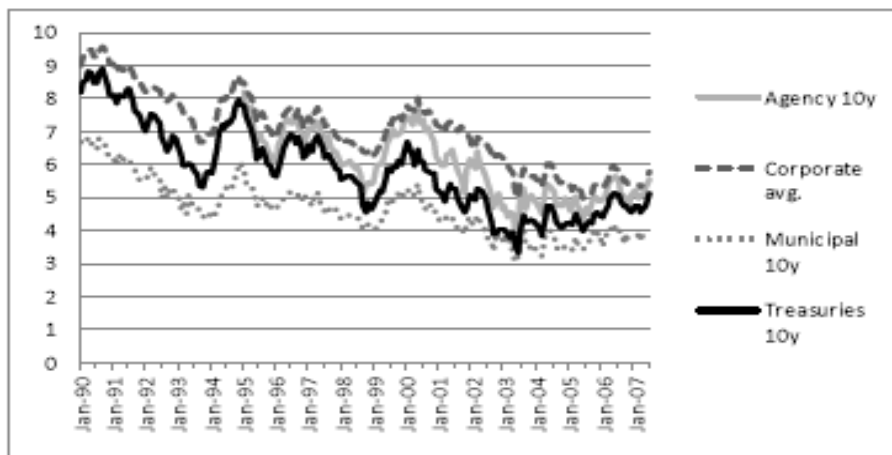
The Growth of the US Shadow Banking System



Source: Pozsar et.al (2012)

Figure 3

US Bond Yields 1990-2007



Source: Goda et al. (2012)

The source of the yield problem could be traced back to the relationship between the world's supply of government and corporate debt securities and the world's demand for these securities. That relationship remained broadly balanced up to the early 2000's, but it then became unbalanced as global demand began to outstrip global supply. The traditional major sources of demand for US debt securities are the large institutional investors of the US and other advanced market economies, most notably insurance companies and pension funds. However, in the decade prior to the crisis other sources of demand became increasingly important, including the governments, institutional asset managers and high net worth individuals (HNWIs) based in the emerging market economies (EMEs). Despite these changes in the geographical composition of world demand, there was no corresponding change in the geographical composition of world bond supplies as attested by the fact that at end-2006 over 80% of the world's bond stocks of approximately \$67trillion were accounted for by the G7 countries while the EMEs at the other end of the spectrum accounted for a mere 9% (a figure that contrasts sharply with the EME's 34% share of world GDP at that same time). Given the lack of investable bonds in the EMEs and given the dominant position of the US bond markets (accounting for 46% of global stocks in 2006) it was inevitable that the pressure of global demand for bonds would be concentrated in these latter markets thereby helping to force US treasury and other US long term yields down to unusually low levels . Figure 4 indicates the extent to which foreign official and private demand for US debt securities became an increasing component of aggregate demand in the 2002-2007 era.

Figure 4

Foreign Holdings of US Debt Securities

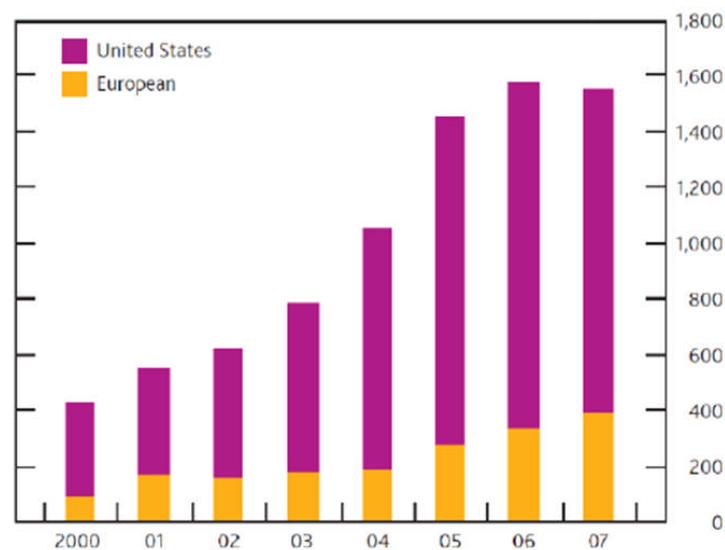


Source: Goda et.al. (2012)

The first way in which the US shadow banking sector was pressed into helping resolve the yield problem was by getting it to rapidly increase its rate of production of asset backed securities. The early development of the US ABS market was chiefly driven by supply push factors as government sponsored enterprises such as Fanny Mae and Freddie Mac, and later on private commercial banks, resorted to securitisation as a means of increasing residential mortgage lending while at the same time conserving capital. However, by the early 2000s, demand-pull factors appear to have taken over as the main driving force behind US ABS expansion. Of the US shadow banking system’s \$22 trillion gross liabilities in 2007, over \$9 trillion consisted of asset backed securities, a sum that represented over

80% of the world’s total ABS stocks of \$11 trillion outstanding at that time. An even more striking statistic, as shown in figure 5, is that approximately \$5.4 trillion of the US ABS figure for 2007 had been created after 2002 . The US ABS market had been in existence for over four decades and yet well over half of its ABS stocks by the time of the crisis in 2007 had been created in the preceding four years, in other words, in precisely the same period when low treasury and corporate bond yields remained an acute problem for investors. Unfortunately, while the rapid increase in the supplies of ABS in the US may have gone some way towards alleviating the yield problem, it certainly did not go all the way as is clear from the fact that, despite the supply increases, ABS yields also continued to remain unusually low right up to 2007.

Figure 5
Asset-backed securities issuance
(US \$Billions)



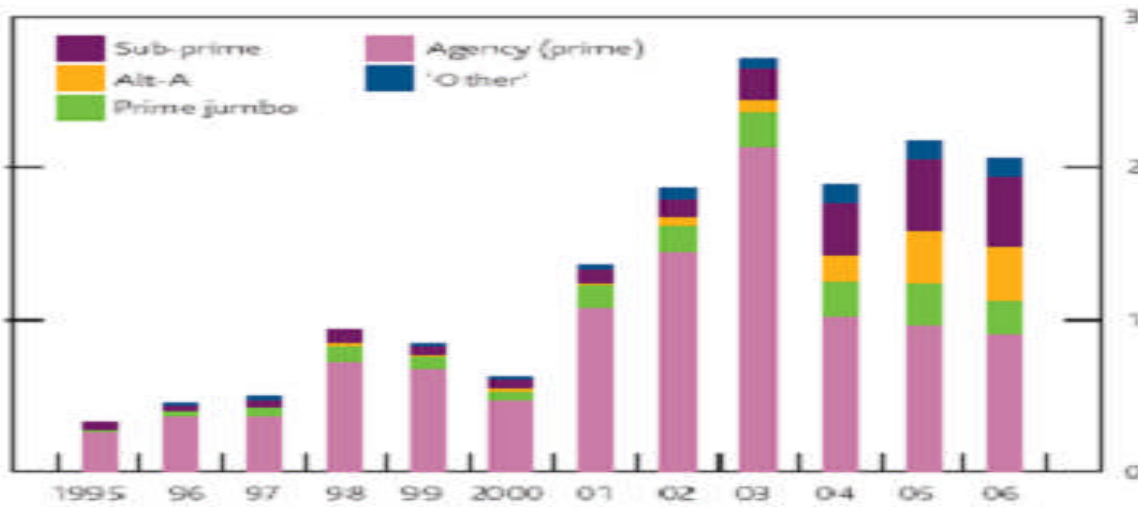
Source: Bank of England (2008)

This observation brings us to the second way in which the US shadow banking system was pressed into helping resolve the yield problem. Given the continuing shortfall in the supplies of US ‘first floor’ asset backed securities relative to global demand, the system had to make up for the shortfall by expanding the rate of production of CDOs, second and

higher-floor securities, securities backed by securities backed by loans . The loans continued to be securitised by SPEs with the difference after 2002, as shown in figure 6, being that it was not just conforming loans that were being securitised but also various non-conforming loans including jumbo, Alt A and subprime. These prime and subprime backed securities were passed on to the SIVs who combined them together as backing collateral for CDOs, the bulk of which comprised of AAA rated tranches. SIVs could create high grade securities out of lower grade ones through the use of three major credit enhancement techniques (CETs): over-collateralisation (the volume of backing assets held is greater than the volume of securities issued), subordination (interest payments on super senior and senior securities are made first and only then are holders of the mezzanine tranche securities paid and so on in descending order) and insurance (the senior tranches were given insurance cover by a sponsoring bank, an insurance company or monoline insurer). CDOs could be sold whole or in single tranches, but the fact that most of the demand for the latter centred on the AA A tranches meant that SIVs were often left with unsold mezzanine and equity (unrated) tranches. Rather than leave these tranches unsold, the SIVs would typically recycle them as backing collateral for CDOs squared using the same three CETs described above, and any unsold tranches of these products would be recycled as collateral for CDOs cubed. According to an IMF report of 2008: “These CDOs-squared and structured finance CDOs were created almost solely to resecuritize MBS and CDO mezzanine tranches, for which there was not sufficient demand from investors. Therefore their value added in transferring risk is questionable” . In our view, what is more questionable is the assumption here that the primary purpose of CDOs was credit risk transfer. This may have been part of the function of CDOs, but the chief rationale behind their creation was so that they could serve as stores of value. It has been estimated that by the time the subprime crisis broke out in 2007, there were approximately 38,000 AAA- rated subprime backed securities in existence as compared with a few dozen AAA- rated government and corporate securities.

Figure 6

US Residential Mortgage-Backed Securities Issuance

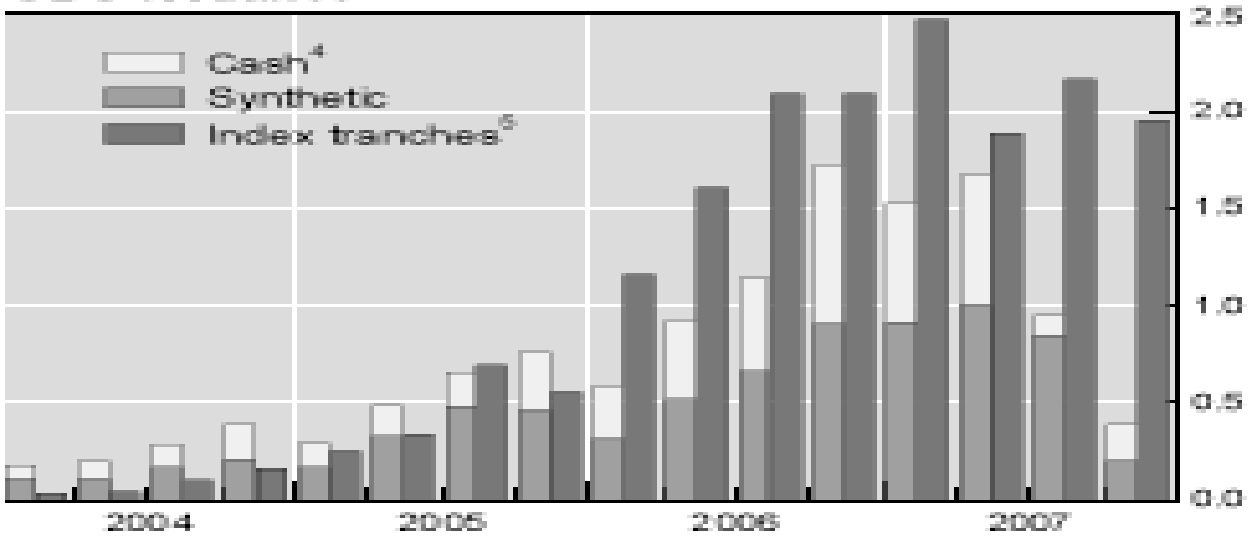


Source: IMF (2008)

Despite the increase in the rate of CDO production after 2002, this rate was still not high enough to satisfy investor demand. Thus it was that from this point on, as can be seen in figure 7, ‘synthetic’ CDOs began to replace ‘cash’ CDOs as the predominant type. As one commentator observed at the time: “The increase in synthetic securitisations in the US can be attributed to several factors. Among them are the enormous popularity of cash CDOs among hedge fund investors and the ensuing shortage of hard asset collateral.” Where cash CDOs could take several months to create, synthetic CDOs could be established in a matter of days. Where cash CDOs involve the use of sophisticated financial engineering techniques, synthetic CDOs by comparison are simple to created inasmuch as they involve nothing other than taking cash CDOs as reference entities for credit default swaps. Finally, while cash CDOs require the involvement of regular and shadow bank institutions at every stage of their creation, synthetic CDOs make no such requirement. A measure of the increasing extent to which non-bank institutional investors were creating synthetic CDOs on their own initiative is given by the changes in the participation ratios in the market for credit derivatives between 2004 and 2006: as can be seen in figure 8, while the percentage share of banks fell over this period, the percentage shares of non-bank institutions rose.

Figure 7

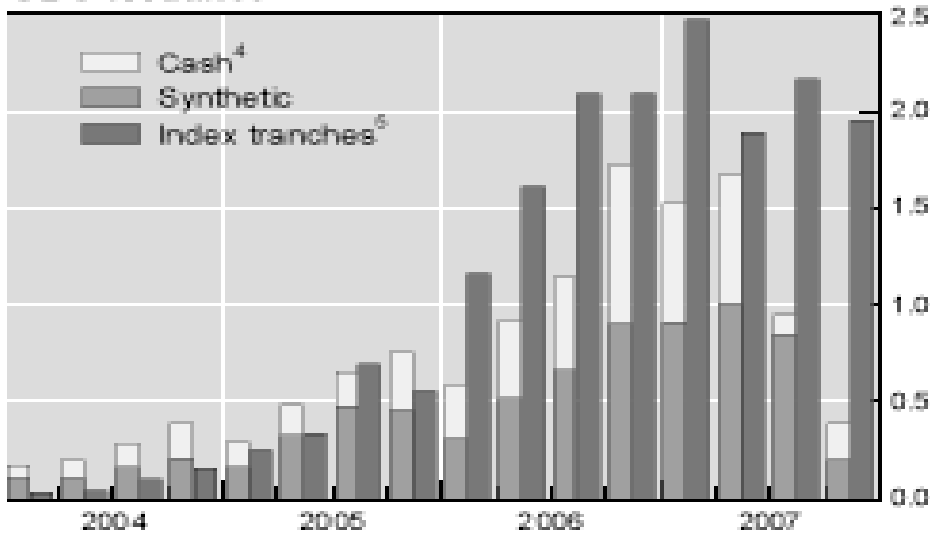
CDO Issuance



Source: Borio (2008).

Figure 8

Main Participants in Credit Derivatives



Source: IMF (2008)

The conclusion that falls out of the above arguments is that it was not the shadow banking system but the hedge funds and other financial institutions outside of that system that had

causal primacy in triggering the financial crisis. It is possible that even without a CDO crisis, a panic may still have broken out in the money markets in the summer of 2007 for some other particular reason, but this is conjecture. What is not conjecture is that it was the abrupt collapse of the \$3 trillion CDO market that triggered the collapse of confidence in the money markets in general and in the interbank market in particular. Furthermore, it is also possible that had the CDO market remained as small in 2007 as it had been in 2002, the emergence of problems in that market may not have had any significant spill over effect in the other financial markets. Again, this is conjecture. The truth of the matter is that by 2007 the CDO market had grown to a sufficient enough size as to be able to wreak general havoc when it eventually collapsed. Finally, it is still possible to pin the blame for the subprime crisis on the shadow banks had it been the case that these entities had retained the bulk of the CDOs that it had created. This too is conjecture. The reality, as shown in figure 9, is that the shadow banking sector held only about 25% of the \$3 trillion worth of CDOs then outstanding, while an assortment of financial institutions outside of that sector held the remaining 75%.

Figure 9
 Holders of CDOs:2006

CDO Tranche	Insurance %	Hedge Fund %	Bank %	Asset Mgr %
AAA	6.9	12.1	14.5	5.8
AA	1.2	4.0	3.5	4.0
A	0.3	4.6	1.4	2.9
BBB	0.6	4.3	0.3	4.0
BB	0.0	2.3	0.3	0.3
Equity	0.9	19.1	4.9	1.7
Total %	9.8	46.5	24.9	18.8
Total \$bn	295	1396	746	564

Source: Blundell-Wignall (2007)

The problem with the above conclusion is that while answering the question concerning causal primacy, it raises another question concerning the crisis-amplifying role of the shadow banking system. If this system had indeed succeeded in distributing the majority of the toxic CDOs that it had created to institutions outside of the system, with the latter itself remaining only a minority holder by the time of the subprime crisis, why did it suffer such enormous damage on the outbreak of that crisis as to bring the regular banking system to the brink of collapse? To answer this question we need to again look at the main entities at the core of the shadow banking system.

4. The shadow banking entities revisited

As noted in the introduction, those who have argued that the shadow banking system was responsible for the financial crisis tend to date that crisis from August 2007. However, as is clear from Karl Brunnermeier's event logbook illustrated in figure 10, the BNP Paribas announcement of August 9th that it could not value the structured products held by three of its hedge funds marked only the 'tipping point' in the unfolding financial crisis, the point at

which the steady erosion of confidence in the months prior to the announcement caused by the accumulating problems with the subprime backed securities culminated in a full scale panic. What is also clear from Brunnermeier's event logbook is that the money market meltdown on August 9th was accompanied by a corresponding breakdown in trust in the interbank market. To understand the reasons for this correspondence we need to look more closely at the functional differences separating the SPEs, SIVs and conduits.

Figure 10

Unfolding Subprime Crisis: Event Logbook

On May 4, 2007, UBS shut down its internal hedge fund, Dillon Read, after suffering about \$135 million of subprime-related losses.

Later that month, Moody's put 63 tranches across 31 U.S. subprime deals on "downgrade review."

Rating downgrades of other tranches by Moody's, Standard & Poor's, and Fitch unnerved the credit markets in June and July 2007.

In mid-June, two hedge funds run by Bear Stearns had trouble meeting margin calls, leading Bear Stearns to inject \$3.3 billion in order to protect its reputation.

On August 9, 2007, the French bank BNP Paribas froze redemptions for three investment funds, citing its inability to value structured products.

"Following this event, a variety of market signals showed that money market participants had become reluctant to lend to each other".

The first "illiquidity wave" on the interbank market started on August 9

Source: Brunnermeier (2009)

As already noted, the major functional difference is that between the SPEs on the one hand, the entities that were responsible for securitising the mortgage and other credit loans, and the SIVs and conduits on the other hand, the entities that were responsible for combining together prime and subprime backed securities to create CDOs. However, even as concerns the latter two types of shadow bank entities there was an important functional difference between them in that where the SIVs sold the majority of the CDOs they created to other customers in return for fees and commissions, the conduits' held on to all of the CDOs they

created and simply made them an integral part of their profit maximising exploitation of the maturity mismatch between assets and liabilities. Note from figure 11 that while the SIVs were officially classified as entities whose ‘assets are traded’, the conduits were classified as entities whose assets largely consisted of ‘nontradable loans’. A further clear indication of the functional difference between the SIVs and conduits is given by the significant difference in the size of assets held respectively by these two types of entities in 2006: as can be seen in figure 11, SIVs held a much lower amount of assets (\$400 billion) as compared with the amount (\$1.4 trillion) held by the conduits, a difference in keeping with the fact that while the SIVs’ chief source of profits were the fees earned from the sales of CDOs, the conduits’ chief source of profits came from the returns on their asset holdings. Finally, note also that while the SIVs’ liabilities largely consisted of medium term notes, those of the conduits consisted solely of ABCP.

Figure 11

	Conduit	SIV
Assets	<ul style="list-style-type: none"> • US\$ ≈1,400 billion • Nontradable loans • Less risky • 47% Traditional assets • 53% Securities and derivatives 	<ul style="list-style-type: none"> • US\$ ≈ 400 billion • Assets are traded • Less risky • ≈ 28% Financial institutions’ debt • ≈ 48% CMBS/RMBS/ABS • ≈ 22% CDOs/CLOs • ≈ 2% Other
Liabilities	<ul style="list-style-type: none"> • 100% Commercial paper 	<ul style="list-style-type: none"> • 27% ABCP • 66% Medium-term notes • 7% Capital notes
Credit enhancement	<ul style="list-style-type: none"> • Varied (sponsoring bank) 	<ul style="list-style-type: none"> • Overcollateralization
Liquidity facility	<ul style="list-style-type: none"> • Contractual 100% coverage 	<ul style="list-style-type: none"> • Contractual < outstanding liabilities • ≈ 10 to 15 percent of senior debt

Source: IMF (2008)

When the money markets froze up on the day of the BNP Paribas announcement, it was through the consequent withdrawal of liquidity from the conduits rather than from the SIVs that there also occurred a crisis of confidence in the inter-bank market. This was not only due to the differences in the size of assets held by these respective entities. More

importantly, it had to do with differences in sponsorship structure. While some SIVs were sponsored by commercial banks, others were sponsored by investment banks, while yet others had multiple sponsors. By contrast, the great majority of conduits (270 out of the 300 or so operating in 2007) were owned or sponsored by commercial banks. Thus when the short term funding for these vehicles suddenly dried up, the assets held by them that had to be brought back onto the parent or sponsoring banks' balance sheets were of sufficient volume as to cause mistrust between the banks. The crux of the matter here is that while the commercial banks had given a 100% guarantee to their conduits (a fact that explains their credit ratings and why they were able to issue ABCP at very advantageous rates) they had made no corresponding capital provision for the conduits' assets . This meant that the banks, already heavily reliant on short term funding to help close the gap in the liability side of their balance sheets caused by the trend fall in household deposits, had to increase that reliance even further. The contradiction was that the banks, knowing that these term short term funding problems were common to all them, became extremely reluctant to lend to each other.

While the conduits differed from the SIVs in terms of asset size at the time of the subprime crisis, there was no basic difference as concerns the percentage share of CDOs in the total assets held. Figure 11 shows that just 22% of the SIVs assets at end 2006 comprised of CDOs, a ratio not far off the 25% aggregate share of all CDOs held by the shadow banking system as a whole at that time. That this pattern pertained as much to the conduits as to the other shadow bank entities becomes clear from figure 12 that profiles the asset holdings of the ten largest conduits operating in 2007. Only in two of the ten cases were CDOs the predominant asset class held; in the other eight cases other asset classes predominated. If this same situation was replicated throughout the entire 300 strong conduit community, as can be reasonably assumed, then it would seem that when the CDO market crashed in August, 2007 the lending institutions in the wholesale money markets should have been more discriminating in deciding which particular borrowing institutions should be denied continued access to short term funds. This did not happen. Rather, the

panic amongst lenders sparked by the BNP Paribas announcement on August 9th of that year was such they immediately withdrew funding from virtually all borrowing institutions. This reaction may have seemed irrational but that it was, on the contrary, an entirely understandable one becomes clear as soon as one considers the opaque and complex nature of the structured credit products.

Figure 12
Ten Largest Conduits and Sponsors (end-2006)

Program Name	Sponsor	ABCP (bn)	Guarantee	Asset Origin	Asset Rating	Asset Type (Share %)
Grampian Funding	HBOS	37.9	Full Liquidity	United States	AAA	Residential Mortgages (36%)
Amstel Funding	ABN Amro	30.7	Full Liquidity	Netherlands	AAA	CDO/CLO (84%)
Scaldis Capital	Fortis Bank	22.6	Full Liquidity	United States	AAA	Asset backed securities (77%)
Sheffield Receivables	Barclays	21.4	Full Liquidity	n.a.	NR	Mortgages (43%)
Morrigan TRR	Hypo Public	18.9	Full Credit	n.a.	n.a.	Bonds (51%)
Cancara Asset	Lloyds	18.8	Full Liquidity	Great Britain	AAA	Residential Mortgages (43%)
Solitaire Funding	HSBC	18.5	Full Liquidity	United States	AAA	Residential Mortgages (45%)
Rhineland Funding	IKB	16.7	Full Liquidity	United States	AAA	CDO/CLO (95%)
Mane Funding	ING	13.7	Full Liquidity	n.a.	AAA	Asset backed securities (91%)
Atlantis One	Rabobank	13.5	Full Liquidity	United States	NR	Commercial Loans (100%)

Source: Acharya et al (2010)

The cardinal rule of market exchange is that the properties of a product have to be sufficiently transparent as to allow it to be valued and traded against market standards. Government and corporate securities generally meet this criterion. So too do asset backed securities. CDOs, however, do not. They may only be ‘second floor securities’, but the jump in complexity going from asset backed securities to CDOs is many times greater than the jump going from the ‘ground floor’ government and corporate debt securities to the ‘first floor’ asset backed securities. The reason has not only to do with the credit enhancement techniques used to construct CDOs. It also has to do with the heterogeneity of the asset classes used in their construction. Asset backed securities have a transparent conformity in that each type has a single asset class as collateral (residential mortgage loans, credit

card loans, commercial property loans etc.). By contrast, no two individual CDOs are alike because of the large variety of ways in which different asset classes (subprime backed securities, other nonconforming loan backed securities, prime ABS etc.) could be mixed together as the backing collateral. CDOs could still be sold, but only as unique, customised products tailored to suit the specific needs of specific investors. Ultimately, it was because the CDO market constituted a fragmented, relation-based space rather than an integrated one as normally exists that explains why lending institutions in the money markets did not know who was exposed to CDOs and to what extent and why they decided to play safe and withdraw funding from virtually all borrowing institutions.

Given that the shadow banking system transgressed the rules of market exchange when producing CDOs, and given that it was precisely this transgression that was the critical factor helping to trigger the financial crisis of 2007-8, it would seem to follow that the system must bear the responsibility for the crisis. This is the commonly held view. However, we believe it to be a myopic one in that it fails to set the pre-crisis growth of CDO production against the more general context of the then prevailing global financial situation. As noted, a characterising feature of that situation was the shortfall in the global supplies of government and corporate debt securities relative to global investor demand, a shortfall that found its most acute manifestation in the continuing fall in US bond yields.

One of the major reasons for the supply shortfall were the constraining effects of the transparency and governance requirements necessary for maintaining the tangibility of debt securities as tradable financial products. Nowhere were these constraining effects more in evidence than in the EMEs. Their relatively small share in the world's supplies of bonds in the pre-crisis period may have been partly due to a continuing preference for bank-based forms of finance as opposed to capital-market-based forms, but it was also in part due to the fact that the transparency and governance requirements for bonds and other financial products are orders of magnitude higher than those required for material products. Turning to the ABS market, we find a similar problem arising in the immediate

pre-crisis period. US commercial banks and their associate were indeed able to exploit the unusually low interest rates to entice increasing numbers of US households' to take out mortgages and other credit loans which could then securitised. However, as there were limits to the numbers of households that conformed to standard lending criteria, there were limits to the volumes of ABS that could be created to meet global investor demand. As this demand continued to be 'insatiable' , there was no option other than for the US regular banking system to relax the normal rules of lending to furnish the raw material needed by its shadow banking entities to create more safe AAA-rated assets.

The shadow banking system was so named because it performs activities similar to those of the regular banking system and yet at the same time performs them outside of the normal scope of bank regulation. This 'outsider' status of the shadow banking system is exactly why, at a critical historical juncture, it alone was in a position to attempt what seemed a solution to the widening supply-demand gap in the world's bond markets. In creating CDOs and CDOs squared and CDOs cubed to satisfy investor demand, of course the shadow bank entities made handsome profits. Of course they felt confident in being able to create safe AAA-rated assets by using an assortment of credit risk transfer techniques. Some accounts of the crisis demonstrate that these institutions or rather, the individuals behind them, felt proud of being in a position to be able to use sophisticated financial engineering techniques in ways that others could not. However, it was not greed, overconfidence or hubris that forced the shadow banking system to step outside of the established rules of the financial market so much as the limits of the global capitalist economy itself.

When the system finally imploded, regulatory authorities began to reproach themselves for having allowed the regular banking sector to develop a vast underground network of long and complex credit intermediation chains based on excessive leverage and characterised by flawed credit risk transfer. However, these deficiencies and flaws, which were so sharply exposed by the financial crisis, were not the chief reason why the shadow banking system imploded with such devastating consequences. That reason is ultimately to

be found in the fact that the system could no longer carry the immense burden placed upon it.

5. Policy implications

Nothing that has been said above should be interpreted to mean that we do not support tight regulation of the shadow banking system. On the contrary, we fully endorse the moves in this direction. Rather, our aim in showing that the shadow banking system played more of an amplifying than a causal role in the financial crisis – the latter role being played by financial institutions outside of the shadow banking system – is to show that regulation of this system will not on its own suffice to prevent a future financial crisis. Indeed, we go so far as to conjecture that if tight regulation of the shadow banking system is not accompanied by certain wider initiatives that target the activities of other important financial players, then it is possible that this particular piece of regulation will make a future financial crisis more, not less, likely. The thinking behind this conjecture centres on the continuing structural imbalance between the global supply of debt securities and the global demand for them and the consequent resurgent problem of yield.

At the present time of writing, it seems that regulating either the production of CDOs or the SIVs responsible for their production will have little relevance as both these financial instruments and financial institutions have largely disappeared following the crisis. The only long term securities that can be meaningfully affected by current regulation insofar as they do continue to be created and distributed are of the ABS type. The problem here is that if the subjection of the bank owned or sponsored SPEs – the major entities behind ABS production – to tight regulation results in a slowing down in the rate of that production, this could have potentially negative consequences because this slow down would come on top of the already existing constraints on the rate of growth of private sector securities. The reason behind this problem is that the detrimental effect on security supplies caused by the fall-out of the financial crisis has not been accompanied by a corresponding effect on the

global demand for debt securities exercised by institutional asset managers and other investor groups.

On the contrary, global demand for investable assets has continued to rise and while the expansion in government debt securities has gone some way to meet this increase in demand it has not gone far enough. The result is that the 'search for yield' phenomenon has again reared its head as attested by the fact that investments in hedge funds and other speculative vehicles are again reaching record levels. Clearly, if the rate of ABS issuance is impeded by new regulatory constraints on SPEs, thus interfering with their ability to make good the shortfall in yield bearing debt securities relative to global demand, then the greater will be the reliance of institutional and individual investors on hedge funds to provide alternative sources of yield and the greater, therefore, the consequent risk taking actions on the part of these and other speculative vehicles in the attempt to satisfy the demand for yield.

The upshot of the above is that regulation of the shadow banking sector, insofar as this affects ABS issuance, must be accompanied by other initiatives aimed at resolving the bond market supply and demand imbalance and thus eliminating the risk of a return of financial products and processes of the type that caused the last financial crisis. On the supply side of the equation, one solution is to give encouragement to EME countries to expand their capital markets at a rate that is more commensurate with the rate of their GDP growth. However, as this requires the development of a governance and legal infrastructure that is orders of magnitude more sophisticated than that required for material goods and services, this is likely only to be a long term solution to the shortfall in global bond supplies. In the short term there has to be a continued reliance on the advanced market economies and on their governments in particular.

The problem here is that although government bond supplies have increased markedly in the wake of the financial crisis as governments faced widening gaps in the budgets caused not only by the bank bail outs but also by the fall in tax revenues, many governments have reached market-imposed ceilings on their debt to GDP ratios while

other governments have proved reluctant to overstep self-imposed debt ceilings. Given that investors in this post crisis era continue to need more supplies of 'safe haven' stores of value (as evidenced by the low yields on US, UK, German and other core economy government bonds that persist even while government debt to GDP ratios remain at unusually high levels in these countries) one could expect these governments to continue a programme of debt financed fiscal expansion for as long as the post crisis global economy remains in a depressed state. However, past historical experience coupled with contemporary economic dogma have lead most,if not all, core economy governments to embark on austerity programmes expressly aimed at reducing government debt levels.

In the light of these constraints on the supply side of the global bond markets, it follows that only by similarly constraining demand side growth in this market can there be a resolution to the structural imbalance problem and thus the accompanying problem of yield. In this regard, it seems that the most logical, if not most easy, point of attack should be on global wealth inequality. The four major investor groups in the world today are institutional asset managers (insurance companies and pension and mutual funds), banks, EME governments (through reserve holdings and through Sovereign Wealth Funds) and high net worth individuals (HNWIs). While the first three of these groups may have reasonable grounds to store wealth in equity and debt securities in ever increasing volumes, the same cannot be said of the last group. There surely can be no economic, moral or any other justification for the fact that the world's HNWIs, totalling today about 10 million or just over 0.01% of the world's population of 7 billion, should hold total assets in excess of \$42 trillion, over 30% of which comprise of debt securities. On the eve of the subprime crisis not only did this group of individuals hold enough of the US' bond supplies as to help contribute to the downward pressure on US bond yields , they also constituted the largest single group of investors in the hedge funds who in turn constituted the largest single group of investors in CDOs . Now while total HNWI assets declined in value in the immediate post-crisis period, from about \$40 trillion in 2007 to about \$37 trillion in 2009, they have since then more than recovered lost ground even while the global economy in

general continues to remain in a depressed state. What this means is that HNWI's will not only continue to be a major source of demand for investable debt securities as a means of storing their vast wealth but they will also continue to be the major source of pressure on hedge funds to find new solutions to the ensuing bond yield problem. The policy implication that all this leads to is abundantly clear: the redistribution of wealth through a battery of co-ordinated tax measures will go some way towards easing the supply-demand imbalances in the global bond markets thereby helping to lift some of the pressure on the banking system to come up with artificial ways of dealing with these imbalances.

6. Conclusion

Our aim in this article has been to examine the role of the shadow banking system in the global financial crisis. Focusing specifically on the cycle of securities production in the shadow banking system, we found that shadow banking has amplified the course and impact of the crisis, yet it did not cause it. That cause is ultimately to be found with the non-bank financial institutions such as hedge funds, pension and mutual funds that were the main driving force behind the production of the toxic CDOs in the run up to the crisis. The implications of our analysis for the study of shadow banking and financial innovation in the crisis are two-fold. First, focusing on the role of the products of unregulated financial innovation, it opens up a 'stock' perspective on the shadow banking system, as opposed to more conventional flow accounts perspectives that have characterised much of the current literature on the phenomenon. Second, our linkage of CDO production to the insatiable demand for safe assets suggests that unlike many earlier financial crises, the global credit meltdown of 2007-09 was not caused by speculation, greed or exuberance. This point has important policy implications.

The shadow banking system that amplified the recent and some argue, ongoing financial crisis, will in many ways cease to exist following regulations aimed at divesting the system of the very attributes that caused it to be so named in the first place. While there can be no

doubt that such regulation is very appropriate even though very belated, there is doubt as to whether it will suffice to prevent a future financial crisis. This issue will be resolved not only by understanding the role played by both the regulated and unregulated parts of the banking system in the last financial crisis but also by understanding the various external pressures on the banking system to play the role that it did. This paper has sought to make a contribution to this task.

References

- Acharya, V and Schnable P (2009), "Do Global Banks Spread Global Imbalances? The Case of Asset-Backed Commercial Paper During the Financial Crisis of 2007-9". November
- Acharya, V, Schnabl, P and Suarez, G (2010), Securitization Without Risk Transfer, NBER Working Paper 15730
- Adrian, T and Shin, HS (2009), The Shadow Banking System: Implications for Financial Regulation, Banque de France Financial Stability Review, Vol.13
- Adrian, T and Ashcroft, A.B (2012), Shadow Banking: A Review of the Literature, Federal Reserve Bank of New York, Staff Report no.580
- Adrian, T and Ashcroft, A.B (2013), Shadow Bank Regulation, Annual Review of Financial Economics,
- Bakk-Simon, K et.al. (2012), Shadow Banking in the Euro Area, An Overview, European Central Bank Occasional Paper no.133
- Bank of England (2008), Financial Stability Report, October
- Bernanke, B.S., Bertraut, C., Pounder DeMarco, L., and Kamin, S. (2011). 'International Capital Flows and the Returns to Safe Assets in the United States, 2003-2007', International Finance Discussion Papers, No. 1014, Board of Governors of the Federal Reserve.
- Blankfein, Lloyd C (2009), Remarks to the Council of Institutional Investors, April

- Blundell-Wignall, A. 2007. 'Structured Products: Implications for Financial Markets', Financial Market Trends, No. 93, Vol. 2007/2, OECD
- Borio, C (2008), The financial turmoil of 2007 -?: a preliminary assessment and some policy considerations, BIS Working Papers No 251, March
- Brunnermeier, K (2009), Deciphering the Liquidity and Credit Crunch of 2007-8, Journal of Economic Perspectives, Vol.23 No.1
- Caballero, R. J. 2010. 'The "Other" Imbalance and the Financial Crisis', Working Paper, No. 15636, NBER.
- Claessens, S, Pozsar, Z, Ratnovsky, L and Singh, M (2012), Shadow Banking: Economics and Policy, International Monetary Fund, December
- Clark, Ellen, H (2008), US Developments in Synthetic Securitization: Rampant Growth and the Spectre of SEC Regulation, in J.J de Vries Robbe and P.U.Ali (eds) Expansion and Diversification of Securitization
- Financial Crisis Inquiry Commission (2010), Shadow Banking and the Financial Crisis, Preliminary Staff Report
- Financial Stability Board, (2012), Shadow Banking: Scoping the Issues, Background Note of the FSB
- Financial Stability Board, (2012), Global Shadow Banking Monitoring Report 2012,
- Goda, T, Lysandrou, P., and Stewart, C. 2011. 'The Contribution of US Bond Demand to the US Bond Yield Conundrum of 2004 to 2007: An Empirical Investigation', Working Paper, No. 20, CIBS.
- Goda, T and Lysandrou, P (2012), The Contribution of Wealth Concentration to the Subprime Crisis: A Quantitative Estimation, Centre for International Business and Sustainability (CIBS) Discussion Paper, London Metropolitan Business School
- Gorton, G (2010), Slapped by the Invisible Hand: The Panic of 2007, Oxford University Press
- Gorton, G and Metrick, A (2010) Securitized Banking and the Run on the Repo, NBER Working Paper, November

- Gorton, G and Metrick, A (2011), Regulating the Shadow Banking System, Brookings Papers on Economic Activity, Fall
- International Monetary Fund (2008), Global Financial Stability Report, April.
- Lewis, M. 2011, The Big Short. Inside the Doomsday Machine, Penguin Books.
- Lysandrou, P. 2009. 'The Root Cause of the Financial Crisis: A Demand-Side View', Financial Times Economists Forum, March 24.
- Lysandrou, P. 2012 The Primacy of Hedge Funds in the Subprime Crisis. Journal of Post Keynesian Economics, Winter 2011-12.
- McCulley, P (2007), Teton Reflections, PIMCO Global Central Bank Focus, No2.
- McCulley, P. 2009, "The Shadow Banking System and Hyman Minsky's Economic Journey", in Insights into the Global Financial Crisis, Research Foundation of CFA Institute.
- Mehrling, P (2012), Shadow banking, Central banking, and the Future of Global Finance, November
- Pozsar, Z and Singh, M (2011), The Non-Bank Nexus and the Shadow Banking System, IMF Working Paper, December
- Pozsar, Z, Adrian, T, Ashcroft, A and Boesky, H (2012), Shadow Banking, Federal Reserve of New York, Staff Report
- Schwarcz, S, (2012) Regulating Shadow Banking, Boston University Review of Banking and Financial Law
- Shleifer, A (2011), Comment on Gorton and Metrick, Regulating the Shadow Banking System, Brookings Papers on Economic Activity, Fall.
- Tett, G. 2009, Fool's Gold, New York: Free Press.



The FESSUD project is funded by the European Union under the 7th Research Framework programme (theme SSH) Grant Agreement nr 266800



Financialisation, Economy, Society and Sustainable Development (FESSUD) is a 10 million euro project largely funded by a near 8 million euro grant from the European Commission under Framework Programme 7 (contract number : 266800). The University of Leeds is the lead co-ordinator for the research project with a budget of over 2 million euros.

THE ABSTRACT OF THE PROJECT IS:

The research programme will integrate diverse levels, methods and disciplinary traditions with the aim of developing a comprehensive policy agenda for changing the role of the financial system to help achieve a future which is sustainable in environmental, social and economic terms. The programme involves an integrated and balanced consortium involving partners from 14 countries that has unsurpassed experience of deploying diverse perspectives both within economics and across disciplines inclusive of economics. The programme is distinctively pluralistic, and aims to forge alliances across the social sciences, so as to understand how finance can better serve economic, social and environmental needs. The central issues addressed are the ways in which the growth and performance of economies in the last 30 years have been dependent on the characteristics of the processes of financialisation; how has financialisation impacted on the achievement of specific economic, social, and environmental objectives?; the nature of the relationship between financialisation and the sustainability of the financial system, economic development and the environment?; the lessons to be drawn from the crisis about the nature and impacts of financialisation? ; what are the requisites of a financial system able to support a process of sustainable development, broadly conceived?'

THE PARTNERS IN THE CONSORTIUM ARE:

Participant Number	Participant organisation name	Country
1 (Coordinator)	University of Leeds	UK
2	University of Siena	Italy
3	School of Oriental and African Studies	UK
4	Fondation Nationale des Sciences Politiques	France
5	Pour la Solidarite, Brussels	Belgium
6	Poznan University of Economics	Poland
7	Tallin University of Technology	Estonia
8	Berlin School of Economics and Law	Germany
9	Centre for Social Studies, University of Coimbra	Portugal
10	University of Pannonia, Veszprem	Hungary
11	National and Kapodistrian University of Athens	Greece
12	Middle East Technical University, Ankara	Turkey
13	Lund University	Sweden
14	University of Witwatersrand	South Africa
15	University of the Basque Country, Bilbao	Spain

The views expressed during the execution of the FESSUD project, in whatever form and or by whatever medium, are the sole responsibility of the authors. The European Union is not liable for any use that may be made of the information contained therein.

Published in Leeds, U.K. on behalf of the FESSUD project.