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The primacy of hedge funds in the subprime crisis

Abstract: *When the subprime crisis broke out in the summer of 2007, the hedge funds avoided blame by disassociating from those that supplied the subprime-backed products and by disappearing among those that bought these products. This twofold defense strategy has worked to perfection because almost everyone who has studied the crisis is convinced that it is the banks and not the hedge funds that were chiefly responsible for causing it. This article puts forward a different interpretation of events. Its central argument is that had it not been for the hedge funds' intermediary position between the investors seeking yield on the one hand and the banks that created the high yield bearing securities on the other, the supply of these securities would never have reached the proportions that were critical in precipitating the near collapse of the whole financial system. Take away hedge funds and a general financial crisis could still have occurred in 2007–8, but it is only because of the hedge funds that the crisis that actually occurred initially took on the form of a subprime crisis. The policy implication of this analysis is that regulatory controls on hedge fund activities must be far tighter than those currently proposed.*

Key words: *hedge fund regulation, hedge funds, subprime crisis.*

Ever since the subprime crisis broke out in the summer of 2007, the hedge funds have strongly denied any responsibility for causing it.[1] There are two arguments that are central to their line of defense. One is that they had nothing to do with the creation of the toxic securities that were at the

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[1] According to a *Financial Times* report on the U.S. House Committee's hearing on Oversight and Government reform, in their testimony to the hearing the heads of some of the largest U.S. hedge funds "emphasised that they were not culpable in the financial meltdown. Mr. Soros pinned blame on the 'financial system itself,' while James Simmons, president of Renaissance Technologies, criticised credit ratings agencies, which he said had facilitated the sale of 'sows ears . . . as silk purses' through their 'fanciful' ratings of mortgaged-backed securities" (Kirchgaessner and Sender, 2008).

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epicenter of the crisis: they did not provide nonconforming mortgages, repackage these mortgages into securities, bundle these securities together with other securities as collateral for yet other securities, or give a rating to the structured credit securities or distribute these securities.[2] The other argument is that they were not the only ones that bought the high yield bearing subprime-backed securities: pension and mutual funds, insurance companies, and European and Asian banks were all similarly seduced into buying them.[3] In short, the hedge funds' basic defense strategy has been to make themselves as invisible as possible by disassociating from those that supplied the subprime products and by disappearing among those that bought these products.

It is a defense strategy that has worked to perfection because policymakers have been convinced that it is not the hedge funds but the banks that must bear the major blame for causing the subprime crisis. Thus, in the United States, Henry Waxman, the Democratic chairman of the 2008 hearing on Oversight and Government reform suggested that the hedge funds' rapid growth and high leverage posed potential risks to the broader economy, but stopped short of blaming the funds, or their trading practices, for the financial crisis.[4] In the United Kingdom, the Turner Review carried out by the Financial Services Authority concluded that the hedge funds did not cause or contribute substantially to the financial crisis but acknowledged that they played a small role in worsening or transmitting the crisis.[5] Even in continental Europe, where there is more public hostility toward the hedge funds, it is widely accepted that the hedge funds played a secondary role in the crisis rather than a primary role. To quote from a report published in February 2009 by the High-Level Group on Financial Supervision in the European Union: "Concerning hedge funds, the Group considers they did not play a major role in the emergence of the crisis. Their role has largely been limited to a transmission function, notably through massive selling of shares and short-selling transactions" (de Larosière, 2009).[6] These conclusions explain why the current drive

[2] In his testimony before the U.S. Senate, Kenneth Griffin, founder and CEO of Citadel hedge fund, argued that the major failures had occurred in the regulated institutions. As he puts it: "We have not seen hedge funds as a focal point of carnage" (Kirchgaessner and Sender, 2008).

[3] See Shadab (2008).

[4] Kirchgaessner and Sender (2008).

[5] House of Lords (2010, p. 22).

[6] Aglietta and Rigot (2008) have closely examined the role of the hedge funds in the subprime crisis from a perspective very different to that reported in the "European High-Level Group on Financial Supervision in the EU," but they too appear to see

for tightening the controls on hedge funds will not go very far, for while that drive is sustained by the idea that hedge funds helped to transmit the effects of the subprime crisis, it is also weakened by the concession that the hedge funds did not play a major role in causing it.

This article puts forward a completely different view. The hedge funds might have played no part in the actual construction of the subprime-backed securities but this is not the point. Rather, had it not been for the hedge funds' intermediary position between the investors seeking yield on the one hand and the banks that created the high yielding securities on the other, the supply of these securities would never have reached the proportions that were critical in precipitating the near collapse of the whole financial system.[7] There should not have been a mass market for the subprime-backed securities given that their complex and opaque structure broke all the rules of commodity exchange, and without the hedge funds such a market would not in fact have existed. Wealthy individuals did not have the requisite expertise to participate in this market while liquidity and risk control considerations prevented institutional asset managers from having more than a limited participation. In both cases, one of the more preferred solutions to the yield problem, which was becoming increasingly acute after 2001, was to pour money into the hedge funds that were in turn convinced that one of the surest ways of satisfying the demand for yield was to divert substantial amounts of this money into the subprime-backed securities. The banking system certainly overreached itself in creating and distributing products that turned out to be highly toxic, but if it did so it was also because of the external pressures placed on it to supply those products, and the hedge funds were a major channel for those pressures. Take away hedge funds and a general financial crisis could still have occurred in 2007–8, but it is only because of the hedge funds that the crisis that actually occurred initially took on the specific form of a subprime crisis.

The rest of this article is organized as follows. The next section briefly looks at the reasons why most commentators only give importance to the supply-side factors behind the growth of the toxic securities. The third

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the hedge funds as having played more of an amplifying rather than causal role in the subprime crisis.

[7] This singling out of the special intermediary role of the hedge funds contrasts with the position taken by Eichengreen, who states that "hedge funds played no special role in the crisis. Everything they did, from risk-taking to the use of credit and procyclical portfolio adjustments, a variety of investment vehicles from SIVs [structured investment vehicles] and conduits to investment and commercial banks themselves similarly did" (2008, p. 14).

section looks at the reasons behind the popularity of these securities with the hedge funds. The fourth section explains why importance should also be given to the demand-side factors behind the growth of the toxic securities. The fifth section explains why the blame for the subprime crisis should be shared equally between the banks and the hedge funds. The sixth section spells out some policy implications. The seventh section provides the conclusion.

The growth of collateralized debt obligations: the push of supply

The financial products that were at the epicenter of the financial crisis were collateralized debt obligations (CDOs): structured credit products created by pooling mortgage-backed securities, mainly comprising those backed by subprime and other nonconforming mortgage loans, with other asset-backed securities as collateral. The use of various credit enhancement techniques in the construction of these products was supposed to have made them safe. However, when the delinquency rate among U.S. nonconforming borrowers began to rise sharply in the wake of the increases in the federal funds rate from mid-2004, not only did these sophisticated techniques fail to prevent a resulting fall in the prices of CDOs, they actually helped to accelerate the rate of that fall by virtue of having helped to make these products too opaque and hence too difficult to value accurately. It was the panic caused by the unexpectedly rapid collapse of the CDO market that led to the breakdown in trust in the money and interbank markets, a breakdown that proved to be catastrophic in that it was the catalyst setting in motion a liquidity-solvency crisis spiral that eventually culminated in the paralysis of the whole financial system.

In the mainstream explanations of the crisis, it is the financial institutions that created and distributed the CDOs that are singled out for blame with overconfidence and greed identified as the two principle motivating factors.[8] Thus, the combination of an undervaluation of risk and the quest for fees and commissions led the mortgage originators and the banks to relax lending standards, the credit-rating agencies to loosen the criteria for evaluating and rating risk, and the investment banks and various off–balance sheet investment vehicles such as structured investment vehicles (SIVs) and conduits to employ excessive leverage. Insofar as more general environmental factors enter into the picture, they do so in ways that bolster

[8] See, for example, Bank of England (2008) and International Monetary Fund (2008).

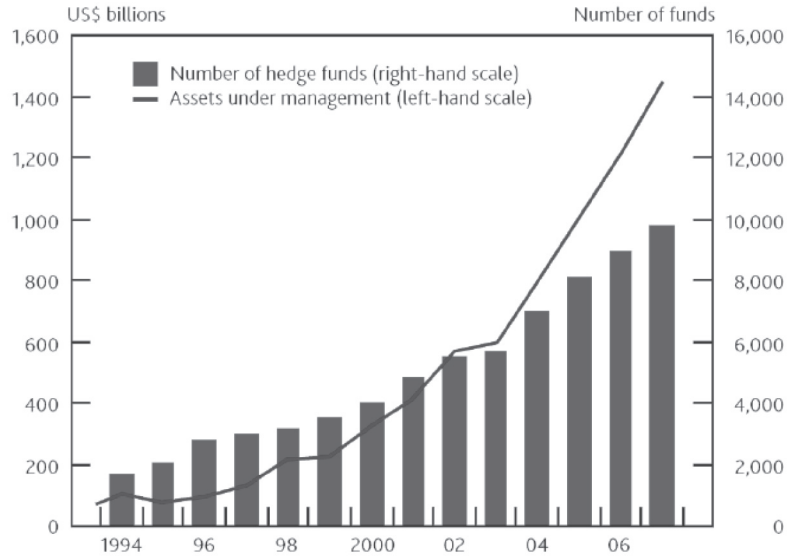
this supply-side story behind the growth of CDOs, one argument being that the years of the "great moderation" and the concomitant relaxation of monetary policies and of bank supervision contributed to the undervaluation and mispricing of risk and another being that the build-up of a "savings glut" in Asia and other parts of the world contributed to the unusually low borrowing costs and the resulting excessive leverage and risk taking in the Western banking system.

In sharp contrast to the preoccupation with the supply-side factors behind the growth of CDOs, the demand-side factors have been virtually ignored essentially because it is generally assumed that the latter merely played a passive role.[9] The reasons for this assumption are pretty clear. In contrast to asset-backed securities that have as their collateral a single and thus clearly identifiable class of loans (conforming mortgage loans, credit card loans, corporate loans, etc.), the securities backing CDOs consist of many different types of asset classes. Given the heterogeneity of the backing assets, and the infinite variety of ways that these can be mixed together, it follows that no two CDOs are alike: each one is a unique, customized product that can be sold to a counterparty on privately negotiated terms but which cannot be widely marketed on standardized terms. Since the opaque and complex nature of CDOs prevented the development of a broad customer base such as was to be found in virtually every other financial market, it would seem to follow that the rapid growth in CDO issuance before 2007 could not have been due to the pull of external demand but that, on the contrary, it must have been powered by the issuing banks to promote their own material interests. The fact that substantial amounts of CDOs remained within the banking sector at the time of the subprime crisis further confirms this impression.

The gap in this reasoning is that it does not allow for the possibility that the pressure of demand for CDOs, blocked from finding vent in a direct and broad-based manner, found vent instead through an intermediary, albeit much narrower, channel, namely, that provided by the hedge funds. As shown in Figure 1, the growth of the hedge fund industry between 2002 and end-2006 was phenomenal: hedge fund assets tripled, rising from $500 billion to about $1.5 trillion, and the number of firms operating within the industry doubled, rising from about 5,000 to about 10,000. One of the key drivers behind the growth of the hedge fund industry was its "institutionalization": institutional investments in hedge funds remained comparatively modest up to 2002 but after that date these rose so rapidly

[9] Caballero (2009) is among the few economists who does give primacy to the demand-side factors.

Figure 1 Number of hedge funds and assets under management



Source: Bank of England (2008).

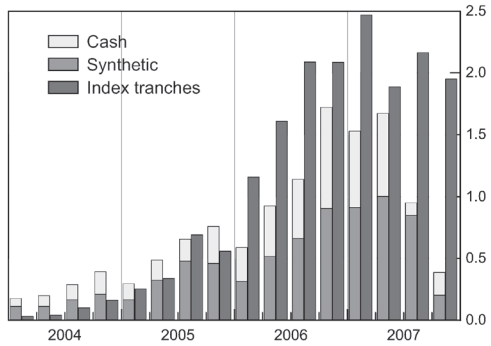
that by 2007 institutional investors were as important a source of hedge fund capital as were high net worth individuals.[10]

These changes in the scale of the hedge fund industry and in the composition of its investor base were largely the result of the unusually low yields that persisted in all of the major bond markets during this period.[11] Although CDOs offered what seemed a good solution to the yield problem that was becoming increasingly acute, the opaque, high-risk, and difficult to trade nature of these financial products meant that the pension and mutual funds and various other institutional investors had to strictly limit their involvement with them and look for additional solutions to the yield problem. This included the placement of large sums with the hedge funds, which, not being subject to the same regulatory and prudential constraints that were binding on the public investment vehicles, used a substantial proportion of these sums to buy large amounts of CDOs. There were other buyers of these products as has often been pointed out not only by the hedge funds themselves but also by many

[10] See Lysandrou (2011a).

[11] See Goda et al. (2011).

Figure 2 Growth of CDOs (US$ trillions)



Source: Borio (2008).

other commentators,[12] but as we will now see, the hedge funds were by far the most important buyers.

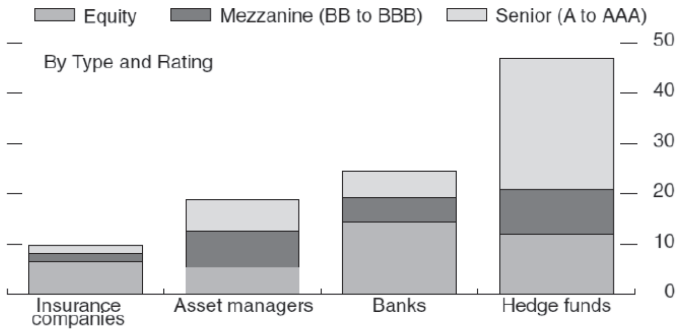
The popularity of collateralized debt obligations with the hedge funds

CDOs were first introduced in the 1980s, but their rate of growth remained slow until the early 2000s when that rate suddenly rocketed, as shown in Figure 2. In 2002 there was an estimated $250 billion worth of CDOs outstanding but by the end of 2006 that sum had multiplied twelvefold to about $3 trillion with about one-third of this sum comprised of "cash" CDOs and the two-thirds comprised of "synthetic" CDOs, that is, CDOs artificially created by taking cash CDOs as reference entities for credit default swap agreements.

The rapid growth in CDOs from 2002 onward bears a close correlation with the growth of hedge fund assets. A strong indication that this correlation is no coincidence but a manifestation of a deeper, causal link is given by the hedge funds' share of CDO holdings at the end of 2006. Figure 3 and Table 1 provide two estimates of all CDOs held by investors at this time, the former given by the International Monetary Fund (IMF) based on data provided by Citigroup, and the latter given by Blundell-Wignall (2007b) based on data provided by various private banks. While these estimates show some notable discrepancies regarding the composition of the CDOs held by the different groups of investors,

[12] See Shadab (2008, p. 8).

Figure 3 Buyers of CDOs: 2006, first estimate (in percent)



Source: IMF (2008).

Table 1
Buyers of CDOs: 2006, second estimate (in percent)

CDO tranche	Insurance	Hedge fund	Bank	Asset manager
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 percent	9.8	46.5	24.9	18.8
Total billions of dollars	295	1,396	746	564

Source: Blundell-Wignall (2007b).

there is no discrepancy regarding the total amounts held by each group of investor: the hedge funds held about 47 percent of all CDOs at end-2006, while the banks held 25 percent and the insurance companies and asset managers held the remaining 28 percent.

From the start of the CDO explosion, it was observed that the hedge funds and CDOs were mutually suited: the high yields on CDOs were extremely attractive for the hedge funds, whereas the latter's structure and expertise meant that they could handle the complex and high-risk nature of these products with comparative ease. To quote from a report published in 2003:

> Hedge funds have constituted the fastest-growing investor base in the CDO universe because they have the structural expertise and ability to move quickly in the market. They are natural buyers of distressed senior collateralised debt obligations due to their analytical ability to break down CDOs. Many investors have stayed away from the market because of the amount of analysis involved. ("A Sharper Focus," 2003).

Indeed, the hedge funds became so important a part of the CDO universe that some commentators have attributed the growth of synthetic CDOs, which barely existed in 2002, to the shortage of cash CDOs created by the heavy demand from the hedge funds. To quote Clark:

> The increase in synthetic securitisations in the U.S. 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. (2008, p. 31)

It was not merely through causing a shortage of hard asset collateral that the hedge funds helped to promote the rapid growth of synthetic CDOs after 2002. As stated, these products were created by taking cash CDOs as reference entities for credit default swaps: one party would sell protection to the counterparty in return for payments of interest and principal, or one party would buy protection from the counterparty and pay interest and principal. There were several variations on this theme. For example, cash flows in the credit default swaps would only involve the payment of interest: the "unfunded" synthetic CDO. Or the reference entity for credit default swaps would be a particular tranche of a cash CDO rather than the whole CDO: the "single tranche" synthetic CDO. There is a general assumption that banks and insurance companies were the only major players in credit derivatives before 2007 and hence the only major holders of synthetic CDOs in this period. The reality was that the hedge funds were also heavy investors in synthetic CDOs as is clear from the fact that they were second only to the banks as protection buyers and as protection sellers (see Table 2).

The above observations prompt two questions. First, how could the hedge funds, which at the end of 2006 held a little over 1 percent of the world's total stock of securities, hold at the same time nearly 50 percent of the total stock of CDOs? Second, why would hedge funds, which were well known for being short-term "buy and sell" traders rather than long-term "buy and hold" investors, choose to invest heavily in CDOs considering their opaque and illiquid nature? They may have had the structural expertise and the relatively unconstrained freedom to invest in CDOs, but what was their motivation? The answer to these questions

Table 2
Main participants in credit derivatives (percent of total)

	Protection buyers		Protection sellers	
	2004	2006	2004	2006
Banks	67	59	54	43
Hedge funds	16	28	15	31
Pension funds	3	2	4	4
Insurance	7	6	20	17
Corporations	3	2	2	1
Mutual funds	3	2	4	3
Other	1	1	1	1

Source: IMF (2008).

can be summed up in one word: *leverage.* On the one hand, hedge funds tend to use a significant amount of leverage to boost asset returns, and this applies to CDOs also with the result that their holdings of these products financed out of borrowings were several times higher than those financed by their own assets; on the other hand, because the hedge funds borrow heavily, they rely heavily on collateralized type loans to minimize borrowing costs and CDOs were well equipped to serve as collateral.

If it is assumed that the hedge funds' CDO holdings at end-2006 were evenly divided between the cash and synthetic varieties, this would put their cash CDO holdings somewhere in the region of $750–$800 billion. We know that total assets under hedge fund management at end-2006 was in the region of $1.4 trillion and we also know that the hedge funds were by this time allocating up to 20 percent of their assets to CDOs and other difficult-to-trade debt securities.[13] The assumption that up to one-half of this amount was allocated to cash CDOs would mean that the hedge funds' holdings of these products financed by their own assets were in the region of about $150 billion, a figure that would in turn mean that the remaining $600–$650 billion worth of cash CDOs were held on borrowed funds; in other words, a leverage ratio of about four. Although it is difficult to directly measure the amounts of leverage involved in the different hedge fund strategies because of lack of data, it has been possible to infer some idea of these amounts by looking at the returns associated with the different investment strategies, the management expense ratios

[13] Farrell et al. (2007, p. 107).

(MER), and the percentage returns given to investors.[14] As shown in Table 3, investors in hedge funds received an average of 11.3 percent in 2006, which meant that the hedge funds would have had to generate a pre-MER return of about 20 percent to be able to return this 11 percent to investors.[15] As also shown in Table 3, while a small proportion of hedge fund assets was assigned to strategies that employed a much higher than average leverage ratio (fixed income arbitrage) and another proportion assigned to strategies that employed zero leverage (long only), the bulk of assets was assigned to strategies that employed the average leverage ratio of four (long-short).

In addition to the leverage ratio, the other indication that the hedge funds' investments in CDOs belonged to the long-short investment category is given by the large amounts of the equity tranches that they bought. Although estimates of these amounts as a percentage of all hedge fund CDO holdings in 2006 vary (recall from that while one source puts this percentage at about 14, see Figure 3, another puts it as high as 19, see Table 1), these amounts were high relative to those bought by some other investors. The equity tranches in CDOs are the highest yielding but also bear all of the residual risk, for which reason they are unrated. Although the pension and mutual funds had to severely restrict the amounts of CDO equity securities that they bought because of prudential considerations and regulatory constraints, the fact that the hedge funds did not face similar complications meant that they were better placed to take advantage of the high yields on the equity securities by going long in them while also controlling for the risk on these securities by shorting other securities or by going long on put options. As shown in Table 4, in 2006 the share of hedge funds' assets assigned to equity hedge strategies came to 29 percent, a sum more than double the share assigned to the second most popular strategy and nearly triple the share assigned to the macro hedge strategy. A decade earlier the latter strategy was the predominant hedge fund style, accounting for 55 percent of all assets under management as compared with the 20 percent accounted for by equity hedge,[16] and it is almost certain that this marked swing in

[14] See Blundell-Wignall (2007a, pp. 47–48).

[15] As Blundell-Wignall explains: "Broking estimates suggest that about 25% of the pre-MER-traded returns are absorbed by fees paid to hedge fund managers, and around 20% are absorbed by execution costs to prime broker dealers i.e. about 45% in all. So for the 11.3% return in 2006, hedge funds would have earned $11.3/(1 - 0.45) = 20.5\%$" (2007a, pp. 45–46).

[16] See Farrell et al. (2007, p. 116).

Table 3
Implied hedge fund leverage calculation

	AUM (billions of dollars)	Required return (percent)	Observed return (percent)	Required asset for 20 percent return on AUM (billions of dollars)	Implied leveraging (billions of dollars)	Leverage ratio on AUM x
Fixed income arbitrage	96.6	20	1	1,931.2	1,834.7	19
Other long-short	919.1	20	4	4,595.6	3,676.5	4
Long only	414.9	20	20	414.9	0.0	0
Total	1,430.6			6,941.7	5,511.2	3.9

Source: Blundell-Wignall (2007a).

Note: AUM = assets under management.

Table 4
Hedge fund styles

Style	Percent	Nature of strategy
Equity hedge	29	Stock and derivative strategies
Event driven	14	Mergers and acquisitions, spin-offs, bankruptcy reorganization
Relative value arbitrage	13	Listing same security in two different markets
Macro hedge	11	Directional plays
Sector	5	Long one versus another
Distressed securities	4	Heavy discount workouts
Emerging markets	4	Equity and debt
Equity non-hedge	4	Activist raids
Convertible arbitrage	3	Buy convertible sell stock
Equity market neutral	3	Long one stock short another
Other	10	
Total	100	
Equities activities	61.0	
Long-short activities	72.5	

Source: Blundell-Wignall (2007a).

the fortunes of these respective hedge fund styles can in large part be attributed to the investments in CDOs.

While the upside of leverage is that it enhances asset returns, the downside is that can entail substantial borrowing costs. However, if we look at the main forms in which the hedge funds borrowed money (see Table 5), it is easy to see how they managed to reduce these costs. In addition to derivatives, which are the largest single sources of leverage (the present replacement value of derivatives is a margin account concept that understates the notional value of derivatives contracts or notional command over securities),[17] the other three sources are securities lending (the prime broker lends securities to the hedge funds and gets cash or other securities as collateral), reverse repos (the hedge funds sells securities to the broker for cash and at the same time commits to buy them back), and margin loans (the broker advances a loan to a hedge and gets a security as collateral). The latter three borrowing forms, particularly reverse repos, were the principle means through which the hedge funds were able to increase their cash CDO holdings by four times the amount of their own money invested in them and, as is evident in the descrip-

[17] Blundell-Wignall (2007a, p. 50).

Table 5
Hedge fund shares of prime broker counterparty exposure

	Total credit exposure (billions of dollars)	Ratio to tier 1 capital	Hedge fund (billions of dollars)	Hedge fund (percent total exposure)	Hedge fund exposure ratio to tier 1 capital
Loaned securities	555	1.09	222	40	0.44
Reverse repos	1,864	3.65	466	25	0.91
Derivatives present replacement value	885	1.74	292	33	0.57
Margin loans	367	0.72	242	66	0.48
Total	3,672	7.20	1,223		2.40

Source: Blundell-Wignall (2007a).

tion of these forms, the borrowing costs attached to each of them were reduced by the use of cash and securities as collateral.

The evidence that CDOs were being used as collateral to obtain low-cost loans to buy even more CDOs lies in the significant amounts of triple-A-rated senior tranches held by the hedge funds in 2006. There seems to be a notion that the hedge funds were only interested in holding the higher yield bearing equity and mezzanine tranches of CDOs. This notion is not correct. It is certainly true that the hedge funds did hold relatively more of these tranches than did other investors because they were better placed to do so. To quote from a report in April 2007:

> Hedge fund managers expertise, experience and appetite for high returns provides them with an incentive to invest in the riskiest component of an issue such as CDO equity tranches. . . . Other investors, like most institutional investors, naturally avoid these areas due to regulation or a lack of knowledge. (Mustier and Dubois, 2007, p. 89)

However, it is also the case that the hedge funds held substantial quantities of the senior tranches as can be recalled from the data provided in Figure 3, and they did so because these tranches served a double purpose for them: on the one hand, they gave better returns than did other high quality government and corporate securities even while having the same superior credit rating and, on the other hand, they could be used as collateral in borrowing arrangements because of their superior rating. If it is asked why the investment banks, which are the primary lenders of money to the hedge funds, were bound to accept these securities as collateral, the simple answer is that it was these very same banks that helped to create the CDOs in the first place.

The upshot of the above is that CDOs represented exactly the type of financial securities that the hedge funds needed in the yield-constrained environment that prevailed between 2002 and 2007. To maximize gross returns on assets in such an environment, the hedge funds had to spend far more money than was given to them by clients, and to maximize the net returns that had to be given back to these clients, the hedge funds had to keep the costs of borrowing the extra sums of money down to a minimum. The CDOs fit into this equation perfectly. There were other securities such as emerging market bonds that gave high returns but could not be used as collateral, and there were other securities such as U.S. Treasuries that could be used as collateral but gave extremely poor returns. Only CDOs combined these two distinct advantages together because only these products comprised triple-A-rated bonds at one end of the scale with unrated equity securities at the other end. However, if

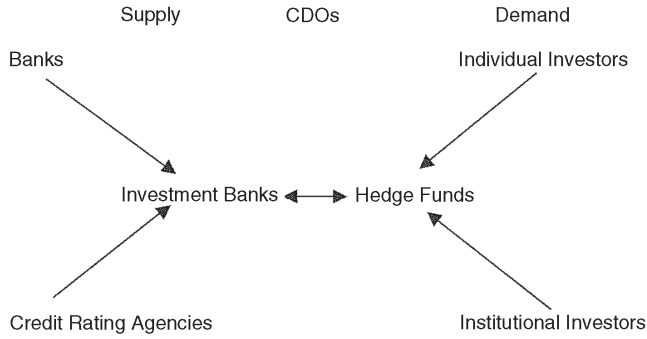
CDOs were extremely popular with the hedge funds because of these products' special attributes, what is also clear from the above discussion is that these special attributes owed much to the special relationship that the hedge funds had with the investment banks. As will now be argued, it was this relationship that was pivotal to the conveyor belt system of the production of CDOs that came into operation between 2002 and 2007.

The growth of collateralized debt obligations: the pull of demand

The supply of CDOs required two basic ingredients: securities backed by conventional loans, including conforming residential mortgage loans, and securities backed by nonconforming residential mortgage loans. The standard explanation for the growth of this part of the mortgage market, which was extremely rapid between 2004 and mid-2007, starts with the mortgage brokers and banks, which, in order to make commissions, gave loans to subprime borrowers on terms that were far too easy, and then moves on to the role of the investment banks and credit rating agencies that, also eager to make commission, were more than ready to create the sophisticated credit products. This standard explanation then finally ends with a discussion of how trusting and gullible investors were seduced into buying these products. Just as plausible, however, is the explanation that runs this story in the reverse direction: in the search for yield, investors pressured the investment banks to supply structured credit products in ever greater quantities, and to do this, these banks needed the mortgage originators to take whatever steps necessary to induce as many subprime borrowers as possible to take out mortgage loans.

There were several clues that this alternative explanation is just as historically accurate as is the conventional explanation. One clue was the sudden growth in synthetic CDOs from about 2003, caused in large part by the shortage of hard asset collateral: no matter how rapid the expansion in nonconforming mortgage loans, this apparently could still not keep up with the rate required to meet the demand for cash CDOs. Another clue was the testimonies given by investment bankers immediately after the subprime crisis that recounted the pressure they came under to provide CDOs. To quote from one testimony given by Gerald Corrigan of Goldman Sachs at a House of Commons hearing on the financial crisis: "To a significant degree it has been the reach for yield on the part of institutional investors in particular that goes a considerable distance in explaining this very rapid growth of structured credit products" (House of Commons, 2008, p. 16). As already noted, these clues that attest to the strength of

Figure 4 The CDO market in outline



demand for CDOs have been ignored in most of the academic and official accounts of the subprime crisis because of the assumption that for the demand for any product to be one of the driving forces behind its supply, the product in question has to be sufficiently transparent as to allow it to be priced and traded against general market standards, and CDOs quite clearly do not meet this criterion.

The reality is that a demand-led market for CDOs did exist between 2002 and 2007, albeit that it was based not so much on a system of arm's-length and impersonal exchanges as on a dense network of personal relations between pairs of agents at the very center of which was the relation between the hedge funds and the investment banks (see Figure 4). This relation has always been a particularly close one. In some instances, this closeness was cemented by the fact that investment banks owned the hedge funds that they were dealing with; in many other instances, it was cemented by the fact that the personnel employed by the hedge funds had been previously employed by investment banks. However, what was universally true and what did more than anything else to bind the investment banks and hedge funds together was the fact that they needed each other: hedge funds simply could not carry out their function to the extent that they did without the range of prime brokerage and other support services provided by the investment banks, while the latter could not maintain profit margins at the level that they did without the interests, fees, and commissions that they charged the hedge funds (it has been estimated that about a quarter of all investment banks' income came from hedge funds).[18] When the problem of yield started to become serious from about 2002, the close-knit and mutually

[18] Mustier and Dubois (2007, p. 86).

advantageous nature of the relation between the hedge funds and the investment banks made that relation the perfect funnel through which the pressure of demand for higher yields emanating from investors at one end of the financial spectrum was passed on to the institutions supplying the high-yield securities at the other end. Just as the hedge funds were more than willing to plow substantial amounts of their clients' money into CDOs because these helped to enhance returns while also helping to reduce leverage costs, the investment banks were equally willing to press the commercial banks and others into helping them to supply the hedge funds with CDOs because in addition to the fees and commissions earned directly from the sale of these products, they could also expect the extra income from the extra business with hedge funds, much of which would have been generated with the help of CDOs.

It was because the mass demand for CDOs called for their mass production that helps to explain why substantial quantities of these products remained within the banking sector when the subprime crisis broke out. As noted before, this fact has been widely interpreted as evidence that the banks created the subprime-backed securities more to satisfy their own need for yield rather than that of other investors: if the opposite was true, and the banks were merely responding to the pressure of demand, why did they not succeed in selling every CDO and thus entirely free themselves of the risk attached to these products? To answer this question we need first to distinguish between three types of investment vehicle: (1) the bank-owned special purpose entities (SPEs) that transformed bank loans into securities, (2) the SIVs sponsored by the commercial banks or operated by the investment banks that transformed securities into CDOs, and (3) the conduits, most of which were owned or sponsored by the commercial banks. The first two of these vehicles were at the heart of the CDO production process while the third was not. In contrast to the SIVs that sold most of the CDOs that they created to other investors, those conduits that had bought or created CDOs continued to hold onto all of them. Their main function was to maximize profits from the maturity mismatch between their assets (the mortgage- and non-mortgage-backed securities that they bought from the SPEs) and their liabilities (short-term commercial paper that they issued in the money markets). Although these conduits played an important role in the financial crisis (more on this below), that role was not connected to that played by the hedge funds and other buyers of CDOs. The situation with the SPEs and SIVs was rather different in that in their case there was a connection.

Consider first the subprime-backed securities that were warehoused in the banks' SPEs awaiting delivery. In contrast to synthetic CDOs, which

can be created in days, cash CDOs can take months. To quote Clark: "pulling together a physical asset CDO . . . can take months to ramp-up with the creation of a physical loan pool, drafting legally required documents, and issuing the debt obligations to investors" (2008, p. 26). The length of time taken to create cash CDOs did not pose a risk for the banks as long as they were assured that the demand for them would continue to hold up. In the period between 2002 and mid-2007, the banks believed that they had such an assurance and there was every reason for them to do so considering the insatiable demand for CDOs. However, the time taken to create cash CDOs does pose a serious risk if the demand for them was to cease, which is precisely what happened in August 2007. On August 9, BNP Paribas, a French bank, announced that it could not value the CDOs held by three of its hedge funds. Within days of that announcement, lenders declared that they were no longer prepared to accept CDOs as collateral,[19] which meant that the hedge funds in particular, finding that one of the major reasons for holding CDOs was no longer applicable, immediately stopped buying these products. In view of the collapse in the demand for CDOs, which was as sudden as it was total, the commercial banks had no choice but to bring the unsold subprime-backed securities held by their SPEs back onto their balance sheets.

In addition to bailing out the SPEs, the banks also had to bail out the SIVs that were under their sponsorship. These vehicles were supposed to have sold the CDOs that they created, maximizing income through fees and commissions rather than through the high returns on these products, yet they were caught holding substantial quantities of CDOs when the subprime crisis started. While it is known that the SIVs had deliberately kept back CDOs for their use, it is also probable that they were holding some CDO tranches for which they could not find buyers. Although there was strong demand for CDOs right up to mid-2007, what must be borne in mind is the composition as well as the strength of that demand. If it was the case that the hedge funds, which were by far the biggest buyers of cash CDOs, bought only the mezzanine or equity CDO tranches while leaving the senior tranches for other investors, such an excess supply problem could not have arisen. The reality is that many mezzanine and equity tranches were left unsold because much of the hedge funds' demand for CDOs was actually directed toward the senior tranches that could be used as collateral to reduce borrowing costs. One solution adopted by the SIVs to deal with this problem was to recycle these tranches as backing collateral for CDOs squared and then to recycle

[19] See Brewster (2007).

any unsold tranches of these products into collateral for CDOs cubed. To quote from a 2008 Bank for International Settlements (BIS) report: "These CDOs-squared and structured finance CDOs were created almost solely to resecuritize MBS [mortgage-backed securities] and CDO mezzanine tranches, for which there was not sufficient demand from investors" (IMF, 2008, p. 59). Ordinary CDOs are complex enough, but given the extra complexity of CDOs squared and cubed it was unlikely that the excess supply of mezzanine tranches would have been fully resolved in this manner.

The conclusion that falls out of the above is that the demand for CDOs was by no means the passive accommodator of their supply as is often made out. To draw this conclusion is by no means to argue that the banks that produced the CDOs were themselves merely passively responding to the demand for these products. They had too much to gain from the production of CDOs to countenance such a view. Rather, it is to argue that the rate of growth of CDOs between 2002 and 2007 could only have been so extraordinarily high because of the dynamic interaction between the push of supply factors on the one hand and the pull of demand factors on the other. This argument takes us back, of course, to the question as to why the hedge funds have not taken a major blame for the subprime crisis. If the growth of the CDO market was powered by a balanced dynamic between supply and demand, and if the hedge funds played the key role on the demand side of this dynamic, why is it that these institutions have not been bracketed together with the banks as coauthors of the subprime crisis? The next section attempts to shed more light on this question.

The growth of collateralized debt obligations and the subprime crisis: the balance of blame

It was previously stated that when the subprime crisis started the hedge funds quickly vanished from view by leaving the foreground to the banks that supplied the subprime products and mingling in the background with the other investors that bought these products. An important additional factor that helps to explain why this vanishing act has worked so well concerns the relatively small amounts of losses incurred by the hedge funds as compared to those incurred by the banks.[20] In the public mind, the subprime crisis has come to be firmly fixed as a banking crisis and

[20] For estimates of comparative losses incurred by the banks and hedge funds as a result of the financial crisis, see IMF (2008).

not as a hedge fund crisis because it was the banks that had to be bailed out by national governments while the hedge funds did not receive a single penny of taxpayers' money. For those researching the causes of the subprime crisis, however, it is not so much the amount of government support received that is the important consideration (as private investment vehicles, the hedge funds were not eligible for public support in any case) as the relative amounts of losses suffered. While the hedge funds as a group may have been holding far greater amounts of CDOs than were held by the banks on the eve of the crisis, it was the latter institutions that incurred the greater losses as a result of the crisis. Some commentators explain this paradox by pointing to the marked differences in the leverage ratio: while hedge funds leveraged up their assets by an average ratio of four, the commercial banks and their off–balance sheet vehicles employed an average leverage ratio ten times this figure. This is too simple. In addition to the quantity of borrowings, what also has to be taken into account is the composition of these borrowings. Recall that the majority of hedge funds' borrowings came via their prime brokers and not via the issuance of asset-backed commercial paper; thus the irony is that when the asset-backed commercial paper (ABCP) market collapsed, the hedge fund–investment bank relation that had been pivotal to the mass production of CDOs now turned out to be the shield protecting the hedge funds from the full effects of that collapse. This is why there was no "hedge fund crisis" as such: several prominent hedge funds did collapse with momentous consequences as will be noted below, but there was no wholesale slaughter of the 10,000 or so firms in the industry. By contrast, there was a wholesale slaughter of the bank-sponsored conduits.

Conduits had approximately $650 billion in assets in 2004, but by mid-2007 that figure had doubled to $1.3 trillion. This figure, which was roughly on a par with total hedge fund assets at that time, was more than three times greater than the amount of assets held by SIVs (see Table 6), a differential in keeping with the fact that while the latter's main source of income were the fees and commissions earned from the sale of CDOs and other structured products, conduits earned their income from the maturity mismatch of their assets and liabilities. Although there were other institutions, including structured finance groups, mortgage lenders, and investment banks, that sponsored some of the 300 or so conduits in operation in 2007, the majority, with over 75 percent of assets, were sponsored by commercial banks.[21] The conduits differed in the precise composition of the assets held, with some concentrating in CDOs and

[21] See Acharya et al. (2010).

Table 6
Conduits and SIVs

	Conduit	SIV
Assets	• US$ ≈ 1,400 billion • Nontradable loans • Less risky • 47 percent traditional assets • 53 percent securities and derivatives	• US$ ≈ 400 billion • Assets are traded • Less risky • ≈ 28 percent financial institutions' debt • ≈ 48 percent CMBS/RMBS/ABS • ≈ 22 percent CDOs/CLOs • ≈ 2 percent other
Liabilities	• 100 percent commercial paper	• 27 percent ABCP • 66 percent medium-term notes • 7 percent capital notes
Credit enhancement	• Varied (sponsoring bank)	• Overcollateralization
Liquidity facility	• Contractual 100 percent coverage	• Contractual < outstanding liabilities • ≈ 10 to 15 percent of senior debt

Sources: Brunnermeier (2009) and IMF staff estimates (IMF, 2008).

Notes: SIV = structured investment vehicles, CMBS = commercial mortgage-backed securities, RMBS = residential mortgage-backed securities, ABS = asset-backed securities, ABCP = asset-backed commercial paper, CDOs = collateralized debt obligations, CLOs = collateralized loan obligations.

others concentrating their investments in the more conventional securities (see Table 7), but the feature they shared in common was the 100 percent financing of their long-dated securities with short-dated commercial paper. This explains why the conduits were as big a source of risk to the banks as they were important as a source of profits: while they helped banks to maximize profits by virtue of being able to exploit the interest differential between assets and liabilities, they also posed a huge risk to the banks because the commercial banks fully guaranteed their conduits' borrowings[22] (for which reason lenders in the money market were prepared to accept comparatively low returns) but did not at the same time make any equivalent capital provision for these guarantees (EU banks, with the exception of the Spanish and Portuguese banks, made zero provision while the U.S. banks made 10 percent provision).

[22] For a full description of the types of guarantees given to the conduits by the commercial banks, see Acharya et al. (2010, pp. 8–9).

Table 7
Ten largest conduits

Program name	Sponsor	Asset-backed commercial paper (billions of dollars)	Guarantee	Asset origin	Asset rating	Asset type (share percent)
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).

Note: n.a. = not available.

The realization of the potential risk to the banks posed by their conduits came on August 9, 2007, when the announcement issued by BNP Paribas that it could no longer value certain asset-backed securities held by three of its investment funds caused panic in the money markets.

As just stated, not all conduits were exposed to CDOs, but because of the opacity of these instruments and because, therefore, money market investors did not know who was exposed to them and to what extent, the latter chose to play it safe and withdraw the cheap lending facility from all borrowing institutions. When the conduits became insolvent, the commercial banks took a massive hit because that insolvency set in train the rapid sequence of events that culminated in the need for governments and their central banks to rescue their banking systems. A key background factor to that sequence was the change in the liabilities side of commercial banks' balance sheets in the years prior to the outbreak of the crisis: while it was traditionally the case that the banks would fund their long-term assets principally with household deposits, the decline in these deposits due to the changes in household savings patterns meant that the banks had to increasingly rely on the short-term money markets to fill the funding gap. Thus, when these markets seized up in the summer of 2007, the banks faced the conundrum that, on the one hand, they had to raise new finance for the conduit-held securities that were brought back onto their balance sheets and that, on the other hand, they themselves were constrained in raising this new finance because of their own exposure to the money markets. It was because it quickly became common knowledge among the bank community that a substantial proportion of their number faced this conundrum that helps to explain why the banks became extremely reluctant to lend to each other and why, as a consequence of this reluctance, the interbank market went into cardiac arrest at the same time as the money market.

To repeat, it was the scale of the damage done to the commercial banks by their conduits that explains why the latter tend to be lumped together with other off–balance sheet entities such as SPEs and SIVs as having caused the financial crisis while the hedge funds tend to be assigned a secondary, amplifying role in the crisis. However, this interpretation of events can only be sustained if no differentiation is made between the two distinct phases of the financial crisis, that is, between the subprime crisis phase that culminated in the BNP Paribas announcement of August 9, 2007, and the money market crisis phase that commenced on that same day. As is made clear in Brunnermeier's "event logbook" (see Figure 5), the BNP Paribas announcement, relayed by Bloomberg to every trading room in every financial institution in the world on the morning of

Figure 5 Unfolding subprime crisis: event logbook

The trigger for the liquidity crisis was an increase in subprime mortgage defaults, which was first noted in February 2007. . . .

On May 4, 2007, UBS shut down its internal hedge fund, Dillon Read, after suffering about $125 million of subprime-related losses. . . .

Later that month, Moody's put 62 tranches across 21 U.S. subprime deals on "downgrade review," indicating that it was likely these tranches would be downgraded in the near future. This review led to a deterioration of the prices of mortgage-related products. . . .

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 $3.2 billion in order to protect its reputation. . . .

Then a major U.S. home loan lender, Countrywide Financial Corp. announced an earnings drop on July 24. . . .

In July 2007, amid widespread concern about how to value structured products and an erosion of confidence in the reliability of ratings, the market for short-term asset-backed commercial paper began to dry up. . . .

IKB, a small German bank, was the first European victim of the subprime crisis. In July 2007, its conduit was unable to roll over asset-backed commercial paper. . . .

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, pp. 82–85).

August 9, 2007, marked 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 cumulative problems in the mortgage-related securities markets suddenly culminated in a full-scale panic. Had that panic not occurred on that scale on that August day, then those banks and those conduits that were not directly exposed to subprime-backed products would not have gone under and the losses in

these sectors would have been localized in much the same way as they were in the hedge fund sector; but because the subprime crisis did morph into a money and interbank crisis on August 9, all of the conduits and many individual banks that were exposed to these latter markets collapsed. Furthermore, what is also made clear in Brunnermeier's event logbook is that while the conduits were among the major victims of the money market crisis that began on August 9, they were not the major instigators of the breakdown in confidence that led to that tipping point; rather, that position was occupied by the mortgage originators and securitizers, on the one hand, and by the hedge funds, on the other.

In sum, the roles played respectively by the hedge funds and the bank-sponsored conduits in the subprime crisis were the exact reverse of those that they are generally assumed to have played: it was the hedge funds together with the mortgage companies and the banks' SPEs and SIVs that caused the subprime crisis, while the banks' conduits helped to turn that crisis into a full-scale banking crisis. It is, of course, 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 spillover 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. It is this single but absolutely crucial fact that explains why the hedge funds must carry the same primary responsibility for causing the subprime crisis as that carried by the SPEs and SIVs sponsored or operated by the commercial and investment banks. The logic is inescapable: if the hedge funds had not played as prominent a role on the buy side of the CDO market as that played by the commercial and investment banks on the supply side, that market would not have grown twelvefold between 2002 and mid-2007, and its collapse at this latter point in time would not have set in motion a liquidity-solvency crisis that rapidly spiralled out of control.

Policy implications

The central policy implication that follows from the above is that there must be a comprehensive rather than selective repeal of the privileges

that are unique to hedge funds and certain other types of private investment vehicle. These privileges have traditionally been divided into two categories: hedge funds have not been subject to strict disclosure rules regarding their investment strategies, and they have not been subject to tight restrictions regarding the financial products and practices that they can use to implement these strategies. The fact that policymakers do recognize the complicity of the hedge funds in the subprime crisis means that these vehicles will henceforth lose the first of their traditional privileges. Thus, following the enactment of the Dodd–Frank Act in July 2010, hedge funds operating in the United States are required to register with state or federal financial authorities and to comply with their guidelines regarding transparency and disclosure;[23] similarly in Europe, hedge funds will in the future only be allowed to operate across all of the member states of the European Union if they register with the newly created European Securities and Markets Authority and agree to comply with its reporting standards.[24] However, the fact that policymakers continue to believe that the hedge funds did not play a major causal role in the subprime crisis means that these institutions will not lose the second of their traditional privileges. Although financial authorities will have the right to impose restrictions on hedge funds' use of certain products (e.g., swaps and other derivatives) and trading practices (e.g., short selling) whenever deemed necessary, the more substantive point is that the hedge funds will continue to be generally exempt from the constraints that are currently binding on the activities of other financial vehicles such as pension and mutual funds.

The view here is that the policymakers are wrong to pull their punches on hedge funds because these private investment firms did play a huge role in precipitating the subprime crisis and because they were able to

[23] Under the terms of Article IV of the Dodd–Frank Act, only hedge funds with less than $25 million assets under management (AUM) will retain private investor exemption. Hedge funds with between $25 million and $100 million AUM will be required to register with the state in which they operate, while hedge funds that operate in over 15 states or have over $100 million AUM will be required to register with the Securities and Exchange Commission. A further point worth noting is that in order to limit the potential risks to commercial banks from hedge fund activities, Article VI of the Dodd–Frank Act sets the limit to bank shareholdings in hedge funds at 3 percent.

[24] The initial position of some EU states, including France, was to require foreign hedge funds operating in Europe to register with the financial authorities of each member state; however, following opposition from the United States and the United Kingdom, which argued that this policy would not only be cumbersome but also highly discriminatory, a compromise solution was reached in October 2010 whereby, after an initial transition period, pan-European marketing rights (the so-called "EU passports") will also be available to foreign hedge funds. See Tait (2010).

do so precisely as a result of their exemption from the type of constraints binding on the public investment firms. Given the scale of the damage done to the world economy by the subprime crisis and given the primacy of the hedge funds in this crisis, the claim that the unregulated activities of these institutions confer net economic benefits is no longer credible, a fact that in turn means that none of the exemptions enjoyed by these institutions is any longer justifiable. All of these exemptions must be terminated if hedge funds are to be effectively prevented from posing a major threat to economic stability in the future. This proposition will, of course, raise the objection that to remove all of the privileges currently enjoyed by the hedge funds is to effectively destroy the rationale for their very existence. However, the deeper question that this objection raises in its turn is whether hedge funds are indeed necessary to the operation of modern economies, and for every argument that answers this question in the affirmative, there is another argument that answers it in the negative.[25]

Conclusion

Governments are still hesitant as to how far they should go in tightening the controls on hedge funds. An important factor behind this hesitation is the continuing uncertainty over the extent to which the hedge funds were responsible for the subprime crisis that subsequently mutated by stages into the worst economic crisis since the Great Depression. As things stand, the supply-side story of the growth of toxic securities that absolves the hedge funds from major blame continues to be far more compelling than the demand-side story that fully implicates them, and the reason for this is that the latter story still contains too many gaps. This article has attempted to close some of these gaps.

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[25] See Lysandrou (2012) for further discussion of the arguments for and against hedge funds.

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