Insurance, Reinsurance, and Technologies of Financial Anti-Fragility
A Note on the Origins of Junk Bonds and CDOs

Alexandros-Andreas Kyrtsis
Professor of Sociology
Department of Political Science and Public Administration
University of Athens
akyrtsis@pspa.uoa.gr

Draft paper – presented at the conference on Risk Management jointly organised by EABH and Swiss Re, 13 June 2014

Swiss Re, Rüschlikon, Switzerland

Abstract:
The financial innovations of post-1980s generations of investment bankers and quants that have shaped the sophisticated operations of securitization and risk management in the era of derivatives-driven finance can be traced back to older traditions of operational styles and risk management. The origins of many of the ideas concerning financial technologies and the methods and techniques of the planning and design of financial contracts can be detected in the history of insurance and reinsurance operations. For instance, Junk Bonds rely on the idea of risk premium. And the operations of issuance, contracting, and trading of synthetic CDOs show remarkable similarities with practices and techniques that have been adopted in the management of complex reinsurance programmes since the late 19th century. The common challenge in all these cases was the need to cope with financial fragility. Although investment bankers and financial engineers are not always aware of the origins of the knowledge and of the practical experience on which their financial innovations rely, it seems that the intellectual capital and the tacit knowledge within certain organizational networks which include famous financial service firms have exerted a significant influence on the development of financial technologies of anti-fragility.
Introductory remarks

A rather disregarded aspect of the history of finance is the history of financial technologies that lie behind all kinds of financial operations. Battilossi (2010: 29) defines financial technologies as forms of knowledge that shapes activities that create economic value and opportunities for risk sharing. R.K. Merton puts emphasis on the aspect of lowering transaction costs and of the reduction of asymmetric information (Merton 1995: 463). We can expand these views in saying that financial technologies trigger off forms of agency promising or directing the accomplishment of deeds with material consequences as prescribed by obligations. Within the techno-organizational settings of finance prescriptions for ordered activities of manipulation of informational objects can create value in financial intermediation. These prescriptions of action the result form both tangible and intangible artefacts have the potential to generate both reports and signals (Cooren 2004). For instance financial bubbles can be made techno-organizationally visible through the institutionalized informational artefacts (i.e. mathematical models, indexes, tables, or diagrams) that communities of practice work with but only when a common understanding concerning the meaning of the manipulation of data and information exists. This understanding emerges with the matching of financial technologies to operational necessities by the managers of financial organizations. This correspondence between technologies and operational settings relies on undisputed cognitive processes given the conditions of the application of these technologies remain stable and continue to be regarded as unproblematic. When this is not the case, corrections and modifications, as well as innovation and crisis management strategies by financial engineers are required. Since the 1980s, high leverage processes leading to financial bubbles have been the main and most significant agents of change in financial technologies (Kyrtsis 2013).

All financial instruments rely on a variety of financial technologies. But where do this knowledge and the experience for developing such financial instruments come from? Where do these ideas for financial technologies come from? Have financial instruments (that have played a critical role in the recent history of finance like Junk bonds and CDOs) been invented out of the blue or are they further developments relying on knowledge and practices that were transmitted from previous conditions? Reinvention of forgotten ideas is not rare in science and technology. New challenges
create pressures for solutions which draw on logical constructions that resemble solutions that have been found in totally different contexts. It can be that there is no indication whatsoever that this previous knowledge could be transmitted to the new problem-solvers. The fallacy that may occur under such circumstances is that we tend to infer a genealogy, just because we can make out analogies between what we can observe in two different cases. More precisely, the question here is whether the challenge of coping with financial fragility in recent years has led to solutions in terms of financial technologies that resemble similar solutions in other periods. If this is the case, can we really observe channels of transmission of knowledge from the one period into the other, from one context into another? An additional question here could be the following: can there have be that similar challenges have led to similar solutions or that different challenges have led to solutions that could be regarded as the inspiration for the solution of different problems in different periods. One more problem has to do with the chains of causation of the events of emergence of financial knowledge and financial technologies: Is there a line of development or do we have an accidental intersection of unrelated chains of causation? Of course in the case of the shaping of knowledge the accidental is not totally unconditional. New knowledge presupposes other pieces of knowledge and skills and inventions and the innovations these imply presuppose tacit knowledge, practical skills and skills of coordination in communities of practice, without which the probability of occurrence of solutions as a consequence of challenges can be dramatically decreased.

**Financial fragility**

This issue can be discussed by taking as an example the case of the technologies of anti-fragility as can be observed in synthetic CDOs. Financial fragility and anti-fragility are terms that can be approached from two different directions. The two name that come in mind in this respect are Hyman Minsky and Nassim Taleb. Minsky (2008: 227) writes that “An economy in which income cash flows are dominant in meeting balance sheet commitments is relatively immune to financial crises: it is financially robust. An economy in which portfolio transactions are widely used to obtain the means for making balance-sheet payments can be crisis-prone: it is at least
potentially financially fragile”. In order to cope with fragility we would need to create practical antidotes that could be regarded as anti-fragile practices, which in turn might need the corresponding technologies. Taleb’s definition of anti-fragility can be extremely useful in this respect (Taleb 2012: 16-17): “And we can almost always detect antifragility (and fragility) using a simple test of asymmetry: anything that has more upside than downside from random events (or certain shocks) is antifragile; the reverse is fragile”.[…]“Crucially, if antifragility is the property of all those natural (and complex) systems that have survived, depriving these systems of volatility, randomness, and stressors will harm them. […] Much of our modern, structured, world has been harming us with top-down policies and contraptions which do precisely this: an insult to the antifragility of systems”. The problems originating from the interplay between fragility and anti-fragility appeared in financial history whenever not only the yield, but also the preservation of the ‘health’ of portfolios depended on sources of refinancing. For the banks especially since the organizational model of the Crédit Mobilier prevailed in the 19th century, this was a problem of attracting deposits and having access to the interbank market. In the insurance industry this was a problem of ceding risks to reinsurers who could promise to collect from networks of insurers and reinsurers the capital needed in case of insurance events. They were encountered with financial technologies of risk management that could be used for coping with financial fragility. These combined in the most cases hedging, speculation and attraction of new investors or risk takers on terms of pyramid schemes. The yield and risk variables had then to be coupled according to models in such a way so that the loss of value of the complex portfolio could be minimized. This means that many financial operations went beyond hedging and speculation (betting on expectations of future values). Investors and financial managers invented schemes which presupposed attraction of new creditors and often consecutive bubbles. Such operations required the handling toxic fragility with certain anti-fragility antidotes. Reinsurance with retrocession was traditionally such a fragile operation, but not with such a dependence on large numbers of newcomers in the game, because much of the fragility was absorbed through distribution of risks among a rather closed set of insurers and reinsurers.1 In contrast, the risks that emerged after

---

1 We could use in this context Bühlmann’s mathematically founded view (1980) in order to make the point that newcomer agents with productive economic goals in transactional processes such as
the late 1970s require a high level of leverage and this could be made possible only with derivatives, and when things got more difficult with synthetic derivatives. Where do the expertise for derivatives issuance, and for derivatives operations, come from? If we look at the reports by mathematically oriented functionaries, it is supposed to be the outcome of the interplay between mathematical modelling of financial instruments and the use of mathematical modelling in the practice of trading. The life of derivatives is mostly described as an interaction between quants and traders (Derman 2004). This approach is mostly applied also in the case of the discussion of synthetic forms of structured finance, as are synthetic CDOs.

The argument here is that the technologies of anti-fragility that have been developed in order to cope with financial fragility since the late 1970s draw on various lines of inspiration from already established practices and knowledge. The transmission of traditions of knowledge was also possible because of organizational and social networks that were in operation in the financial world. The significance of these traditions has been extensively blurred by the reference to the role of the ‘rocket scientists’ or ‘quants’ in financial engineering. It is true that high standard training in mathematics, physics and engineering, as well as in mathematical economics has played a crucial role. Also, there is no doubt that in the arenas of financial innovation, this knowledge had a highly instrumental value for the exploitation of ideas that originated from problem solving and procedural methods in banking and finance. However, actuarial and accounting knowledge was very often much more significant than we usually think, especially when it came to connect modelling (e.g. for the valuation of derivatives) with trading operations, or with back-office operations without which clearing, settlement and custody would have been impossible. But what is even less obvious is that many aspects of knowledge used in this context come from insurance and reinsurance. Especially in reinsurance where since the middle of the 19th century fragile financial operations were implemented in order to hedge risks that could not be covered by the usual insurance techniques, we can observe a combination of actuarial, accounting, and contracting techniques that have led the foundations for the knowledge that was used much later, in the era of the derivatives reinsurance schemes bring additional coverage without additional risks, whereas newcomer assets in synthetic CDOs which rely exclusively on earnings from portfolio management would bring additional leverage and thus additional risks.
revolution of the 1990s. The financial technologies and the planning and design of reinsurance contracts that were developed for the crafting and management of complex reinsurance programmes, if compared to the technologies and contracts that are needed for the development of complex processes of securitization, as we observe them in the case of synthetic CDOs, create the impression of unexpected similarities. Comparable contractual procedures we can observe since the late 19th century in banking only in the case of project finance, especially in cases where the management of various risks of ventures had to be combined with syndication. In spite of fragmentations and discontinuities, business and useful organizational knowledge was around and was used even if it had to be reconfigured in organizational settings. It is worth stressing here the significance of reinsurance, especially of reinsurance programmes with a kernel of treaty reinsurance that have been the core business and the core competency of big dedicated reinsurance companies. This model of traditional reinsurance, as we tend to call it nowadays, was the dominant one in the decades before it became a fashion (or a necessity?) to adopt financial reinsurance in order to cede and spread insurance risks into the financial markets. Tranching and the management of interconnection between various layers of premium risk was something usual in reinsurance contracts. This technique has been made famous (for others infamous) in the recent years and in the context of the discussion of the synthetic CDOs and the impact that their mismanagement has had on the outbreak of the 2007-2009 financial crisis. Did the designers of synthetic CDOs have anything to do with reinsurance actuaries? Complex reinsurance programmes and their management with layering of risk exposures was a speciality of big continental European reinsurers like Munich Re and Swiss Re (Arps 1965; James 2013). Synthetic CDOs was an American invention. Did knowledge cultivated in the European reinsurers, and much less with their US counterparts, play a role? Is it a mere coincidence that JPMorgan invented the BISTRO (Broad Index Secured Trust Offering) as a financial instrument to cope with both financial fragility and regulatory pressure from the BIS authorities in December 1997, just a few month after Swiss Re and Credit Swiss First Boston had put on the market their first tranched Catastrophe Bond?

It seems that reinsurers have been in many cases highly successful in their anti-fragile operations. Does this logic of anti-fragility appear also in the synthetic CDO operations, or is there something lost from the operational wisdom that was to
be found in the actuarial and contracting traditions of reinsurance? Unfortunately there is not much literature that directly tackles this issue; there are though various reports which offer us background information that could be combined in order to reconstruct the interrelation of chains of events. There is of course a lot of information on financial technologies and on the documentation of contracts that can also be used. The paper in its present draft form does not go into the technical details that must be described in a later version. It draws the broad lines of sequences of events and tries to draw some general conclusions on the impact of the interconnection of various traditions in the development of financial technologies.

**Contracting**

In the case of synthetic CDOs, as well as in the case of simpler forms of financial instruments, the aspect of contracting is of paramount importance. Synthetic derivatives are artefacts which do not only connect stocks of assets and pecuniary flows. They contain also standards of transactions and of interaction in financial networks. This means that they comprise obligations and their terms of fulfilment, provisions against moral hazard and against the probable opportunism of service providers, as well as sanctions (both positive and negative). As economic contracts tend to be more voluntary multiparty obligations than the result of the direct application of rules of procedural justice, what counts more is the agreed calculus, and less the formal legal prescriptions. Not that the latter are not important. But as Hugh Collins stresses, law observes and regulates the planning and design of contracts from a certain distance; law is not the origin of the substantial aspects of contracts. In cases of lack of density of social networks with a surplus of social capital and trust, or under conditions of deficient institutionalization, contracts lawyers are called upon “to translate the economic deal into a legally enforceable written agreement”. (Collins 2000: 149). The main bulk of the prescription incorporated in agreements, comes from the economic rationale. The process of the construction of a synthetic instrument and the shaping of the operations according to which it is traded and preserved or maintained by custodial services assembles various aspects of knowledge. We know where mathematical, actuarial and accounting knowledge comes from, but there is
less discussion about where the complex financial contracting knowledge comes from. We come across documents of offering circulars of CDOs it can happen that we will be intrigued by the character of contractual elements that can be observed in these texts. The spontaneous reaction would be that the knowledge their authors have used might come from the intellectual capital of law offices. Indeed, law companies do play a role. But for the most part, this contracting knowledge of finance comes to a great extent from reinsurance, and especially from a special kind of it, namely treaty reinsurance. Another source of contracting knowledge is project finance. It may be true that direct insurers have been involved in the risk management of project finance, but they were for the most part concerned in handling separate risks; whereas reinsurers where involved in the management of interrelated risks and also managed those risks as a project of distribution of risks. It is crucial to bear in mind in this that such forms of risk management do not only face the threat of bursting bubbles, and thus of being vulnerable because of their pyramid-scheme component, but from liquidity demands as well, i.e. from the problem of a run. Liquidity risk is perhaps the most important problem which requires intelligent contracting and legal or quasi-legal regulation of contracts. This is why financial technologies work only in tandem with contracting technologies. In commercial banking financial technologies had to deal with for the most part simple financial contracts, the result of which was aggregated at the level of overall asset-liability management. In the case of reinsurance the logic evolved with the progressing 19th century into something different. There was a growing demand for going beyond reinsuring separate risks. There was a demand for reinsurance programmes and big reinsurers could provide such services. This led to complex financial contracting. The kernel of these programmes and of the construction of such complexes of contracts was treaty reinsurance. Treaty reinsurance was (and still is in the rare cases that it is now applied) a very special kind on configuration of contractual representations of risk management techniques that have been quintessential for the enablement of investment. It was a financial technology that managed both the insurance risks and the financial profile of the direct insurers, which means that it managed also liquidity and legal risks to which the direct insurer was exposed. For instance, treaty reinsurance contracts did not only define the terms of running or obligatory reinsurance, or the premiums on the basis of maxima of exposure and terms of indemnification, but also commissions, terms of deposit of reserves with the direct insurer and conditions of organizational
relationships (e.g. screening and monitoring of the business of the direct insurer). For
the reinsurer itself this meant a backward and a forward configuration of operations:
towards the direct insurer and towards the retrocessionary. Similar relationships we
can see much later in the case of another form of complex financial contracting,
namely synthetic CDOs where the investment bankers develop relations on the one
end with the originator and on the other end with the custodians who manage their
clients’ synthetic financial contracts. Complex reinsurance programmes with a kernel
of treaty reinsurance were not the sole form of complex financial contracting. As
already stressed project finance, especially in the cases when syndication was
required, created valuable contracting knowledge. The management of the financial
risks of complex projects became of paramount importance at latest since the
construction of the Panama Canal, and the financial failures that such projects brought
was a proof of the value of sound planning and prospective understanding of risks.

One possible explanation of such failures could be traced back to the
underrepresentation of actuaries in the engineering of such contracts, in spite of the
insurance elements they comprised. The actuarial presence in project finance,
especially when the management of financial issues is bound to techniques of
alternative risk transfer is nowadays regarded as a must, but this was not always the
case. Be that as it may, project finance was in parallel to reinsurance contracting a
source of complex financial contracting knowledge with a long-term impact on the
evolution of finance. It created tracks of knowledge accumulation in banking,
insurance, reinsurance, and in specialized law offices. It influenced also the standards
of communication and the technical background of relationship finance. One very
interesting and disregarded aspect of grand style relationship banking and of grand
style relationship reinsurance is the interplay between technical knowledge and
modalities of negotiation. The gentlemen (no ladies) who were writing down the
terms of complex contracts on napkins after rich meals and while drinking their
brandies and smoking their cigars were, in spite of their euphoric mood, driven by
actuarial guidelines. The broad lines of the agreement set by these experienced
operators were then specified by actuaries and only marginally controlled by lawyers
for conflict with insurance, reinsurance or general commercial law (in case of dispute
this was almost always resolved in arbitration). Complex financial contracting in
reinsurance was most frequently poor in legal prescriptions, but rich in calculations.
Project finance was more bound to legal aspects than reinsurance. Besides in the case
of reinsurance, the background of insurance mathematics and of pertinent actuarial practices had a clear impact on the culture of contracting, whereas in the case of project finance, the ramification which could be traced back to construction or to other forms of hard-core engineering were the ones that made the difference.

Did these traditions of financial contracting and the accumulated knowledge behind these play a role in the development of financial instruments and techniques of risk management as we know them since the 1980s? The most spectacular of these techniques have been the management of portfolios consisting of junk bonds and the synthetic CDOs. Where do the ideas for these risk management techniques come from? Or are they mere reinventions without any recourse to previous forms of financial management and contracting? In reality, the effect of the reinvention of the wheel and the effect of drawing to traditions appear in a non-linear interconnection of chains of causation. I will explain this. Reinsurers are observing both the market, the environmental, and the organizational behaviour of the firms they are dealing with, namely direct insurers. They are driven by an agent based approach. Portfolio and CDO managers have a vision only for curves and indexes and thus adopt a keyhole vision of economic realities. This is not an unknown mechanism in economic history. All kinds of equity-portfolio management since the middle of the 19th century had this characteristic. This problem of lack of actuarial prudence was apparent in most cases that corporate finance shifted from the analysis of entrepreneurial practices towards underwriting and then towards short-term detachment from credit risk by IPOs. It is not meant here that securitization should be necessarily regarded as the main generator of unmanageable risks. There is plenty of evidence against such sweeping generalizations. But anti-fragility in finance has always been more the result of the relationality of contracts, than of their formal, model driven mechanics. Relationality is a concept that has been extensively used in Socio-legal theory. The theory of the relationality of contracts predicts that in some circumstances informal social or organizational network relationships can compensate many of the deficiencies of incomplete contracts in a incomparably efficient way compared to the explicit, formal and standardized components of contracts. (Macneil 1978; see also Collins 2005: 140-143). The element of relationality of financial contracts has been put at a low priority as a consequence of the dominance of financial engineering after the 1990s.
Stories of organizations

The point that can be made as a result of this reference to contracting is that without the accumulated experience in treaty reinsurance and project finance many of the financial innovations that occurred from the late 1970s till the early 2000s would have been much slower and perhaps operationally much less efficient. This is not only a matter of available and codified generic academic knowledge, or of proprietary knowledge cultivated and transmitted within firms. It is also a matter of organizational and social networks which made possible the development, configuration, synthesis, and transmission of knowledge. These networks defined also the imitation effects which have amplified waves of innovations in the financial world. It is no coincidence that these innovations and their adoption by companies and investors occurred within certain networks of financial organizations which included investment banks, commercial banks, insurance and reinsurance companies, and often law offices. Concerning the involvement of law offices, although crucial, it was always incremental despite the fact that most financial innovations ended up being legal innovations (or more precisely innovations in the method of law evasion by discovering loopholes). To come to the facts, the emergence of junk bond portfolios, as predecessors of synthetic derivatives and then synthetic CDO contracts have to do with a well demarcated network of businesses: Drexel Burnham Lambert, Kidder Peabody (a takeover specialists that used junk bonds), First Boston (which was later integrated in CSFB), JPMorgan, Credit Suisse, Swiss Re, etc.

The story can be structured with the following narrative along lines that have to depict also the multi-causal processes with partially unrelated chains of causation: In all cases there are events external to the organizations that trigger off the processes, like crises or pressures coming from competition, but the intersections and interplays emerge from existing organizational dynamics, resources and capabilities. What counts the most in the background is the intension to raise the yield of investment and the practices that investment bankers or other agents that undertake such operations tend to adopt. It is very interesting that since the late 1970s and with waning investment opportunities in ventures in production and services, returns from portfolios acquire a central importance. This led to higher levels of fragility because
of the growing volumes of assets that were fuelled by portfolio management. Playing with financial fragility brought revenue as a direct function of exposure to risks. The need for taming risks brought in addition the need of operations aiming to anti-fragility.

Fragility was a problem that was of paramount importance in insurance but in a different sense: Insurance portfolios could not keep their ‘health’ without growing numbers of policies which brought higher diversification of risks. The remaining risk had to be reinsured and thus the reinsurer was assuming the fragility of the portfolios, i.e. the risk from the inability to attract additional newcomer in the scheme. This was the case of the reinsurer who was not insuring separate risks but whole business streams of the reinsurer. In this later case the reinsurer had to manage also another form of fragility of the direct insurer who was rapidly expanding his business. The need to issue even more policies brought costs which were over-proportional in relation to premiums. These operating costs could not be covered with bank loans, and so the reinsurer came up with a rebate or returns that were then compensated with the indemnification in case of an insurance event (Lengyel 1927). This fragility depended not on the need for attraction of new investors but of new insured. The insured is carrier of two probabilities of occurrences: the probability that nothing negative happens and the probability of an insurance event. This made an insurance portfolio analogous to a bank loan portfolio which contains the probability of sound profitable business and the probability of default. An interesting difference which is of importance in the discussion on the origins of ideas which led to the junk bonds and later to forms of securitization that in turn led to CDOs is that contrary to the banks, reinsurers were further ceding their risks to other reinsurers and direct insurers through the process of retrocession. Retrocession is not a static process of risk management. It requires a continuous management of diversification by various loosely coordinated agents. As soon as this activity stops or deteriorates, fragility grows because portfolios do not create the mix of expected returns and hedging. The practice of ceding risks and thus the practice of shifting these risks to other organizations created capital that was earned from the management of fragility (i.e. from the yields of portfolios and not from revenue from products and services). Protection from the risks that this implied presupposed however operations of anti-fragility. This required three sets of operational action: Calculations (on the basis of mathematical or quasi-mathematical models), defining rules of action in multi-agent
relationships (in terms of both explicit and implicit contracts), and negotiation and renegotiation of the modalities of calculations and contracting within social, organizational and financial networks on a basis of a minimum of trust. The highest form of the interrelationship of all these elements could be found in the late 19th century in the big dedicated reinsurance companies and especially in the continental (mostly German) companies that offered reinsurance programmes with a strong bulk of treaty reinsurance. In modern high leverage securitization-based finance that became dominant since the late 20th century the third element, namely negotiations in social networks, has almost vanished. The other two elements have played a role as traditions, the reverberations of which have influenced the course of developments in financial technologies. From the direct insurance industry originated the culture of calculating the profitability of risk exposure which we have seen in the post-WWII years first in the junk-bond business (returns on premium risk). From the reinsurance business originated the calculus of ‘tranching’. Perhaps it is no coincidence that the tranching element that was integrated in the construction of cat bonds in 1997 preceded only a few months the tranching that created the basis of the first predecessors of synthetic CDOs, the latter being the basis of managing bubbles based on asset-backed securities.\(^2\) This was one of the main events that shaped the economic and financial history of the first decade of the 21st century.

The reference to this event enhances the argument for the origins of junk bonds in insurance knowledge and for the origins of structured finance in reinsurance knowledge and operational skills. What is missing in most cases from structured finance is the aspect of the culture of negotiation that was central to those reinsurers that were offering and managing complex reinsurance programmes since the last third of the 19th century (Standardization and undervaluation of the element of negotiation came with the need for litigation [not settlement with arbitration] – Details for this in

\(^2\) As Coval et al (2007) observe: “The fundamental asset pricing insight of Arrow (1964) and Debreu (1959) is that an asset’s value is determined by both its distribution of payoffs across economic states and state prices. Securities that fail to deliver their promised payments in the “worst” economic states will have low values, because these are precisely the states where a dollar is most valuable. Consequently, securities resembling economic catastrophe bonds should offer a large risk premium to compensate for their systematic risk”. This conclusion that draws on formal modelling shows the structural side of the affinity between cat bonds and CDOs.
Tillman Roeder’s book, 2012). The undervaluation of this element of negotiation came from the intention to cope with fragility with mathematical modelling and standardized tradable financial instruments that could be rated. This scientific and technical approach came from mathematical portfolio management and ended up being a highly contradictory undertaking. This standardization was deemed necessary if financial products were to be offered to the wider public and then traded in exchanges. The most complicated financial products were traded over-the-counter (OTC), but these still needed a certain level of standardization. This standardization of financial products has its roots in the social and economic history of the post-WWII era and the need after the 1960s of the growing middle classes and of companies with growing reserves to secure their pecuniary assets with relatively higher yield than depositors’ interests. The impact of the invention of mathematical portfolio management, mainly by Harry Markowitz, on the junk bond and later on the CDO business is trivial. What is less trivial is how this invention has redirected this tradition by infusing everything in model-driven financial innovations. The consequence was that financial engineering became dominant and relationship finance was driven in the shade. Even less obvious is the fact that although the intention of the constructors of the models was anti-fragility, at the end they succeeded to raise fragility and further to make it poorly manageable. It is questionable whether the securitization trend among especially the powerful reinsurers will bring about conditions of anti-fragility as the basis of risk management operations. A great part of the control occurs in these organizations through technical accounting (by the way custodians have similar operations with the ones that large contemporary reinsurers have in place). But the images produced by technical accounting produce information on what should be renegotiated or which contracts or business streams a company must withdraw from, but do not produce information on how contracts should be renegotiated in order to have profitable network economies within multi-agent relationships. But let’s come back to the sequences of events. Investment in junk bonds was a business that was developed in one dominant firm, namely Drexel Burnham Lambert (DBL), and by an individual that has played the central role, Michael Milken. As we know from the history of ideas and research in the sociology of knowledge, ideas rarely, if ever, emerge without the appropriate environment. They emerge in environments where external influences and internal processes of social interaction create organizational capabilities or social network capabilities. A few remarks that
can help us understand both the internal and the external environment of DBL are the following: the theoretical conditions of thinking about junk bonds existed in economic theory but remained buried in scriptures that couldn’t be but regarded as obscure by practitioners (for instance in works by W.B. Hickman, or by Modigliani/Miller). W. B. Hickman was the one who made these ideas relevant as a result of the need to carry out a project that he was commissioned by the US Federal Deposit Insurance Corporation (FDIC) and which was carried out in the US National Bureau of Economic Research (NBER). Junk Bonds emerged as an unintended consequence of this study. The intension of FDIC was to protect commercial banks from risky lending. The idea was that credit risk assessment should not rely predominantly on investors experiences that led to the valuation of stocks. The fact that short term investment in equity of companies exposed to high risk of default gave high yield, and thus the composition of corresponding portfolios, should not be correlated with the impressions that should drive credit risk assessment. In other words, signalling and risk management in direct lending should not be confused with signalling and risk management in indirect lending (Hickman 1953). This issue was highly relevant in the fifties under conditions of rapidly expanding corporate lending. But this attention on what banks shouldn’t do became the source of Michael Milken’s idea about how could one exploit junk bonds for higher portfolio performance, something that enabled Drexel Burnham Lambert to become a giant of investment banking. The hard landing came later, due to economic and legal developments. But through this activity junk Bonds became a hot thing throughout the 1980s. The financial technologies behind this came not only from the exploitation of Hickman’s economics of corporate finance, but also from developments in the mathematics of portfolio management (Markowitz 1952, see also Bühlmann 1980). But in addition to the idea of hedging that defined Markowitz’s portfolio management techniques, in the junk bonds appears also the idea of risk premium which comes from insurance. It may be that the connection of key players to the insurance world might have played a role. Behind both the Hickman project and the Milken- innovation there have been connections to insurance organizations and to the long American traditions of securities issuance and trading. Richard Sandor, the professor and financier was another important transmitter of knowledge and ideas that have significantly influenced the culture of operations in this setting. The experience of the Chicago Board of Trade that Sandor brought into Drexel Burnham Lambert must have been also of decisive importance. The same
Sandor was also the one who commissioned in the early 1970s Swiss Re to develop reinsurance futures for the CBoT (Straumann 2013: 338). It is well known that the Chicago Board was the exchange that has exerted the most important influence on the development of derivatives (Mackenzie 2006). Junk bonds have played a crucial role in the development of financial engineering in spite of the failure of junk bonds. Why did junk bonds fail? This was to the greatest extent due to the DBL bankruptcy. This bankruptcy was caused by the withdrawal of trust because of the political fury related to junk-bond-financed buy-outs and the fact that the company and in particular Milken were accused for insider trading (Livingston and Williams 2007).

Usually we discuss the impact of successes on further evolution, but in many cases failures play a much more significant role. In finance it occurs very often that there appears a desire to replicate the results of failed operational modalities with different means. This cannot be avoided, since as John Maynard Keynes has repeatedly stressed, only part of the available capital is used for commercial and industrial ventures. The rest remains interest-dependent and thus bound to portfolio management. The dynamic management of junk-bond portfolios has been very profitable (though, as the judges have revealed also with a little help from insider information), until because of economic events this kind of operations ceased to be viable. As long as there is a need for managing portfolio fragility, the question is not to abandon operations but to ask how they could be reshaped. In this case, what was missing was the mechanism of ceding risks to other entities or investors. It is interesting in this context to remark that one of the companies affected by the downfall of the junk bond business was Credit Swiss First Boston. First Boston had a heavy junk bond portfolio and when it was acquired by Credit Swiss brought into the CS group the knowledge of the problem of this kind of financial instruments and this triggered off action the positive results of which have been made visible at a later stage. Few banks worldwide disposed of knowledge of insurance and reinsurance operations which could be regarded as comparable to the one available in Credit Suisse. This bank had created in 1863 Swiss Reinsurance and contacts between the two companies never ceased. This means that there was knowledge of what it means to cede risks to other entities, something that bankers learned after the late 1980s (as

---

3 When the junk bond market crashed in 1989, CS bailed out First Boston and then overtook this company.
can be seen from the history of the invention of SIVs and SPVs). As we will see, in the late 1990s the tradition of reinsurance contracting converged with securitization.

Another organizational environment that must be discussed is JPMorgan, where the derivatives of the late 20th century were developed. This environment has been thoroughly described by Gillian Tett in her best seller *Fool’s Gold* (2009). There is no indication whatsoever that these JPMorgan investment bankers and financial engineers have been inspired by ideas that came from the insurance, and much less from the reinsurance industry. The stories around junk bonds must have been an issue and the personal stories of people like Michael Milken have been definitely at the epicentre of discussions (Partnoy 2004). But the idea of prospective credit events as the source of yield, as in the junk bonds, had perhaps influenced the idea developed by Blyth Masters of raising yield from risk perception, namely from the probability of prospective credit events with CDSs. It is highly probable that the origin of the idea of CDS could have come from the older business with naked commodity option contracts (for these instruments see Long 1973). But the idea of derivatives insurance came also from the monolines that were insuring mostly municipal bonds since the early 1970s and later were involved also in the insurance of CDO notes. Many of the JPMorgan staff around Bill Demchak, one of the pioneers of credit derivatives, have been well familiar with the business of monolines (Tett 2009: 126-142). But the idea of packaging processes of risk transfers was of purely mathematical character and more inspired by portfolio theory. This was the case with the invention of the BISTRO (the predecessors of the synthetic CDO structures), the innovative instruments that CSFB adopted very quickly. The idea of BISTRO was thus transferred in an environment in which many operators were familiar with the idea of complex reinsurance programmes. The CSFB staff created CDOs, BISTROs and later in 1997 in the wake of the Asian Crisis they created synthetic CDOs which boosted securitization and created the conditions for managing the MBS bubbles. But also Cat Bonds have played a role which is very significance for tracing the probable relationships between reinsurance and structured finance. The year 1997 was a decisive point in time: Multi-tranche cat bonds have appeared by Swiss Re and CSFB; and in the same year we had the first synthetic CDOs by JPMorgan. It is highly unlikely that the major investment banks and their investment bankers were not monitoring their competitors. In such competitive environments the diffusion and adoption of innovations must have relied to a great extent on imitation, improvement,
reconfigurations and repackaging. Furthermore, as we know in many cases financial services organizations were not only up to imitate knowledge that was not patented, but also to attract staff that was injecting know how that couldn’t be easily developed from scratch into their operations. There is no indication that knowledge was directly transmitted from the Credit Suisse First Boston / Swiss Re scheme into JPMorgan. Also the pace of developments is highly interesting. The CSFB/SR tranched cat bond was issued in July 1997. For this it might have played a role that alternative risk transfer services (ART) have been developed in Swiss Re and that the individual who had achieved with his efforts since 1995 a competitive advantage for the company in this business stream, Walter Kielholz, was named CEO in January 1997 (Straumann 2013: 341). It is highly unlikely that this had no influence on strategic considerations and on the way responsibility has been assumed for entering into new territory with synthetic instruments. The JPMorgan BISTRO was issued in December 1997, in January 1998 the BISTRO-style CDS trade took off, and in February 1998 Credit Suisse, the financial intermediary with the strongest relations with one of the champions of reinsurance, made public its own BISTRO-style CDS instrument (Tett 2009: 57-58). The investment banking branches of Credit Suisse have became very quickly top market leaders in structured finance. This pace does not only prove the existence of knowledge receptors, but also of organizational and operational capabilities which have enabled the extremely quick adaptation of the business to new requirement and stresses. It is highly improbable that this restructuring of the business could be preceded by far reaching organizational restructuring in such a short time span. In the case of Credit Suisse is well known that many of the investment banking capabilities have been brought into its group through the acquisition of American broker and investment banking companies (Tett 2009: 73). This activity facilitated the fusion of skills from American style investment banking with the continental European traditions of reinsurance. American investment bankers had a different experience from reinsurance which originated from their role in the capital relief activities of American insurers and reinsurers since the early 1980s (Greenberg 1986). This was the beginning of the so called financial reinsurance that has led gradually to the convergence of insurance (and reinsurance) and financial markets by the adoption of the practice of shifting insurance risks into the financial markets and by using the increasingly refined financial instruments (Cummins and Weiss 2009).
Concluding remarks

Junk bonds and CDOs are the outcome of convergence of financial technologies which come from two different directions: from the insurance and reinsurance industries and from the investment banking industry. This is an aspect of the convergence between banking and insurance that has been rarely discussed. Most researchers and commentators focus on the convergence between financial markets and insurance markets and on the securitization of insurance risks, as well as on the passage from traditional to financial reinsurance. This convergence was accelerated because of legal and regulatory changes exposing insurance and reinsurance companies to new legal, institutional and country risks, but also because of the trends towards financialization and the risks that this trend implied for the banks, the insurance and the reinsurance companies. But paradoxically we can see that the financial technologies which put traditional reinsurance out of fashion have their origins to a great extent in the actuarial and contracting practices of traditional reinsurers and direct insurers. In the world of today the paths leading to the origins of this knowledge and to the accumulated experience are hidden behind the glamour of financial engineering and the risk management techniques that keep afloat the business of the investment bankers and sometimes also have a contribution to the effort to restore the trust of the public in complex financial operations. The volume of CDOs has dramatically declined (from $110 billion between 2005 and 2007 to about $2 billion in 2012) as a consequence of the decline of the arrangement of mortgage based securities that were bundling subprime loans with extremely high credit risk exposure. The junk bonds had almost vanished about two decades earlier. Both have been counted among the top achievements of financial engineering. Especially the synthetic CDOs had been glorified before the outbreak of the financial crisis as the technologies that might enable us to cope even with excessive financial fragility. In the discussions about the causes of the latest major financial crisis very often dominate psychological references to greed and recklessness. But many of the problems could be traced back to technological beliefs. CDOs, and especially the synthetic CDOs were supposed to be financial technologies of anti-fragility. However, the financial engineers that designed and constructed these instruments of structured
finance did not seem to be interested in approaches to the problem of fragility as the ones expressed by Taleb. If we adopt Taleb’s perspective CDOs can be regarded as highly fragile instruments and thus they are not the appropriate instruments that might be used in order to cope with financial fragility. This was not the case with traditional reinsurance. For instance treaty reinsurance or heterogeneous (diversified) reinsurance portfolios have been partly artefacts, partly networks. Although their constructors adopted ideas of formal and explicit contracting, in reality the implementation of these contracts was embedded in networked action among various agents ceding risks between each other by adopting kind of piecemeal engineering. This was not something totally alien to the CDO business that safeguarded the continuation of the 1.2 trillion subprime mortgage business, as long as this was possible. Many of the risks that the CDOs implied have been managed by the custodians. They were monitoring the trading of the underlying assets and the subsequent transactions. This was an incremental activity that was keeping risks within certain limits. In a sense the invisible custodians are to a greater extent inspired by the spirit of actuaries because they think and act according to probabilities of alternative scenarios. This was not the case with the hard core financial engineers. In reality, the contracting culture of synthetic CDOs can be regarded as a perversion of the contracting culture of reinsurers and project finance managers. Of course, we shouldn’t blame the mathematicians and mathematics for this. Many of the problems can be traced back to the neglect of traditions of actuarial mathematics and of the actuarial practices that have been dominant in the actuarial profession since the middle of the 19th century (Bühlmann 1997). Contrary to traditional actuarial mathematicians, the quants of the post 1970s era are blind to market risks, to non-pecuniary risks and to contingencies arising from alternative economic scenarios. This is not an unexpected consequence of their practices. Financial engineering, contrary to actuarial techniques is about hiding risks with originate-and-distribute techniques, and not about revealing risks and acting on the basis of a corresponding awareness. The ultimate criteria of risk exposures are induced by the values of indexes set by the rating agencies. It is worth bearing in mind that there is financial wisdom beyond this kind of technical knowledge. The study of the origins of structured finance in the knowledge and practices of the insurance and the traditional reinsurance industry could help us reveal facets of financial processes and operational traditions the resurfacing of which might be useful for a new wave of innovations in less fragile financial technologies.
References:


Optimize sales opportunities. The reinsurance contracts were subject to French law and arbitration and the case led to a court dispute and mediation in relation to the implication of France. European distribution agreement and regulatory implications.

James is the chair of the Global Insurance Practice Group and head of the Financial Institutions and D&O team. James’ practice focuses on all aspects of D&O and financial services and has extensive experience in acting for directors and officers and financial institutions on contentious matters in a number of jurisdictions. Much of this has involved arbitration and cross-border work with an international connection.

Insurance - Insurance - Reinsurance: A significant insurance practice is that of reinsurance, whereby risk may be divided among several insurers, reducing the exposure to loss faced by each insurer. Reinsurance is effected through contracts called treaties, which specify how the premiums and losses will be shared by participating insurers. Two main types of treaties exist—pro rata and excess-of-loss treaties.

Reinsurance. A significant insurance practice is that of reinsurance, whereby risk may be divided among several insurers, reducing the exposure to loss faced by each insurer. Reinsurance is effected through contracts called treaties, which specify how the premiums and losses will be shared by participating insurers. We call it reinsurance process. Reinsurance helps to insurance companies reduce risks and it also prevent appearing financial loss. Reinsurance also known as insurance for insurers or stop-loss insurance, is the practice of insurers transfering portions of risk protfolios to other parties by some form of agreement to reduce the likelihood of having to pay a large obligation resulting from an insurance claim [10]. Reinsurance lets insurers cover their risks by recovering some or all of the amounts they pay to claimants. Besides that insurance effects to balance of payments, financial stability positively and it also increases employment in economy. These factors also accelerate economic growth.