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## **Through a Glass Darkly: Tracing the Mundane Organisation of a Bubble Network**

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### **INTRODUCTION**

It is nearly nine years since Lehman Brothers collapsed, sparking one of the most significant financial crises and deepest recessions of our time. At the centre of this crisis was an obscure, then virtually unknown credit derivative called a collateralised debt obligation or ‘CDO’. A number of disciplines have advanced our understanding of the 2008 financial crisis, whether in finance (Acharya, Philippon, Richardson & Roubini, 2009), sociology (MacKenzie, 2011), economics (Obstfeld & Rogoff, 2009; Crotty, 2009); or politics (Engelen et al., 2011). Yet despite the scale of the CDO market and the consequences of its collapse, there has been only muted interest from within organisation studies (OS) (see Munir, 2011).

Our paper attempts to bring an OS analysis to the study of CDOs by tracing the changing supply side organisation of its structuration process over time. Empirically we draw upon our self-built database of CDO network relations drawing on a variety of industry documentation. Conceptually we treat CDOs as a ‘networked product’ to avoid two traps: the trap of reading a market through its lead organisation and the trap of viewing organisation – and the structuration process in particular – as one with a linear, sequential temporality. Methodologically we use social network analysis methods to explore the market’s organised and emergent dynamics (D’Andret, Marabelli, Newell, Scarbrough & Swan, 2016; Corbo, Corrado, & Ferriani, 2016; Dagnino, Levanti, & Mocciaro Li Destri, 2016), where network structure, field position, agency and power interact in a process of ‘bricolage’ (Engelen et al., 2011 & 2012; MacKenzie & Pardo-Guerra, 2014). Our findings shed new light on agency, embeddedness, and governance in CDO structuration, and offers a new organizational perspective on the causes of the CDO crisis.

### **BUBBLES AND THE DEMAND SIDE**

Finance is predisposed to booms and busts - and the metaphor of the ‘bubble’ is central to most accounts of such crises. The history of the bubble metaphor is well known, with its origins in poems like Jonathan Swift’s 1721 ‘South Sea Project’ and in print via Daniel Defoe’s alter ego ‘Anti-bubble’ (Downie, Furbank, Owens, Hayton & McVeagh, 2000). Academically, the discussion of bubbles has been dominated by the discipline of economics, where it is discussed largely as a demand-side problem. Neo-classicals argue that bubbles can be understood as ‘rational’ demand side responses in efficient markets if investors believe they can sell their asset at a higher price at some later point (Tirole, 1982; Blanchard & Watson, 1982); or when investors exploit information asymmetries (Allen, Morris & Postlewaite, 1993; Brunnermeier, 2001). Behaviouralist economists, in contrast, emphasise investor irrationality as a driver of market excess (Shiller, 2012; Keynes, 1934; Tuckett & Taffler, 2008). Special focus is given to ‘speculative manias’ where news of price increases spurs investor enthusiasm, reinforcing stories that justify the price increases, drawing in a larger and larger pool of investors (Kindleberger &

Aliber, 2005; Shiller, 2015). Explanations for the CDO bubble and collapse follow this pattern. Some focus on macro-imbalances, over-saving and the problems of too much (Chinese) money chasing too few dollar denominated assets (Ferguson & Schularick, 2011; Obstfeld & Rogoff, 2009); others on more traditional concerns about moral hazard, speculation and subsidised risk-taking in the financial services sector (Dowd, 2009; Acharya et al., 2009). The supply side analyses that do exist focus narrowly on either the Gaussian copula models used to structure these securities (Duffie, Eckner, Horel & Saita, 2009; Donnelly & Embrechts, 2010; Salmon, 2011) or the usual problems around lax standards and/or fraudulent selling (Ben-David, 2009; Keys, Mukherjee, Seru & Vig, 2010). The exception is MacKenzie (2011) who explores the relations between MBS sellers, CDO structurers, and credit rating agencies. Our aim is to extend this analysis of the inter-organizational relations that form part of the CDO structuration process to glean an organizational perspective on the process of structuration in a bubble market and the potential causes of its collapse.

### **‘CDO’S AS A NETWORKED PRODUCT**

A CDO is an asset backed security backed by the cash flows of other asset backed securities (see Duffie and Garleanu 2001; Langley 2008; Poon 2009). From a network-organisational perspective, to create a CDO a number of connected function positions must exist, each positioned in specific cultural, institutional and regulatory contexts (see Fligstein, 2001 for discussion) which include: i) a financing relation between the initial purchaser in New York and the co-issuer (a Special Purpose Vehicle or ‘SPV’) in Delaware to avoid the creation of a taxable event when asset risks are transferred (Tavakoli, 2008); ii) a transfer of asset risks between the co-issuer in Delaware and the issuer (another SPV) in the Cayman Islands to further reduce regulatory costs; and, iii) a marketing relation between the issuer in the Caymans and the listing agent on the Irish Stock Exchange to reduced tax payable on interest (Arthur Cox, 2013, p. 3). These three relations may look like they occur in a linear sequence, but in reality they are constructed contemporaneously for the purpose of minimising regulatory costs and maximising the gains from jurisdictional arbitrage. In addition, independent collateral managers were required to act on behalf of the buyer to select the underlying portfolio of securities and thus avoid mis-selling risk, and trustees were needed as custodians to report on and protect asset value. There were also legal advisors, payment agents, listing agents and administrators whose inputs were required by various parties.

The CDO itself might therefore be thought of as a networked product which we define as a product: a) that is not embedded in a linear transformation process with value adding activities at each node; rather it is an assemblage of knowledge, socio-technical expertise and calculative technology brought to bear upon it contemporaneously; and b) where the conditions of profitability generate a requirement for certain function positions in certain jurisdictions within the network, creating co-dependencies between all actors involved in the process; where actors’ power to legitimately enforce or coerce actions, norms and behaviours is limited by these mutual obligations and dependencies.

The product therefore embraces a network logic – it is the meeting point for a range of expertises and social relations, embedded in specific jurisdictional domains designed to arbitrage national legal and taxation arrangements. Product changes may alter the network if new requirements for certain skills empower other actors outside the network; or alternatively new entrants might offer new, more profitable means of structuring CDOs, thus changing the character of the product. Product and network thus sit in a dialectical relation, typical in a form

of financial innovation led by processes of ‘bricolage’ (Engelen et al., 2011) where ‘tangible cliques mutually observing each other, adjust behaviour’ (White 1981).

The CDO network is not like a market where new entrants move into the supply chain on the basis of competitive or competence-based advantage. In networks, relationships may endure despite the presence of alternatives (Krackhardt, 2003) as a matter of convenience: working repeatedly with the same actors may reduce time and resources spent (Uzzi, 1997). Relations may also congeal and exclude others as systems of trust and reciprocity build (Kenis & Knoke, 2002). They may also coalesce around shared ‘shadow norms’ (Lampel 2001) which may add to the cost of exiting relations. We trace this structuration network and assess the degree to which repeat relations persist using the following data and methods.

### **DATA AND METHODS**

In terms of data, we built our database from Offering Circulars (OCs) – documents issued by banks from which we obtained information about the relationships between actors involved in the process of structuring CDOs. These documents were sourced from a variety of places including the Senate’s Financial Crisis Inquiry Commission (2011) investigation into the subprime crisis, the Irish Stock Exchange databank and other online repositories. Overall our dataset contains 373 unique CDOs issued in USD between 2001 and 2008. The frequency of OCs from which we populated our database was dependent on data availability and broadly speaking mirrors the frequency of US originated CDOs. The database contains a total of 361 firms involved in the US CDO structuration process. Although actors generally perform one supply-side service, there are notable exceptions – for example some firms are involved in both trustee and administrative services. In those circumstances firms were allocated to the function they were most involved in.

The OCs from which we took this information are lengthy documents published and distributed by the initial purchasers for a variety of users (investors, regulators, legal departments). OCs vary substantially from the glossy publications (pitch-books & term-sheets) aimed at investors: OCs are normally 200+ pages long and contain important detailed descriptions of the product’s structures, management and processes, including distribution of income. Lengthy glossaries, disclaimers and tax considerations turn these OCs into highly ‘technical legal’ artefacts (see Riles, 2011 for a detailed discussion) from which valuable information about the organisation of the supply-side can be drawn.

The salient points of detail are that CDOs are normally structured and arranged by investment or commercial banks (the initial purchasers), the underlying assets are selected and managed by an independent collateral manager on behalf of the issuer (an off balance sheet SPV, usually a wholly owned subsidiary of the initial purchaser) who then sells securities backed by the cashflows from these assets to investors. A trustee holds title to the assets of the CDO for the benefit of the investors (Tavakoli, 2008). There are also legal representatives to each party involved; plus Irish listing and paying agents who sell these securities on the Irish Stock Exchange for the benefit of institutional investors.

The OCs cannot reveal the precise nature of the relationship between the agents, but it can be used to map interactions between the more prominent players and the centrality of those actors over time. Our network tracing focuses four lines of enquiry: i) an exploration of function position concentrations to understand the shape of the network and how they relate to product characteristics ii) a longitudinal analysis to explore the embeddedness of certain actors and their network relations over time iii) degree centrality to identify the presence of repeat relations and

actor interdependencies and iv) core-periphery analysis to consider whether specific network patterns might provide new insights as to the causes of problems in the sector.

### **RESEARCH FINDINGS: AGENCY, EMBEDDEDNESS, GOVERNANCE AND CAUSES**

Our research findings from the social network analysis tell us four things. First, it tells us something about agency and the dialectical relation between the product and the network. A CDO is not a tangible product embedded within a supply chain with a linear transformation process and value adding activities at each node. A CDO is intangible - the product of an assemblage of knowledge, socio-technical expertise and calculative technologies brought to bear upon it contemporaneously. Changes at the level of the product requires negotiation, collaboration and mutual changes in practice across central function positions within the network. Agency is therefore 'distributed' because actors within the network are co-dependent, which limits the power of any one actor to fully exert bureaucratic control or coercion. However if CDOs are to be scalable and profitable the network must include certain function positions, often within specified jurisdictions. Risk minimising positions like collateral management are viewed as essential trust-building features for clients which allows the market to grow, whilst CDO profitability depends on minimising regulatory costs which fixes certain function positions in particular jurisdictions - such as the presence of issuers and co-issuers in Delaware and the Caymen Islands respectively. Thus the CDO - as a networked product - also influences the structure of the network.

Second, it tells us something about social and economic embeddedness within the network, through our longitudinal study of initial purchasers and other actors. Those IPs who were present and core in the early stages of market formation were more likely to remain there than new entrants, suggesting some kind of positional or relational embeddedness at work. This is not to suggest that the growth of the market did not pull in new actors: there is a rising number of firms in total within the network between 2002-2007 and a growing number of actors in the core. However, despite that growth, banks like Merrill Lynch, Citigroup and Goldman Sachs retained their position in the top 5 CDO initial purchasers in all three years of peak activity (2005-7). Furthermore, the structure of network relations consolidates during this growth phase, suggesting either that as market opportunities expand, the value of the existing relations between nodes increases, or that the social relations which underpin these networks may act as a barrier to entry (Uzzi, 1997). This may imply that whilst there are no formal alliances between function positions, there are less visible but nevertheless strong, embedded social ties between key actors (Granovetter, 1973).

Third, the surprising centrality of law firms in the network tells us something about structure, governance and power within the CDO structuration process. It is conventional to represent the CDO market as something put together exclusively by the banking industry for the banking industry. Our analysis shows a much more complex picture - one where there are strong, repeat relations - 'preferred attachments' - between particular elite law firms and particular elite financial institutions. These form a 'core' core within our social network analysis, suggesting the presence of longer term attachments that build a sense of co-dependence and mutual interest. The process of innovation through bricolage (Engelen et al., 2012) within the CDO market might therefore emerge from an ongoing dialogue between law and finance in a context where regulatory arbitrage is central to the profitability of the product and where change occurs through the social actions of interdependent actors observing each other and adjusting behaviour, as White (1981a) observes.

Fourth, it tells us something different - potentially - about the causes of the 2008 crisis. We observe a strong core-periphery structure in our network, where the periphery contains many independent collateral managers involved in only one or two CDOs. This structural feature represents an attempt to allay client fears about impropriety and moral hazard by having an independent entity separate from the IP to select and manage the CDO assets. Notionally this independence allowed collateral managers to reduce the risk exposure and increase the likely return for the client. However, as we have shown, collateral managers in the network periphery could only select assets put together by a relatively small group of core firms in the network. The benefits to diversification or active management of those assets, therefore, were limited for the simple reason that they were structured by the same interconnected core. This organisational feature may have played some role in the crisis, if only to sedate the normal sensitivities to risk had clients bought securities directly from the IPs.

These findings contribute to the ongoing discussion within organisation studies about the ‘collective nature of organisational action and the role of networks in maintaining stable

### **DISCUSSION AND CONCLUSION**

A key ambition of our research project was to trace the evolution of the CDO market leading up to the financial crisis using network analysis in a way that opens up debate for organisational scholars. Fundamentally, our focus here was to enrich existing studies by adding an element of agency, not at the macro level, but at the level of individual actors.

The view of CDOs as networked products itself is an important conceptual innovation as it opens up a debate about the functional expertise that is required to produce this product and how this shapes the structure of the supply market. In some ways there are similarities to White’s (1981 & 2002) work on the general mechanisms through which actors seek to shape networks and markets: “markets are tangible cliques of producers observing each other” (1981: 543), where cliques generally consist of suppliers, producers and buyers (2002: 6). However, our case offers a different account whereby cliques are defined at the level of each CDO product. These cliques are initiated through a focal firm, an investment bank or CDO sponsor, but relationships are more network-like because to produce a CDO, functional expertise is required to ensure profitability and it is this requirement that structures the activity in the supply-side. Thus the product itself has agential qualities and constraints and shapes network structures based on its specific requirements, and this is relevant in explaining how supply-side activity is organised and organises itself. However this does not explain the different dynamics observed for functions.

The growth of unique actors (from 31 in 2001 to 236 in 2007) in itself is intuitively relevant with respect to White’s notion that cliques establish markets initially through an alignment of activity and quality of outputs to create a set of specific market norms of behaviours (Fligstein, 2003). However it only offers limited insights into the emerging structures because it ignores functional distinctiveness. As argued previously, some functions activity remains concentrated in few actors – there are only 5 issuers/co-issuers involved in 2001 rising to 13 in 2007 – whereas other functions features a much larger range of unique firms: the number of law firms increases from 7 (2001) to 51 (2007) and collateral management firms increase from 5 to 88 respectively. This suggest that the organisation of functional expertise follows different logics: the concentration of ties per function ranges from effective monopoly and duopoly positions of actors (co-issuers and issuers) to very broad and non-repetitive allocation mechanisms for (most) collateral managers. Other functions, such as law firms and investment banks, feature a high number of unique actors, but activity across functions remains concentrated

in few firms at the network core. There is something much more organising and agential about how the supply-side is organised through key actors, investment banks or CDO sponsors, who make decisions about the suppliers that will be involved based on their “ideas about what the market might be and some notions about what other people are doing” (Fligstein, 2003: 673) given the constraint of the market. Whilst a culture that is specific to the CDO market emerges early on, the firms’ agency may either reproduce or challenge these, and their ability to do so may be greatest if these are centrally embedded.

The traditional treatment of the relationships formed between actors involved in CDOs are at first glance purely contractual, “undersocialized” (Granovetter, 1973), both at the level of the supplier-firm relationship as well as the investor-seller. At the level of the product, the duration of a tie in our network is effectively limited to the production process of each CDO. However, this changes when we take into account the repeat interactions between (central) actors in the aggregate network what are maintained over long periods of time through joint involvement in further CDO creation and may create a more sustained, social relationship. The relationships in our network are thus of two types: 1) arms-length relationships where there is no, or limited repeat interaction between actors; and 2) embedded relationships where repeat interactions occur between two actors or more (Uzzi, 1997; Granovetter, 1985). The former would naturally involve organisations that are peripheral to the market, whilst the latter occurs between actors that exhibit high centrality scores. Recurring interaction between these central actors that create a capacity for knowledge, resources and capabilities to homogenise (Rowley, Behrens & Krackhardt, 2000, Uzzi, 1997) and consequently it is these actors’ increasing embeddedness in the supply-side and capacity to re-/produce market norms and behaviours through repeat interactions (Gulati, 1995; Uzzi, 1997). From an OS perspective, this is important as it mirrors Beckert’s (2010) call for the inclusion of networks in the theoretical treatment of changes to market fields, where institutions, cognitive frames and (agency through) social networks interact thereby transforming the nature of the market over a period of time. To some extent it speaks to a struggle for market share between incumbents and challengers discussed by Fligstein (2001).

Noting the strong divide between core and peripheral actors, some of the prominence may be explained through preferential attachment (Barabasi & Albert, 1999), where more prominent nodes receive more ties. However, given the structural limitations of the CDO as a networked product and its specific requirements, we would argue that a less mathematical and more sociological treatment of preference may be more suitable in explaining repeat interactions. We thus prefer to speak of preferred attachment between organisations where repeat interaction may indeed produce some competitive advantage. Gulati and Gargiulo (1999) and Powell, White, Koput and Owen-Smith (2005) suggest that these are linked to similar status of actors which may be particularly true for law firms and investment banks which hold symbolic capital and power (Bourdieu, 1987). However, given the highly specific and relatively low-status or mundane nature of activities some of these actors are involved with in our case (for example, payment and listing agents or administrators), some of these may reflect the constraining force of the product requirements, and given that little advantage may be gained from altering these relations with respect to a reduction of transaction costs through prolonged engagement.

The results of our analysis of CDOs as networked products raise a number of important questions about the organisation of a bubble market like CDOs in a way that opens up debate for organisational scholars. By shining light on the mundane structures that emerge from our network analysis, we have built foundations on which to further discuss patterns and key

positions of network actors that are of interest. At its most fundamental level, our study reveals structures and suggests agency which should form the basis for further enquiry. Financial activity, organisations, markets and their products become increasingly complex, and such complexity requires organisations to pool expertise. Thus from the very outset, what it takes to create the product itself, because of its reliance on multiple parties, has implications for agency and structure of the market in future; and here, the complexity arising from the involvement of multiple actors means that both micro and macro-level explanations become increasingly problematic as organisation occurs through these interactions.

By focusing on this particular bubble, we hope to have created a novel way of understanding how distortions in markets are created as arising from seemingly mundane, yet complex activities visible in the supply networks and interactions between multiple interested parties. As such, previous investigations that zoomed in on investment banks as primary proprietors of CDOs appear insufficient in light of the involvement of a host of other essential agents and the concentration of some of these functions in relatively few actors. Moreover, our analysis raises a more poignant question about the creation of new markets where financial innovation is fast-paced, yet of little social usefulness, in particular when those markets failure has substantial and long-term repercussions for economy and society. In an effort to understand financial crises and individual actor's activity, future research should not only focus on the obvious actors within a market – the ones visible to the buyers and of interest to regulators and politicians. Instead, future analysis should target actors that remain out of sight from public debate.

**REFERENCES AND EXHIBITS: AVAILABLE ON REQUEST**