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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), with notable exceptions (Lounsbury and Hirsch 2010).

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’Andreta, 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 US\$ 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 however 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). This may be 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 trading relations. We trace this structuration network and assess the degree to which repeat relations persist using the following data and methods.

DATA AND METHODS

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 using network tools, we can explore and map interactions between the supply-side actors and the more prominent players. 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 require 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 Cayman 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.

Fourth, it tells us something different - potentially - about the *causes of the 2008 crisis*. We observe a strong core-periphery structure in our network (13 nodes account for 83.9% of ties), where the periphery contains many independent collateral managers involved in only one or two CDOs. The presence of collateral managers is a structural feature and 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.

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.

Our treatment of CDOs as *networked products* is our attempt to open up a debate about the functional expertise required to create complex financial products and how this shapes the structure of the supply-side and the CDO market. There are similarities to White’s (1981 & 2002) work on the general mechanisms through which actors seek to shape networks and markets via “tangible cliques of producers observing each other” (1981: 543). In our network, cliques are defined at the level of each CDO product initiated by a focal firm, an investment bank or CDO sponsor. But unlike supply-chains, the relationships are not merely an outcome of contracts; they are socially embedded, complex and entangled.

Our findings raise questions about whether current macro- and micro-level conceptualisations of financial activity are sufficient in explaining innovation, growth and failure in financial markets. We are not the first to argue that interconnectivity between financial actors matters (Acemoglu, Ozdaglar, and Tahbaz-Salehi, 2015; French and Leyshon, 2011; Haldane, 2009), but we have tried to develop these insights to focus on the broader social assemblage of functional experts required to bring a complex product like a CDO into being. The networked-product frame is pertinent in explaining how activity is organised when there is no unitary logic of organisation across all functions. It helps illuminate a multiple set of logics specific to both the product requirements and actor strategies within the network: some functions remain concentrated (issuers & trustees) whereas others become increasingly dispersed (collateral management); some actors repeatedly engage with another whereas others do not. Other functions, such as law firms and investment banks, have a high number of unique actors, but activity across functions remains concentrated in few firms at the network core.

The network shows different types of ties which have different organising effects: a) arms-length relationships that involve organisations that are peripheral, but not irrelevant, to the network assemblage of the CDO; and b) embedded relationships between actors that exhibit high centrality scores and who interact repeatedly, centralising knowledge, resources and capabilities (Rowley, Behrens & Krackhardt, 2000, Uzzi, 1997). This supply side embeddedness may indicate actors' capacity to re-/produce market norms and behaviours through repeat interactions (Gulati, 1995; Uzzi, 1997). It may also therefore contribute to 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.

Our findings contribute to the ongoing discussion within organisation studies about the 'collective nature of organisational action and the role of networks in maintaining stable structures that facilitate coordination' (Salancik, 1995). But it also suggests an important role for organisational analysis in the study of extreme events like the 2008 financial crisis. By focusing on this particular bubble, we hope to have created a novel way of understanding how distortions in markets are created from seemingly mundane, yet complex activities visible in the supply networks and interactions between multiple interested parties. In an effort to understand financial crises and individual actor's activity, future research could analyse how visible and invisible actors interact to create unstable products and unstable systems.

REFERENCES AND EXHIBITS AVAILABLE ON REQUEST