

The Price is Right: Social and Material Structures in Financial Markets

Introduction

As finance transitions into daily life, it is necessary for the population to understand how financial markets operate, specifically, how prices are formed (van der Zwan, 2014). Prices are a crucial piece of information involved in the majority of commercial goods and services, which enables comparative valuation of these goods (Uzzi and Lancaster, 2004). Prices are not only created by computational rules and efficiency criteria, but also through social and material processes, such as social networks, status, and technological systems (Preda, 2006). This forms the dominant trait of the sociological approach to prices, which understands price formation as the result of social and political forces that operate within the market, such as interactions involving social actors and technological devices (Beckert, 2011; Black, 2013). These forces within a market can increase or reduce information asymmetries. Information asymmetry consists of one market participant knowing more information than another, and in imperfect markets information asymmetries affect the price at which trades are executed (Armstrong et al., 2011). The social and material structures of financial markets contribute to the formation of prices, through the creation or destruction of information asymmetry. This essay will examine examples of social and material structures in markets such as the Chicago Board of Trade and the London Futures Market, discuss how these structures are intertwined, and further examine the effect of information asymmetries on prices.

Social Structures in Financial Markets

Social structures of financial markets include the personal relationships between actors within the market, which are based on status and trust, and the embodiment of physical bodies within the market. These social structures primarily contribute to information asymmetries, and prices, through visibility.

Viewing economic action as embedded in personal relationship networks makes prices dependent on the structures of these relationships (Beckert, 2011). Markets are constituted partly by a constant physical interaction amongst dealers, as well as the power relations interwoven through this social structure (Black, 2013; Attard, 2000). For example, due to the chaos of the trading pit in the Chicago Board of Trade (CBOT), trading relations often develop with those in the direct vicinity. Themes of trust and status are embedded in relationships. Status differences refer to the social stratification of market participants, and generally higher status participants are able to underbid participants of a lower status, and those high status (“big dog”) traders tend to be watched more intently, such as what bids and deals they make (Beckert, 2011; Zaloom, 2003). Trust is also important, as mutual trust is also essential to sustain the security of any transaction (Attard, 2000). Higher status brokers often seem more trustworthy and credible, therefore more authoritative on the formulation of prices (Preda, 2006).

Another example that is a part of a social structure of financial markets which influences the formation of prices, is the physical embodiment of bodies within these markets. The most prominent example of this was seen in the trading pit of the CBOT. Deals here were done by voice, eye contact, and hand signals, and the shouting of the trading conveyed bids and offers, and delivered market information that led to the formulation of prices (MacKenzie, 2009; Zaloom, 2003). A key skill that brokers had in this market was to observe the body language and

physical actions of other participants, and thus be able to judge whether or not their proposed offer was adequate. Bodily signs of fear, such as a loud, panicked tone of voice, or the stress in one's eyes, cannot be divorced from the body, and can reveal the level of desperation a trader has to change their position, indicating that the offer is substandard, thus changing the prices within the market (MacKenzie, 2009; Zaloom, 2003).

These social structures contribute to the formation of prices through the theme of visibility. The visibility of transactions conveys information about the state of the market, and even the noise created in the pit affects the market: as sound levels increase, so do trading volumes and price volatility (Attard, 2000; Zaloom, 2003). In a fast moving, loud, and active market, a participant on the floor cannot fully survey all potential trading services, and this reduction in visibility restricts the amount of information said participant is privy to (Baker, 1984). Thus, even though all the available information in a market is presented and accessible to all present actors, such as through shouting in the trading pit, the limits imposed through human bodies forces participants to resort to their relationships in order to perform informed actions.

Material Structures in Financial Markets

While social structures and the bodies that form them play a large role in financial markets, markets are a combination of human beings and physical objects, meaning social structures and material structures are intertwined (MacKenzie, 2009). Material structures include technology and any physical tools that enact market actions. Some examples of material structures are the stock ticker, the computer, as well as the buildings that house market participants. These structures contribute to the formation of prices through creating the same information asymmetry that the aforementioned social structures produce.

The first example of a material structure is the stock ticker, invented by Edward Calahan in 1867, which broadcasted price quotations to brokers' offices, allowing brokers to monitor transactions that occurred on the exchange floor (Hochfelder, 2006). The ticker made price variations visible, eliminating large time gaps and making transactions present in several brokerage offices at once (Preda, 2006). The motivation behind the creation and use of the ticker was to reduce errors that came from the disorder and chaos from the social structures of the market (ibid). The ticker was a simple, clear way to distribute information to many market participants. Tickers eliminated the limitation of the human body's inability to be in two places at once, and they also made the behavior of market participants more efficient, consequently reshaping financial markets (MacKenzie, 2009).

Another example is the use of computers, and screens in general. Technology with screens requires different bodily work than face-to-face trading (Preda, 2009). This example is most clearly seen in the London Futures Market (LDF), where the shift from face-to-face trading to the use of screen-based technologies reconstituted bid and offer numbers (Zaloom, 2003). These screens structure the market and therefore affect the way traders act within the market, shaping the way the participants make calculations and manage quantitative information, which formulates prices (ibid). The use of screens suggests a desire for mutual visibility and the facilitation of conversation (Hardie and MacKenzie, 2007).

The final example of a material structure which influences the formation of prices is the physical buildings within which market participants interact and perform actions. This idea of "financescapes", where physical interactions of the market take place, is best evidenced through the trading pit of the CBOT, and the English Stock Exchange (Knight, 2013). The sensation of being inside these physical spaces shapes the traders' perception of the market, through visibility

(i.e. the obstruction of lines of sights by pillars), and noise. Specifically, the wooden floor of the old English Stock Exchange produced sounds that allowed jobbers to tell what was happening to the market (Attard, 2000; MacKenzie, 2009). Overall, the physical spaces of these structures influences the actions and information available to market participants, consequently affecting the formation of prices. The beginning of the use of 21st century technology starts to change this, leading to less face-to-face action that occurred on the stock exchange floor, to screens and computers. This shift eliminates the need to be tied to one specific location, though, the “financescapes” that house these technologies and participants still have their own structures that affect prices (Knight, 2013).

Technology most readily affects information and access to said information, so these material structures affect the formation of prices (Clemons and Weber, 1990). The ticker transformed financial information by providing rapid and accurate price quotations, instead of the summaries of price quotations that were printed before the ticker, which were slow, not standardized, and inaccurate (Knight, 2013). While the ticker provided clear, standardized information about prices, it could only be observed by a few people at once, which actually had the effect of limiting access to information (Preda, 2006). Computers and screens have this same effect of limiting the amount of information available to traders, as they only represent the market as changing numbers on a screen (Zaloom, 2003). Buildings can also limit information transparency, through structures that prevent clear visibility between market participants, thus exacerbating asymmetries. However, by providing space for participants to work together, buildings may in fact reduce information asymmetry for those participants who can gather and converse amongst themselves, thus spreading information and the formation of prices.

The Intertwining of Social and Material Structures

While this essay has so far discussed the social and material structures of financial markets separately, the two are actually intertwined, and together they influence the formation of prices. Market participants enable the economic structuring of a financial market through the social structures of financial markets, by building relationships and negotiating norms of coordination amongst themselves, and also through the material structures, by implementing technologies and practices (McKague, Zietsma, and Oliver, 2015). Prices are not formed just through social structures, such as interactions between buyers and sellers, and neither are they formed just through material structures, such as calculative devices and technology (Black, 2013). Instead, prices form as a result of both of these structures, individually and through the interactions between them. Analyzing social networks should not only study the relations among participants, but should also include the influence of material structures on everyday market practices, which impact trust and information asymmetries (Beunza and Stark, 2004; Roscoe, 2013).

For example, even in the LDF, where traders utilized computer, screens, and the market was represented numbers, traders still attempted to gain context about these numbers via interactions with the traders around them, as well as creating identities for their online competitors and constructing a social narrative around the market fluctuations (Zaloom, 2003). These market participants construct sociability, even in the absence of social interaction, through the mediation of technology (Roscoe, 2013). This example demonstrates that the material cannot be strictly divorced from the social, and vice versa, as the stories that traders rely on depend on social relations and interactions, but also require technology to play out.

The social structures discussed so far have also been intertwined with material structures. Author Michel Callon discussed economic actors being made up of socio-technical agencements, meaning the actor is not just an individual being, but is also made up of technology, tools, and equipment (Hardie and MacKenzie, 2007). The trading that occurred in the trading pit of the CBOT, which relied heavily on the social structures, also required material structures such as telephones, slips of paper, and boards to carry out the extent of actions necessary for the market to function, and thus form prices (Roscoe, 2013; Zaloom, 2003). A price is a thing, and is communicated both through social means, such as voices within a trading pit, but also by marks on a piece of paper or through a computerized trading system, and these computers also require social, bodily skills (Beunza, Hardie, and MacKenzie, 2006).

Material structures of markets developed in order to supplement the limitations of the social structures, so that together they could work together to reduce information asymmetries, and form accurate prices (Baker, 1984; MacKenzie, 2009). Information about an asset has to be socially established so that both buyers and sellers believe the same knowledge, so that market prices will be stable, and bid and ask prices will not diverge widely (Carruthers and Stinchcombe, 1999). Technology standardized the relevant information needed for price data, and thus trust and authority moved away from the individuals within the social structures, to technology, where information could be accurately produced, recorded, and assimilated, and then generate prices (Preda, 2006). Time constraints can be eliminated, and brokers do not have to be together in a singular location, however the relevant information cannot be separated from the narrative structure of social ties that are still a part of these technologies (Preda, 2006; MacKenzie, 2009). Overall, material and social structures are not independent of each other, and

are in fact interconnected and work together to dispense information that is relevant to formulate prices.

Information Asymmetry and the Formation of Prices

A fundamental claim within this argument is that information asymmetry contributes to prices. Modern financial markets are based on the foundation of information transparency which presents market information as facts that have no distortion of social information, and prices within these markets are affected when this transparency is not there (Zaloom, 2003).

Information asymmetries often manifest themselves through issues of visibility within the social and material structures already discussed in this essay. Numbers and price data are elements of knowledge production that increase objectivity, and this information transparency or asymmetry is seen in both social and material structures that conduct trading (ibid).

Information asymmetries influence prices, and can explain a significant portion of the variation of these prices, due to the amount of private information available to different groups of investors (Chan, Menkveld, and Yang, 2008). This is because asset prices respond instantaneously to the arrival of new information, and these prices also reflect any information already available within a market (Fama, 1991; Zghal et al., 2020). Information asymmetries can cause market imperfections, which can then lead to evaluation errors (Zghal et al., 2020). These evaluation errors then impact the material and social structures of financial markets, creating a cyclical effect on the formation of prices.

Information asymmetry more distinctly affects the social structures of financial markets, as the amount of knowledge a human being has impacts not only the actions of an individual, but also how that individual interacts with other market participants. The trades of better-informed

investors have a greater influence on prices because of their superior knowledge, and information asymmetry will also manifest in prices when investors with different amounts of knowledge interact with each other (Armstrong et al., 2011). Prices fully reflect all known information, and price changes can be unpredictable and random, due to the flow of information. This flow (and impediments to this flow) comes from the social structures of financial markets, through social relationships, and the material structures, through communicative technologies like telephones and computers (Malkiel, 2003).

The material structures of financial markets primarily help the spread of information. Information plays a large role in trading decisions, and information is available more easily in offices than on a trading floor, as technology such as telephones allow for the fast spread of information anywhere. However, information is also easily available if participants are located in the same location, which deals with both the material structure of a building, as well as the social structure of the grouping of participants and the relationships amongst them (Clemons and Weber, 1990). Traders in an online market like LDF have tried to create information transparency through presenting the market as a series of numbers, but traders in both open-outcry markets like the CBOT, and online markets, exploit information ambiguities of numerical information, leading to changes in prices (Zaloom, 2003). Altogether, both the material and social structures of financial markets are influenced by and produce informational asymmetries that affect the formation of prices.

Conclusion

In conclusion, social and material structures of financial markets contribute to the formation of prices through the creation and reduction of information asymmetry. Social

relationships and the embodiment of market participants are examples of social structures that create information asymmetry and transparency, through visibility. Material structures such as the stock ticker, computers, and physical buildings also relate to information asymmetries. Material structures are interconnected with social structures, and together they formulate prices. These structures are relevant today because technology continues to evolve, and it is important to be aware of how future technology may influence these structures, the individuals within them, as well as prices. Future advancements in technology may not always correspond with a reduction in information asymmetries. It is also important to further investigate information asymmetries and how they arise, because as more citizens become investors, different amounts of knowledge could severely impact ordinary people if they do not possess substantial financial literacy (van der Zwan, 2014). Therefore, this topic of discussion is pertinent to not only market participants, but future participants that could be any average person. In closing, as social and material structures progress and change, access to information will also change, impacting the formation of prices.

References

- Armstrong, C. S. *et al.* (2011) “When does information asymmetry affect the cost of capital?,” *Journal of accounting research*, 49(1), pp. 1–40. doi: 10.1111/j.1475-679x.2010.00391.x.
- Attard, B. (2000) “Making a market. The jobbers of the London Stock Exchange, 1800–1986,” *Financial history review*, 7(1), pp. 5–24. doi: 10.1017/s0968565000000019.
- Baker, W. E. (1984) “The social structure of a national securities market,” *American journal of sociology*, 89(4), pp. 775–811. doi: 10.1086/227944.
- Beckert, J. (2011) “Where do prices come from? Sociological approaches to price formation,” *Socio-economic review*, 9(4), pp. 757–786. doi: 10.1093/ser/mwr012.
- Beunza, D., Hardie, I. and MacKenzie, D. (2006) “A price is a social thing: Towards a material sociology of arbitrage,” *Organization studies*, 27(5), pp. 721–745. doi: 10.1177/0170840606065923.
- Beunza, D. and Stark, D. (2004) “Tools of the trade: the socio-technology of arbitrage in a Wall Street trading room,” *Industrial and corporate change*, 13(2), pp. 369–400. doi: 10.1093/icc/dth015.
- Black, J. (2013) “Reconceiving financial markets—from the economic to the social,” *Journal of corporate law studies*, 13(2), pp. 401–442. doi: 10.5235/14735970.13.2.401.
- Carruthers, B. G. and Stinchcombe, A. L. (1999) “The social structure of liquidity: Flexibility, markets, and states,” *Theory and society*, 28(3), pp. 353–382. Available at: <http://www.jstor.org/stable/3108553>.
- Chan, K., Menkveld, A. J. and Yang, Z. (2008) “Information asymmetry and asset prices: Evidence from the China foreign share discount,” *The journal of finance*, 63(1), pp. 159–196. doi: 10.1111/j.1540-6261.2008.01313.x.

- Clemons, E. K. and Weber, B. W. (1990) "London's big bang: A case study of information technology, competitive impact, and organizational Change1," *Journal of management information systems : JMIS*, 6(4), pp. 41–60. doi: 10.1080/07421222.1990.11517871.
- Fama, E. F. (1991) "Efficient capital markets: II," *The journal of finance*, 46(5), pp. 1575–1617. doi: 10.1111/j.1540-6261.1991.tb04636.x.
- Hardie, I. and MacKenzie, D. (2007) "Assembling an economic actor: The agencement of a hedge fund," *The sociological review*, 55(1), pp. 57–80. doi: 10.1111/j.1467-954x.2007.00682.x.
- Hochfelder, D. (2006) "'Where the Common People Could Speculate': The Ticker, Bucket Shops, and the Origins of Popular Participation in Financial Markets, 1880-1920," *Journal of American history (Bloomington, Ind.)*, 93(2), pp. 335–358. doi: 10.2307/4486233.
- Knight, P. (2013) "Reading the ticker tape in the late nineteenth-century American market," *Journal of cultural economy*, 6(1), pp. 45–62. doi: 10.1080/17530350.2012.745439.
- MacKenzie, D. (2009) "Ten Precepts for the Social Studies of Finance," in *Material Markets: How Economic Agents Are Constructed*. Oxford, England: Oxford University Press, pp. 8–36.
- Malkiel, B. G. (2003) "The efficient market hypothesis and its critics," *The journal of economic perspectives: a journal of the American Economic Association*, 17(1), pp. 59–82. doi: 10.1257/089533003321164958.
- McKague, K., Zietsma, C. and Oliver, C. (2015) "Building the social structure of a market," *Organization studies*, 36(8), pp. 1063–1093. doi: 10.1177/0170840615580011.
- Preda, A. (2006) "Socio-technical agency in financial markets: The case of the stock ticker," *Social studies of science*, 36(5), pp. 753–782. Available at: <http://www.jstor.org/stable/25474473>.

- Preda, A. (2009) "Brief encounters: Calculation and the interaction order of anonymous electronic markets," *Accounting, organizations and society*, 34(5), pp. 675–693. doi: 10.1016/j.aos.2008.06.005.
- Roscoe, P. (2013) "Economic embeddedness and materiality in a financial market setting," *The sociological review*, 61(1), pp. 41–68. doi: 10.1111/1467-954x.12004.
- Uzzi, B. and Lancaster, R. (2004) "Embeddedness and price formation in the corporate law market," *American sociological review*, 69(3), pp. 319–344. doi: 10.1177/000312240406900301.
- Zaloom, C. (2003) "Ambiguous numbers: Trading technologies and interpretation in financial markets," *American ethnologist*, 30(2), pp. 258–272. doi: 10.1525/ae.2003.30.2.258.
- Zghal, I. *et al.* (2020) "The effect of market sentiment and information asymmetry on option pricing," *The North American journal of economics and finance*, 54(101235), p. 101235. doi: 10.1016/j.najef.2020.101235.
- van der Zwan, N. (2014) "Making sense of financialization," *Socio-economic review*, 12(1), pp. 99–129. doi: 10.1093/ser/mwt020.