Effect of Network Relations on the Adoption of Electronic Trading Systems

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ABSTRACT: Information systems can serve as intermediaries between the buyers and the sellers in a market, creating an “electronic marketplace” that lowers the buyers’ cost to acquire information about sellers’ prices and product offerings. Although electronic trading systems provide potential to create an efficient market structure, we witness that a $45 trillion fixed-income market still makes little use of these systems. Low penetration of electronic trading systems in the marketplace is at odds with the existing information technology research doctrine. The reason is that the creation of efficient market structure through an electronic marketplace is based on macro-level interfirm relationships that do not take into account the recurrent micro-level, interpersonal
interaction among the market actors. Our empirical investigation, based on face-to-face interviews with 90 fixed-income senior managers and traders from 25 financial institutions, provides a unique insight into the social capital based on social networks of interpersonal relationships in the fixed-income market. Our research findings show that the market structure of embedded interpersonal ties enables participants to take advantage of information asymmetry for profit taking. As a result, imposition of solely electronic trading systems on the present fixed-income market structure is at odds with the present interfirm market norms and business processes enacted for large transactions among market makers and institutional investors.

KEY WORDS AND PHRASES: alternative trading systems, arm’s-length relationships, electronic trading, embedded relationships, fixed-income market, information flow, network ties.

Markets have three main functions: matching buyers and sellers; facilitating an efficient exchange of information, goods, services, and payments associated with market transactions; and providing an institutional infrastructure, such as a legal and regulatory framework, that enables the market to function efficiently [5]. Operational efficiency means that market participants are able to conduct transactions at competitive cost, and informational efficiency means that all available information is incorporated into the price. The degree of informational and operational efficiency determines the extent to which markets are allocationally effective. Information systems can serve as intermediaries between the buyers and the sellers in a market, creating an “electronic marketplace” that makes it less expensive for buyers to acquire information about sellers’ product offerings and prices [6, 7, 8, 41]. Thus, one would expect electronic trading systems to replace the inefficiencies of traditional face-to-face and telephone systems among buyers and sellers in the financial marketplace. Recent research shows, however, that electronic trading systems have had little impact on the traditional methods of brokerage in financial markets [29, 47, 51, 52, 67]. To better understand factors inhibiting the use of electronic trading systems in support of transactions, we believe, as do others (e.g., [5, 54]), that it is necessary to study the microstructure of the markets. In this endeavor, our focus in this paper is on the secondary fixed-income (FI) market microstructure among the actors to better understand the inhibiting issues affecting use of electronic trading systems.

In recent years, we have witnessed the growth of the use of electronic trading systems in support of FI trade. To date, there are at least 23 platforms used internationally to enhance the efficiency of electronic trade execution and to reduce user costs [20]. A recent survey [20] shows that virtually all trading platforms offer a combination of the following services: (1) pricing data, (2) confirmation and allocation services, (3) pre-trade analytics, (4) matching services, (5) electronic research delivery, (6) regulatory compliance services, (7) risk monitoring or management services, and (8) identity management services. In spite of the variety of services offered by the trading platforms,
about 90 percent of the trade volume is performed by phone or squawk box in the FI market [3, 20, 26, 51]. The reasons reported for this relatively low use of electronic trading systems are generally anecdotal, such as (1) the variety and complexity of different type of bonds (the mortgage-related market has almost 2 million issues, for example), making it difficult to present them on a single platform; (2) the variation in the design of different electronic platforms, which makes it difficult to use a common interface; and (3) the effect of platform ownership by competing interest groups which makes it difficult to adopt a system across the board [26]. The shortcoming of research to this point is that it has focused on the “electronic integration effect” of the FI trading systems, assuming an arm’s-length relationship between buyers and sellers to be the only desirable outcome. But this overlooks the significance of social capital in the form of “socially embedded network relations” among the actors that enable them to exchange information toward mutually profitable trades. It is probable that the embedded relationships among the actors cannot be easily replaced by a self-serve technology [57] such as electronic trading systems.

Thus, our research objective is to explore the ways information flow mediates brokerage relationships that are enacted through interaction of actors in the FI market and assess its effect on the use of electronic trading systems. Although research aimed at explaining why one would use a given information technology (IT) is interesting, our knowledge on this issue is well developed; it is not so with respect to why people do not use a technology, which is the research question addressed in this paper.

The Fixed-Income Market Environment

An FI security is defined as one whose income stream is fixed for the duration of the loan and whose maturity and face value are known. It is estimated that the global FI market is about $45 trillion. In a typical FI market, there are four major players—securities issuers, dealers, brokers, and investors. FI securities are issued by the borrower—governments or corporations—and are purchased by a dealer or a group of dealers for resale. Actual trading takes place in the secondary market, which lists and trades primary issues once they are sold. Market quotes (benchmark prices) to the FI market are provided through information vendors, such as Reuters and Bloomberg, that are connected electronically to the dealers’ market. Investors (buy side) are usually blind to the “real” and “live” market, and the prices (quotes) provided to them serve as a benchmark and are the first step in a process that may lead to a trade. The “real” or “live” dealers’ markets normally take place over the phone and represent a binding commitment by the dealer either to buy or sell [51]. FI market infrastructure is built around information asymmetry.

Information is critical to market transparency in FI trade [1, 11, 29, 53]. Market transparency refers to the amount of quote, price, and volume information available to markets and to the general public. In FI markets, dealers provide quotes to a potential counterparty, and they also act as market makers, taking on inventory risk. Complete transparency in these circumstances may reduce their ability to manage this risk, which could have the adverse effect of reducing liquidity and increasing transaction
costs. Thus, we find an important aspect of FI market operation to be information asymmetry, which arises when one side has private information that is not disclosed to the other side, and which is the cornerstone of the FI trades environment. This information could be about securities and their issuers, about general market conditions, about economic events, or about the analytic models used to analyze the profit margin of particular securities.

Sell-side firms have traditionally played a critical role in FI markets. In negotiated deals (as opposed to auction-based deals), which are the dominant type of transactions in FI market, sell-side firms utilize their market expertise, which constitutes an information asymmetry that works to their advantage [26]. The information needs for sell-side firms in particular include information that they would like to receive about positions held in the buy-side portfolios to make better trading recommendations [53] and to gain control over the significant effects of information asymmetry [42, 48, 66, 67, 68]. Thus, brokerage relationship among the actors in the FI market has a major impact on their daily transactions.

Conceptual Model of Network Relations

Relational views of information seeking and learning of actors in a social network indicate that, faced with information asymmetry, the probability of seeking information from another person is a function of (1) knowing what that person knows, (2) valuing what that person knows, (3) being able to gain timely access to that person’s thinking, and (4) perceiving that seeking information from that person would not be too costly [8]. The benefit accrued through exchange of information among actors in a social network is labeled as social capital. More broadly, social capital can be defined as resources embedded in a social network that can be accessed or mobilized toward specific actions (such as the strategic advantage of the firm) [2, 10, 15]. It consists of three components: (1) resources embedded in a social structure (embeddedness), (2) accessibility to such social resources by individuals (accessibility), and (3) use or mobilization of such social resources by individuals toward specific actions (use). For example, within the context of the FI market, information is expected to spread across the actors in the market, but it will circulate within the social network before reaching those outside the network (e.g., timely market intelligence received from a market maker). This enables the network members to be better informed and to take advantage of their “time-sensitive” information asymmetry relative to others in the market. To this end, social capital is used in the creation of the company’s intellectual capital in the interests of organizational advantage [54]. Thus, social capital can be defined as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit [54]. Intellectual capital, on the other hand, refers to the knowledge-knowing capability of a social collectivity, such as an organization, intellectual community, or professional practice [54]. Intellectual capital is believed to be the cornerstone of today’s knowledge-based organizations. For example, in regard to the FI market, Duarte et al. [18] found that the strategies whose implementation required more “in-
intellectual capital” tended to be more profitable after controlling for bond and equity market risk factors. Our contention in this paper is that intellectual capital in the FI market is derived through exchange of information among a network of actors in both sell side and buy side in order to benefit from information asymmetry for profitable trade. Thus, transparency enacted through electronic trading systems is detrimental to the present FI trade structure.

We adopt Schultz and Orlikowski’s [57] network relation model to explore the ways information flow mediates brokerage relationships that are enacted through interaction of actors in the FI market. This model, depicted in Figure 1, presents two different types of network relations that vary according to structure (i.e., network ties, and network configuration) and agency (i.e., cognitive and relational dimensions).

Network Ties

The conduct and performance of firms can be more fully understood by examining the network of relationships in which they are embedded [34, 55]. Actors use direct and indirect ties to seek private information under conditions of information asymmetry [36, 43, 58]. Direct ties between actors could shift the logic of the transaction from one of economic relationship to one of social relationship [46]. By embedding a transaction in an ongoing social relationship, direct ties motivate both parties to maintain the relationship in a fair and trusting manner, and generate a sense of obligation between the parties, which causes them to behave generously toward each other [34]. Thus, in the absence of direct prior ties, actors are more likely to engage in zero-sum business transactions through arm’s-length ties [31, 32, 61]. Furthermore, embedding economic exchange in social attachments can both create unique value and motivate exchange partners to share the value for their mutual benefit [63]. Embeddedness demonstrates how informal mechanisms of trust and agreed-upon expectations of cooperative behavior arise in relationships and facilitate resource transfers between actors. Arm’s-length
ties, on the other hand, are characterized by lean and sporadic transactions [62]. These ties determine the degree to which an actor can access heterogeneous information in a market, even if that information is publicly available, because actors use network ties to search for up-to-date information [10]. Because arm’s-length ties require little investment in time or mutual obligation, they enable actors to economically maintain many ties to other actors. Therefore, when public information is scattered unevenly among actors in a market, arm’s-length ties should provide an effective and economical means for acquiring that information [64].

Embedded ties, on the other hand, encourage private knowledge transfer because expectations of trust and reciprocity provide assurances that the transfer will be used to the mutual benefit of both parties [62]. Uzzi and Gillespie [63] contend that the process of embedding commercial transactions instills into future exchanges expectations of trust and reciprocity that promote unique value creation in the relationship. These expectations arise because the embeddedness of commercial transactions in social attachments endow the commercial transaction with expectations of exchange that people normally use for transacting with individuals they have come to know well, expectations that offer a reliable template for managing transactions from what they have learned in their prior experiences. Embedded ties, therefore, are well suited for the transfer of novel and private information. Nonetheless, embedded ties and arm’s-length ties are complementary rather than cannibalistic when they are combined within the same social network [62]: arm’s-length ties are superior at “shopping” the market for publicly available information, and embedded ties are superior at “plugging” actors into the unique private information network. This enables organizations to benefit from social capital through embedded ties in social networks. The reason is that information can be expected to spread across the people in a market, but it will circulate within the social network before reaching those outside the network. Therefore, the network members are better informed and take advantage of their information asymmetry relative to others in the market.

Network Configuration

Network ties provide the channels for information transmission, but the overall configuration of these ties constitutes an important facet of social capital [54]. In line with our research objective, let us place the above network ties within the context of brokerage behavior in social systems. Marsden defines brokerage as a process “by which intermediary actors facilitate transactions between other actors lacking access to or trust in one another” [47, p. 202]. Thus, any brokered exchange can be thought of as a relation involving three actors, two of whom are the actual parties to the transaction and one of whom is the intermediary or broker [29]. Gould and Fernandez [29] identified five structurally distinct types of brokerage configurations by examining differences in activities and interests of the actors in the network relationships. Two of their five brokering types—gatekeeper and liaison—are particularly relevant to our discussion of IT-mediated network relationships in the FI market.
A liaison brokerage arrangement (Figure 1a) consists of actors who have different interests and are without any allegiances among them. In this liaison arrangement, the broker is seen to be both independent and unbiased (i.e., arm’s-length tie between the broker and the customer). In contrast, in the gatekeeper brokerage arrangement (Figure 1b), the broker’s interests tend to be aligned with those of the buyer. As a gatekeeper, the broker gathers information from a third party and manipulates it by filtering, sorting, and editing it before distributing a selective content of it to the buyer (i.e., embedded tie between the broker and the buyer).

Embedded ties between actors (broker and client, for example), to exchange private information within the framework of the gatekeeper brokerage arrangement, are affected by interpersonal relations and cognitive attributes: the cognitive dimension consists of shared codes and language as well as shared narratives, whereas the relational dimension consists of trust, norms, obligations, and identification.

Cognitive Dimension

Intellectual capital is a social artifact, and that knowledge and that meaning are always embedded in a social context—both created and sustained through ongoing relationships in such collectivities. This sharing may come about in two main ways: through the existence of shared language and vocabulary or through the sharing of collective narratives [54].

Shared Language and Codes

Language has a direct and important function in social relations, for it is the means by which people discuss and exchange information, ask questions, and conduct business in society.

Shared Narratives

Shared narratives consist of myths, stories, and metaphors that provide powerful means in communities for creating, exchanging, and preserving rich sets of meanings.

Relational Dimension

Trust

Drawing on social psychology and marketing, Doney and Cannon [17] define trust as the perceived credibility and benevolence of a target of trust.

Norms

A norm exists when the socially defined right to control an action is held not by the actor but by others. Thus, it represents a degree of consensus in the social system [54].
Obligations and Expectations

Obligations represent a commitment or duty to undertake some activity in the future.

Identification

Identification is the process whereby individuals see themselves as one with another actor or group of actors. This may result from their membership in that group or through the group’s operation as a reference group “in which the individual takes the values or standards of other individuals or groups as a comparative frame of reference” [54, p. 256].

Methodology

OUR RESEARCH OBJECTIVE IS TO EXPLORE THE WAYS INFORMATION FLOW MEDIATES BROKERAGE RELATIONSHIPS THAT ARE ENACTED THROUGH INTERACTION OF ACTORS IN THE FI MARKET AND ASSESS ITS EFFECT ON THE USE OF ELECTRONIC TRADING SYSTEMS. WE FOLLOWED THE DEDUCTIVE METHODOLOGY, ALSO CALLED CONCEPTUAL [50], TO DEPICT AND UNDERSTAND THE UNDERLYING RELATIONSHIPS AMONG THE FI ACTORS. IN DEDUCTIVE STRATEGY, THE RESEARCHER HAS SOME ORIENTING CONCEPTUAL FRAMEWORK TO TEST OR OBSERVE IN THE FIELD. THE INITIAL VERSION OF THE CONCEPTUAL FRAMEWORK IS AMENDED AND REFINED AS IT IS TESTED AGAINST EMPIRICAL DATA. TO THIS END, THE PROCEDURE THAT WE FOLLOWED TO COLLECT THE REQUIRED DATA WAS AS FOLLOWS. FIRST, WE DEVELOPED A CONCEPTUAL FRAMEWORK TO FOCUS AND BOUND THE COLLECTION OF DATA.

A CONCEPTUAL FRAMEWORK EXPLAINS, EITHER GRAPHICALLY OR IN NARRATIVE FORM, THE MAIN THINGS TO BE STUDIED—THE KEY FACTORS, CONSTRUCTS OR VARIABLES—and presumed relationships among them. [50, p. 18]

A LITERATURE SURVEY WAS PERFORMED TO IDENTIFY MICRO-LEVEL PRACTICES BY THE ACTORS IN THE FI MARKET. WE USED THE MULTILEVEL ORGANIZATIONAL MEMORY FRAMEWORK, PROPOSED BY ANAND ET AL. [4], TO DEPICT THE INFORMATION FLOW AND NETWORK TIES AMONG ACTORS IN THE SELLSIDE AND BUY-SIDE FI MARKET GLEANED FROM VARIOUS PUBLICATIONS ON THE TOPIC. NEXT, IT WAS PRESENTED TO A SENIOR CONSULTANT, WHO HAD WORKED FOR MORE THAN 20 YEARS IN BOTH BUY-SIDE AND SELL-SIDE FIRMS, TO REFINIE THE DEPICTED RELATIONSHIPS AS THEY PERTAIN TO PRACTICE. THIS MADE IT POSSIBLE TO BETTER UNDERSTAND THE DYNAMICS OF RELATIONSHIPS AMONG THE ACTORS, AND IT PREPARED US TO ASK MEANINGFUL QUESTIONS DURING OUR INTERVIEWS WITH THE SUBJECTS. TWO OF THE AUTHORS CONDUCTED ALL OF THE FACE-TO-FACE INTERVIEWS TOGETHER TO ENHANCE CREATIVE POTENTIAL OF THE STUDY BENEFITING FROM COMPLEMENTARY INSIGHTS. FURTHERMORE, PARTICIPATION OF MULTIPLE INVESTIGATORS IN ASSESSING THE COLLECTED DATA WAS INSTRUMENTAL TO ENHANCE CONFIDENCE IN THE FINDINGS [21].

RESEARCH SITES WERE SELECTED TO MAXIMIZE VARIATION AND ALLOW COMPARISONS [33]. SIMILARITIES AND VARIATIONS PERTAIN TO FOUR CHARACTERISTICS OF THE FI MARKET ENVIRONMENT: INSTITUTION TYPE (SELL SIDE AND BUY SIDE), INSTITUTION SIZE (LARGE, MEDIUM, AND SMALL BUY SIDE), PRODUCTS (GOVERNMENT BONDS, T-BILLS, MUNICIPAL BONDS, AND CORPORATE
bonds), and actors (traders, sales reps, portfolio managers, senior managers). We used the Investment Dealers Association members’ list to select financial institutions for data collection. Next, we called senior management in each institution to explain the objective of the study and ask for their participation by providing up to four senior sales reps, traders, and senior management for face-to-face interviews individually. We made sure that the subjects selected within each firm had expertise in handling different products. In return, they were promised a copy of the final report. Out of 45 financial firms, 26 agreed to participate in the research. The 19 firms that did not participate were all small buy-side firms that declined because of a lack of resources.

Our subjects consisted of 90 senior managers, traders, and sales reps from 26 financial institutions that represented both sell side and buy side (see Table 1), one interdealer broker (IDB) service provider, one alternative trading system (ATS) service provider, and one major research boutique. On the sell side, 10 major firms that include domestic banks, international brokerage houses, and international banks dominate 95.5 percent of domestic FI trading activities in the Canadian market. The seven large sell-side firms that participated in our investigation had a total share of 87.6 percent of the market, and four small firms accounted for at least 1 percent of the Canadian FI market. The buy-side firms that participated in our study manage $409 billion of Canadian FI funds. This accounts for 56 percent of the bonds held by these financial institutions. The average pertinent work experience of the subjects was 17.7 years (standard deviation of 7.83) and 12.5 years (standard deviation of 6.91) for the subjects from the sell side and buy side, respectively. Thus, data collected from participating firms represent an unbiased coverage of the Canadian FI market.

Three sources of evidence were used in support of internal validity: direct observation, documentation, and face-to-face interviews [19] through a semistructured questionnaire (see Appendix A). This enabled us to view the live operation on the trading floor and discuss, through face-to-face interviews, the specific operational issues with the actors within the context of their specific activities. The purpose of the direct observation was to understand the operational dynamics on the trading floor of sell-side and buy-side actors (dealers, sales reps, and management). The essence of direct observation is the better understanding it affords us of the values, meanings, motivations, and logics that govern the actors [23, 35]. It is based on “naturalist modes of inquiry such as participant observation and semi-structured interviews, within a

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predominantly inductive framework” [38, p. 1240]. As a result, the researcher is immersed in the operational environment for a period of time to participate directly with the group being studied. Furthermore, face-to-face interviews based on a semistructured questionnaire enabled us to get detailed insight about specific issues. During face-to-face interviews, we asked each subject to walk through the information flow as it was depicted and explain the relationships among the actors in his or her firm. Subjects had the opportunity to make changes to the depicted information flow and to the relationships among actors. Each interview, conducted by two of the authors, lasted from 60 to 120 minutes and was tape-recorded with the consent of interviewee. This enabled us to use the transcripts of the interviews for further analysis. Figures 2 and 3 present the final outcome, showing information flow and network ties among actors in sell side and buy side, respectively. We are confident that these figures correctly represent the micro-level structure of the FI market because 28 subjects at the end approved it without any change.

We also asked subjects to respond to a series of semistructured questions related to the relational and cognitive dimensions of their daily activities on the desk (see Appendix A). Our basic assumption, based on literature, was that embedded ties between actors (broker and client, for example), to exchange private information within the framework of the gatekeeper brokerage arrangement, are affected by interpersonal relations and cognitive attribute. Thus, the data collected were analyzed in two stages [21]. Within-case analysis was performed to identify similarities and variations within each of the four categories of interest: institution type (sell side and buy side), institution size (large, medium, and small buy side), products (government bonds, T-bills, municipal bonds, and corporate bonds), and actors (traders, sales reps, portfolio managers, senior managers). Within-case analysis enabled us to become intimately familiar with each case as a stand-alone entity. This process allowed the unique patterns of each case to emerge before creating generalized patterns across cases [21]. As suggested by Miles and Huberman [50], for the within-case analysis, response of the subjects to each question was tabulated to identify between-subject similarity and differences.

Coupled with within-case analysis is cross-case search for patterns [21]. Cross-case analysis was conducted by comparing cases in pairs to identify the subtle similarities and differences between each pair. Thus, the chain of evidence developed through within-case and cross-case analysis enabled us to accurately capture the relational and cognitive dimension of their daily activities on the desk. To assess further the validity of our findings, we presented our findings to 14 managers from six participating firms. There was a general agreement that our findings were an accurate representation of the relational and cognitive dimensions of the FI market actors.

Analysis

Network Ties Analysis for the Sell Side

Figure 2 depicts network ties among actors from sell-side operational activities. All boxes but one are divided into two parts—internal and external—representing within
Figure 2. Information Flow and Network Ties Among Actors in a Sell-Side FI Market

Figure 3. Information Flow and Network Ties Among Actors in a Buy-Side FI Market
the sell-side firm and outside the firm (i.e., other sell side, buy side, government, news agencies).

Let us start with the front office. The primary responsibility of sales reps is to manage the relationship between the clients (large institutional investors such as TEACHERS' Pension Plan and Ontario Municipal Employees Retirement System [OMERS]) and dealers on the trading desk. The sales reps provide information to the client about the state of the market (market intelligence) or pass information to a specific trader at the desk if the client intends to buy/sell securities. Furthermore, sales reps also initiate daily contacts with “preferred clients” and each sales rep has embedded ties with up to 40 such clients who are considered profitable for the firm. The daily contacts enable the sales reps to keep track of clients’ needs and provide them with market intelligence about the “breadth” of the market and, if necessary, provide further information about the “depth” of the market through traders at the trading desk. Large institutional clients, because of embedded ties with the dealers, enjoy the privilege of directly calling the trading desk by phone for consultation, negotiation, and immediate execution of the order. This relationship with traders enables them to exchange private information such as depth of market, liquidity, and effects of large transactions on the market. For example, traders as intermediaries may divide a large order into smaller lots for market offerings to avoid any adverse effect on their market (e.g., a $500 million purchase of a specific bond can send an undesirable signal to the market causing a price increase). Here we see private information exchanged between client and trader with embedded ties to create information asymmetry for their mutual benefit. The relationship between small institutions and traders is usually at arm’s length, however. For example, the $1 million purchase of a specific bond may not get the attention of a senior trader. As a result, a junior trader (or retail trading desk) would use ATSs such as TradeWeb to purchase the bond for the client. The exception here arises when the client from a small institution contacts a trader with whom he or she has embedded ties (e.g., they are friends). In this case, the client from the small institution can receive from the trader with embedded ties the same service as a large institution. It should be noted that institutional clients use a mix of embedded ties and arm’s-length ties when contacting sales reps/traders. They use arm’s-length ties to broker market differences by asking for “benchmark quotes” from sales reps belonging to different financial institutions. However, embedded ties are used to exchange detailed private information when the client asks for a “market quote” for an immediate transaction.

Sales reps use internal and external private and public information to serve their clients. Internal private information includes in-house research (supplied by the firms' analysts), in-house experts, and information created by different groups or departments (e.g., internal news, order flow, and market intelligence). Thus, sales reps use embedded ties with knowledge sources within the firm to obtain internal private information. External private information is gathered from external contacts (e.g., colleagues who might be working for other firms, and business acquaintances “in the know”) through embedded ties with their contacts outside their firm. Internal public information is accessed through a proprietary automated trading platform that supplies the firm’s quotes and prices accessible internally to the traders and sales reps as well as externally to some
of the clients (e.g., in-house ATS). The external public information includes market prices and news from public information/data vendors (e.g., Reuters and Bloomberg), research boutiques (e.g., Action Economics, UFG Research) that the firms subscribe to, and the external trading platform (e.g., TradeWeb, eSpeed, and CBID).

The traders at the trading desk also gather private and public information internally and externally. Internally, the trader has access to private information from (1) embedded ties with other traders at the desk (e.g., information about prices of other “related” bonds, market intelligence), (2) embedded ties with the firm’s sales rep’s private information (e.g., information about the firm’s order flow and volumes for the current day), (3) embedded ties with senior management’s private information (e.g., firm’s guidance and policy, and expertise), and (4) embedded ties with the internal research unit and publications.

Externally, the trading desk has access to IDBs’ markets. The IDB market is an “intermediate” and “live” market designed to facilitate trading between different dealers—traders who post bids and asks on individual securities on interdealers’ screens for execution. The IDBs (e.g., Shorcan, Prebon, Cantor, Tullet, and Freedom) enhance market liquidity by managing inventories from different traders/firms for a fee. The public information accessed through IDBs includes market prices, market supply, and demand (indicated by the sizes of the bids and asks posted) from anonymous competitors. Like sales reps, traders also have embedded ties with outside contacts such as colleagues in other financial institutions. Their external public information includes market prices and news from public information/data vendors (e.g., Reuters and Bloomberg), research boutiques, and the external trading platform (e.g., TradeWeb, eSpeed, and CBID).

Network Ties Analysis for the Buy Side

Figure 3 depicts information flow and network ties among actors in buy-side FI market, and it is similar in design to Figure 2, all boxes but one being divided into two parts—internal and external—representing within the buy-side firm and outside the firm (sell side, research boutiques, government agencies, etc.). The first noticeable difference in Figure 3, however, is the absence of the front office. Typically, the buy-side firms are private institutions representing one major client (such as TEACHERS and OMERS) and are not in need of a sales office. Instead, the buy-side management is in charge of investment origination, asset mix, trade execution, and fund management.

The management consists of a number of individuals with preassigned tasks, headed by a senior manager who is ultimately responsible for the performance of the FI portion of the fund. Other individuals include portfolio managers who oversee different portions of the FI fund. Portfolio managers are the key players in the buy-side firms and are the focus of the sell-side daily contacts through embedded ties with sales reps and traders. These contacts provide information (market intelligence) beyond what is provided by the financial media (i.e., news/data vendors and research boutiques). For example, sell-side sales reps provide a “daily offering package” before the start of the trading day, or traders pitch trade ideas that may be based on recent market news.
Typically, the day of a buy-side manager starts with the gathering of information. As one portfolio manager commented, “it starts with examining the daily offering package” and by morning calls to sales reps/dealers, surveying available securities.” Portfolio managers (or their assistants) execute their own transactions. The bulk of trading is done over the phone (90 percent); large buy-side firms (institutional investors) prefer the direct contact with the sales reps/dealers, confidentiality being a major concern. However, this preference varies from firm to firm and from manager to manager. In selecting a dealer before a possible trade, portfolio managers first “check the daily offering package” to select dealers with the desired inventory. Selection of a trading venue is governed by several concerns: liquidity of the issue, the dollar size of the trade, limit orders, additional trading information needed, user preference, and confidentiality.

Other actors on the buy-side desk include research analysts/associates/assistants/trainees and quantitative analysts in support of the portfolio managers. The analysts are either assistants or junior portfolio managers performing research or execution for the portfolio manager. These positions are created to provide additional research/information and serve as a training ground for potential portfolio managers. The quantitative analysts assist portfolio managers with the assessment of economic and industrial variables. Both analysts and quantitative analysts are located in close proximity to the portfolio managers. This enables them to exchange information freely through embedded ties among them.

Portfolio managers use internal and external private and public information in decision making. Internal private information includes internal in-house research supplied by the firm’s analysts, internal experts, and pricing platform (e.g., CanPX, showing IDB market information: bid–ask, last trade, and volume). External private information is gathered through embedded ties with colleagues in other firms, sell-side sales reps, and traders. Public information is accessed through ATSs (e.g., dealers’ proprietary automated trading platform, TradeWeb, eSpeed, and CBID), information/data vendors (e.g., Reuters and Bloomberg), and research boutiques (e.g., Action Economics, UFG Research).

Network Configuration

Information is the lifeblood of the FI market operation, with benefits contingent on access, timing, and referrals. Access refers to receiving a valuable piece of information and knowing who can use it. This is particularly relevant in the FI market in which actors are unevenly connected with one another, are attentive to the information pertinent to the trade at hand, and are overwhelmed by the flow of public and private information. Traditional FI market trade is based on gatekeeper brokerage arrangements in which the embedded relationship between the sell side and buy side has facilitated an exchange of private information among actors to optimize mutual profits through embedded ties. Recent applications of the electronic marketplace, however, have resulted in two complementary means of trade. On one hand, liquid bonds—small lots of bonds—and/or products with little information asymmetry, such as foreign
exchange, are traded through online systems or ATSs. This is where the retail trade benefits from market efficiency and from the transparency that the electronic marketplace provides. We see here brokerage arrangements with arm’s-length relationships among the actors (Figure 4a). The liaison brokerage arrangement is also evident from IDBs that facilitate efficient transactions among traders who are well informed about the products traded. In other words, there is little information asymmetry among the dealers trading through IDBs. On the other hand, more than 90 percent of the volume of the total FI trade is done between institutional buyers and market makers using the traditional gatekeeper brokerage arrangement (Figure 4b). They use the traditional telephone method of communication, relying on their embedded ties to use information asymmetry for mutual profit taking.

Our analysis shows that buy-side and sell-side actors in the FI market perform their daily transactions through both embedded and arm’s-length ties as follows. The daily transactions between sell and buy side begins with a “daily offering package” report sent from the sales reps (sell side) to the major clients (i.e., institutional investors). The daily offering package contains a list of dealers’ inventory as well as bonds that some of their clients wish to buy or sell anonymously. Each sales rep serves up to 40 portfolio managers of institutional investors. Sales reps may contact each client up to 35 times per day, mostly by phone, to share proprietary information. Sales reps provide market intelligence to the portfolio managers and try to engage them to learn about possible new decisions (strategy) by the buy-side firms that may affect their portfolio mix (see Figure 5a). Thus, sales reps use embedded ties with portfolio managers to share their tacit knowledge of the market intelligence with the portfolio managers and at the same time seek information from clients that may lead to sales. Furthermore, for new bonds, sales reps expect portfolio managers to act as a bridge to pass information to other pertinent decision makers (e.g., private investors that are clients of the institutional investors) for possible adoption.
The daily offering package provides a base for the portfolio managers to get a basic understanding of what is available in the market. They initiate contacts with sales reps and market makers when they wish to shop around or place an order for execution. For example, contact with sales reps is initiated when they wish to get an in-depth feel for the market (i.e., market intelligence) or receive a benchmark price of a bond. In so doing, they expect to use sales reps as a bridge to receive inside information from market makers, sell-side reports, and management that may lead to execution of an order (see Figure 5b). Sales reps may connect the client with a market maker if the
client requires more in-depth information or wants to place an order. Significance of the information passed on to a client is a direct correlate of amount of execution completed by the sell-side firm. Thus, to keep the sales reps engaged, institutional investors tend to place orders with different sell-side firms as needs arise. Small buy-side firms place their largest transactions with selected sales reps to maintain embedded relationships for access to in-house information and “market intelligence.”

Market makers are usually busy with executing large transactions. As a result, sales reps may connect a client to a market maker if the sales rep cannot satisfy the information requirements of the client who requires a significant transaction. Here, the sales reps are used as a bridge to link a portfolio manager with a market maker as shown in Figure 5b. The portfolio manager may, however, also contact the market maker (or ask a sales rep for a connection to a market maker) for immediate execution of a large order as depicted in Figure 5c. The communication between market maker and the portfolio manager is based on complete mutual trust: the client expects to receive the lowest price possible for the product, and the market maker expects that the client is firm in conducting the transaction immediately. This stage of communication is important for both sides: the market maker shows his or her hand in regard to the price of the bond, and the client shows the amount of the specific bond that he or she is interested in. Therefore, the market maker does not like to show his or her hand to a client who is not seriously considering placing an order. At the same time, the client, by announcing his or her need for a product, wants to purchase it as quickly as possible from the market maker. If the client should decide to place the order with another firm, then the market maker, knowing the needs of the client, can manipulate the market to the market maker’s advantage. Although most of the contact with clients is done through sales reps, market makers at times contact clients directly on special occasions that require immediate feedback (Figure 5d), such as

1. To interest the client in a possible trade as supplier of the bond (the market maker sold that bond to this client earlier).
2. To repurchase bonds from the client at a higher price than the earlier selling price because the market maker may have another client on the other end who is looking for a large transaction beyond his or her available inventory. In this case, the market maker is shopping around to provide a client with a large order.
3. To provide information on the “breaking news” that could lead to a possible trade by the client.
4. To receive information about “market intelligence” from the client’s point of view.

Embedded ties between the sell side and buy side, to exchange information within the framework of the gatekeeper brokerage arrangement, are based on interpersonal affect, trust, and shared vocabulary and language [54], discussed next.

Our analysis of the relational and cognitive dimensions of the actors in the FI market revealed that they all share the same view, which is considered market “norm.” On one hand, shared cognitive dimension enables the actors to communicate accurately their
requirements and knowledge within a short period (about 30 seconds) for large and complex transactions over the phone. On the other hand, shared relational dimension is a prerequisite for building embedded relationships to trust each other as business partners. The actors’ position/job “norm” is learned through mentorship and through observing others as they work their way through the ranks. This is in addition to in-house training and mentorship programs for new recruits, who usually come from reputable academic institutions. A detailed description of our findings is as follows.

Cognitive Dimension

*Cognitive dimension* consists of shared language and codes and shared narratives and metaphors among the market actors as follows.

Shared Language and Codes

Shared language and codes are essential to convey transaction information quickly and accurately between actors in the FI market (see Appendix B for a detailed scenario of a transaction between a buyer and seller). For example, the use of language and codes includes the terms such as “on-the-run” and “off-the-run” bonds to distinguish between active/liquid issues and inactive/less liquid issues, respectively. “I have an axe” or “I have no axe” are used to convey an interest or no interest, respectively, in the bonds that are about to be traded. Shared language and codes in the FI market evolve over time. For example, new expressions that may be unfamiliar to traders who retired a few years ago include “custody holdings” and “maple bonds.” The former refers to Federal Reserve holdings on behalf of foreign central banks in the United States, and “maple bonds” refer to the issuance of new foreign bonds in Canada.

Shared Narratives and Metaphors

Shared narratives and metaphors are in used in the FI market to share information accurately without having to go into detail, such as “market color” (see Appendix B). For example, “the market feels clean” means that there seem to be no products for sale at this moment; “everybody is clean” signifies that the dealers are out of inventory of a particular bond. This implicitly signifies that the market is expected to keep bidding up the prices to entice sellers into the market. Another example is “no one is long”—indicating that dealers have no inventory. The “street is heavy” means that the dealers are carrying a significant amount of inventory and would like to sell them (lighten their load of bond inventory), but there are no buyers around. The “street is short” has the opposite meaning; it signifies that the dealers are light on inventory and would like to buy but there are no sellers around.

The cognitive dimension helps the actors to communicate effectively and efficiently with each other. However, the relational dimension interaction among the market actors is based on a well-defined code of conduct that governs the FI market to function efficiently.
Relational Dimension

Trust

The basic view of actors in the FI market is summarized in their motto “My word is my bond,” which refers to trust in “reliability, capability, and competence” of the trading partners. For example, when a trader buys bonds, the trader is expected to accept delivery at an agreed price and is capable of due payment in a timely fashion. Competence implies professionalism in conducting transactions at the best available rate and sticking to the code of conduct. For example, one sales rep commented that “my loyalty is to my clients and the firm.” Occasionally, these loyalties might be at odds with each other. A case in point is the dilemma faced by a sales rep who has to choose between loyalty to the client and loyalty to his or her own firm when faced with the following scenario. A client might confide to a sales rep that his or her firm has a large selling program that often involves a number of issues amounting to billions of dollars that can be completed over a specified period of time. The sales rep, after receiving this confidential information from the client, notices that one of his or her traders intends to aggressively buy up one of the bonds that his or her client intends to dump onto the market. The sales rep faces an ethical dilemma here. The sales rep cannot divulge the information to his or her trader and at the same time he or she cannot stand by and see his or her firm lose money. The situation might be handled as follows: the sales rep might tell the trader, “Are you sure that you want to buy this bond” or “I wouldn’t buy that bond right now.” An experienced trader immediately understands what the sales rep is trying to communicate: do not buy the specific bond right now because someone is going to sell a large amount of it in the near future. The trader also knows that no further details should be asked of the sales rep because of customer confidentiality.

Norms

The general norm is to act in a professional manner in the FI market. Professionalism is expected from all of the actors because the action of one player has a direct impact on the well-being of others. For example, the FI actors are rewarded based on their own individual performance as well their group performance in the firm. Thus, there is little tolerance for poor performance. Because the actions of others outside the firm can also affect one’s performance, professionalism is therefore expected from outside actors as well. For example, when a market maker buys a large amount of bonds from a client, it is expected that the client will follow certain implicit norms as follows: first, the market maker expects that the client has given him or her his or her entire order, especially if the market maker has accommodated the client’s needs well. Second, the market maker expects the client to keep the transaction confidential. Third, the market maker expects that the client will allow ample time for the rebalancing of books before trading in the same security again.
Obligation and Expectations

As pointed out before, FI actors expect professionalism and courtesy from each other in their daily activities. They are expected to live by the motto of “My word is my bond” (once they say “done” regarding a trade, they are not expected to go back on their word) and to respect market norm. Buyers expect to receive market information from the sales reps and market makers. Sellers in return expect to receive orders from the buyers. As one sales rep commented: “It’s a give-and-take game like a poker game. You need to keep the information close to your chest and ‘trade’ it to get more information.” Sellers and buyers assume different obligations depending on the type of information they expect to exchange. Buyers call different sales reps to receive market intelligence that includes market quote and market flow. When a client asks for the market price of a bond, however, it is understood that the buyer is obliged to accept the deal (see Appendix B for detailed example). On the other hand, the client expects the market maker to give the best deal possible. Sales reps are also expected to contact the clients to provide pertinent market information. In return, sales reps expect to receive orders from their clients, otherwise their contact with them will drop significantly. These reciprocal obligations are a market norm that provides prosperity to both buyers and sellers and enables the FI market to function.

Identification

There are no official groups or subgroups that the FI actors belong to. They come from all walks of life. Most portfolio managers and some traders have acquired the designation of CFA (chartered financial analyst) and belong to their local chapter (e.g., the Toronto Society of Financial Analysts has about 4,000 members and is the second largest in the world after New York Financial Analysts’ Society). Most of the FI functions (e.g., luncheons and dinners) are geared for sales reps and clients to attend. However, occasionally a trader is asked to join a function with a potential institutional client and to introduce the client face-to-face to the trader who will be handling the client’s business. Acceptance in the FI business is done through reputation in daily transactions. The trader is expected to be a capable person, hardworking, able to deal with failure and to recoup, and also able to interact with others in a respectful manner.

Discussion

The objective of this study was to explore the ways information flow mediates brokerage relationships that are enacted through interaction of actors in the FI market and assess its effect on the use of electronic trading systems. Essentially, these relations, instantiated daily, are by and large embedded to deal with mutual need of the actors for private information to maximize their profitable transactions. The basic need for embedded relationships among actors is to deal with information asymmetry for mutual profit taking. To this end, more than 90 percent of FI transactions in volume are done by phone. However, to improve distribution of information, digital economy
encourages the creation of institutional structures that assure online interorganizational exchange relationships.

Our analysis of micro-level practices and social interaction of the actors in the secondary FI market is the first attempt to understand the macro-level practices of the buyer and sellers to perform their daily transactions. Our findings, based on face-to-face semistructured interviews with the actors, reveal the reason behind low-level use of ATSs. There is no shortage of ATSs in the FI marketplace. More than 23 different ATS platforms are used internationally to support different types of FI trade. These ATSs, such as TradeWeb, are notably characterized by (1) the impersonal nature of the online environment and (2) the extensive use of computer-based IT as opposed to other modes of transactions, such as face-to-face and telephone. The question arises as to why ATSs, in the form of arm’s-length relationships (Figure 4a), have not replaced traditional methods of telephone transactions (Figure 4b) in the FI market to trade. Characteristics of the brokering arrangement, as depicted in Figure 4, are central to this question: sell side and buy side are engaged in embedded “gatekeeper” brokerage relationships to benefit from FI market information asymmetry. Consider the following interview excerpt:

TRADER: TRADEWEB HAS BEEN BENEFICIAL TO CLIENTS BECAUSE IT MAKES IT CONVENIENT TO SHOW BEST PRICE FROM FOUR DEALERS. IN THE PAST, THE EXPECTATION WAS THAT IF A CLIENT CAME TO ONE DEALER AND YOU SAW ALL THEIR BUSINESS, YOU WOULD BE WILLING TO GIVE THE CLIENT A BETTER PRICE BECAUSE NOBODY ELSE ON THE STREET KNEW WHAT THEY HAD DONE. WITH ATS SUCH AS TRADEWEB, EVERYONE ON THE STREET KNOWS WHAT YOU ARE DOING. AND BECAUSE OF THAT, YOU ARE NOT WILLING TO BE AS AGGRESSIVE ON A SYSTEM LIKE TRADEWEB AS ON THE PHONE. THE REASON IS THAT IF YOU SELL $200 MILLION OF A BOND THROUGH TRADEWEB THE WHOLE STREET GETS TO KNOW THAT. THEY [OTHER TRADERS] WOULD GO TO BROKERS AND PUSH IT AGAINST YOU AND YOU CANNOT DO ANYTHING ABOUT IT TO GET IT BACK.

INTERVIEWER: WHAT IS THE LARGEST TRADE YOU HAVE SEEN ON THE TRADEWEB?

TRADER: $400 TO $500 MILLION.

INTERVIEWER: WHAT IS THE EFFECT OF SUCH A LARGE TRADE ON THE PRICE?

TRADER: WHEN YOU TRADE SUCH AN AMOUNT AND SHOW IT TO TWO OR THREE OTHER DEALERS, THEN YOU GET A PRICE THAT IS APPROPRIATE FOR THE SIZE AND THE FACT THAT EVERYONE ELSE SAW IT [THAT IS, BID–ASK SPREAD IS WIDER].

INTERVIEWER: WHY SHOULD ANYONE TRADE $500 MILLION ON TRADEWEB IF THEY KNOW THAT IT IS TO THEIR DISADVANTAGE?

TRADER: IF THEY [CLIENTS] HAVE AN INTERNAL GUIDELINE THAT REQUIRES THEM TO CHECK WITH TWO TO THREE BROKERS TO GET THE BEST QUOTE TO SATISFY THAT REQUIREMENT, A LOT OF THEM FIND IT MORE EFFICIENT TO DO IT THROUGH ATS. LIKE, IF YOU WANT TO DO IT UNDER ONE MINUTE. IF THE MARKET STARTS MOVING AND YOU WANT TO BUY, YOU CAN SEND A TICKET TO THREE OR FOUR DEALERS [THROUGH TRADEWEB]. EVEN IF YOU GET ONE-BASIS
point wider, you can satisfy both that you got the best quote and you are done under one minute. As opposed to calling one dealer, then a second one and a third. Going back to the first one who had the best price. Updating him and, by that time, the first trader may say, “I am not willing to offer the initial quote.” You missed the price. Then you have to go others. This can be an iterative process that could take anywhere between 10 to 15 minutes, which is a long time if you want to get a trade done in a fast-moving environment.

Interviewer: Wouldn’t trade of a large deal through TradeWeb in a fast-moving environment make the environment even more volatile?

Trader: Absolutely. And there are a lot of accounts that try to take advantage of volatility on their so-called predatory accounts.

Interviewer: What happens when a client uses TradeWeb exclusively to do all of his or her trade?

Trader: We had a very large user of TradeWeb, who comes in good size, called us and complained that because they have used TradeWeb almost exclusively, they get no flow, no comments, no guidance from dealers. Sales reps aren’t calling them because they are not rewarding us with the trades. We treat this type of account just like dealing with another dealer [instead of a client]. Let these accounts think that they are getting the best price and best execution and easy compliance by using TradeWeb. This allows our sales reps and the firm to focus on more value-adding accounts. Accounts that we can develop a relationship with and mutually benefit both them and the firm. The information that I provide [to this type of client] is built into price.

There is a general agreement that informed traders exploit their informational advantage and trade optimally to profit from uninformed investors [27, 45, 65]. For example, Madhavan and Smidt [45] decompose the bid–ask spread into two parts: one part the result of informational asymmetries, and the remainder attributable to inventory carry costs, market maker risk aversion, and monopoly rents. Using a maximum likelihood technique, they find that the adverse selection component of the bid–ask spread is not economically significant for small trades, but that it increases with trade size. Therefore, as we noted in our investigation, the institutional investors use embedded direct ties with market makers (depicted in Figure 4b) to access private information and negotiate preferential trade for large transactions over the phone. Time is very much of the essence in negotiating bond prices for large transactions, and exchange of tacit knowledge by the actors must be completed within seconds through a communication medium with a high social presence to exchange private information. Social presence is defined as “the degree to which the medium facilitates awareness of other person and interpersonal relationships during the interaction” [24, p. 118]. On one hand, when a task is interpersonal, as in a negotiation of pricing bond, real-time synchronous media with a high social presence such as phone interaction are deemed the most appropriate choice [59]. Therefore, telephone communication is
the most suitable medium to negotiate large transactions in the FI market because of
the geographical distance between institutional investors and market makers. On the
other hand, ATSs such as TradeWeb become a suitable means of transaction for small
or liquid trades when there is no room for negotiation. The sellers provide closure by
posting the price and quantity of their bonds on the ATS.

Implications for Practice and Research

There has been a successive forecast over the past 20 years in business media that
technology would catch up in replacing phone transactions with ATS [16, 20]. This
has not materialized. FI market actors use a variety of IT to enhance their operations
within and between firms. It is usual to see four to six large computer monitors on a
trader’s desk that constantly display a variety of data from news services and information
from peers. However, our analysis of micro-level practices and social interaction
among the FI actors shows that the major players, which constitute market makers
and institutional investors, have developed a strong social network to exchange private
information and to benefit from the information asymmetry inherent in the market.
Thus, as suggested by Uzzi [62], arm’s-length ties are used for “shopping” the market
for publicly available information (e.g., from Bloomberg), and embedded ties in the
form of social capital are used for “plugging” actors into the unique private information
network for large transactions. Social capital owned by the FI firms in effect governs
90 percent of FI transactions in volume. Therefore, it is necessary to support this
social relation with appropriate technologies. Otherwise, replacing it with ATS can
have a dysfunctional effect on the present market structure. This is because a change
in an organization’s technology entails adjusting the tools, devices, knowledge, or
techniques that create new products or services [60].

Technological change can be classified as competence enhancing or competence
destroying. Competence-enhancing adjustments that build on existing know-how
within the organization tend to consolidate industry leadership: “the rich get richer”
[60, p. 460]. Competence-enhancing technologies, within the context of the FI market,
consist of a variety of IT employed by the sell side and buy side to access information
(e.g., Bloomberg and Reuters information services, Bloomberg messenger, private
chat line, and squawk box) and to reduce the cost of inventory control and invoicing
(e.g., Portfolio Accounting System performs an audit trail, verifies trades with counter
parties, arranges for payments and settlement, and prepares electronic reports to the
Portfolio Management System, which reports to upper management and the portfolio
managers).

In contrast, the introduction of fundamentally different technologies or competence-
destroying discontinuities is associated with major changes in the distribution of
power and control [9, 44, 57]. Competence-destroying discontinuities disrupt industry
structure [49]. For example, a recent investigation by Schultz and Orlikowski [57]
shows that the use of self-serve technology made it more difficult for sales reps to build
and maintain embedded relationships with their customers with consequent adverse
effects on the social capital of the firm. Similarly, use of ATS for large transactions
would have an adverse effect on the social relations and profitable transactions among FI actors. Thus, we need supporting technologies, such as knowledge management, to improve the relational network among the actors and optimize the social capital of FI firms. For example, data mining can be used to match products and information to the needs of individual buyers.

Task–technology fit theory contends that use of technology may result in different outcomes depending upon its configuration and the task for which it is used [28]. Thus, we need to fit information-processing support features to the task. A task–technology fit exists when the actors use the technology. To this end, we need to look at the ideal profiles for a given task to assess fit/misfit between pertinent task and proposed technology. We know, from media synchronicity research findings, that verbal communication is best suited for tasks in which actors need to converge on and agree to the meaning of information or a course of action because it provides rapid feedback [25, 39, 59]. Thus, the telephone is an appropriate technology fit in support of large FI transactions because portfolio managers need to receive market intelligence from the sales rep/trader, negotiate a preferred price, and execute the order within seconds. In this case, access to timely market intelligence is the major reason for the actors to seek embedded relationships for large transactions. ATS becomes the medium of choice whenever clients do not need to receive information about market intelligence from traders/sales reps to perform transactions (e.g., for small amounts of liquid products). This supports suggestions made by Schultz and Orlikowski that

1. Where use of IT in a network relationship reduces the exchange of privileged and situated information, there is a decline in the opportunities to create and sustain social capital.

2. Where use of IT reduces the necessity and opportunity for joint problem solving, there is less collaboration among the participants, and thus a challenge to the value of social capital within interfirm relations. [57, p. 104]

Nonetheless, we found two major phenomena in the FI market environment that are different from the case reported by Schultz and Orlikowski [57]. First, resistance to change is significantly higher in the FI market than the case of WebGA reported by Schultz and Orlikowski. ATS has not replaced the traditional phone transactions mainly due to resistance from market makers and institutional portfolio managers (i.e., sell side and buy side) alike. These actors are responsible for their own profit/loss reports. Thus, senior management cannot enforce use of ATS. The second major difference is the effect of ATS on social capital. Preferred clients (i.e., institutional clients that trade large transactions by phone) receive preferential rates even when they transact through ATS. Thus, in this case, FI actors use a mix of embedded and arm’s-length ties to transact. Their embedded ties are not compromised as long as clients use phone media for major transactions.

Mismatch of task–technology adversely affects operational efficiencies [25, 28, 37, 39, 59]. Yet we witness disregard for it when it comes to implementation of technology. This is partly due to the hasty decision by management to automate routine transactions without paying attention to the nature of the social network embedded within the
transaction [57]. The problem is also related to a lack of metrics to assess the worth of social capital and of social networks among the cooperating firms [40], making it difficult to explicitly assess the cost–benefit of IT to mediate network relations.

Our investigation reported in this paper is unique in providing firsthand insight into the micro-level practices and social interaction of the buyers and sellers in the secondary FI market. Our findings highlight the shortcomings of previous investigations, based on tenuous assumptions, into the use of ATS in support of FI market transactions between dealers and portfolio managers. Let us consider a recent investigation into the impact of IT on market information and transparency [30]. Granados et al. [30] contend that market transparency benefits buyers in three ways. First, search costs decrease as more information is made at no additional cost. Second, the value of a purchase increases if the consumer discerns product characteristics of existing alternatives with higher precision, resulting in more accurate product valuation. Third, information becomes available that allows a consumer to transact at a lower price for a given product. Our empirical research findings, however, point to a different reality concerning the FI market. First, search cost through ATS may decrease. However, information is built into the bond price—it is not possible to access more information at no additional cost. Portfolio managers who solely transact through ATS get a wider spread than those with embedded relationships with the traders and sales reps (i.e., those who do the bulk of their transactions by phone). Second, the bond prices available via electronic platforms (e.g., Bloomberg, CBID, and TradeWeb) do not allow the consumer (i.e., portfolio manager) to discern product characteristics of existing alternatives with higher precision, resulting in less accurate product valuation. As one trader noted:

The relationship that we have with our clients enables us to be more accommodating. Such a relationship is lost by using ATS that uses anonymous trading platforms such as CBID.

Embedded relationships among the actors enable them to take advantage of public and private information. Traders and sales reps provide private information (i.e., market color/market intelligence) to their institutional clients with embedded ties. Public information is also shared and analyzed among the clique. As one portfolio manager noted:

If information is publicly available through IT media such as Bloomberg and Reuters, it doesn’t mean that you have seen it. There are all kinds of gray areas. I hear stuff on the phone when talking to sales reps all the time. I get Bloomberg messenger constantly throughout the day from traders, sales reps, and in-house colleagues. You choose to share information with others based on knowing their specific needs. You don’t just stand up and broadcast it to the world. You tell it to people that you feel it is relevant to.

Another basic assumption for the lack of ATS penetration in FI trade is that the variety and complexity of different types of bonds (e.g., corporate bonds) make it difficult to present them on a single platform [26]. Granados et al., for example, contend that the "emergence of transparent electronic markets for bonds has been slowed down by
their own nature. Bonds are not as commodity-like as stocks. So considerations necessary to an effective market process may still be affected by the inherent complexity of bonds” [30, p. 158]. Although partly correct, this assertion ignores the fact that it is unusual to trade liquid government securities through ATS when the size of the trade can have an adverse effect on the market bid/offer spread. As a result, institutional investors use embedded relationships with the market makers and sales reps to garner market intelligence and perform favorable trade by phone for large transactions of government bonds.

In 1986, we witnessed the birth of the “big bang” when IT replaced floor-based trading at the London Stock Exchange [12]. Since then we have seen other exchanges around the world that have replaced floor-based trading with IT. However, imposition of large transactions among the actors through ATS has proved to be challenging [13]. Sophisticated information systems such as OptiMark [14, 56], in pursuit of efficient large transactions, have received little support from market makers and institutional investors. Nonetheless, there is a clear need to streamline all of the interrelated processes in the marketplace supported through IT [22]. The $45 trillion size of the FI market makes it significant enough to merit the attention of information systems scholars to help financial firms adopt IT in an “appropriate” manner for improved efficiency and effectiveness in the marketplace. Detailed analysis of information requirements and of social network structure can provide us with the requisite knowledge of the transition of the FI market to the electronic marketplace in our quest for improved market efficiencies. The analysis of FI market information flow and network ties detailed in this paper provides a first step in this endeavor.

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NOTES

1. Nicknamed “market color.”
2. Daily roster of “specials” or available inventories of FI securities of a particular sell-side dealer (or their clients), the report can be either provided by e-mail or over the phone. Large buy-side institutions receive the daily offerings report on a regular basis.
3. From different dealers.
4. The venue used depends primarily on the size of the trade: the smaller the size, the more likely it is that the trade will be executed electronically. If additional information is needed regarding a trade, e-mail or phone is used. Some portfolio managers may place “limit orders” with market makers via e-mail and ask for these orders to be filled once the limit price is reached. Liquidity is another major determinant of venue.
5. Different buy-side firms use different designations.

REFERENCES


Appendix A: Guide for the Semistructured Face-to-Face Questionnaire

Structural Dimension

Network Ties

Access

1. How do you access information to buy and sell FIS (fixed-income securities)?
2. How do you place your orders to buy or sell FIS?
3. Approximately how many other traders do you know?
4. How many traders do you interact with regularly for trades?

Timing of Information Flows

1. How do you use personal contacts to receive/provide information sooner than it becomes available to you without such contacts?
2. What is the value of such information?

Referrals

What would you do if someone contacted you to receive information and/or products that you don’t have?

Network Configuration

1. When do you use online trading systems such as CANDEAL, and when do you use direct contacts by phone or face-to-face?
2. When do you use both online trading systems and direct contact to buy/sell a product?
3. When do you need to get permission to buy/sell a product?

Appropriate Organization

Exchange, Combination, and the Cognitive Dimension of Social Capital

Shared Language and Codes

1. Do you use any language that is specific to traders? If you do, give us a few examples.
2. Why do traders use special language to communicate with each other?
Shared Narratives

1. Do you use myths, stories, and metaphors to exchange information? Provide some examples.
2. Why do you use myths, stories, and metaphors to exchange information?

Relational Dimension

Trust

Which of the following play a role in trusting your interaction with other traders?

1. Belief in the good intent and concern of exchange partners
2. Belief in their competence and capability
3. Belief in their reliability
4. Belief in their openness

Norms

Which one of the following norms do you take for granted when dealing with other traders?

1. Cooperation
2. Open disclosure of information
3. Loyalty
4. Willingness to value and respond to diversity
5. Openness to criticism
6. Tolerance of failure

Obligations and Expectations

What kinds of obligations to you do you expect from other traders?

Identification

Do you have to be member of a society, club, or any other organization:

1. To perform your daily tasks?
2. To be accepted by other traders?
3. To learn the code of conduct?

Appendix B: Institutional Client/Dealer Trade Phone Transaction

The following scenario is a telephone conversation between an institutional client called Dave, and a market maker/dealer called Joe which highlights some of the shared language and codes used in the FI market.
Background

Dave, who is an institutional client, intends to buy $200 million of Government of Canada (GC) 10-year, 8 percent bonds. He checks the quotes on the Bloomberg screen and finds that the best quote on a GC 10-year is offered by Joe of XYZ firm and is $145.34/$145.44 with maximum size of 5 \times 5 \text{ (i.e., }$5 \text{ million on the bid side by }$5 \text{ million on the offer side). This translates into the quoted bid price where Dave can immediately sell $5 million at $145.34 \text{ (per }$100 \text{ face value)} and quoted offered price where Dave can immediately buy $5 million at $145.44 \text{ (per }$100 \text{ par value).} Dave knows that this screen-quoted price and size is a benchmark that can be used as the base to negotiate orders larger than $5 million. He calls Joe, the market maker, for a possible trade. The scenario presented below highlights the interaction between Dave and Joe, which results in the completion of a more than $290 million transaction over the phone within a few seconds.

A Typical FI Transaction Scenario by Phone

(ICC: Institutional Client, MM: Market Maker/Dealer)

<table>
<thead>
<tr>
<th>Actual Dialogue</th>
<th>Translation</th>
</tr>
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<tbody>
<tr>
<td>IC: Hey Joe, how’s the market on the long end?</td>
<td>The client is trying to receive market intelligence on the segment of the bond market he is interested in (i.e., the supply and demand on the GC 10-year). However, he doesn’t want to show his intention (not yet) and asks “how is the long end of the bond market” that covers bonds with long maturity from 10-year to 30-year bonds.</td>
</tr>
<tr>
<td>MM: Hi Dave, the market feels clean. What do want to do?</td>
<td>The MM recognizes the caller is David, one of his regular clients, and conveys to Dave his impression of the current status of the market for long-term bonds. The market “feels” clean because there is no major seller in the market. Then he asks about Dave’s intention, whether he is a buyer or a seller.</td>
</tr>
<tr>
<td>IC: I have an axe on 10s. What’s your market?</td>
<td>The client pointed the MM in the direction of his interest and asks for his bid and offer on the Government of Canada 10-year bond (10s). By using the coded word “market” instead of “benchmark quote” or “quote,” the client conveys his seriousness about the upcoming transaction and shows he is not just window-shopping. In addition, the client asks for the market and not where he can buy the bonds; he still has not “revealed” his true intention to the MM.</td>
</tr>
</tbody>
</table>
MM: 37 to 42, 25 up. The market maker acknowledges that the buyer is serious and “tightens” his market spread to $145.37/$145.42 and in addition increases his quoted size to $25 million on both sides of the bid and offer (the word “up” conveys that). Furthermore, there is no need to spell out the whole price value (i.e., 37 instead of $145.37) because both are familiar with the industry’s shared language and codes. To speed up the transaction, only the last two digits are used. In addition, there is no need to say millions; at the institutional desk, it is a given (unless otherwise stated). The smallest trading volume increment is $1 million and any order less than $1 million face value is considered an odd lot.

IC: I’m 39 bid. At this point, the client reveals his true intention and declares that he is prepared to pay $145.39 for the bond. Note that the quantity has not been discussed yet.

MM: Okay, sell 25 at 39. At this bid, the MM is prepared to supply $25 million to the IC.

IC: I bought them, keep going. This tells the MM that the client bought $25 million and is interested in buying more bonds.

MM: What’s your total interest? At this point, the MM understands that the client wants to purchase more than $25 million. Therefore, he tries to “size” the client to see how large the order is. It also says, “Let’s get down to business and I will try my best to accommodate you.”

IC: I can buy another 175. Based on their past experience, Joe and Dave have developed a degree of trust, and at this point, Joe reveals his remaining total quantity desired, which is $175 million.

MM: 75 will come at 41 and the balance will come at 42. As long as you don’t get in my face. The MM tells the client he is ready to offer him $75 million at $145.41, and the reminder of his order (i.e., $100 million) at $145.42. The statement “as long as you don’t get in my face” means that “I am going short on the ‘10s’ to accommodate you. Therefore, I need to replenish my inventory in the market. You should give me some time to do so, and I wouldn’t be happy to find out that you are trying to buy more ‘10s’ from another dealer. If you have more to buy this is the time to come clean.”
IC: That seems dear. At this point, Joe knows that he can purchase the $200 million from Dave. However, Joe tries to “shave” some pennies off the price (reduce the price).

MM: A lot of interest on 10s. And the street is light. I have other buyers interested in these bonds. Given the current market, that is the best I can do for you right now. There are no large sellers in the market and inventory is scarce.

IC: Okay, done. The client agrees and the trade is done.

MM: Okay, you paid 39 for 25, 41 for 75, and 42 for 100. The MM recaps the order. So you paid $145.39 for $25 million, $145.41 for $75 million, and $145.42 for $100 million.

IC: Right. The client confirms and the contract is binding on both parties (phone conversations are recorded) and both back offices (the sell and the buy side) take over to complete payment and settlement of the transaction.

MM: Thanks for the business. Thank you and come again.

Because of shared language and codes, the two parties were able to complete a transaction valued at $290,825,000 within seconds.