

THE FUTURE OF INDIA'S STOCK MARKETS

In commodity markets, standardisation refers to the exact grade of the commodity. Markets work better in trading "new saurashtra lokvan wheat" instead of dealing with "wheat", a non-standardised commodity.

Standardisation can play a role in accurately defining the goods being traded (as in the wheat example), in specifying the date on which the seller will deliver the goods (e.g. the securities pay-in date on NSE), or in specifying the quantities in which trades can take place (e.g. the market lot on the equity market).

One of the common difficulties voiced by traders on India's fixed income market is the fragmentation of liquidity across too many government and corporate bonds. Liquidity on this market could be enhanced by modified policies on the part of the Reserve Bank and the corporate bond issuers.

Liquidity on the fixed income market could also be enhanced by the introduction of a futures market in treasury bills, which would allow the seller to deliver one of the several series of treasury bills (e.g. the contract definition may allow the delivery of any treasury bills which have between 80 and 100 days to expiration), thus pooling the liquidity of these instruments into one traded object. This example recurs in many other contexts; the general principle being that delivery options can enhance standardisation. Similarly, a futures contract where any AAA corporate bond can be delivered would be a lot more liquid than any of the AAA corporate bonds taken individually.

This discussion reveals a basic problem with the real estate market: every piece of real estate in the world is different. This lack of standardisation is an intrinsic barrier towards obtaining a liquid real estate market. The market for used cars is another example of a market which is intrinsically hard to standardise.

Counterparty risk (i.e., default risk) can play a role in de-standardising an otherwise uniform market. If there is no clearing cor-

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poration, and financial houses bear counterparty risk in every trade that they undertake, then prices vary depending upon the credit risk of the two counterparties. A trade between State Bank and Citibank would involve a different price from a trade between State Bank and Indian Bank. This generates noise in traded prices, and reduces the liquidity of the market. Such markets often settle into club markets where trading is concentrated in a small club of companies with *homogeneous* credit risk.

Aggregation of Order Flow and Information Revelation

Given a market which trades a standardised object, there is a flow of buy or sell orders in the economy. These orders can either be speculative (i.e. based on forecasts of future prices), or informationless (e.g. an exporter selling dollars).

A market mechanism has two responsibilities: (a) aggregation of the order flow into a single market, and (b) transparency. The ideal market would involve a convergence of all orders coming from any location in India into one single trading place, and the ideal market would make the state of the market visible to all traders, located anywhere in the economy.

Ideally, aggregation should additionally result in price-time priority, whereby every order is matched against the best price available on the entire market, and older orders receive precedence against more recent orders. If a market mechanism guarantees price-time priority, the search cost of users for the best price is eliminated.

There are two forms of market organisation which excel at these attributes: the electronic limit order book market and the electronic call auction market. These forms of market organisation feature very strong aggregation – orders from the 1600 offices of NSE members are aggregated into one single trading screen. They also feature complete transparency of quotes, prices and market liquidity. This is in sharp contrast with distributed dealer markets, where each dealing

room observes a small part of the order flow, and the full state of the market is unknown to all dealing rooms. Any user of the limit order book market can accurately know the market impact cost faced *before* doing any transaction. This is in contrast with the distributed dealer market, where impact cost is not easily forecasted. Finally, both these market mechanisms guarantee strict price-time priority, in contrast with the distributed dealer market, which imposes the cost of search for the lowest price upon users of the market.

Trading floors, as in the BSE prior to automation, or the NYSE and the CME today, are successful in obtaining *aggregation* of the order flow, but fare poorly on *transparency*.⁴ We should also note that trading by open outcry (e.g. on the CME) involves a breakdown of price-time priority. At any instant in time, trades taking place on the floor a few metres away from each other would involve different prices. An order delivered to one end of the floor would generally obtain a different price from that obtained at the other end of the floor.

The distributed dealer market fares poorly on both aggregation and transparency. This would be expected to generate poor price discovery and reduced liquidity.

Intermediaries

There are two polar kinds of market intermediaries: brokers and dealers. Brokers are pure intermediaries: they perform transactions on behalf of users, never committing their own capital to bearing

⁴Trading floors also generate unequal access to the market. For example, prior to VSAT technology, the equity market was concentrated in Bombay. Today, only 36% of the trading volume on NSE comes from Bombay. This has generated a massive expansion of the financial industry in locations outside Bombay, and reduced the importance of being in Bombay. It has also enhanced market liquidity by harnessing the order flow, which was otherwise latent, in locations outside Bombay.

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risk. Dealers adopt principal positions against users, buying from a user at a stated price with the expectation of being able to sell off to others at a higher price. The distinction between brokers and dealers is not watertight, but it proves to be useful in the analysis.

Entry Barriers Regardless of whether a market uses brokers or dealers, the basic economics of competitive markets suggests that the costs of intermediation would be minimised if there were no entry barriers into intermediation. The ideal competitive market would have fierce competition between myriad intermediaries, all of which have no market power, thus driving down user fees to levels consistent with zero economic profits. When the market is not competitive to this extent, the fees charged by intermediaries rise above the zero-profit level, and generate illiquidity (i.e., the fees serve to elevate the transaction costs faced by users).

How do entry barriers in intermediation arise? Three major routes can be isolated:

1. *Broker-owned exchanges*

The financial exchange, a central trading place where the order flow aggregates, is a major advance over primitive forms of market organisation. However, when exchanges are owned by brokers, the exchange has incentives to set up entry barriers which diminish the supply of brokerage services and elevate the profits of existing brokers. The extent to which this is present is easily measured by observing the seat prices on the exchange. If seat prices (not including the value of any bundled real estate) are positive, then entry barriers exist.

Markets like NSE (in India) and OM (in Europe) are an interesting new variant, where the exchange is a *corporate entity* which has no incentives to introduce entry barriers into the brokerage industry. The simplest and most obvious impact of NSE upon India's equity market has been a three-fold reduction in the overt brokerage fees, owing to the 1,000 new brokerage firms which entered India's equity market as members of NSE.

2. *Club markets*

The other major source of entry barriers is a consequence of counterparty risk. Without a clearing corporation, the market reduces into a "club market" characterised by homogeneity of credit risk of the players. This generates entry barriers where an entrant cannot easily compete with the existing intermediaries. The credit enhancement services of the clearing corporation are hence essential to reducing entry barriers into intermediation.

3. *Technology*

Primitive technology also plays a role in generating entry barriers.

- (a) If a physical trading floor is used, then there is a physical limit to the number of traders who can enter the floor. If trading floors are made extremely large, the breakdown in price-time priority (discussed on page 27) becomes acute. The largest physical trading floors in the world accommodate roughly 1,000 individuals.
- (b) Some distributed dealer markets rely on a bank of telephone lines connecting together the dealers. If the $N + 1^{\text{th}}$ dealer enters the market, he has to obtain N phone lines, which gets harder as N rises. The limitations of human information processing also play a role: it is hard for a trader to attend to more than a dozen telephones. This hinders entry of intermediaries, and reduces the speed with which information propagates through the market.

Modern computers and computer networking are vital to enabling the concept of a single market populated by an extremely large number of traders. Equity trading at NSE often involves above 3,000 traders connected into one single trading system; this is far in excess of the largest physical trading floors imaginable.

Agency Problems The relationship between the user of a market and the intermediary is fraught with agency conflicts. We will first

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focus upon the broker–customer relationship. Brokers can elevate the costs faced by customers in many ways:

1. Customers could be charged prices which are different from those which the broker actually faced on the market. This is the old practice of *gala* which was once ubiquitous on India's equity market.
2. Frontrunning can take place against the user. If a user wishes to buy 10,000 shares, the broker could first place an order for 1,000 shares on own account, then buy 10,000 shares for the user, and sell off the 1,000 shares on own account. Frontrunning would elevate the impact cost faced by users.
3. Allocation of trades is another contentious issue; users may fear that they are being allocated poor trades which were incurred by the brokerage firm in its own trading.

Market transparency is all important in checking these abuses. One common mechanism used in India's equity market is that of users being physically present before an NSE terminal, placing orders. This eliminates the potential for *gala*, frontrunning and trade misallocation. In the future, similar relationships could be conducted over telephone, without requiring physical presence before the trading terminal, once the limit order book is accessible in realtime over the Internet.

This discussion of agency conflicts is based on the institution of a *broker*, who is a transactional intermediary between the user and an exchange (the repository of liquidity). The problem is much more ambiguous with *dealers* on distributed dealer markets. By definition, the dealer is a profit-maximiser who seeks to earn profits off trades against users. Ethical conduct on the part of the dealer is thus hard to define. The furore generated by *gala* on India's equity market is in sharp contrast with norms on a distributed dealer market: the explicit objective of a dealer is to charge any price that he can get

away with (subject to competition from other dealers), a situation which is not unlike that of the BSE prior to automation.

The broker is supposed to allow users to transact at prices available on an exchange; the brokerage fee is unbundled and showed explicitly as a charge to the user. Users can shop amongst alternative brokers and find the lowest brokerage fee (something which does not change intra-day), knowing that the execution that they obtain when an order is placed is protected by price-time priority, no matter which broker is selected. In contrast, the profits of a dealer are built into the price and there is no distinct notion of a brokerage fee. Users would need to shop amongst alternative dealers, seeking the best price. This is difficult given the intra-day fluctuations of prices. In this sense, the relationship between the user and the intermediary is fraught with greater dangers in dealer markets than in broker markets.

The discussion so far has dealt with agency conflicts between the user and the intermediary. The picture is considerably complicated when we consider the agency conflicts between the dealer (the individual) and the organisation he works for (e.g. a bank). The same problems exist at the user organisation as well.

A variety of abuses can surface at this level, whereby employees act in ways which are not in the interests of the organisation. The simplest abuse is the use of trades at unusual prices in order to achieve "transfer pricing" to move funds from one firm to another. The scam of 1991 is replete with examples of such transfer pricing (Basu & Dalal 1993). The basic issue at stake is the absence of strict price-time priority. As long as price-time priority is enforced, it is not possible to do transfer pricing and move profits from one place to another. In distributed dealer markets, where there is no price-time priority, transfer pricing is much easier.⁵

⁵Negotiated trades, "all or nothing" and "minimum fill" orders are all market

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Better design of employee compensation is one of the crucial ways through which the Indian firms will obtain diminished conflicts of interest amongst their employees. To the extent that the distortions of India's labour market might take many years to eliminate, it becomes more important to have market mechanisms which are intrinsically safer through the use of anonymity and strict price-time priority.

Anonymity

Some market mechanisms support complete anonymity in trading, other market mechanisms have less anonymity. Anonymity influences market quality in myriad ways.

The economists' ideal market is one where myriad economic agents compete without market power and strategic behaviour. Markets where anonymity is lacking often exhibit strategic gaming. This is exacerbated by the existence of "club markets" where only a few major players dominate. The ideal market should generate prices through supply and demand; the existence of strategic games on the market generates noisy prices.

The lack of anonymity can also lead to the formation of cartels. Episodes like the scam of 1991, or the short squeeze on the US treasury bills market (by Salomon Brothers and their associates in 1991) were only possible in the absence of anonymity (Mayer 1993).

Finally, the lack of anonymity enables a variety of ethics lapses, particularly the transfer pricing under market mechanisms which do not enforce price-time priority.

Counterparty risk

One conception of an ideal market involves electronic networks for payment of funds and securities, so that delivery and payment take place one millisecond after the trade. In this event, if one leg of

practices on India's equity market which violate strict price-time priority.