

Clearing and Settlement

I do not need to spend too much time on the reliable custody and clearing methods. The Indian efforts are steps in the right direction. However I must emphasise that dematerialisation is the trend and the quicker it happens the better. Across the world it has happened country by country and I would like to share a great secret with you. India is not the only market in the world where tax considerations play a role when it comes to dematerialising securities. In addition, costs influence investors directly. You just charge the cost of the paper to the investor who wants a piece of paper and you give a better price if he accepts to work electronically. Let the economic forces drive the paper out of the market and put you on electronic books.

Transparency

The third element, the transparency of the orderflow is also critical. Transaction information is expected to be available in real time for retail and institutional transactions since this helps pricing decisions. We need that and there are many markets which do not have it yet. Transparency is much better in an order-driven auction market like the one you have developed in India. The dealer based market is not amenable to transparency by nature.

Block Trades and Insider Trading

The key challenge that we are all facing is how to avoid problems with the block trading upstairs. In other words how to ensure that important institutional transaction not only get reported quickly but ideally executed on the floor of the exchanges.

Insider trading is another major challenge. No market participant should be able to be a privileged player and abuse that position. The definition which you have gone through, which as you will

INTRODUCTION

see will develop over time of who is insider and who is outsider, is particularly critical. There should be no ambiguity about who gets the information as an insider and therefore is totally debarred from trading or who is outsider. As per NYSE regulation, if a listed company informs the specialist on the floor of a transaction that they want to announce confidential information, the specialist has to suspend trading in that stock pending the news announcement. This is important because otherwise nobody will trust the market maker.

REGULATION OF MEMBERS

One of the key challenges that Indian security markets are facing is the supervision of a broker-dealer community. India has a very fragmented population. It has much more stock brokers than we have in the US, though we are slightly bigger. NYSE authorities do visit and inspect the member firms on an annual basis. For example, Merrill Lynch has about 40,000 sub-brokers and hence we almost have a team living in Merrill Lynch.

The economic costs of inspection are huge. The NYSE has 1500 people and one third of every employee of the NYSE is in regulation. We pay 500 people and half of them just to regulate and man the funds. We regulate, with 250 people, 490 of the 8,000 brokerage firms we have in the US. But these 490 firms represent 95% of the volume.

Regulation is an expensive affair and I think the regulators, the central bank and the exchanges have to realise this. There are some avenues for improvements in this regard. The growth of the volume makes exchanges slightly better off financially. The new clearing systems and development of the trading, and the consolidation of the brokerage industry, will happen in India as it did happen in every other market.

MARKET DESIGN

I would like to make a point here as well about the electronic markets. I will make it very clear that the SEC has announced a complete revision of the electronic markets with a purpose of regulating them as well. The fact that electronic markets exist is a good thing. Everything that facilitates transactions is important but we cannot tolerate a system where electronics is a proxy for non-regulated markets. An electronic market is supposed to improve processes and systems. It is not about cheating on regulations and that is very important. The new regulations are also going to put some limits on the private placements and the possibility to trade international stocks in the US when they are not listed. All those are issues of integrity.

The Institutional Development of India's Financial Markets

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INTRODUCTION

In India, one of the most important challenges of the 1990s concerns the development of institutional arrangements in financial markets. The reliance upon prices to guide resource allocation is the essence of liberalisation, and a major aspect of the economic reforms has been to eliminate government restrictions upon the contracts and trades which economic agents enter into. However, the modern financial system does not operate in an institutional vacuum. If agents have the freedom to trade with each other, that does not by itself produce a sound system of prices which can be the planning commission of the modern economy.

The institutional development of markets is a critical hurdle faced in the transition into the market economy. When markets function poorly, the withdrawal of government controls can prove to be po-

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litically costly, and this can diminish the political will that is the prerequisite for liberalisation. Malfunctioning markets can generate tactical reversions into interventionist policies on the part of government, as seen in India's foreign exchange market, which generate confusing signals about the credibility and the usefulness of reforms.

Policy makers are hence faced with the challenge of fostering the development of financial markets. Each of the five major financial markets of the economy – equity, debt, foreign exchange, commodities and real estate – presents major challenges in terms of the institutional development of markets.

It is perhaps paradoxical that the withdrawal of the state from resource allocation can be best enabled by an activist state which fosters the development of liquid and efficient markets. The experience of many countries suggests that there is, indeed, a role for the state in enforcing contracts, and playing a strong role in the development of market institutions which are conducive towards efficient price discovery, liquidity, and market efficiency. The experience of India's equity market in the last four years is consistent with this perspective.

THE MENU OF CHOICES

There are five major methods of organising markets known in the world today:²

1. The open electronic limit order book market

The most important new idea in market organisation of the recent decades is computerised order matching, which is also called the open electronic limit order book market (Black 1971, Glosten 1994).

In the limit order book market, liquidity is supplied by investors and traders all over the country, who place limit orders. The limit order

²For a detailed discussion on the organisation of trading activity on some the world's major markets, see Domowitz (1993).

INTRODUCTION

book (the list of all unmatched limit orders) embodies the liquidity of the market. The limit order book is publicly visible (hence the term "open"). Orders are matched by computer, based on strict price-time priority. The continuous trading on the "normal market" of NSE or BSE is an open electronic limit order book market.

2. The open electronic call auction market

The call auction market is a uniform-price auction. The auction takes place at a designated time. The (computerised) auctioneer displays a provisional price, based on which limit orders can be revised. At the end of the auction, the computer pairs off all orders which are mutually compatible, at a single price. There is no market impact cost in the call auction. The pre-opening session on NSE is a call auction.

3. Markets with market makers

These are markets dominated by "market makers" who give out two-way quotes. Investors must trade through the market makers, and cannot trade against each other. OTCEI or NASDAQ are market maker markets.

4. Floor-based open outcry

This is a market where an unsystematic pool of traders meet on a physical trading floor, and trade by voice and hand-signs. There are no limit orders, there is no price-time priority, and there are no market makers. Examples of this include the futures exchanges of Chicago, and the old BSE floor.

5. The distributed dealer market

This is a market where the "unsystematic pool of traders" (mentioned above) are spread over geographical distance. They communicate by telephone and over computer systems. As with open outcry, there is no price-time priority. In addition, the information flows of the trading floor are not as easily accessed by all market participants. Distributed dealer markets generally do clearing and settlement bilaterally, without benefit of institutions like the clearing corporation. India's dollar-rupee market and fixed income market are distributed dealer markets.

The choices that we face in India in the context of each major financial market — equity, debt, foreign exchange and commodities — consist of choosing the appropriate style of market organisation for each traded object.³

THE POLITICAL ECONOMY OF INSTITUTIONAL CHANGE

Policy issues concerned with institutional arrangements in the securities industry are fraught with controversy. Market participants possess skills which are specific to existing institutional arrangements, and often stand to lose from institutional change. Hence, major market participants are often conservatives who resist institutional change. This resistance is most pronounced when a new form of market organisation directly hurts revenues of intermediaries— e.g. through improved market transparency or through reduced entry barriers into intermediation.

The conservatism of market participants is not peculiar to India; it is observed in every country. A striking example of the resistance to change is seen in the US, arguably one of the pioneers of modern securities exchanges. The major markets of the US — NYSE, NASDAQ, the Chicago Mercantile Exchange (CME) and the Chicago Board of Options Trade (CBOT)— continue to use market mechanisms which were designed many decades ago. Hence, they fail to exploit contemporary technology in computers and communications.

Similarly, the US treasury bill market has many deficiencies which derive from its organisation around a small club of primary dealers. The worldwide foreign exchange market operates in the institutional vacuum of the distributed dealer market, lacking basic qualities like price-time priority, centralisation of order flow, public visibility of liquidity, etc.

³See Madhavan (1992) for a discussion of the characteristics of different types of market organisations.

INTRODUCTION

Electronic order-matching first appeared in small markets (Toronto and Mexico) or new markets (India's National Stock Exchange (NSE)). These successes paved the way for adoption in larger markets (like Paris, Tokyo and London) (Domowitz 1990, Melamed & Tamarkin 1996). In November 1997, the London Stock Exchange commenced trading through order matching, and Indian readers of *The Financial Times* witnessed a replay of the debates which took place in India's equity market in 1993 and 1994. In each situation, the introduction of computerised order matching has encountered the same fierce political opposition which was seen in India, from existing intermediaries who face the prospect of reduced revenues.

ATTRIBUTES OF MARKET QUALITY

From an economic perspective, a well functioning market is one where transaction costs are near zero. Every question about the design of markets can be usefully addressed by inquiring about the level of transaction costs implied by the alternatives under consideration. Every blemish in the functioning of markets translates into transaction costs for users of the market. A liquid market is one where transaction costs are low, and the ideal market is that where many components of transaction costs are zero, and other components are as low as possible.

The key issues in designing and evaluating markets are standardisation, aggregation and revelation of order flow, intermediaries, anonymity, counterparty risk, settlement, enforcement/prosecution, and futures trading.

Standardisation

The foundation of a liquid market is standardisation of the traded object. When many economic agents in the economy have buy or sell intentions for the same object, the time and information processing expended in negotiation is reduced.