the trade fails to supply funds or securities, the impact upon the counterparty is minimal. Such a post-trade procedure is obtained using real-time gross settlement (RTGS) (Folkerts-Landau, Garber & Schoenmaker 1997).

In the real world, all financial markets, even spot markets, are forward markets to the extent that delivery and payment take place with a certain delay after the trade takes place. In this intervening period, both legs of each transaction face counterparty risk. If prices go up, the seller is tempted to declare bankruptcy, and vice versa. This risk of bankruptcy is a component of the transaction costs faced by users. On exchanges, counterparty risk sometimes exerts a domino effect, where the failure of one member leads to the failure of another, and so on, and the entire exchange is paralysed in a payments crisis.

The club market is one method through which counterparty risk is contained (though not eliminated). Only a small club of entities is effectively permitted to participate in the market, and each market participant often uses "counterparty exposure limits" against each other member.

The functioning and price discovery on the club market can be improved in two directions: (a) entry of members,[6] and (b) anonymity in trading. However, both these run afoul of counterparty risk. An existing club would not wish to trade with members of inferior credit risk, and trades which did take place would involve a risk premium for the credit risk, thus generating noisy prices. An existing player would not be willing to trade in the blind against unknown counterparties, in an anonymous trading system.

The vital institution which makes unrestricted entry into anonymous trading possible is the clearing corporation. The clearing corporation performs novation, i.e. it interposes itself into every trade,

[6] Madhavan (1992) shows that when entry into market making is free, the dealer market is equivalent to a continuous auction market

buying from one leg and selling to the other, thus insulating each leg from a default on the other. The clearing corporation makes safe trading possible between strangers. Its credit enhancement services ensure that traders on the market focus on liquidity and prices without fear of default. The creation of the National Securities Clearing Corporation (NSCC) is a major milestone in the institutional development of India's securities industry.

Counterparty risk is also present in any institutional mechanism which gives traders access to borrowed funds and securities, which are (in turn) essential for enabling speculative long or short positions. This counterparty risk is best addressed by interposing the clearing corporation into every lending transaction; the clearing corporation would borrow the securities from the lender and lend them to the borrower, thus shielding both legs from the risk of default of the other. The clearing corporation would be well equipped to know the full risk exposure of the member of an exchange, including any borrowing/lending activities, and can calculate margins appropriately.

Settlement

Trading culminates in the exchange of funds for securities. This is a step which is fraught with dangers. The scam of 1991 centred around settlement procedures in India's fixed income market. India's equity market has been plagued by counterfeit and stolen certificates. Book entry procedures for settlement can dramatically reduce transaction costs. The two depositories in India, RBI's SGL and NSDL, are clearly sources of major gains in transactions costs and reduced complexities of supervision.

Enforcement and Prosecution

The ideal market would leave few opportunities for malpractice. If trading is anonymous with strict price–time priority, if users can ensure that brokers deliver the correct trade to them, and if clearing

and settlement work flawlessly, then users face few risks from malpractice.

However, when anonymity is lacking, when market mechanisms lack strict price-time priority, when counterparty risk exists and settlement is vulnerable, when agency conflicts generate malpractices on the part of employees of finance companies, there is a vital role for the *threat of punishment* in reducing the incidence of malpractice, and thus reducing transaction costs on markets. Our experience in India of white collar malpractice reliably leading to swift imposition of punishment is (as yet) unsatisfactory.

It is remarkable to observe that *effective enforcement and prosecution* can enable traditional market mechanisms to work well even if intrinsic qualities like anonymity and price-time priority are lacking. The tradeoffs in reforms hence concern the relative ease of evolving market mechanisms or evolving strong enforcement and prosecution. If implementing enforcement and prosecution is easy, then traditional market mechanisms like the BSE floor or the distributed dealer market can be considered acceptable. If the human ingredients that go into enforcement and prosecution prove to be hard to create, then new market mechanisms are the easiest path for market reforms. The electronic limit order book and the electronic call auction are uniquely attractive from this perspective.

Futures Trading

Futures trading supplements the spot market by increasing the incentives for economic agents to invest in research and information gathering about the future. The onset of futures trading is also often correlated with improved liquidity on the spot market.

Futures trading thus improves price discovery and market efficiency. The development of futures markets is hence a tool for improving market quality on the spot market.

In many cases, if a spot market is functioning poorly but reforms

of market mechanisms on the spot market are hard to implement, a strong futures market can prove to be the focus for price discovery. This is particularly relevant when facing distributed dealer markets on the spot market where reforms of market mechanisms prove to be politically infeasible. Since futures markets mostly do not exist, the opposition of existing market participants would not be encountered in the creation of healthy market mechanisms on the futures market. In this sense, if the spot market is considered to be beyond reform, the development of liquidity and price discovery centred around the futures market is a second opportunity for improved market quality.

CASE STUDIES

The Real Estate Market

Real estate is an area where a liquid and efficient market is intrinsically difficult to obtain. Each unit of real estate is different, hence liquidity is fragmented. The distributed nature of the market results in an absence of data about transactions, so that participants are not able to infer values from recent transaction prices. In an environment where unaccounted money is used for a large fraction of the true transaction value, market participants are unwilling to even disclose true transaction prices. Of course, even when recent transaction prices are known, their usefulness is limited owing to the heterogeneity of traded objects.

In addition to these difficulties, transactions costs on the real estate market are driven to extremely high levels, owing to the 10% stamp duty (which one leg of the transaction faces). This can be interpreted as a one-way transactions cost of 5%. Even if all other aspects of the real estate market were functioning well, this addition of a transaction tax of 5% would suffice to make it a highly illiquid market.

We can obtain an intuition into the 5% transaction tax by visual-

ising the impact of such a tax on transactions in the equity market. The shares of Reliance, under such a tax, would achieve the liquidity that we presently observe (without this tax) of a company with a market capitalisation of under Rs 15 crore.

If the institutional development of financial markets is about reducing transactions costs, then transaction taxes are distortionary and should be eliminated. This is particularly relevant for the real estate market, which is intrinsically handicapped with poor price discovery.

The Equity Market

The experience of India's equity market from 1993 to 1996 is a success story of the role that an activist state can play in fostering the development of a liquid and efficient market.

1. The entry of 1000 new brokers at NSE resulted in a sharp drop in brokerage fees.

2. The use of VSAT technology by NSE and now the BSE has spread equities trading all over the country, in contrast with the earlier concentration of the equity market in Bombay. VSAT technology coupled with the open electronic limit order book market yields equal access to the "trading floor", regardless of physical location. This has given enhanced *liquidity*, by harnessing the order flow from all over the country.

3. The transition from floor-based trading to the open electronic limit order book generated a sharp reduction in market impact cost.

4. The transparency of screen-based order matching greatly diminished the incidence of *gala*, the covert component of brokerage fees.

5. The creation of NSCC eliminated counterparty risk, and enabled an enormous growth in trading among members of *heterogeneous* credit risk.

6. The creation of National Securities Depository Ltd. (NSDL) would yield massive reductions in post-trade transactions costs on the equity market.

The equity market is now the best developed financial market in India, and features superior institutional arrangements as compared with the equity markets of many OECD countries. For the further institutional development of the equity market, the agenda now is:

- Complete adoption of the depository.
- Integration between the "upstairs" market for negotiated trades and the main limit order book, thus pooling the liquidity and price discovery of both markets.
- The introduction of equity derivatives.
- Transition out of the weekly futures market into a true T+5 spot market.
- The introduction of 'margin trading' facilities for borrowed funds and shares.
- The use of market mechanisms *other* than the open electronic limit order book in order to produce better liquidity for small and medium capitalisation stocks.