

Designing Markets for Developing Countries*

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It was the best of times, it was the worst of times

ABSTRACT

This paper highlights what we know from market microstructure and how this should guide the design of equity markets in developing countries. I first consider the basic economic functions of capital markets and of exchanges. I develop more fully the importance of price discovery and liquidity, and how these are affected by the market environment and by characteristics of firms themselves. I then consider the particular implications of this for capital markets in emerging countries. Research has suggested various links between market designs and performance, and I review the implications of these for exchange structure. I conclude with some thoughts on how best to structure markets for newly listing companies.

I. INTRODUCTION

The Dickensian sentiment expressed above could well be uttered by stock exchanges around the world. By many metrics, the environment for stock markets is flourishing. The number of markets is growing, helped in part by the prolific opening of new options and futures markets by established equity markets. New trading systems are revolutionizing trading, both on the exchanges and on their new rivals, the ECNs. And the equitization of global capital markets continues, creating demands for equities and their derivatives worldwide. But prosperity is not universal. Revenues for Asian-Pacific stock exchanges have been falling since 1994, and the revenues of South American exchanges have recently followed suit.¹ Some established markets such as Argentina and New Zealand have had such calamitous falls in trading volume as to be approaching extinction. The new markets designed to incubate fledgling companies are in shambles – Germany's Neuer Market, with 340 listings, has perhaps ten successful

* I would like to thank Richard Levitch and Pongsak Hoontrakul for helpful comments on this research.

1 The revenues of Asian-Pacific exchanges in 1994 were US\$1,415 but in 1998 were only US\$1,183. For operating data on exchanges see FIBV Annual Report (1999).

companies, while Spain's Nuevo Mercado has only 12 listed companies and virtually no trading. Hong Kong's Growth Enterprise Market (GEM) has lost more than 60% of its value in the past 14 months, and Mesdaq, Jasdaq and Sesdaq are all faltering.² The current situation today is clearly a tale of two markets.

In this paper I relate the work done in the research area of market microstructure to the very practical question of what to do now. My particular focus is on the role of market design. Issues of design have moved to the forefront in part because of the link, or at least the potential link, between liquidity and market design. Moreover, market design is taking on a new importance now that markets have to compete. Competition has changed the position of exchanges, and for some it has proved disastrous. In part, these difficulties reflect the natural breakdown that occurs when national capital markets are replaced by global ones. In other cases, stock market difficulties arise when market regulators try to hold on to a structure that has worked in the past, in effect to regulate markets into existence. In still other cases, the problems reflect an ignorance of the function and role of markets. The disappointing performance of so many of the specialized markets for newly issued stocks reflects, in my view, a disregard for these underlying functions. In the long run, no market design can ignore the underlying economics of what markets do.

This paper highlights what we know from market microstructure and how this should guide the design of equity markets in developing countries. To focus our thoughts, I first consider the basic economic functions of capital markets and of exchanges. I develop more fully the importance of price discovery and liquidity, and how these are affected by the market environment and by characteristics of firms themselves. I then consider the particular implications of this for capital markets in emerging countries. Research has suggested various links between market designs and performance, and I review the implications of these for exchange structure. I conclude with some thoughts on how best to structure markets for newly listing companies.

II. THE ECONOMIC ROLE OF MARKETS AND EXCHANGES

Let's begin with a basic question: what exactly do capital markets and stock exchanges do? It is important to recognize that the answers are not the same for these economic entities. Capital markets play two main roles. They provide capital for firms and entrepreneurs, and they provide financial assets for investors. These functions can be met in a variety of ways and by a variety of institutional arrangements. Stock exchanges also play two roles. They provide liquidity and price discovery. These stock exchange functions tend to be inextricably linked: the market that provides price discovery tends to be the most liquid, and conversely. The viability of a stock exchange depends largely on how well it can perform these functions.

² The problems of these markets are discussed in 'Crashing Clones', *Newsweek* (4 June 2001).

Liquidity is perhaps best described by how easily and inexpensively investors can trade assets. There are many aspects to liquidity, including simple transactions costs, the time it takes to execute trades (or immediacy) and the price impact of trades. These can be lumped under the rubric of execution costs, and in general the market with the lowest execution cost will be the winner in a competitive environment. How then to foster liquidity? Three factors of immediate importance are size, technology and design. Size matters because bigger markets are able to aggregate supply and demand from more traders, and this in turn lowers trading costs. Technology matters because better trading systems can dramatically lower the cost of executing trades. And design matters because different trading configurations can make markets more attractive to investors, and thus attract the trading volume that leads to lower costs. There is now a large literature linking liquidity to the return investors require from a stock (see, for example, Amihud and Mendelson 1986; Brennan and Subrahmanyam 1996; Datar et al. 1998; Amihud 2000). Greater liquidity lowers execution costs and lowers the return investors demand from firms.

Price discovery refers to the ability of the market to find the efficient price. Efficient prices reflect the underlying prospects of a firm, and as these prospects change, so too should the price. How well, and how quickly, prices adjust to fundamental values is an important metric for all exchanges. There are two main factors that influence this efficiency. One is simply the fairness and integrity of prices. Exchange monitoring to prevent manipulation and front-running, as well as general regulation to prevent fraud and self-dealing, ensure greater price integrity. Second, and equally important, is the information structure itself. How much information on firms is available to investors affects how well prices reflect information. This information structure is enhanced through accounting rules, disclosure requirements and corporate governance standards. These are often dictated by exchange listing requirements or by security market regulators.

Investors care about the efficiency of price discovery because it influences the risk of holding stock. In particular, if information can be asymmetric, then traders with private information can benefit at the expense of traders who know only public news. Easley and O'Hara (2000) show that uninformed traders, knowing that they are potentially at a disadvantage, will demand higher compensation to hold stocks with greater private information risk, a result confirmed empirically by Easley et al. (2002). Evidence consistent with this effect is also provided by Botosan (1997), who shows that greater disclosure reduces the cost of capital for her sample of firms by 28 basis points, and by Bhattacharya and Dazouk (2000), who find that enforcement of insider trading laws lowers the cost of capital. Similarly, LaPorte et al. (2000) find that corporate governance rules influence returns because of their influence on how returns are split between insiders and outsiders.

What do these economic functions imply for stock market design? The simple answer is that the optimal design must lower execution costs and enhance price discovery. But there is no generic market that works for every setting. In particular, one temptation has been to import trading systems or designs that work in other markets and hope that this will also result in local liquidity. This

generally doesn't work because it ignores the important fact that where companies are domiciled is not necessarily where companies trade. Alternatively, recognizing the importance of scale, some regulators have tried to enhance local liquidity by restricting the ability of firms to trade elsewhere. This strategy fails because it ignores the simple fact that investors may choose not to hold the company at all! In a global market there are alternatives, and investors will hold the companies that they want, not the ones that they 'should'. There is now a large literature investigating the differential trading behaviour of foreign and domestic investors for stocks (see Kang and Stulz 1994; Tesar and Werner 1995; Brennan and Cao 1997).

These difficulties suggest that price discovery and liquidity depend upon the characteristics of firms and their investors. Thus, the optimal stock market for a country must also depend upon these characteristics. In the next section I develop this idea more fully, and consider its implications for market design in developing countries.

III. DESIGNING MARKETS

For large companies, capital markets are global, not local. Price discovery and liquidity follow a firm's investor base, and where a company trades need not be where it is domiciled (or even listed). Thus, the market for Tel Mex stock is now in New York, not Mexico City, because that is where the price discovery and liquidity are greatest. The market for large Argentine stocks has essentially migrated north, while that for large Canadian stocks has headed south (sometimes figuratively!). But it is not always the largest market that 'wins'. Trading in Daimler-Chrysler shares has now largely migrated to Frankfurt, despite the fact that the stock is listed on the NYSE and 15 other exchanges.

Conversely, price discovery and liquidity for small companies tend to be local, not global. Knowledge of a small company's prospect is generally greater for domestic investors, and so they are more likely to form a company's investor base. This may reflect simply that foreign investors don't know about the stock (Merton's 1987 investor recognition story) or that local investors are better able to determine the risk of a stock (see Coval and Moskowitz 1999; Huberman 2000). Thus, the recent dismal showing of Chinese technology stocks on Nasdaq compared to US technology issues is consistent with this local advantage.

Let us turn now to our subject at hand: what does this imply for capital markets in developing countries? Perhaps foremost is the observation that the capital market will not be in the same location for every firm. Large, multinational firms will trade in global markets, not local markets. If the goal of capital markets is to lower the cost of capital for firms and enhance investment opportunities for investors, then this is a good thing. But this does mean that, for many countries, their largest firms will no longer trade in any meaningful way on their national exchanges. It is the smaller firms that will be traded on national capital markets, and it is these firms that stock exchanges should seek to serve.

Yet this defection of large firms to global markets creates a potentially disastrous economic problem for local stock exchanges. The revenue of an exchange is largely volume-driven, and a rule-of-thumb often cited is that 90% of an exchange's revenue comes from 10% of its listed companies. If the largest firms trade elsewhere, how is an exchange to survive? There are three possible answers. One is that the increased exposure of a country to the global market will increase the overall investment interest in the country. If this is true, then order diversion need not diminish the local volume because cross-listings of large firms will lead to larger volumes both globally and domestically. This is the argument of Sofianos and Smith (1996), who suggest that globalization makes the 'trading pie' bigger for local markets as well. The empirical evidence on this is generally supportive, as epitomized by Karolyi's (1998) conclusion that 'for many issues, home market trading volume increases'. Thus, Hargis and Ramanlal (1998) found increases in South American trading volume following cross-listing in the USA, but the more recent experience of Argentine exchange volume is much more negative. Domowitz et al. (1998) found mixed evidence from the cross-listing experience of three Mexican firms. Virtually all studies of these cross-listing effects examine short time intervals; whether these effects hold more generally remains to be seen.

A second possible answer is to increase scale by adding new products to the domestic market. This strategy is typified by the additions of futures and options trading to established equity markets, and by the introduction of products such as exchange traded funds. Indeed, even the largest markets are actively pursuing this latter tactic as a means to generate more trading revenue. Nasdaq 'cubes (QQQ)' and the new NYSE 'global shares' typify this development.

A third solution is to design a trading environment that enhances the liquidity and price discovery process for small and medium-sized firms. Smaller firms will trade closer to home, but even here national exchanges face competition. As New Zealand has discovered, local investors may feel just as comfortable trading regionally as they do locally. Trading for local shares will gravitate to the venue offering the greatest liquidity and price discovery. While for small and medium-sized firms this is unlikely to be a distant global market, regional venues can aggregate trading to provide better liquidity. Thus, the existence of the CLOB in Singapore was very successful in attracting order flow from surrounding countries.³

How then to keep order flow at home? One solution, of course, is to forbid it to move elsewhere. Yet this may be a Pyrrhic victory, sacrificing the greater benefits of better capital markets for the specialized welfare of exchange members. Moreover, restricting access to global markets can increase the cost of capital for firms, thereby imposing higher costs on the economy as well. A better solution is to enhance exchange performance through better design. This suggests creating markets that are focused on providing price discovery and liquidity of domestic firms.

³ For an interesting discussion surrounding the impact of the CLOB on Malaysian stocks see McNish and Lau (2000).

Research in microstructure suggests a number of ways to do so. Fundamental to all trading is the basic design of the trading system. Traditionally, trading systems were characterized as order-driven or quote-driven. Quote-driven systems provide liquidity through the actions of dealers who buy and sell the security, while order-driven systems allow traders to interact directly via the posting of limit orders. While some trading platforms retain features of both systems, all major stock exchanges now feature order-driven systems. By allowing customer orders to interact, order-driven systems generally reduce execution costs and thus increase liquidity.

Alternatively, trading platforms can be divided into continuous-trading systems and call markets. Call markets aggregate orders and then execute trades at specified times. Continuous markets allow for individual orders to execute throughout the trading day. In general, continuous trading enhances immediacy, and virtually all exchanges (and every ECN) feature such a structure. Amihud et al. (1998) find significant liquidity improvements for stocks switching from call market trading to continuous trading on the Tel Aviv Stock Exchange. Muscarella and Piwowar (2001) report a similar result for switching stocks on the Paris Bourse.

Continuous trading systems can falter in the presence of too much volume or too little. Thus, many exchanges open markets via call markets, in part to facilitate more efficient processing of accumulated overnight orders. Similarly, continuous markets often allow trading halts when order imbalances (or the underlying uncertainty that is generating them) become too large. The problems of too little volume are potentially more severe. Without sufficient volume, orders can languish in a continuous order-driven market. This problem particularly affects the stock of small companies, as the outstanding float may not support significant trading volumes. One approach proving successful in both Paris and Frankfurt is to designate dealers to provide liquidity for such stocks.

The trading mechanism, whether it be a call or continuous market or quote- or order-driven, has to provide price discovery for stocks. Fundamental to this discovery process is the information conveyed by the trading system. Here issues of transparency, or exactly what information is available to market participants, become important. Transparent markets provide information easily and cheaply to participants. This information can include quotes, trades, depths, trade sizes, trader identities and orders. In general, most markets provide some, but not all, of this information to participants. An important question in market design is: how much transparency is optimal?

Determining the optimal level of transparency is complicated because of the complex role that information plays in markets. On a basic level, information availability levels the playing field between participants, and thus it makes markets fairer. Viewed from this perspective, the best markets are those that are the most transparent. Indeed, this view is often expressed by the SEC, and it is the reason why transparency is specifically articulated as a goal of the US national market system. Yet while transparency has obvious benefits, it has less obvious,

but substantial, costs. Problems arise because transparency can reveal more than simply information related to underlying asset values. If transparency reveals a complex trading strategy to the market, then traders can free-ride off the efforts of others, or, more perniciously, attempt to manipulate the market to gain at the other traders' expense. Is it fair to mandate transparency if it disadvantages one class of traders to the benefit of others?

A second difficulty connected with transparency is its link to market competition. Bloomfield and O'Hara (1999) find in an experimental market study that dealers in transparent markets have less incentive to compete. Whereas with limited transparency dealers had to set better prices to obtain information from order flow, mandating total transparency allowed dealers to set larger spreads. Thus, these authors find that transparency benefits market makers at the expense of traders (see also Flood et al. 1999 for an alternative experimental analysis of transparency).

A related competitive dimension is the effect of transparency on inter-market competition. If transparency rules differ with venue, how does this affect the trading outcome? Two issues are relevant here. First, some traders may opt to trade in the less transparent venue if it allows them to protect the value of their information. Thus, when the Paris Bourse required greater trade disclosure than the London Stock Exchange, order flow migrated to London. To remain competitive, the Paris Bourse had to adopt similar, less transparent rules. Second, the dealers themselves may eschew transparency. Bloomfield and O'Hara (2000) address this issue in an experimental study where dealers are allowed to choose whether to be transparent or not. They find that less transparent dealers are more profitable, in part because they are able to acquire an informational advantage over the transparent dealers. This causes dealers generally to opt for less transparency.

What does this suggest for the optimal level of transparency? Transparency is useful to the extent that it enhances the fairness and competitiveness of markets. Thus, requiring quote transparency and trade transparency, as well as some information on the overall depth available, is generally useful. But transparency on individual traders' strategies is less benign. Consequently, it is not optimal to disclose specific order information like size or trade identity. Indeed, many successful trading platforms have allowed traders to hide specific features of their limit orders. Such limited transparency can induce greater trader participation, thereby enhancing the overall liquidity of the market.

While transparency enhances traders' ability to learn from the trading process, information on firms and their prospects may arise more directly from their accounting and disclosure policies. Here listing requirements imposed by exchanges (or in some cases regulators) can play an important role in attracting order flow to markets. By replacing information that is missing in the capital market, listing requirements reduce the risks facing traders. Thus, rules requiring firms to use particular accounting standards, or publish specific annual reports, or even adopt exact corporate governance proposals, make the value of firms more apparent to the market.

A different risk confronting traders in many markets is clearing and settlement. Exchanges have the responsibility to settle trades expeditiously. To the extent that this doesn't happen, traders face uncertainty, and trading on the exchange becomes less attractive. Clearing and settlement are areas that traditionally have been part of the stock exchange structure, but recently there has been a shift towards outsourcing these functions. This largely reflects the impact of technology, as scale allows for the costs of clearing and settlement to fall precipitously. For many small exchanges, it makes little sense to retain such an internal clearing function. Instead, clearing and settlement can be handled externally, perhaps even by global clearing entities.

While the discussion above has focused on general aspects of market design, a specific application of these issues can be found in the recent opening of designated markets for newly public firms. Endemic to virtually all capital markets is the difficulty new firms face in raising capital. Traditionally, venture capital was provided largely by private sources (e.g. venture capitalists) or by banks. However, the ability to raise equity capital provides tremendous advantages to entrepreneurs, and increased liquidity of fledgling companies' stock provides incentives for investors to provide this needed funding. How then to make the equity market more accessible for new ventures?

An immediate challenge to doing so is that new companies are inherently illiquid. Small by definition, these companies have limited float and ownership. While trading volume on the offer day may be large, it often falls dramatically, with many companies not trading on a daily or even weekly basis (for an analysis of trading of IPO firms on Nasdaq see Ellis et al. 2002). Insiders typically retain most of the shares, creating potential corporate governance problems. New firms are also difficult to evaluate, with short performance histories, few (or, more typically, no) analysts and rudimentary accounting statements. From an investor's perspective, these stocks are inherently more risky than are established firms. From an exchange's perspective, these firms typically do not meet the minimum required listing standards.

A popular approach has been to develop new, specialized markets for these companies. France (the Nouveau Marché), Germany (Neuer Market) and Hong Kong (GEM) are but a few examples of markets designed just for fledgling companies. These markets typically feature much less stringent listing requirements, and a designated dealer or market maker structure. But can market structure overcome the inherent difficulties of trading these companies? The recent dreadful performance of these markets suggests not.

I would argue that these difficulties reflect a lack of appreciation of what markets can accomplish. As we have discussed throughout this paper, stock markets exist to provide liquidity and price discovery. Market structures explicitly recognizing the particular needs of fledgling firms can enhance this liquidity production role, but this may not be enough to make such firms reasonable investments.⁴ In particular, the inherent lack of information on new firms makes

⁴ A new awareness of the risks of these markets is captured by the current logo of Hong Kong's Growth Enterprise Market: 'a "buyer beware" market for informed investors'.

price discovery both more important and more difficult. Reducing listing requirements exacerbates these difficulties, and enticing retail investors to hold these stocks compounds the problem. A more realistic market design would compensate for information deficiencies with tighter listing standards and more extensive monitoring of trading. Such a structure seems particularly important for many developing countries, where capital markets may not be sufficiently developed to provide such information otherwise.

IV. LESSONS FOR DEVELOPING COUNTRIES

What should we conclude about designing markets for developing countries? I believe there are five lessons that are most important for designing optimal stock markets. First, and foremost in my view, is that market viability depends upon price discovery. With the advent of cross-listing and the removal of many barriers to trading across national boundaries, equity trading has become a global business. But the market that is the source for price discovery has an enormous advantage over other settings that are merely clearing trades. Price discovery, however, requires information. Listing requirements, disclosure rules, accounting treatments and corporate governance protocols all enhance the production of information at the firm level. Transparency of trade information enhances the information produced by the trading mechanism. Structuring the exchange to incorporate these information enhancements will strengthen the competitive position of the exchange.

Second, technology matters. Reducing the costs of trading by outsourcing some scale-driven functions is a first step towards greater efficiency. Investing in faster and more cost-effective trading platforms is another. Fundamental to the workings of the new world of technology is size. The network-based nature of trading dictates that size matters, and national exchanges must recognize this if they are to compete with the larger regional and global markets. A simple dictum for markets today is 'attain scale where you can and outsource where you can't'.

Third, recognize and focus on small and medium-sized companies. The advantages of national markets quickly evaporate as companies become large. Home markets are the natural habitats for smaller companies, but such companies pose difficulties for efficient trading. Using designated liquidity providers or establishing alternative trading arrangements for small companies are possible strategies to pursue.

Fourth, focus on exchange competitiveness. Being the only exchange in a country is no longer sufficient to guarantee survival. Exchange viability depends upon exchange competitiveness, and this dictates having an agile corporate structure. For many exchanges, changing corporate governance has proved an important step in moving the exchange to more competitive behaviour.

Finally, it is important to consider alternative trading arrangements. While it is traditional for every country to have its own stock market, the new economic realities dictate a very difficult existence for some of these exchanges. Alternative

arrangements such as regional coalitions may provide better access to capital markets for a country's firms and its investors. The innovative structure of Euronext provides a template for one such arrangement. Euronext evolved from the merger of the Paris, Brussels and Amsterdam exchanges, and it features a single trading platform with multiple points of entry. As the second largest exchange in Europe, the success of this market is undeniable, and its achievements suggest that even large, developed countries may benefit from adopting a broader geographic focus.

V. CONCLUSIONS

Stock markets today face competitive challenges, and these are particularly acute for markets in smaller or developing countries. This paper has highlighted some of these difficulties, and suggested how market structure can play an important role in market performance. For most countries, stock exchanges are a source of national pride and of economic development. Enhancing stock exchange performance is crucial to fostering the 'best of times' for companies and countries alike.

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