SOCIAL SCIENCES & HUMANITIES AND LAW & MANAGEMENT
Research Journal - Volume 3 - 2000 University of Mauritius, Réduit, Mauritius.

THE MAURITIUS STOCK EXCHANGE: AN ASSESSMENT

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(Received January 1999 – Accepted June 1999)

ABSTRACT

This paper focuses on three main aspects of the Stock Exchange of Mauritius: the trading mechanism, the trading progress of the exchange and the regulatory framework. The author finds that low levels of trading activity and high market concentration are severely hampering the development of the exchange. It is also found that returns are serially correlated in the weak-form. Steps taken by the SEM and the SEC to reverse this tendency and to reinforce the regulatory framework are also reviewed.

Keywords: Stock Exchange, Mauritius, Stock Market Development

INTRODUCTION

Two decades ago the financial system in most developing countries were heavily repressed and Mauritius was not an exception. With the empirical work of Mc Kinnon (1973), Shaw (1973), Fry (1982), Cho (1988) and others, the paradigm that an orderly and prudent deregulation of the financial sector is critical for an efficient allocation of resources in the economy has gained considerable leverage. As in most other developing countries, policy-makers in Mauritius realised that there was an urgent need to liberalize and enhance the level of competition in the financial system.

However, this could only come about by a proper development of the money and the capital markets in order to increase the range of financial instruments available to savers and investors. With this objective in mind, a Secondary Market Cell (SMC) for the auctioning of government paper was established in February 1994, a leasing company came into operation in January 1989, a stock exchange was set up in July 1989 and a venture capital fund created in March 1996.

The Stock Exchange of Mauritius, the Port Louis Stock Exchange (PLSE), started operations in July 1989. It is composed of an Official Market and an Over The Counter Market (OTC). The trading activity of the exchange is administered by the Stock Exchange of Mauritius Limited (SEM). The regulatory body is the Stock Exchange Commission Limited (SEC). In absolute terms, the exchange has made some progress. On the Official Market, the number of listed companies grew from six at December 1989 to 42 at December 1998 and the market capitalization increased from 1.44 billion rupees to 45.34 billion rupees over the same period. The listed companies are classified into seven broad categories, namely banking and insurance, industry, investment companies, sugar, commerce, leisure and hotels, and transport. Banking and insurance, leisure and hotels and commerce account for around 60 per cent of the total market capitalisation. However, complacency would be a serious mistake as there are some serious challenges ahead. It is opportune therefore that after ten years of operation stock is taken of the development of the market and the future of equity financing in Mauritius considered.

The paper is organized as follows and will deal only with the official market:

a) The existing trading system is analyzed, paying particular attention to the improvements or forthcoming improvements in the services to be offered by the SEM to investors.

b) Descriptive statistics relating to market size, liquidity and concentration are investigated and an index of stock market development is computed for the PLSE.

c) In the third section of the paper, a test of the weak-form efficiency of the market is performed and it finally concludes with a review of the regulatory framework.

THE TRADING SYSTEM

Trading is conducted through the open outcry method. Trading on the Exchange is done by an order-driven system. The stockbrokers gather around a trading ring and a central quoter conducts the auction, starting with the closing price of the last session. Prices can vary from one trading session to another by a maximum limit of 6 percent for the official market and 10 percent for the OTC market. Trading is for spot transactions only.

The development of the infrastructure and improvement in the services offered by the exchange are crucial to boost the operational efficiency of the market, to mitigate the serious problem of liquidity and to attract both local and foreign investors. In fact, since August 1994, with the suspension of the Exchange Control Act, foreigners can buy shares on the local market, provided that there is no intention to acquire a controlling interest. They also cannot acquire more than 15 percent of the voting rights of a company in the sugar sector. Foreign portfolio flows have been accounting for at least 30 percent of total turnover over the last few years.

. A Central Depository and Settlement (CDS) system, a computerized system to speed up clearing and settlement, has been operational since January 1997. Transfer and settlement operations are carried out in a maximum of five days. In the past it would take more than twenty-one days. This was obviously a serious constraint to trading activity and may have kept away many ordinary investors. The CDS also minimizes the risk of loss or forgery of share certificates.

In fact, the CDS is a *sine qua non* before moving to continuous trading. It will be linked in the future with an automated clearing and settlement system to be set up by the Bank of Mauritius. Investors want "a quick in and quick out" system and the CDS responds to that need. Many countries in the Southern African Development Community (SADC) have decided to adopt the Mauritius CDS model, which is itself based on Group Thirty recommendations on "Clearing and Settlement of Securities" and International Organization of Securities Commission (IOSCO) blueprint on "Clearing and Settlement in Emerging Markets".

· Initially trading was twice per week that was increased to three times per week in January 1994. However, with the view to improve market liquidity, as from 24th November 1997, the exchange trades daily on the official market. This has been possible with the coming into operation of the CDS.

But the ultimate objective is the implementation of an electronic trading system where stockbrokers and other market players can from their back office submit orders to the trading floor.

· The SEM has also opened a web site, giving access to market information.

THE MARKET INDICATORS FOR PLSE

How can stock market development be empirically measured? Theory does not provide a unique concept of stock market development. There are five main issues relating to stock market development. These are (i) the size of the market, (ii) the liquidity of the market, (iii) the level of market concentration, (iv) the information system in place and (v) the regulatory framework. There are several indicators that can be used but unfortunately no single indicator is adequate in itself to provide an overall assessment. It is therefore important to devise indices. But indices have their limitations. The issue of weightage and the quantification of qualitative data are serious challenges.

The size of the market

The size of the market is important in order to have a critical mass of buyers and sellers. Size of the market, in the literature, is more appropriately measured by looking at market capitalization as a percentage of Gross Domestic Product (GDP). This together with other relevant statistics about the size of the market is summarized in Table 1 below.

It can be seen from Table 1 that market capitalization in relation to the size of the economy has improved significantly. Except for the year 1994/95, the market capitalization to GDP, has increased from a mere 4.3 percent in 1989 to 47.4 percent in 1998. The average growth rate in market capitalization has been around 49.5 percent. The SEM has been successful in getting companies listed. But over the last three years there has not been any additional listing and the market capitalization ratio is still below 50 percent.

Table 1- **Market Size Indicators**

Year	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**
Market Capitalization (Rs billion)	1.44	3.79	4.86	6.60	14.91	28.54	27.82	33.38	36.93	45.34
Listed Companies (End of Period)	6	13	19	21	29	34	32	42	42	42
Growth in Market Capitalization (%)	N/A	163.199	28.23	35.80	125.911	91.42	2.52	19.99	10.64	22.77
Market Cap/GDP (%)	4.31	9.66	10.97	13.28	26.39	45.35	40.33	43.26	43.05	47.35

(Source: Author's computations, SEM and SEC Annual Reports)

However, a market might be large in size but inactive. The evolution of the liquidity of the market which is considered next lends support to this view. It could be that companies get listed with the view to benefit from tax concessions that accrue from listing. Listed companies pay a corporate tax rate of 25 per cent instead of the normal rate of 35 per cent and those in the Export Processing Zone when listed pay a tax rate of only 15 per cent instead of 25 percent.

Market Liquidity

Liquidity generally refers to the ability to easily buy and sell securities. Savers are very often unwilling to place their saving in financial instruments for long periods of time. Yet many profitable capital projects require a long term commitment of funds. Liquid equity markets therefore allow companies on the one hand to have a permanent access to capital through equity issues and, on the other, allow savers to switch out of equity if they need access to their funds or if they want to change the composition of their portfolios.

However, though a reasonable level of liquidity is important, an excessively liquid market could be as bad as a market characterized by thinness. Greater stock market liquidity may reduce the rate of savings. Secondly, it may also seriously reduce an investor's incentive to monitor management and firm's performance as they can quickly sell their stake (Derminguç – Kunt and Levine (1996), Stigliz (1994)).

Two measures of liquidity commonly used in the literature are computed – total value traded to GDP and the turnover ratio. The turnover ratio gives the total value of shares traded in relation to the size of the market. The results are reported in Table 2 below.

Table 2 - Liquidity Indicators

Year	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**
Value Traded/GDP (%)	0.04	0.23	0.18	0.32	1.22	2.47	1.79	2.08	3.49	2.67
Turnover Ratio (%)	0.99	2.33	1.67	2.41	4.64	5.45	4.43	4.80	8.11	5.64

(Source: Author's computations)

It can be seen that though there has been a modest increase in the turnover ratio, the market is characterized by low levels of trading activity. Several factors could account for that. The market is highly concentrated. This is confirmed in Table 3 below. A related argument could be that the shareholders are not willing to part with their shares for fear that they will have to purchase them later at a higher price. The buy and hold strategy rather than a speculative strategy predominate. There might also be a lack of awareness among the investing public. Savers are used to placing their money in bank deposits and keeping it there for a sufficiently long period of time. The same principle might naively be followed when it comes to buying shares. The cap on prices as well as infrequent trading before November 1997 could be other explanatory factors. The SEM is in fact considering increasing the price limit to 10 per cent. Also, brokers can only put deals during the time trading is done.

Market Concentration

In many economies, only a few companies dominate the stock market. High concentration is not desirable as it can adversely affect liquidity. It is common to find a negative correlation between concentration and liquidity. Market concentration can be measured by looking at the share of market capitalization accounted for by the largest stocks. A concentration ratio of seven is chosen here. As evident from Table 3, the market concentration ratio has been hovering above 60 percent for most years.

Table 3 Concentration Measure

Year	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**
% of Market Cap/Total Market Capitalization	82.92	70.63	70.57	64.69	63.31	68.70	57.85	62.65	69.50

(Source: Author's computations)

A Comparison with other Markets

The market size and turnover ratio for the PLSE compare quite favourably with some of the emerging markets in Africa. Unfortunately, when compared to some of the stock markets in Asia (Thailand would be a good example) it is found that the PLSE is still very much in an infancy stage.

Table 4 – Size and Liquidity Indicators

MARKET CAPITALISATION GDP				
YEAR	1990	1992	1994	1996
Mauritius	9.66	13.28	45.35	43.26
African Countries				
Nigeria	5.31	8.1	8.5	N/A
Zimbabwe	29.79	10.03	27.28	45.95
Kenya	5.57	8.70	34.15	21.63
Asian Countries				
Malaysia	113.37	166.34	267.43	310.58
Thailand	27.69	52.46	90.91	55.66
Indonesia	7.24	8.79	27.71	40.37
TURNOVER RATIO				
Mauritius	2.33	2.41	5.45	4.80
African Countries				
Nigeria	0.9	1	0.8	2.6
Zimbabwe	2.9	2	11.5	8.8
Kenya	2.2	2.1	2.9	3.7
Asian Countries				
Malaysia	24.6	27.3	58.7	66
Thailand	92.6	153.6	60.9	36.7
Indonesia	75.8	41.2	29.4	40.8

(Source: Author's computations, IFC Factbook)

An Index of Stock Market Development

An index of stock market development is computed, taking into account market size, liquidity and concentration, based on the method constructed by Dermirguç – Kunt and Levine (1996). The measure of market concentration is given a negative sign as it is expected to be negatively correlated with the level of stock market development. Institutional indicators are not taken into account at this stage as their arbitrary quantification might artificially improve the index. To compute this index a simple average of market capitalisation to GDP, turnover ratio and concentration ratio is taken. The index can range from –1 to +1 with –1 being least developed and +1 most developed.

YEAR	1990	1991	1992	1993	1994	1995	1996	1997	1998
INDEX	**-0.24**	**-0.19**	**-0.18**	**-0.11**	**-0.04**	**-0.08**	**-0.03**	**-0.04**	**-0.06**

(Source: Author's computations)

As it can be seen the index is negative though there has been some improvement compared to the early 1990s. This is mainly due to the low level of trading activity and high level of market concentration. However, it is to be noted that for many emerging markets, the index is negative and is in the range of –0.20 to –0.50.

TEST OF WEAK – FORM EFFICIENCY

The efficient market hypothesis has historically been sub-divided into three categories: weak-form efficiency, semi-strong form efficiency and strong form efficiency. Weak form efficiency tests argue that it is not possible to study patterns or behaviour of past share prices in order to predict the future share price. Semi-strong form tests claim that an investor cannot use publicly available information to obtain abnormal returns as all that information is fully reflected in the current share price. Strong form efficiency, on the other hand, postulates that the current share price reflects all information both public and private. The levels of efficiency are nested with strong-form efficiency of the highest order.

The serial correlation test is most frequently used for studying patterns in share prices and in market returns (see Fama (1965), Fama and Macbeth (1973), Jegadeesh (1990)). If share prices exhibit positive correlation or negative correlation, it would tend to indicate that prices or returns are predictable based on past patterns. Only zero correlation would be consistent with the weak – form hypothesis that share

prices follow a random walk and that no trading strategy can yield above-normal returns.

A holding period of one month is assumed and the cummulated monthly return in one period is regressed on those of prior months. Serial correlation in weekly returns was not tested for three main reasons. Firstly, the low turnover ratio tends to indicate that the average holding period is much longer than a week, so assuming a holding period of one month is more appropriate. Secondly, assuming that weekly returns are serially correlated, it would most probably not be profitable to exploit such correlation after taking into account transaction costs. Third, infrequent trading of securities is likely to induce serial correlation in returns. However, the extent of the bias is likely to be small when monthly returns are used (Scholes and Williams (1977). The following equation was tested, including up to eight lags.

$$R_t = b_o + b_1R_{t-1} + b_1R_{t-1} + b_2R_{t-2} + \ldots\ldots\ldots + b_8R_{t-8}$$

To be consistent with the random walk hypothesis, the coefficients in the above equation are expected to be zero or close to zero and not statistically significant. A random sample of nine companies out of the 19 companies with price data as from January 1992 or earlier was taken. The results are reported in Table 4 below.

It can be seen that for all the companies, the returns indicate significant positive first-order auto-correlation. The results are consistent with Buckberg (1995), Claessens et al (1995) and many other studies, which show that many emerging stock markets are possibly inefficient in the weak-form, showing strong positive correlation in returns. However, the result must be interpreted with caution as they might also be evidence of time-varying risk premiums or they may be due to the infrequent trading of shares.

Table 5 – Testing for Serial Correlation

Lag	1	2	3	4	5	6	7	8
Company 1	1.05[a] (8.6)	-0.21 (-1.23)	0.19 (1.07)	0.09 (0.52)	-0.09 (-0.48)	0.05 (0.29)	-0.22 (-1.20)	0.077 (0.59)
Company 2	1.16[a] (9.7)	-0.24 (-1.34)	-0.02 (-0.12)	0.30 (1.63)	-0.32[b] (-1.73)	-0.006 (-0.035)	0.21 (1.16)	-0.13 (-1.19)
Company 3	0.81[a] (6.4)	0.02 (0.18)	-0.064 (-0.4)	-0.035 (-0.22)	0.002 (0.01)	-0.11 (-0.7)	0.24 (1.5)	-0.08 (-0.66)
Company 3	0.81[a] (6.4)	0.02 (0.18)	-0.064 (-0.4)	-0.035 (-0.22)	0.002 (0.01)	-0.11 (-0.7)	0.24 (1.5)	-0.08 (-0.66)
Company 4	0.92[a] (7.3)	-0.09 (-0.58)	0.15 (0.88)	0.32 (0.20)	-0.11 (-0.74)	-0.20 (-1.2)	0.25 (1.48)	0.008 (0.06)
Company 5	1.16[a] (9.25)	-0.60[a] (-3.1)	0.56[a] (2.7)	-0.38[b] (-1.8)	0.39[b] (1.8)	-0.18 (-0.87)	0.02 (0.12)	-0.09 (-0.75)
Company 6	0.91[a] (7.7)	-0.08 (-0.5)	-0.13 (-0.84)	0.03 (0.17)	0.08 (0.52)	-0.07 (-0.43)	-0.07 (0.43)	0.18 (1.5)
Company 7	0.78[a] (6.4)	0.07 (0.5)	0.15 (0.98)	0.02 (0.16)	-0.042 (-0.26)	-0.12 (-0.79)	0.099 (0.63)	-0.03 (-0.27)
Company 8	0.87[a] (7.2)	-0.02 (-0.12)	0.10 (0.63)	0.02 (0.09)	-0.007 (-0.04)	0.04 (0.24)	0.02 (0.11)	-0.06 (-0.50)
Company 9	0.77[a] (5.8)	0.11 (0.65)	-0.05 (-0.33)	0.09 (0.56)	0.12 (0.69)	0.26 (1.5)	-0.30[b] (-1.7)	-0.06 (-0.44)

a and b indicates significance at 1% and 10% level respectively.
t - ratios in brackets

THE REGULATORY FRAMEWORK

The need for a proper and effective regulatory framework cannot be over-emphasized. Investors want a trading system where there is transparency in relation to trading activities, which encourages good financial conduct on the side of the corporate sector and provides timely disclosure of all material information to the investing public. However, given that information is very often asymmetric and that large sums of money are involved the SEC must see to it that investors, particularly the small and unsophisticated investors are adequately protected and that market integrity is observed. To achieve these objectives the SEC requires listed companies to publish half-yearly results and annual reports within set deadlines. Companies are also required to make full and timely disclosure of all material information. The SEC must also ensure that stockbroking companies which deal on the securities market are properly registered and comply with high standards of business practices and professional conduct. Moreover, the SEM has the obligation to report all mal practices to the SEC. The SEM is itself regulated by the SEC. All the rules of the SEM must be approved by the SEC. The Commission must also control and supervise the operation of the stock exchange.

- A new set of listing rules prepared by the SEM are currently being considered by the SEC. The listing rules are also being harmonized with the Listing Rules of countries in the SADC with the view to encourage cross-listing. There is also the intention to set up an independent Listing Department at the Stock Exchange.
- At present the SEM is owned and managed by the stockbrokers. Yet the SEM is required to monitor the activities of all stockbroking companies. There is an obvious conflict of interest. In order to promote the independence of the SEM, its management should be distinct from membership. In order to improve the management structure, the SEM is contemplating of opening up its capital structure to non-members.
- The establishment of a Compensation Fund for the protection of investors is also being envisaged.
- At present the SEC is constrained in its control and supervision of trading activities on the exchange. The Commission tries to detect practices that are likely to be harmful to the small and generally unsophisticated investor. It also attempts to detect movements on the market which may appear abnormal. With the move to fully automated trading in about a year, the SEC will be equipped with the necessary software for effective on-line market surveillance.

CONCLUSION

The Mauritius Stock Exchange has been in operation for slightly more than ten years. This study postulates that companies may be getting listed primarily with the view to enjoy tax benefits, rather than contributing to the development of an equity market. The market has been characterized by poor liquidity and high concentration. In order to correct the situation major reforms have only recently been implemented with regards to trading activity. Since November 1997 the market trades daily on the official market. A computerized system for the settlement and transfer of shares has been set up since January 1997. The market has been open to foreign investors since August 1994. There are also important projects in the pipeline such as the implementation of an automated trading system, new listing rules in harmonization with the listing rules of countries in SADC and the further reinforcement of the regulatory framework. Though the Stock Exchange of Mauritius is still at an early stage of its development path, the market indicators have not been very encouraging. The market also displays significant first order correlation in the weak-form. The author also contends that if the equity market in Mauritius is to assume greater significance, the major market players must have in view the important linkages between the primary market and the secondary market.

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