



The Stock Exchange of Mauritius Ltd (SEM)
(Member of the World Federation of Exchanges)

Laying the foundations of a new era:

Introducing SEM-7 Index Futures
& Single Stock Futures



Central Depository & Settlement Co. Ltd (CDS_

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1. Background

In their quest to move up in the value-chain of products traded on the Exchange, the SEM and CDS, subject to approval of the Financial Services Committee (FSC), are planning to introduce the trading and clearing of Index Futures during the financial year 2009/2010. In recent years, the trading of derivatives on Exchanges has gained growing momentum and has, in some cases, become the focal point of Stock Exchange operations, with volumes on derivatives surpassing volumes on cash instruments. Introduction of derivatives trading on many exchanges has had very positive impact on liquidity in the underlying instruments, enhanced the process of price discovery and enabled investors, both retail and institutional, to manage their investment portfolios in a more dynamic manner, better manage investment risks and enhance portfolio returns over time. Conscious of investors' need for new and innovative products that can ensure dynamic portfolio management, the SEM will, as a first step of a program that hinges on product innovation, introduce futures contracts on the SEM-7 index and on some of the most liquid stocks traded on the Official Market.

This Brochure summarizes the key benefits and risks associated with these new products, dwells briefly on their key characteristics and describes how they will be traded on SEM and cleared and settled by the CDS.

2. Introduction to Futures Contracts

2.1 What is a Future?

Broadly, a future is an agreement to buy or sell a particular asset on a specified future date at a price agreed upon today.

When an investor buys an index future (goes long), he agrees to buy the underlying index at a particular date in the future. His profit (loss) is dependent on where the price of the future is at expiry of the contract or at the time he closes out his position (i.e. buys it back).

When an investor sells an index future (goes short), he agrees to sell the index at a particular date in the future. His profit (loss) is dependant on where the futures price is at expiry or at a level at which he closes out the contract and the price at which you bought the contract.

3. Specifications of Futures Contracts to be introduced

In the initial phase, the SEM plans to introduce futures contracts on the SEM-7 Index and on a few liquid stocks traded on the Official Market.

Index futures enable investors to obtain benefits of the price movements of the constitutive stocks of the Index without the need of actually purchasing or selling the underlying stocks of the Index. Similarly, a Single-Stock future enables investors to obtain similar benefits without the need of acquiring or selling the Stock in question. The initial investment required to gain exposure to an Index futures or to a Single-Stock Future is only a fraction of the actual value of the index constituents or of the underlying stock.

Purchasing a SEM-7 Future constitutes a perfect substitute for holding the seven constitutive stocks of the SEM-7 Index without actually purchasing them.

The SEM will introduce SEM-7 Index Futures with a maturity of one month. The basis of quotation of each SEM-7 Index Future will be in index points, with each index worth Re 1. Each SEM-7 Index Future Contract will be equal to 100 SEM-7 Futures. For example, if an investor purchases 100 sem-7 Index futures Contracts at 310 points per contract, the value of his exposure will be equal to: $(100 \times 100) \times 310 = \text{Rs } 3,100,000$.

Single-Stock Futures on the liquid stocks traded on the Official Market will also have a maturity of one month. The basis of quotation of the Single-Stock Futures will be in rupees and each contract traded will be worth 100 Futures.

For example, if an investor purchases:

- 1) 100 contracts of Company X Futures at Rs 125 per contract, the value of his exposure will be $(100 \times 100 \times 125) = \text{Rs } 1,250,000$.
- 2) 200 contracts of Company Y Futures at Rs 70 per contract, the value of his exposure will be $(200 \times 100 \times 70) = \text{Rs } 1,400,000$.

3.1 Contract specifications: SEM-7 Index Futures

Abbreviated contract name	FSEM7-MONYY where: F - type of instrument SEM-7 - abbreviated name of underlying instrument MON - delivery month code (set by the Exchange) YY - two last digits of delivery year
Underlying instrument	SEM-7 Index
Basis of Quotation	Index points: One index point = 1 MRU
Tick size	1 MRU
Contract size	One Contract = 100 SEM-7 Futures
Delivery months	Three nearest of January through December
Last Trading Day	The last Friday of the delivery month. If this date is not a trading day, then the Last Trading Day before the third Friday of the delivery month. In exceptional cases, the Exchange may set the Last Trading Day to fall on a different date, but must disclose such information to the public at least 4 weeks in advance.
Expiry Date	The date on which the final settlement price is determined. The same date as the Last Trading Day.
First trading day of a new series	The first trading day following expiry of the previous contract. Set out by the Exchange for the first series in a class.
Daily settlement price	Daily settlement price is determined after each Session starting from the date on which the first transaction of a contract series was made, exclusive of the Expiry Date. Daily settlement price shall be the Closing Price of given contract series. If there is no trade in a Futures Contract on a day, the day's settlement price shall be the Theoretical Price of the Futures Contract on that day.
Final settlement price	Final settlement price is determined on the Expiry Date as the closing value of the SEM-7 Index determined as follows: calculation of the SEM-7 index at market close based on the Volume Weighted Average Price of all the index constituents during the trading Session of the Expiry Date. In case no transaction takes place in any of the index constituents on Expiry Date, the Volume Weighted Average Price on the last day on which that specific index constituent was traded, will be used.
Publication of the daily and final settlement price	Immediately following the close of trading.
Settlement method	Daily mark to market and cash settled
Margin Requirements	As set out in the rules of CDS
Market wide position limit per contract class	5% of the total number of issued shares for the index constituents
Position limit per investment dealer, inclusive of all its clients, for the contract class	1% of the total number of issued shares for the index constituents

3.2 Contract specifications: Single-Stock Futures

Futures contracts on Company X Abbreviated contract name	F-CompanyXMONYY where: F - type of instrument Company X - abbreviated name of underlying instrument MON - delivery month code (set by the Exchange) YY - two last digits of delivery year
Underlying instrument	Company X shares
Basis of Quotation	MRU
Tick size	The minimum price of a security by which the order price and the quotation price are altered. Tick size depends on the price level as per ATS Trading Procedures Section 4.6
Contract size	One Contract = 100 Company X Futures
Delivery months	Three nearest of January through December
Last Trading Day	The last Friday of the delivery month. If this date is not a trading day, then the Last Trading Day before the third Friday of the delivery month. In exceptional cases, the Exchange may set the Last Trading Day to fall on a different date, but must disclose such information to the public at least 4 weeks in advance.
Expiry Date	The date on which the final settlement price is determined. The same date as the Last Trading Day.
First trading day of a new series	The first trading day following expiry of the previous contract. Set out by the Exchange for the first series in a class.
Daily settlement price	Daily settlement price is determined after each Session starting from the date on which the first transaction of a contract series was made, exclusive of the Expiry Date. Daily settlement price shall be the Closing Price of given contract series. If there is no trade in a Futures Contract on a day, the day's settlement price shall be the Theoretical Price of the Futures Contract on that day.
Final settlement price	Final settlement price is determined on the Expiry Date as the closing value of the underlying stock (Company X) determined as follows: calculation of the underlying stock (Company X) at market close based on the Volume Weighted Average Price of the underlying stock (Company X) during the trading Session of the Expiry Date. In case no transaction takes place in the underlying stock (Company X) on Expiry Date, the Volume Weighted Average Price on the last day on which that specific underlying stock (Company X) was traded, will be used.
Publication of the daily and final settlement price	Immediately following the close of trading.
Settlement method	Daily mark to market and cash settled
Margin Requirements	As set out in the rules of CDS
Market wide position limit per contract class	5% of the total number of issued shares for the underlying stock (Company X)
Position limit per investment dealer, inclusive of all its clients, for the contract class	1% of the total number of issued shares for underlying stock (Company X)

4. Potential benefits of SEM-7 Index Futures or of Single Stock Futures

The introduction of index futures and single stock futures constitutes an important developmental step for the Stock Exchange environment in Mauritius and can generate a number of potential benefits for market participants, while laying the foundations for the upliftment of our stock market to yet another level. This section summarises some of the potential benefits that the new products can generate for investors.

4.1 Benefits from Directional Trading

4.1.1 Bullish View

If an investor believes, based on his own personal assessment of market trends, that the market is poised for an increase, he can buy SEM-7 futures contracts and make a profit if the market effectively goes up, pocketing thereby the gains from the upward price movements of the constitutive stocks without having to actually purchase and own the constitutive stocks, even on a temporary basis. If after a period of upward price movements, the investor believes that prices will start to decline, he may close his long position by selling the contracts before the expiry date.

Example:

An investor buys 1000 SEM-7 Index Futures on 15th July at 310 points per futures. On 25th of July, the investor feels that the market is poised for a correction and decides to close his position by selling the 1000 futures at 335 points per futures. Consequently, the investor will pocket a profit of $[1000 \times (335 - 310)] = \text{Rs } 25,000$.

4.1.2 Bearish View

If an investor believes that the market is poised to drop, he can sell the SEM-7 index futures contracts and make a profit if the market has effectively fallen, reaping thereby the benefits of directional trading at a relatively cheaper cost. If after a period of downward price movements, he believes that prices will start to rise, he may close his short position by purchasing the contracts before the expiry date.

Example

An investor feels the market is going to drop in the next two weeks. On 15th of July the investor sells 5000 SEM-7 Futures at 310 points. The market effectively drifts down and on the 25th of July the SEM-7 futures are trading at 295 points. If the investor feels that the market is poised for a rebound soon, he may be tempted to close his position by purchasing 5000 SEM-7 Futures at say 295 points per futures. In so doing, he pockets $[5000 \times (310 - 295)] = \text{Rs } 75,000$.

4.2 Benefit of Portfolio Hedging

If an investor owns a portfolio that broadly tracks the SEM-7 index and believes for instance, that the market is bound to fall, he can protect his portfolio by selling SEM-7 index futures. He can calculate the exact number of contracts that he needs to sell to achieve a quasi-perfect protection against downward market movements.

When an investor implements a hedging strategy using SEM-7 futures, any decrease (increase) in the value of his underlying portfolio will become compensated by an increase (decrease) in the value of the SEM-7 index futures contract.

Hedging via the sale of Index futures contracts enables an investor to achieve a number of objectives in an efficient manner, which can be summarized as follows:

- It enables the investor to hedge his exposure to the market without having to sell his entire portfolio of stocks.
- It enables the investor to lock in a particular return for an equity portfolio – e.g. the investor has already achieved a target return for a period and wants to lock this return in. He just needs to sell the number of index futures contracts that would enable him maintain this target return over a period of time.

Example to illustrate the use of SEM-7 Futures to hedge

A portfolio manager is concerned that the stock market will temporarily decline in the next few days. He does not wish to incur the commission costs and price selling pressure of selling stocks and then repurchasing them after the anticipated decline. Selling SEM-7 futures contracts can help him to hedge his portfolio against the suspected market decline.

Let's assume that the portfolio manager owns a portfolio of Rs 1million in stocks with a portfolio beta (sensitivity relative to the index) of 1.20 relative to the SEM-7 Index.

Suppose that the SEM-7 index is at 250 points and the SEM-7 futures price is also 250 points. How many SEM-7 contracts should the Portfolio Manager sell to achieve the perfect hedge of his portfolio against downward price movements?

Number of SEM-7 Futures Contracts to sell, given that one contract = 100 SEM-7 futures as per contract specifications defined earlier,

$$N = 1.2 \times (\text{Rs } 1,000,000/250) = 4800 \text{ contracts}$$

The manager should sell 4800 SEM-7 futures to ensure a perfect hedge of his portfolio.

4.3 A tool for dynamic portfolio Management

Index futures provides Portfolio Managers with an effective tool to dynamically manage their portfolios.

Example

A portfolio Manager has already achieved a return that has enabled him to outperform his benchmark during the first eleven months of the financial year. Suppose that he expects some of the stocks with strong weights in his portfolio to drop significantly during the last month of the financial year. The portfolio Manager can choose to lock in the performance of the first eleven months by selling Index Futures Contracts and/or Single-Stock Futures on those underlyings whose prices are expected to fall.

4.4 Other Potential Benefits

- The SEM-7 futures will enable an investor to gain exposure to the 7 largest stocks traded on the SEM at a fraction (~ 10 %) of the actual value of the stocks constituting the underlying index.
- Unlike traditional investment products which yield positive returns only when the market is rising, Futures enable investors to realise positive returns even in a declining market.
- SEM-7 futures will potentially enable an investor to ride the benefits of leveraging. By trading SEM-7 futures, an investor can have a relatively larger exposure to the underlying index constituents for a relatively small initial outlay. If the market evolution follows the investor's outlook, his ROI will be high due to effects of leveraging.

5. Risks associated with Futures Contracts

Trading in futures, as described earlier can generate a number of benefits but can also produce large losses if prices move in the opposite direction of positions taken on the futures market, due to the effects of leveraging. An understanding of leverage, how it can work either to one's advantage or disadvantage is absolutely essential to an understanding of futures trading.

Only a relatively small amount of money (known as margin) is required to buy or sell a futures contract. Margin requirements vary generally between 7% and 10% depending on a number of characteristics of the underlying financial instrument to the futures contract. Consequently, an investor can potentially obtain an exposure worth 10 to 15 times the value of his margin. The smaller the margin in relation to the underlying volume of the futures contract, the greater the leverage.

If an investor trades in futures by taking a directional view of near-term market movements, and the price moves in the direction he anticipated, high leverage can yield large profits in relation to the initial margin deposit. But if prices move in the opposite direction, high leverage can produce large losses in relation to his initial margin deposit. Leverage is a two-edged sword.

Example

An investor feels that the price of Company X shares will fall and chooses to sell 10000 futures of Company X at the price of Rs 70 per futures. Assuming that an initial margin of 7%, is required to trade in Company X futures, the investor will need to deposit 7% of 0.7 [10,000x70] = Rs 49,000.

Let suppose that the price of Company X shares increase to Rs 80 two weeks later and the investor chooses to close his position, fearing further increases in Company X share price. He, therefore, purchases 10,000 Company X futures contracts at Rs 80 per contract. In so doing, he loses [10,000x(Rs 80 – 70)] = Rs 100,000.

The investor's trade results in a loss equal to 204 % of his margin deposit of Rs 49,000. That is the arithmetic of leverage.

An absolute requisite for anyone considering trading in futures contracts is to clearly understand the concept of leverage. It is important to calculate precisely the gain or loss that would result from any given change in the futures price of the contract that one would be trading.

If an investor cannot afford the risk or is uncomfortable with the risk, he should refrain from trading futures contracts. These products are meant for investors who have a sound understanding of the underlying risks and are prepared to take those risks.

6. Trading of SEM-7 Futures Contracts and Single Stock Futures on the SEM

- Trading of the SEM-7 futures on SEM will be done in accordance with the trading procedures and rules that have been specifically designed for the SEM derivatives segment.
- The SEM-7 Futures will be traded in a similar manner as other instruments that are currently traded on the other boards of the SEM.
- The matching principles will be the same and will be guided by the price/time priority attribute.
- A separate Derivative Board will be set up by SEM and brokers and Investors, via, I-net will be able to follow the order books of the derivative products as well as other key underlying market data in real time.
- Two key differences between a cash instrument and a futures instrument essentially lie in the introduction of the concepts of mark-to-market and margin requirements.
- The following examples describe how clearing and settlement of SEM-7 Futures contracts and Single Stock Futures will be handled by CDS and how risk-management will be effected.

7. Clearing and settlement of futures transactions by the Central Depository & Settlement Co. Ltd (CDS)

7.1 Difference between futures and shares transactions

The fundamental difference between futures and shares transactions is the clearing and settlement process. If an investor buys shares for a value of Rs 100,000, the investor will need to make a payment of Rs 100,000 to its broker three business days after the trade date (T+3) and will receive the shares in return. On the other hand if an investor buys futures for a value of Rs 100,000 (say 1,000 contracts @ Rs 100 per contract), it does not have to make a payment of Rs 100,000. The investor must only deposit a percentage of the transaction value (usually around 7 to 10%) with its broker before placing the order. Investors who uses the services of a custodian bank, must deposit the margin with the latter. The money deposited with the broker is called margin and is used as a guarantee that the investor will make payment if it makes a loss on the futures transaction. The process of calculating the profit or loss on a futures transaction is called mark to market and is performed on a daily basis until the expiry of the contract. An investor who buys futures will make a profit if the price of the contract goes up. Conversely, the investor will make a loss if the price of the contract goes down. The profit or loss on a futures transaction that is calculated everyday, is settled on the next business day. The investor will have to enter into an agreement with its broker for managing the cash deposited (margin) and making/receiving payment for the daily profit/loss on the futures position. The margining, mark to market and settlement processes are explained below.

The other major difference between futures and shares transactions is that when an investor sells shares, it must first own the shares, however, in the case of futures the investor does not need to own any shares or

futures contract to be able to sell a futures contract. When selling a futures contract, the investor simply takes a short position and it will have a negative balance in its securities account. An investor will normally take a short position, i.e. will sell futures, if it is of the view that the price or value of the underlying security or index will go down in the future. Again, before selling futures, the investor will need to deposit margin (usually 7 to 10% of the transaction value) with its broker. An investor who takes a short position (i.e. sells futures) will make a profit if the price of the contract goes down. Conversely, the investor will make a loss if the price of the contract goes up.

The margin required will be calculated on a daily basis and will depend on the volatility of the underlying instrument. It will generally be around 7 to 10 %. The practical example below illustrates the margining, mark to market and settlement processes.

7.2 Practical Example

Broker A has two clients X and Y. X thinks that the SEM-7 will go up in the next 3 months while Y thinks the contrary – this means that X would like to go long (buy SEM-7) while Y would like to go short (sell SEM-7 contracts). Both clients must deposit margin (any form of collateral) with Broker A to be able to trade in futures. Broker A must in turn deposit margin with CDS to be able to trade in futures. The automated trading system will automatically check whether the broker and its clients have deposited sufficient margin before accepting an order from the broker and its clients.

7.2.1 Maximum Allowable Exposure

Say the margin requirement on a particular day (mean absolute daily value change of SEM-7 plus 3.5 standard deviations calculated over the last 30 days) is 10% (this will change on a daily basis depending on volatility of SEM-7). If both clients X and Y deposit Rs 30,000 with Broker A, each will be able to take positions in futures up to a maximum allowable exposure of Rs $30,000/10\% = \text{Rs } 300,000$. If Broker A deposits margin for the amount of Rs 100,000 with CDS, it will be able to open positions for its clients and for its own account up to a Maximum Allowable Exposure of Rs 1,000,000.

7.2.2 Trading and Exposure

Say the current value of the SEM-7 is 245. Client X buys 1,000 SEM-7 contracts at Rs 250 while Client Y sells 1,000 contracts at Rs 250. Broker A buys 1,000 contracts at Rs 252 for its own account. Each client will have an exposure of Rs 250,000 which is still below their Maximum Allowable Exposures. Broker A will have a total exposure of Rs 752,000 ($250,000+250,000+252,000$) which is still below its Maximum Allowable Exposure of Rs 1,000,000. Broker A and its clients will not be allowed to place new orders if the orders can potentially cause their Maximum Allowable Exposure to be exceeded.

7.2.3 Mark to Market on the First Day

Say at the end of the first day, the closing price of the SEM-7 futures increases to Rs 253. Client X (who bought the SEM7 futures at Rs 250) will make a profit of Rs 3,000 ($(253-250) \times 1000$). Client Y (who sold the SEM7 futures at Rs 250) will make a loss of Rs 3,000. Broker A (who bought the SEM7 futures at Rs 252 for its own account) will make a profit of Rs 1,000 on its proprietary account. On the next day (T+1), Broker A will receive a net amount of Rs 1,000 ($3,000-3,000+1,000$) through the CDS settlement mechanism. Client X will need to pay Rs 3,000 to Broker A while Client Y will receive Rs 3,000 from Broker A. Both clients will need to enter into agreement with the broker for the cash management and the frequency of payment/receipt of profits/losses.

7.2.4 Mark to Market on Other Days

Say on the next day, the closing price of the SEM-7 futures decreases 251. Assuming that Broker A and its Clients do not do any other trades in futures, Client X (who has a long position) will make a loss of Rs 2,000 ($(251-253) \times 1000$). Client Y (who has a short position) will make a profit of Rs 2,000. Broker A will make a loss of Rs 2,000 on its proprietary account. On the next day, Broker A will need to pay a net amount of Rs 2,000 through the CDS settlement mechanism. Client X will receive Rs 2,000 from Broker A while

Client Y will now need to pay Rs 2,000 to Broker A. Such mark to market will be done a daily basis up to the day preceding the expiry date of the contract.

7.2.5 Final Mark to Market

Say on the expiry date of the contract (after 3 months), the value of the SEM-7 is 275 and that the closing price of the SEM-7 futures on the previous day was 270. On that day, Client X (who has a long position) will make a profit of Rs 5,000 $((275-270) \times 1000)$ while Client Y (who has a short position) will make a loss of Rs 5,000. Broker A will make a profit of Rs 5,000 on its proprietary account. On the next day, Broker A will receive a net amount of Rs 5,000 through the CDS settlement mechanism and the position in all accounts will be reset to 0. Client X will receive Rs 5,000 from Broker A while Client Y will need to pay Rs 5,000 to Broker A.

7.2.6 Effective Profit / Loss over 3 Months

Client X (who had a long position) will make a profit of Rs 25,000 $((275-250) \times 1000)$ over a period of 3 months with an initial deposit of Rs 30,000 which will be returned to it by the broker upon request. Client Y (who had a short position) will make a loss of Rs 25,000 over a period of 3 months but the initial deposit of Rs 30,000 will still be returned to it by the broker upon request. Broker A will make a profit of Rs 25,000 on its proprietary account with a deposit of Rs 100,000 (out of which Rs 60,000 was funded by its clients).

7.3 Management of Counterparty Risk

The CDS will set up a guarantee fund mechanism to manage a situation where a broker fails to make payment for losses. The guarantee fund mechanism has been designed in such a way that a default in the futures market will not contaminate the cash market and will also not affect the financial soundness of CDS. If the amount required to make good a default is higher than the total resources available to the Guarantee Fund, CDS shall close the net open positions relating to the excess, off-market by compulsorily reducing the opposite net open positions in all securities accounts registered with all other participants on a pro-rata basis. Such a measure is crucial because the liability of CDS and the Guarantee Fund cannot be left open-ended

If a broker's client fails to make payment to the broker for any loss, the broker will use the margin deposited by the client to settle the loss. The broker may then close the open positions of the client by executing offsetting orders on the trading system.

8. How to trade in futures?

To trade in futures, an investor just need to contact its broker or custodian bank. If the investor already has a CDS account, it does not need to open a new account. The contact details of all brokers that trade on the SEM can be found on the following website: www.stockexchangeofmauritius.com