BUILDING AFRICAN FINANCIAL MARKETS CAPACITY BUILDING SEMINAR

THEME: ADDRESSING LIQUIDITY CONCERNS IN AFRICAN CAPITAL MARKETS

DATE: APRIL 28th-29th 2016 VENUE: THE NIGERIAN STOCK EXCHANGE, LAGOS

#BAFMSeminar





BUILDING AFRICAN FINANCIAL MARKETS Instituting an Optimal Price Mechanism on African Stock Exchanges

Presented by

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Executive Director, Market Operations and Technology

28 April 2016

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- Introduction to Price Mechanism
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- Capital Market Mechanisms
- Determinants of Capital Market Trading Rules
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- Importance of Transaction Cost Analysis
- Market Quality and Optimal Pricing Mechanism
- Closing Price Mechanisms
- Optimizing Price Mechanisms
- Conclusions

12 • Q & A

The true price of anything is the

amount of life you give up for it.

Introduction to Price Mechanism



Definition

- A price mechanism/system, is the interaction of buyers and sellers in free markets that enables goods, services, and resources to be allocated prices.
- A price mechanism has rationing, signaling and incentive functions.
- A market starts with a stable equilibrium (demand = supply).
- Relative prices, and changes in price, reflect the forces of demand and supply.

Supply Side Shock





Source: economicsonline

Overview of Market Structures and Design



Nature and Function of Securities Markets

- The main assumption underlying the equilibrium price that emerges from the intersection of supply and demand curves is that we have ignored the structure of these markets, taking for granted that somehow the interested buyers and sellers of commodities will find their way to the marketplace.
- In practice, bringing all buyers and sellers together is not quite so simple.
- Securities markets are organized to help bring buyers and sellers together, such that both parties to the transaction are satisfied that a fair transactions price, close to the true equilibrium price, has been arranged.
- Markets that trade existing securities are organized as either auction, broker, or dealer markets.

Types of Markets



MS is the rule of engagement for all participants.

The Nigerian Stock Exchange

Capital Market Mechanisms



THE Nigerian STOCK

Closing

Auction

MMQ

MO, LO,

SO, SL

SO – Stop Orders

SL – Stop Limit

- Market structures have converged towards hybrid systems in which a central role is given to order-driven trading.
- The two main equity reforms of the late 1990's of the NASDAQ market and the London Stock Exchange (LSE) were both moves in this direction in that limit order trading was introduced to markets previously structured as pure dealerships.
- The size of price concession needed to trade immediately depends on the number of traders, and each market ٠ mechanism has its niche.
- Actual markets do not conform to simple structures. Indeed, they typically involve more than one structure. •

Determinants of Capital Market Trading Rules



- Market microstructure refers to the process and outcomes of exchanging assets under specific set of rules. It focuses on how specific trading mechanisms affect the price formation process.
- The rules by which trades occur determine how market structures work and thus how prices are formed. So what is more important is not the operation of any specific trading mechanism, but rather the rules by which trades occur.



Microstructure and Investment Decisions



• Market microstructure determines the efficiency of markets



Importance of Transaction Cost Analysis



Exchange Explicit and Implicit Costs



- Secondary markets work well if they bring together buyers and sellers of securities so that they transact at prices close to the true equilibrium price. Markets that accomplish this objective have low transactions costs and are considered liquid.
- Until now, we have focused on implicit trading costs which are generally best understood as being the average difference between a market mid-price at the point at which an investor wishes to trade and the average execution price achieved when completing that entire order.
- However there are other costs associated with trading in securities markets such as explicit costs.

Market Quality and Optimal Pricing Mechanism



Outcomes of Optimal Pricing

- Optimally priced securities tend to have more liquidity over sub-optimally priced securities.
- Investors place a positive value on liquidity, thus all other things being equal, more liquid securities sell for higher prices than less liquid securities.
- Charts 3 & 4 below shows the Volume and No. of Deals traded on two securities on the NSE over a one year period.
- With tangible stability gained over a period of time, investors' confidence become a perceptive index for optimal pricing.

Volume Traded: GTB Vs. BetaGlas



2 Opening and Closing Prices: GTB Vs. BetaGlas

	Best Bid (₦)	Best Offer (₦)	Spread (웦)
BETAGLAS	45.95	46.24	0.30
GTB	16.07	16.10	0.03

Prices as at 26th April 2016 @ 11:17



Number of Deals: GTB Vs. BetaGlas

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Stock Exchange Trading Schedules...1/2



New York Stock Exchange (NYSE) Trading Schedule

Opening Auction		Closing Auction			
Pre-open 7:30am – 9:30am		Continuous Trading 9:30am – 4:00pm			Close
	9:00am - 9.20am	9:28am – 9:35am	3:45pm – 3:59:55pm	3:58pm – 4:00pm	4:00pm
	Data is published at one-minute intervals final ten minutes prior to the market open is every 15 seconds	Likely opening price for each security is added to the published date stream. Orders placed between 9:28am and 9:35am cannot be canceled	Information about trading volume, matching trades, trade imbalances and pricing is released	Market on Close (MOC) and Limit on Close (LOC) orders are final and no longer canceled	Market Closes

Reference Price = Previous Close Regular orders that start to come in when the market officially opens at 9:30am are also factored into the closing price, as are a special type of orders knows as the Closing Offset Order (CO)

Stock Exchange Trading Schedules...2/2



Nigerian Stock Exchange (NSE) Trading Schedule

Pre-open 9.30am - 10.05am	Pre-Open Adjust 10.05am - 10.15am	Continuous Trading 10.15am - 2.:30pm			Close
			Pre-Close 2.10pm - 2.20pm	Pre-Close Adjust 2.20pm - 2.30pm	2.30pm
	Market Makers address imbalances and provide liquidity	Traders can enter orders	Traders can enter orders Indicative closing price is continuously published to the market	Traders can only enter orders in Continuous book No publication of market prices during this period	Market Closes
⁺ 5% Price Limit		⁺ 5% Price Limit			1
Reference Price = Previous Close		New Reference Price is calculated after Pre- Open Adjust session		Closing Price is calculated after Pre-Close Adjust session	

Closing Price Mechanisms



Types of Closing Batch Mechanisms

- Traditionally, a stock's closing price has simply been its last-traded or volume-weighted average price.
- However, amid mounting concerns over price manipulation, stock exchanges are increasingly turning to closing batch mechanisms to calculate closing prices.



Optimizing Pricing Mechanisms



- An optimal pricing mechanism is achievable through an optimization of the market micro-structure of the Exchange because the market micro-structure underpins the price discovery process.
- Beyond the market micro-structure of the Exchange, factors that are necessary in achieving an optimal pricing mechanism include:







Price Mechanism determines:

- 1. Whether a market will attract and retain investors and participants (Market Quality);
- 2. The price of securities;
- 3. The liquidity of a market in attracting both foreign and domestic flows; and
- 4. Facilitates 'Best Execution'.

"When you place an order to buy or sell stock, you might not think about where or how your broker will execute the trade.

But where and how your order is executed can impact the overall costs of the transaction, **including the price** you pay for the stock."

~The Securities and Exchange Commission

Price is what you pay,

Value is what you get.

~Warren Buffet



THANK YOU Questions & Answers

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Stock Market Pricing Methodologies



Bayesian Learning – Learning Based Model

• The key to extracting information from order flows is Bayesian learning.



Dealer Pricing- Information Based Model

In information-based models:

- The solution to the learning problem determines the prices set by market makers.
- They highlight the role of market parameters such as the size of the market or the ratio of large to small trades in the adjustment of prices.

Prior belief about the
true value (V) of an
assetBUY (V =
$$\overline{V}$$
)
SELL (V = \underline{V})Posterior belief \mathbf{a}_t
Posterior belief \mathbf{b}_t Definitions
 $a_t = Ask$ Price
 $b_t = Bid$ Price
(V = \underline{V}) = V is lower than market makers prior belief given that a trader wishes to trade
(V = \overline{V}) = V is higher than market makers prior belief given that a trader wishes to trade
Source: Bank for International

Efficiency of Secondary Market Trading



Market Efficiency

- The operating efficiency of secondary markets is measured by how closely actual transactions prices conform to theoretical equilibrium prices.
- A narrow bid-asked spread in a dealer market produces transactions prices that are close to the true equilibrium price.
- Other dimensions to operating efficiency include the size of order that can be accommodated at a given quotation.
- Unlike Exchanges, OTC markets have never been a "place." They are less formal, although often wellorganized, networks of trading relationships centered around one or more dealers.
- Dealers act as market makers by quoting prices at which they will sell (ask or offer) or buy (bid) to other dealers and to their clients or customers.
- However, that does not translate into quoting the same prices to other dealers as they post to customers, and they do not necessarily quote the same prices to all customers.
- Moreover, dealers in an OTC security can withdraw from market making at any time, which can cause liquidity to dry up, disrupting the ability of market participants to buy or sell.

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Strengthening Equity Market Structures in Africa To Better Address Low Liquidity

Temi Popoola, CFA

28th April 2016



Outline

- Introduction
- Market Structure Today
- Enhancing Market Structure Key considerations
- Enhancing Market Structure Recommendations
- Conclusion

Introduction

Introduction

- Africa is increasingly funding Africa
- Liquidity is best described by three measures size, price and time
- Liquidity is important due to its close relationship with asset pricing and trading behavior
- Liquidity is an important issue in market microstructure theory and empirical work
- Innovation, regulation and competition are the foundation for a liquid, well developed market

Market Structure Today

Current state (1 of 2)

- Investors are doing better today than they did in the old manual markets
 - Cost of execution
 - Intraday volatility
 - Bid/Ask Spreads
- Markets are now dominated by computer algorithms which generate orders at a volume and speed that have transformed the nature of trading
- There is however, a need for improvement in certain aspects of market structures across Africa

Current State (2 of 2)

- Not everyone is benefiting from some of the improvements and advancements of recent times
- Some improvements not being enjoyed due to excessive intermediation
- Market has evolved faster than structure

Market Structure – Key Considerations

Considerations

- The market exists for investors and public companies and their interests must be paramount. All issues must be evaluated through the prism of capital formation for public companies
- One market structure does not fit all
- Assumptions about long-standing rules and market practices must be tested. Market based solutions should be explored

Market Structure – Recommendations

Recommendations (1 of 10)

Technology

- Nothing evidences the impact of technology more than Direct market access
- Allows investors trade directly with market makers or specialists
- Stock broker and/or agent interface reduced or eliminated
- Front end trading software and high speed computer access to stock exchanges
- Speedy execution, cost reduction, slippage, control

Recommendations (2 of 10)

- Tick Size
 - Tick size is the minimum variation of price movement allowed in a trading mechanism
 - It acts like the binding constraint for the bid-ask spread in the asset pricing equilibrium
 - Small tick size will lower trading costs and lower spreads. It will help arbitrageurs and improves queue wait time
 - Tokyo stock exchange heeded to investor demands in Jan 2014 and reduced tick sizes by 50-90%

Recommendations (3 of 10)

- Transparency and disclosure for investors
 - Increased transparency will increase investor confidence, which is essential to a robust equity market system that can stimulate growth in Africa
 - Recommendations for Retail Investors
 - Recommendations for Institutional Investors

Recommendations (4 of 10)

- Fragmentation of exchanges
 - In the US, there are 11 exchanges, more than 40 alternative trading systems, and more than 250 broker dealers
 - Keeps trading fees low
 - Encourages diversification of services
 - Can help avoid trading disruptions if one venue has an isolated problem
 - Can introduce new challenges of its own

Recommendations (5 of 10)

- Preventing market instability
 - The risk of instability and disruption is one of the biggest risks facing the market today
 - Technology has greatly market efficiency but it can also allow problems develop very quickly
 - Technology audits encouraged
Recommendations (6 of 10)

- Building quality markets for smaller companies
 - Number of IPOs declining
 - Even worse for smaller companies
 - Explore pilot program to allow wider tick sizes for the stock of smaller companies (one size does not fit all)

Recommendations (7,8,9 and 10 of 10)

- Securities Lending
- Data Dissemination
- Fee reduction
- Limit-up, Limit-down considerations

Conclusion

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BOURSE REGIONALE DES VALEURS MOBILIERES (BRVM)

Capital Market Integration - A Catalyst For Boosting Liquidity On African Stock Exchanges

Birahim DIOUF Director Studies, Strategy And Market Development

Lagos, 28 April 2016











African capital markets : recent developments





Despite the encouraging results, African capital markets face many challenges

Low market liquidity	 In 2014, the turnover on African stock exchanges was an average of 9% compared to 72 % in Brazil; 41 % in Russia; 123 % in Japan; 106 % in Korea. <u>Turnover 2014 BRVM</u>: 2,59 % <u>In 2015</u>= South Africa, 41,3 %; Egypt, 24,12 %; <u>BRVM, 3,76 %</u>
Small size of equity markets	 Market Cap in % GDP in 2015 = Nigeria: 10 %; Kenya: 29,9 %; Morocco: 45 %; BRVM: 14,3 %; compared to 146,47 % in India and 109,88 % in China.
Small number of listed companies	 382 listed in South Africa 252 listed companies in Egypt 184 listed companies in Nigeria 75 listed companies in Morocco and 72 in Mauritius 39 listed companies in BRVM About 2 000 listed companies in African exchanges, <u>compared to :</u> 7 630 in India and 4 693 in China.
Difficult access of SMEs to market	 Listed SMEs in 2014 : 61 in South Africa ; 48 in SE Mauritius ; 33 in Egypt ; 13 in Morocco ; 10 in Botswana ; 9 in Namibia ; 4 in Kenya ; 1 in Ghana. <u>BRVM: none</u>
Low intervention of international investors	 From 1990 to 1995, net investment inflows into Sub-Saharan African countries were 10 times lower than those recorded in the countries of Latin America. 2014: FDI inflows to Africa have stagnated at \$ 54 billion compared to \$ 465 billion for developing countries in Asia and \$159 billion to countries in Latin America and the Caribbean.

Low savings rates and low banking rates	 Savings rate in 2015 : South Africa (15.6% of 49 % in China, 47% in Singapore (2014). 23 % of adults in Africa have a bank account 	GDP) ; UEMOA (17.5 compared to 41 % in	%) ; CEMAC (21%) ; compa developing countries .	red to
Low demand	 Low financial market culture. Low intervention of institutional investors 			
Low private sector bonds issuance	 In WAEMU (1998-2015) : 4 253 billion FCFA r private sector, (12.8 %). 	aised in the bond m	arket, 546 billion issued b	oy the
Risk perception of local and foreign investors	 Insufficient information to understand the ris companies, little or no ratings by recognized Lack of reliable and structured information. 	sks : opacity of publi rating agencies, etc	c finances, accounts unce	rtified
Low dissemination of financial information	 <u>2011 Information Disclosure Index</u> (scale from 0 to 10): Eastern Europe and Central Asia Middle East and North Africa High-income economies of OECD East Asia and Pacific Sub-Saharan Africa South Asia Latin America and Caribbean 	6,3 6,3 6 5,2 <u>4,8</u> 4,4 4,1	Index in 2015: • Libya • Kenya • Algeria • Angola • Liberia • Namibia • Morocco • Nigeria • Egypt • South Africa	1 3 4 4 5 6 7 8 8

What are the challenges and approaches to solutions?



... 3 major areas for deepening African markets





Capital markets integration increase liquidity ?

.....Capital markets integration increase liquidity?

Capital markets integration

aims to foster stronger, sustainable economic growth by:

- creating deeper and more integrated capital markets between countries;
- removing barriers to cross-border investments;
- increasing competition and reducing costs of raising capital;
- improving access to financing for businesses, especially for Small and Medium-sized Enterprises (SMEs).

Financial markets liquidity

- refers to the ability to execute large transactions with limited price impact with low transaction costs and immediacy in execution.
- facilitates the global flow of capital between investors, or savers, and borrowers.
- facilitates the distribution of financial risks to market participants;
- helps market participants to effectively manage risks and their own funding needs.
- is necessary for the effective generation and dissemination of issuer information.
- Deep and liquid financial markets are important for the effectiveness of monetary policy to financial stability.

Benefits of financial markets liquidity



Financial markets liquidity facilitates the efficient allocation of economic resources through a number of channels:

- Liquid capital markets facilitate the distribution of financial risks to market participants ;
- Market participants require liquid markets in order to effectively manage risks and their own funding needs ;
- It enables investors to manage and hedge against risks, as well as adjust their portfolios effectively ;
- Liquidity is necessary for the effective generation and dissemination of issuer information ;
- The effectiveness of monetary policy depends on liquidity conditions in financial markets. Deep and liquid financial markets are important to financial stability ;
- Efficient capital markets facilitate the global flow of capital between investors, or savers, and borrowers.

What does it mean for issuers when it comes to raise funding....

.... Quest for liquidity driving capital market integration.....

According to a PWC survey, for 62% respondents, liquidity is the most important factor for issuers when choosing a stock market for an IPO?



The survey shows also that <u>74% of emerging market companies</u> will look to another emerging market instead of a developed market for secondary listing. This strategy will drive capital markets consolidation programs.... Integration is already happening in developed an emerging markets with all the stock exchanges consolidation programs and gathering :

In Europe : London Stock Exchange (LSE) merger with Borsa Italiana in 2008 and the merger of NYSE Group and Euronext in 2007.

In Latin America, the Integrated Latin American Market (MILA), which connects the stock exchanges of Bogotá (Colombia), Lima (Peru) and Santiago (Chile), aims to develop the importance of the listing venues of individual economies by pooling resources and liquidity.

<u>Singapore Exchange (SGX)</u> is also trying to create a deep pool of regional liquidity, and is doing so by pitching itself as a gateway to Asia. In 2012, Malaysia, Thailand and Singapore launched the ASEAN trading link to offer easy access to each other's stock markets.

BRVM an example on how capital markets integration can pool liquidity.

Fiction : If BRVM <u>was composed of 8 separated domestic stock exchanges</u> the liquidity in some markets would be to low to attract investors and support economic growth...



BRVM Case Study : A stock exchange with a unique profile

... The Bourse Régionale des Valeurs Mobilières

□ Started operating in September 1998

- Fully electronic stock exchange and compliant to international standards
- Common stock exchange for the 8 countries of the West African Economic and Monetary Union (WAEMU) : Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo
- Only single unified, fully-integrated regional stock exchange in the world
- Successful political, institutional and technical capital market integration
- Demutualized Stock Exchange
- Shares are lodged in a fully dematerialized CSD and has a settlement guarantee fund to mitigate settlement risk



<u>BRVM</u> : 5th most attractive and promising African stock exchange



Market performance as of 31st December 2015: BRVM ranks 1st in 2015

african markets

<

Weekly market performance 31 December 2015

Selected	Index	Index Index		Year-To-Date returns		
markets	name	level	Local	Local	USD	EUR
			% chg	% chg	% chg	% chg
Botswana	BSE DCI	10,602.32	-0.03	11.58	-5.49	5.33
	BRVM-CI	303.93	3.78	17.77	2.77	17.90
Egypt	EGX 30	7,006.01	2.84	-21.52	-28.28	-20.12
💶 Ghana	GSE-CI	1,994.91	0.31	-11.77	-25.45	-16.98
💶 Kenya	NSE ASI	145.70	2.24	-10.55	-20.78	-11.75
Mauritius	SEMDEX	1,811.07	0.79	-12.67	-22.65	-13.79
Morocco	MASI	8,925.71	0.37	-7.22	-15.60	-5.57
🟏 Namibia	NSX OI	865.49	-2.61	-21.18	-41.04	-34.39
Nigeria	NGSE ASI	28,642.25	6.59	-17.36	-24.20	-15.40
≽ South Afric	a JSE ASI	50,693.76	-1.23	1.85	-23.81	-15.23
🖊 Tanzania	DSE ASI	2,333.76	0.56	-7.38	-25.23	-17.29
Tunisia	TUNINDEX	5,042.16	1.16	-0.94	-9.68	1.01
	USE ASI	1,763.75	1.40	-8.47	-24.68	-16.16
Zambia	LuSE ASI	5,734.68	0.39	-6.73	-45.93	-39.56
📜 Zimbabwe	ZSE Ind.	114.85	0.65	-29.45	-29.45	-21.38

www.african-markets.com

BRVM: <u>A booming stock market</u> ...

Market cap > 7,000 XOF billion (\$12 Bn)





Current integration projects

Current African stock exchanges integration projects

AFRICAN UNION

Project to create a "Pan African Stock Exchange"

Steps:

- 1. Encourage consolidation of national exchanges in regional stock markets (in progress)
- 2. Implementation of the "Pan African Stock Exchange"

SOUTHERN AFRICA (SADC)

 Project to create a common trading platform to SADC (14 countries).

Steps:

- 1. Adoption of a trading system, clearing and settlement automated and interconnected Regulation (realized)
- 2. Harmonisation of national stock exchange listing rules (realized)
- 3. Harmonization of accounting rules (in progress)
- 4. Harmonization of Technical Development (in progress)
- 5. Implementation of the common market (forthcoming)

EAST AFRICA

 Project to create a common trading platform for Kenya, Uganda, Tanzania and Rwanda.

Steps:

- 1. Harmonization of national rules of trading, clearing and settlement (realized)
- 2. Establishment of a regional trading system (in progress)
- 3. Implementation of the common market (forthcoming)

WEST AFRICA

 Integration of the ECOWAS securities exchanges (BRVM, Ghana Stock Exchange, Nigeria Stock Exchange, Sierra Leone Stock Exchange, Bolsa De Valores De Cabo Verde): WACMI

Steps:

- 1. Sponsored access (in progress)
- 2. Implementation of Qualified West African Brokers and mutual recognition of visas (in progress)
- 3. Launch of a common trading platform (forthcoming)

The future of ECOWAS capital markets with the WACMI

Before WACMI	After
NIGERIAN STOCK EXCHANGE• Equitie Market cap: \$ 60.88 bn• No of listed companies: 192• No of brokerage firms: 172	WEST AFRICAN SECURITIES MARKE (WASM) Integrated Market Profile
• Equity Market cap : \$ 5.06 bn	
 No of listed companies : 37 No of brokerage firms : 34 	Total Market cap : US\$ 76.89br
BRVM	7% of African continent Market c
 Equity market cap : \$ 10.87 bn No of listed companies : 39 No of brokere so firms 	273 listed companies
• NO OF DFOKETage Hirlis : 21	233 Brokerage Firms
CAPE VERDE STOCK EXCHANGE• Equity Market cap: \$ 89 m• No of listed companies: 4• No of brokerage firms: 5	2nd financial Market after
SIERRA LEONE STOCK EXCHANGE • Equity Market cap : N/A • No of listed companies : 1 • No of brokerage firms : 1	Johannesburg Stock Exchang

BRVM countries : BENIN, BURKINA FASO, COTE D'IVOIRE, GUINEA BISSAU, MALI, NIGER, SENEGAL & TOGO)

THANK YOU FOR YOUR KIND ATTENTION







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#BAFMSeminar





Securities Lending

by Segun Sanni Head, Investor Services(West Africa) Stanbic IBTC Bank

Building African Financial Markets (BAFM) Capacity-Building Seminar April 2016



Outline





What is Securities Lending?

Securities Lending describes the market practice by which, for a fee, securities are transferred temporarily from one party, the lender, to another party, the borrower, who collateralizes the loan and is obliged to return them either on demand or at the end of the agreed term.

- Absolute legal title over both lent and collateral securities passes between the parties
- Once securities have been acquired, the new owner(the borrower) has certain rights e.g. to sell or vote at general meetings



What is Securities Lending (cont'd)?

- The borrower is legally entitled to the economic benefits of owning the borrowed securities
- The fundamental principle of securities lending is that the lender be kept in the same economic position as if he never lent out the securities at all



Benefits of Securities Lending

To Lenders

- Additional income from investment portfolios
- Market liquidity by increasing the number of potential sellers and buyers in the market

To Borrowers

- Market making without having to carry inventory
- Failed trade protection(Covered short selling)
- Additional Income
- Market liquidity by increasing the number of potential sellers and buyers in the market
- Hedge against volatility



Benefits of Securities Lending (cont'd)

To Lending Agents / Intermediaries

- Income
- Increased business volumes

To the Market

- Market Liquidity by increasing the number of potential sellers and buyers in the market
- Price discovery: Efficient pricing and market depth
- More competitiveness of market



Benefits of Securities Lending (cont'd)

To the Market (cont'd)

- More confidence and attractiveness of market
- More business for brokers, hedge funds etc.
- Elimination / reduction of trade fails
- Financial system stability on account of better liquidity and hedging.

To the Issuers

- Efficient Pricing
- Market liquidity by increasing the number of potential sellers and buyers in the market



Benefits of Securities Lending (cont'd)

To the Depository & Exchange

- Additional income
- Increased asset levels in depository

To Regulators

- More efficient markets
- More attraction for FPIs
- Increased market liquidity
- Increased confidence and competitiveness
- Increased revenue
- Better risk mitigation


What is Liquidity?

• If there is a single, most important quality that securities markets require to function successfully and to grow, it is liquidity; the ability to buy and sell substantial investment positions quickly, smoothly and with minimal impact on the market.



Liquidity encourages financial system stability and promotes confidence.

 As former Fed Chair, Alan Greenspan, noted, the existence of strong capital markets alongside well regulated banking systems may help insulate a nation's whole financial system from systematic risk by producing alternative sources of liquidity and financing that can be tapped whenever the banking systems or securities market are in short term crisis.



Impact of Securities Lending on Market Liquidity (cont'd)



We must foster liquidity in our markets as an overarching objective for growth, depth and stability.



Liquidity can be analyzed in 3 major related ways:

- **Tightness:** How far transaction prices diverge from mid-market prices. What is the size of bid-ask spreads
- **Depth:** How large volumes of transactions can be processed without significantly affecting prevailing market prices or the amount of orders in the books of market makers at a given timeframe
- Resiliency: How quickly price fluctuations resulting from trades are dissipated and/or how quickly imbalances in order flows (bids and asks) are adjusted and price recovery occurs.



Sometime in the early 1990s the G-30 recommended securities lending in order to reduce the high rates of trading 'fails' that were discouraging cross border investors and rendering domestic capital markets illiquid and prone to paralysis.

The G-30 urged regulators to take down regulatory and taxation barriers that inhibit securities lending.



This was so well embraced that through out the 1990's countries like Japan, Australia, UK, Switzerland, Italy, France etc. acted to remove the barriers.

From that beginning in the 1990's in Europe, the total repo and securities lending transactions settled on the Euroclear settlement platform amounted to 95 Trillion Euro for the year 2000.

* Source: Bond Market Association comment- letter to Basel committee on banking supervision. May 30 2001.



The Place of Securities Lending in Capital Markets (cont'd)

- The indispensable role of credit to a functional banking system and economy is replicated by securities lending to the capital market and economy.
- The ability to borrow securities is in fact a key element in the development of advanced capital markets.
- Wherever securities lending has not yet become an accepted practice, the evolution of national or regional capital markets is stunted, limiting their ability to allocate capital more efficiently to economic development- pretty much like a banking system without the ability to borrow.



- With the obvious contribution of securities lending from the 1990's, capital market assets in the UK and USA are now more significantly larger than the total holdings of their banking systems.
- Securities lending is a very strong and effective stimulus to market depth and liquidity which however, Sub-Saharan African markets have neglected, apparently for lack of information.



The Place of Securities Lending in Capital Markets (cont'd)

 To unleash the growth potential, depth and liquidity of our capital markets we have an urgent responsibility to fast track the process of putting in place securities lending and removing the regulatory and tax barriers to its smooth operation in our markets.





- As securities lending is a good source of market growth and liquidity, so could it be a significant source of risk and contagion in bad market conditions, if not well regulated.
- Following the fall of Lehman Brothers, a significant number of securities lending programs were suspended in major capital markets all over the world.



- At the height of the financial crisis between September and November 2008, the amount of assets available for lending globally shrunk by about 20%.
- There was a sizeable reduction in the value of securities lending transactions as well.
- Though this situation was caused by the prevailing market conditions globally, the impact of the suspensions in securities lending transactions and the large scale recalls of security loans that followed further exacerbated the crisis.



 Collaterals which had been re-invested (some of which had also been compromised) had to be unwound with big losses and further stress to the market.

From the above scenario;

- Regulation of securities lending should not just be limited to investor/policy holder protection but should encompass a focus on financial system stability
- There should be total transparency on securities lending activities (through financial and regulatory reporting and monitoring)



- Total disclosure of re-investment of collateral by asset classes and counterparties
- Collateral:
 - There should be strict rules guiding collateral type, minimum margins/haircut, restriction on the reuse or re-hypothecation of collateral



• Shadow Banking:

 By reinvesting cash collateral received from securities lending transactions lending agents may effectively perform 'bank like' activities e.g. credit and maturity transformation thereby subjecting portfolios to further credit and liquidity risks.



- Regulators should demand full reporting on the re-investment of collateral and should monitor the same with focus.
- Collateral velocity and/or reuse/ re-hypothecation (length of repledging chains) have reduced since the financial crisis. Lenders now accept high quality government bonds or cash collateral re-invested in short maturities in high quality government bond repos, T-bills and or money market funds.



- Collateral fire sales may lead to market turmoil as seen during the financial crisis.
- All these and other risks of securities lending should be watched by the regulators





- Securities Lending is crucial to the growth and liquidity of our markets, just as lending is essential to a functional banking system.
- South Africa has a functional effective and growing securities lending market.
- Securities Lending has been an indispensable catalyst to the growth and liquidity of the South African market
- Its time has come for the rest of Africa. We have enough leads to follow and enough models to replicate.



- With Nigeria's entry into the world of securities lending, it provides a lead and example to other sub-Sahara African markets to follow.
- It is likely that other markets, especially in West Africa, will follow in that lead soon.
- A new vista of opportunity for growth and liquidity is opening for Africa.





- Securities Lending, Liquidity and Capital Market Based Finance(State Street White Paper December 2001).
- Securities Lending and Repos: Market overview and Financial Stability Issues
- Interim report of the Financial Services Board (FSB) workstream on Securities Lending and Repos













BUILDING AFRICAN FINANCIAL MARKETS CAPACITY BUILDING SEMINAR

THEME: ADDRESSING LIQUIDITY CONCERNS IN AFRICAN CAPITAL MARKETS

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#BAFMSeminar





Liquidity Enabling Regulation

Zeona Jacobs, Director: Marketing and Corporate Affairs

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In its simplest form it is essentially the ability to buy and sell shares on a market

- Turnover velocity
- Depth of order book
- Bid ask spreads



The most liquid exchanges around the globe

• Forex (currency) exchange markets

- 24/7 market
- Global market which no one really "owns"
- Virtual market that is accessible to everyone
- One of the biggest markets globally mainly OTC market
- Dynamic continuously changing every second
- Driven by choice = what investors and traders want
- Not well regulated market



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Two Pillars of Securities Exchange Regulation:

- Primary market regulation
- Secondary market regulation

Regulation ensures financial market integrity, which leads to investors trusting the market and in turn ensures liquidity = achieved by a combination of both primary and the secondary market regulation



Primary Market Regulation

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Primary market regulation: governance and transparency

- Disclosure
 - Company Financials, Director Dealings, etc.
- Initial upfront enforcement of public spread
 - Minimum amount to be held by the public
- Governance requirements: sponsors/DA's



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Secondary market regulation: prudential regulation and market conduct

This regulation is crucial to ensure investor protection

Prudential regulation

 Enough capital to support broker trading activities and protect customers

Market conduct

- Detecting and investigating market abuse
- Safe guarding of customer assets
- Conduct of business



Important relationship with the regulator and the exchange in ensuring that market abuse does not happen

Importance of Regulatory Structures

- Publicly available information crucial for trading and liquidity
 - Corporate Actions: information about the company that is of interest to investors distributed both locally and globally in real time
- JSE currently only has official market making program for currency derivatives (mainly competing with OTC market) investigating others
 - JSE market operations team monitoring market quality metrics (order to trade ratios, etc.)
 - Globally markets have market makers for ETF's to ensure liquidity in the ETF market
 - JSE requires market makers for ETFs, but has no fee incentive program
- Market taker billing models: some multi-lateral trading facilities pay brokers to trade on their markets
- When considering market makers incentives always ensure fair market place

Size and liquidity around the globe





JSE in global context



JSE in African context



African context (excl. JSE)



Liquidity Enablers



Vibrant Primary Markets

- Free float
 - Encourage companies list a large percentage of shares outstanding available for trade
- Quality of listings
 - Ensure quality companies from sectors investors are looking for exposure to
- Ensure the free flow of information
 - Essential for exchange news service to be international
- Having multi market listed instruments enables more liquidity
 - Dual listed stocks
 - ETF's
- Good corporate governance is critical



Vibrant Secondary Markets

- Market makers and their role
 - Market makers are only willing to make markets in the most liquid instruments – liquidity begets liquidity: ensure programs incentivise right behaviour
- Technology
 - Critical to have stable, reliable systems that are scalable when your markets grow
- Functionality for investors
 - Large in scale order types to meet needs of investors with large orders due to the size of the funds they manage
- Vibrant securities lending market place
- Require covered short selling
- Liquid and vibrant derivative markets


Free Flow of Funds

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- Crucial to build out large local market e.g. Institutional asset base or vibrant retail market
 - Ensuring either with government or exchange incentivise
 - Foreign exchange control not a bad thing
 - No exchange control restrictions on foreigners
- Free flow of funds in and out the country based on mandates
- DMA or Sponsored Access
 - Direct broker access to the market
 - Broker still responsible for trading, clearing and settlement
- Colocation
 - Fastest access to trading system

Free Flow of Funds (cont.)

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- Global networks/order routing
 - Ensuring that your market is available on international platforms
 - E.g. connected to international networks (Bloomberg and Reuters, SunGard, etc.)
- Market Data: ensuring your data is available globally "eyes on screens" result in trading
- Partnering with well-known Index Providers e.g. FTSE put JSE on global map



Liquidity Challenges

Local and global economic and political factors

- Circuit breakers are in place to ensure fair markets
 - Major corporate actions can also result in trigger of circuit breaker for a particular instrument

Volatility

 Increased volatility results in increased liquidity, but could result in severe market movements which negatively affect investors who then loose market confidence

Technology failures

 Technically if systems cannot cope with the flows could result in market downtime which causes reputational damage and can result in financial claims



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Liquidity Challenges (cont.)

Run on the currency

 Selling of currency could result in severe depreciation – detrimental impact on the economy and ripple effect of imports, country global performance and investors that invest offshore etc.

Naked short selling

 Shorting of shares without having any shares or borrowing arrangements in place would result in structural imbalances in the markets



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Liquidity Challenges for African Markets

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For us as African exchanges it is important to grow local investor base and increase liquidity which will attract global investors but important to keep local investor base as large as possible:

- Number and quality of listings
- Prudential limits could support growth of local asset base
- Investor mandates are important
- Investor appetite
 - Biggest issue is liquidity
 - If free float of company is too small leads to difficulty for investors

Concluding remarks

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If you want liquid markets:

- Strong regulation of both primary and secondary markets
- Make sure you are on the global map
- Incentivise strong local liquidity pool
- Design products that will create multiple reference points
- Encourage entrepreneurs to list on the markets have more free float





Driven for your growth

JSE

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Mobile Technology as an Enabler for Enhancing Liquidity of Securities

Geoffrey O. Odundo

Chief Executive

Nairobi Securities Exchange Limited





Agenda

Liquidity Status – Key Indicators	
Challenges Impacting on Liquidity	
The growth of Mobile Technology - The Global Scale	
Mobile Technology - The African Story	
Capital Market Mobile Technology Enabled Opportunities	
Mobile Capital Market Products - M-Akiba Case Study	



Liquidity - Definition



Market Liquidity:

Is a business, economics or investment term that refers to an asset's ability to be easily converted through an act of buying or selling - *without causing a significant movement in the price and with minimum loss of value.*

Features of a Liquid Market



 Assets can be sold rapidly, with minimal loss of value, any time within market hours.

Existence of ready and willing buyers and sellers at all times

 Existence of float liquidity for securities.

Liquidity Status – Key Indicators

- The Main Drivers of Liquidity
 Include: -
 - The Presence of Diverse
 Orders
 - The Number of participants (E.g. Availability of Market Makers)
 - The tradable float available (share split, bonus,)



Challenges impacting on Liquidity

The main contributors to lack of Liquidity in Markets include:

- Access to markets
- Financial literacy
- Limited infrastructure
- Limited range of products



Challenges impacting on Liquidity - What happened?





Challenges impacting on Liquidity - What happened?





Challenges impacting on Liquidity – Effect of Technology





The growth of Mobile Technology -The Global Scale



GLOBAL DIGITAL SNAPSHOT

A SNAPSHOT OF THE WORLD'S KEY DIGITAL STATISTICAL INDICATORS





Mobile-cellular penetration, 2013*, and mobile-cellular subscription growth rates, 2005-2013*



Source: ITU World Telecommunication /ICT Indicators database Note: * Estimate

Cell Phone Ownership Surges in Africa

Adults who own a cell phone



Source: Spring 2014 Global Attitudes survey. Q68.

PEW RESEARCH CENTER

Texting Most Common Use of Cell Phones in Africa

<u>Median adult cell phone owners</u> who used a cell phone in the past 12 months to ...



Note: Median percentages across seven African countries. Source: Spring 2014 Global Attitudes survey. Q74a-h.

PEW RESEARCH CENTER

Few Own Smartphones in Africa, But Cell Phones Common

Do you own a cell phone? Is it a smartphone?



Note: Percentages based on total sample. U.S. data from December 2014 Pew Research Center surveys. Median percentage excludes the U.S.

Source: Spring 2014 Global Attitudes survey. Q68 & Q69.

PEW RESEARCH CENTER





Kenya's M-Pesa proves that when people are empowered, they will use digital tech to innovate on their own behalf.

— Bill Gates —

AZQUOTES

Capital Market – Mobile Phone enabled Opportunities

Order submissions through Mobile phone

Payment submissions through Mobile Money.

Direct Market Access through their Brokers Back Office Systems.

Market News & Statistics

Mobile integration to customer's bank account.

(For Bank Owned Brokers)



Capital Market Opportunities





Mobile Capital Market Products – M-Akiba Case Study – The Business Case



Drive Liquidity for the NSE by growing the Existing Business



Financial Inclusion – Acquire New Customers (18,000 Accounts of which 2% are retail) at the Central Bank of Kenya vs 36M Mobile Money Users)

Save Money, Make Money, Build Kenya



Greater Market Access – Pilot the Mobile Trading as a viable alternative Channel For collecting Funds for the Government



Investor Awareness by simplifying the products and making them very relevant to meet needs of the people



Mobile Capital Market Products – M-Akiba Case Study

M-Akiba is a Government of Kenya issued retail bond with the following unique characteristics: -

- Purpose Government development expenditure / Budgetary support
- Mobile Traded Bond Registration, trading, settlement using mobile money .
- Target Amount Kshs 5 Billion with Green shoe option.
- Minimum investment amount per account Kshs. 3,000
- Maximum Investment per account / per day Kshs. 140,000
- Tenure of Bond (to be communicated)
- Coupon Rate (to be communicated) after every 6 Months.
- Period of Sale 2 weeks (to be communicated)
- Price traded at par (factoring in the accrued interest)
- Taxation Tax-free as provided for under the Income Tax Act.



Mobile Capital Market Products – M-Akiba Case Study

Primary Market - Improvements

	CURRENT	M-AKIBA
1.	Investor must go to CBK or its Agent for Account Opening	Account created on phone, anywhere
2.	Provide bank details and deposit cash at a bank	Use Mobile Money – No Need for a bank Account
3.	Give Buy instructions to broker	Purchase done on phone
4.	Allocation dependent on outcome of auction	Allocation guaranteed on first come first serve basis
5.	Minimum amount Kshs. 50,000.	Minimum Amount is Kshs. 3,000.

Secondary Market - Improvements

	CURRENT	M-AKIBA
1.	Place buy sell order at the agents	Place orders on phone
2.	Instructions sent to bank to release funds	
3.	Orders placed on Market pending counter party	Order execution to be guaranteed by Market Markers
4.	Market Time 9:00 a.m. – 3:00 p.m. (Mon - Fri)	Market is available 24/7



Thank You

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Building African Financial markets

Protecting the house

Role and Importance of Central Counter Party (CCP) in a Derivatives Market

Dr. Leila Fourie & Dr. Alicia Greenwood

JSE



world has

ever faced

ear-old credit crisis faded. Stocks tumbled, concern grew

bout which financial firm would all next, and investors rushed toward the safe haven of governret bonds in the wake of the colapse of Lehman Brothers Holdnew Inc. and the crisis at incorer

ume on the New York Stock Exchange was the second highest in history, falling just shy of the record set on Tuesday. The VIX, a widely watched measure of market volatility that is often referred to as the "fear index." hit



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RANDALL SMITH AND JENNY STRASBURG

Morgan Stanley sought shelter from the growing financial storm Wednesday, entering preliminary merger talks with Wacho-

Why CCPs?

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PROVIDING SETTLEMENT ASSURANCE

- Reduce systemic risk
- Ensure efficient, fair markets
- Protect investors
- Ensure orderly markets
- Promote transparency
- Establish appropriate risk standards

Case example: Lehman at LCH

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ALTHOUGH LOSSES WERE EXPERIENCED IN THE OTC* MARKETS, CCPS WEATHERED THE GFC* CRISIS WELL

IMPACT OF THE LEHMAN FAILURE ON A CENTRAL CLEARINGHOUSE (LCH.CLEARNET)



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THERE HAVE BEEN ISOLATED INCIDENTS WHERE CCP LOSSES WERE INCURRED

ССР	COUNTRY	DATE	DESCRIPTION	
Caisse de Liquidation	France	1974	 Steep rise in sugar prices attracted speculative investors, who are caught out by a sharp correction, leading to inability to meet margin calls CCP failed to increase margin in response to greater market volatility Lack of coordination between clearing house and exchange Allocation of losses among GCMs were not transparent 	
Kuala Lumpur Commodity Clearing House	Malaysia	1983	 Crash in palm oil prices led to the default of six brokers CCP slow to respond to market conditions – 12 day delay between market crash and broker default Lack of management experience and coordination among market participants 	Actua — CCP Failure
Hong Kong Future Exchange	Hong Kong	1987	 Trading suspended for four days in the wake of "Black Monday" Bailed out by consortium of banks supported by government once it was clear the guarantee fund would be insufficient Guarantee fund separate form clearing house and exchange – clearing house responsible for risk management, but was not expose to losses CCP did not increase margin despite sharp growth in trading volumes No position limits and high concentration of brokers 	
BM &F	Brazil	1999	 Sudden \$/Real devaluation caused two small clearing banks to default Margin and default funds insufficient as banks were beyond BM&F operational limits, and margin stress tests were inadequate for major move Central bank intervened and bailed out the banks 	Near CCP Failure

* Source Oliver Wyman 2014)
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A CCP is an entity that provides a guarantee to both parties in a trade, that if either party defaulted before the fulfillment of its obligations with respect to the trade, the CCP would fulfil the financial obligations to the non-defaulting party, as agreed at the time of the trade

CCPs have become of increasing systemic importance since 2009, with the G20 ambitions to clear all standardized OTC derivatives through CCPs

Market participants want certainty that CCPs do not introduce systemic risk, and are able to fulfill their obligations as the counterparty to all counterparties

To this end, CCPs have made significant improvements to way in which it mitigates counterparty credit risk over the past number of years

CCPs and Multilateral Netting

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MULTILATERAL NETTING SIMPLIFIES EXPOSURES AND REDUCES COSTS AND RISK



(a) Over-the-counter market



(b) Over-the-counter market with bilateral netting



Figure 1:

- (a) Payment obligations in an OTC market
- (b) Payment obligations after bilateral netting
- (c) Payment obligations in a centrally cleared market

Source: Glasserman, Mallemi and Yuan, Hidden liquidity with multiple central counterparties, working paper, 2014.

Guarantee structure – SA case study

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RISKS MUST BE UNDERWRITTEN BY DIVERSE MULTIPLE LAYERS



Default Waterfall – SA Case Study

- A CCP's default waterfall defines the order in which prefunded resources are used to fund losses associated with a clearing member default
- In December 2012 the JSE Clear default fund was established, and with it, the following default waterfall came into existence:



Initial Margin

- Initial Margin (IM) together with the default fund (DF) is intended to cover the Variation Margin (VM) payments of defaulting entities, from the point of default to the point at which the portfolio is completely liquidated
- Under a "defaulter pays" waterfall, the majority of the abovementioned VM should by covered by the defaulter's IM
- Account level IM is calculated centrally by the CCP. Clearers can, however, call for additional IM from their clients
- For JSE Clear, IM is calculated through a portfolio scanning methodology, J-SPAN
- In November 2013, the JSE embarked on a 5-phased review of all parameters that feed into the J-SPAN framework

The Default Fund

- Since its establishment, the size of the JSE Clear Default Fund has remained static at ZAR 500 million
- JSE contributes ZAR 100 million with the remainder made up by the clearing members
- Clearing member contributions are based on clearing member's portion of the total initial margin on deposit
- Size of JSE Clear Default Fund is tested on a daily basis through JSE Clear's stress testing framework

- The default fund has to be large enough to at least withstand the default of JSE Clear's largest clearing member under the set of extreme but plausible stressed scenarios:
 - This includes the default of the largest clearing member's largest client, and the particular client's trading member

Default Fund Quantification

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DEFAILT

- Current Exposure Method (CEM)
- ETL & stress testing for comparison
- Bottom-up approach was used to optimize clearing member capital requirements on default fund contributions
- Minimum default fund size of ZAR 500 million was introduced after extensive market consultation. In order to keep the default fund as stable as possible
- Problem with current approach is that it fails to recognize the risk associated with the largest 1 or 2 clearing members defaulting under stressed conditions (as it looks at a probabilistic average of all clearing member exposures)
- Going forward, in line with regulatory guidance, total prefunded resources (including default fund) will purely be quantified using stress testing

Credit Stress Testing

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- The purpose of stress testing is to assess the adequacy of a firm's financial resources to sustain it in a period of severe stress, defined by "extreme but plausible" stress scenarios
- Stress scenarios informed by historic periods of high volatility & extreme gains/losses and hypothetical movements

CCP stress testing involves:

- Revaluing each portfolio (all contracts in a particular account), assuming these extreme market scenarios occur;
- Calculating stressed VM associated with the change in portfolio value;
- Comparing the stressed VM to the IM held against the particular account; and finally
- Calculating the shortfall associated with the default of JSE Clear's largest clearing member and its affiliates.

Parameter	Value
Look-Back Period	10-years
Liquidation Period	Same as used for IM (2-days)
Confidence Interval	Worst case scenario
Netting	Performed at account level
Desired Level of Coverage	Largest clearing member and affiliates (Cover 1)



Concentration Margin



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- Concentration margin (which forms part of initial margin) is required when:
 - Stress testing indicates that the exposure in a particular account is large enough to put the default fund at risk; and when
 - The exposure in a particular account will take longer than 2-days (the standard contract level liquidation period assumption) to liquidate.
- In November 2014 the JSE Clear Risk Committee agreed on a framework whereby concentration margin will be called for when the above conditions are met
- Concentration margin ensures that under JSE Clear's stress testing framework, JSE Clear will always have enough prefunded resources to withstand the default of its largest 1 or 2 clearing members

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CCPS ARE SUBJECT TO INCREASING REGULATORY CHANGE

REGULATIONS	TIMELINE	CORNERSTONES OF REGULATION
1. EU: EMIR and MiFIR	End 2012	 Mandatory exchange trading and central clearing of "standardised" OTC derivative contracts Assure broad scope of derivatives covered Exemptions for end-user below certain threshold Pre- and post-trade transparency for prices and volumes Robust CCP risk and liquidity management processes Minimum CCP capitalisation and margin requirements Segregation and portability of customer funds Reporting of all cleared and OTC transactions to trade repositories
2. US: Dodd-Frank and CFTC	Q2 2012	
3. Basel III	Gradual phase-in by 2019	 Incentivise central clearing Higher capital chargers on bilaterally cleared trades (e.g. CVA charge, higher margin period of risk) Preferential treatment of centrally cleared trades – low risk weight on trade exposure, but CEM in default fund exposure calculation Encourage collateralisation – CVA heavily penalises uncollateralised trades
4. CPSS-IOSCO	End 2012	 Updates principles for CCPs, including Higher financial resources and collateral requirements More robust and frequent stress Processed for orderly resolution of CM positions in event of default Enhanced governance CCPs need to comply to receive preferential treatments under Basel III

New Challenges Facing CCPs

- CCP recovery and resolution
- Extraterritoriality
- Standardized stress testing:
 - Regulators are looking for ways in which to compare the risk management standards of different CCPs; and
 - To ensure that CCPs can effectively withstand the default of one or multiple of its clearing members.



Questions

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Trading Derivative Products

Practical Derivatives & some Case Studies

29 April 2016

Dr Antonie Kotzé

Financial Chaos Theory: Independent Consultant University of Johannesburg: Investment Management Sciences University of Pretoria: Department of Applied Mathematics www.quantonline.co.za



Outline

- The starting point
- Regulations
- Structure of the Capital Market
- What is a Financial Derivative?
- Players and drivers of the markets
- CCPs
- Liquidity creators
- Payoff Profiles
- Linear Derivatives: Futures
- Basket Arbitrage, Basis and creation of Liquidity
- Non-linear derivatives: Options
- Derivative strategies
- Case study 1: the asset manager
- Case study 2: the corporate

The Starting Point

- Have a thorough comprehension of yield curves
 - The relationship between the maturity of the instrument and the yield is termed the term structure of interest rates.
 - A yield curve is a graphical representation of the term structure of interest rates for instruments of a similar credit rating.
 - Generated from traded FRAs, swaps and bonds



- Emerge yourself in the realm of volatility surfaces
 - 3D graph of implied volatility (IV), strike and time to expiry
 - Surface exists due to simplifying and plainly wrong assumptions of Black-Scholes option pricing theory
 - Generated from traded option prices



Volatility

- In finance, the volatility is defined as a variational measure of changes in the price of a given financial instrument over time
- There exist many types of volatilities
 - Historical or realised volatility: standard deviation. Derived from time series data and based on past market prices.
 - Local or instantaneous volatility: not directly measurable from the market nor from historical data. Estimated by model
 - Stochastic volatility: not directly measurable from the market.
 - Implied volatility, however, is a type of volatility derived from the market obtained from traded derivatives like options.
 - It is market observable.
 - The implied volatility is not the standard deviation of the historical prices.
 - Implied volatility is simply a short-hand notation to quote a price.

VIX and SAVI

Volatility Index, which shows the market's expectation of 30-day volatility.
 Constructed using implied volatilities of a wide range of S&P 500 index options. It is forward looking and is calculated from both calls and puts. Calculated by CBOE.
 Often referred to as the fear index.



Liquidity Destroyer: Regulations

- Liquidity risk now evident in all markets: government bond and currency and credit markets and repos
- How much depth has the market lost in the USA? Two year ago, you could trade about \$280 million of Treasuries without causing prices to move. Now, it's \$80 million.
- Much of the blame has fallen on financial regulations in response to the 2008 credit crisis, which included limits to risk-taking.
- Primary dealers, large banks that buy bonds straight from the Treasury market, with the intention of reselling them, have reduced their U.S. debt holding by 80% since October 2013.
- Before the financial crisis and the exchange rate-manipulation scandals of 2014, traders at large FX brokers were more willing to abide short-term loss and supply liquidity, reasoning that a rapid depreciation would likely result in a discount. But in the modern regulatory environment, traders say there is more emphasis on short-term performance.
- Credit derivatives trade shrunk 57% to \$686 billion from more than \$1.58
 <u>trillion</u> in late 2008 as post-crisis regulations made it costlier to trade.



Regulations and Liquidity

- Bank regulations appear to be having unintended consequences for major markets.
- By limiting the risk that the major financial institutions can take, regulators have reduced risk taker participation.
- When a large transaction hits the market there is no longer someone willing or able to step forward as a buyer or seller to facilitate this.
- A dealer's function is really about smoothing trading across time, not about preventing price moves. Professional traders do not care if markets go up or down.
- Now, instead of a smooth flow of prices market-makers risk a gap in prices when they have a large transaction to do.
- Illiquidity begets illiquidity when participants fear getting caught in a trade they cannot turn.
- This has reduced dealer participation. Due to gapping markets, price volatility rises and spreads widen more expensive for investors.
- <u>https://www.youtube.com/watch?v=TAf8nxImpUw&feature=youtu.be&list=</u> <u>PLgADTI06-0lWlt68zT5cugAaGx2u7bcYq</u>
- <u>http://feelthebern.org/bernie-sanders-on-financial-regulation/</u>

Structure of the Capital Market

Each market sector has different instruments or components but the structure is similar for all









1997 Nobel Laureates for Economics

Basic/Cash securities: defined similar to physicists' definition of "basic particles". These particles cannot be subdivided into smaller ones. They form the base of our entire universe.



What is a Financial Derivative

- "A derivative can be defined as a financial instrument whose value depends on (or derives from) the values of other, more basic underlying variables." -John C. Hull
- "A derivative is simply a financial instrument (or even more simply an agreement between two people) which has a value determined by the price of something else."
 Robert L. McDonald





The Real Definition

Financial derivatives are conduits used to transfer risk





Drivers of the Market

- Like the energy in the universe, financial risk cannot be created nor destroyed
- Risk can only be transferred or shifted
- Only two emotions drive the market
 - GREED and FEAR
- Two types of traders
 SPECULATORS (risk takers)
 and HEDGERS (risk shifters)



The Players: hedgers, speculators and arbitrageurs

- Hedgers are investors with a present or anticipated exposure to the underlying asset which is subject to price risk
 - They use futures or options to reduce or eliminate this risk
- Speculators wish to bet on future movements in the price of an asset
 - Derivatives can give them an extra leverage to enhance their returns
 - Take on risk but usually with a short term view
- Arbitrageurs (risk neutral) work at making profits by taking advantage of discrepancies between prices of the products across different markets
 - This is considered riskless profit for the investor/trader
 - Arbitrage exists as a result of market inefficiencies; it provides a mechanism to ensure prices do not deviate substantially from fair value for long periods of time
 - Examples: Anglo in Johannesburg and London; basket arbitrage

Speculators and arbitrageurs supply liquidity



Users of Derivatives

USER	Major Motivation
Corporates	Hedging, Asset/Liability Management, Securitisation
Commercial Banks	Hedging, Risk Management, Asset/Liability Management, arbitrage
Investment Managers	Hedging, Alpha Gain, Speculation
Insurance Firms	Risk Management
Hedge Funds	Speculation, Risk Arbitrage
Brokerage Firms	Market Making, Trading, Structuring New Products
Individual Investors	Speculation

- Banks use derivatives to hedge against risks that may affect their operations.
- Farmers use derivatives to lock in the price of their crop in order to protect their harvest.
- Derivatives help in discovery of future as well as current prices.





The Listed Derivatives Market



The Basel Committee on Banking Supervision defines a central counterparty (CCP) as a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. Novation is the key but most important, for the purposes of the capital framework, a CCP is a financial institution. A derivative exchange's back office (operations) is known as a clearing house.

Interaction between OTC and Listed Derivatives



Pay off Profiles

- A payoff profile shows the payoff that would be received if the underlying is at its current level when the derivative expires
- A payoff is the likely profit or loss that would accrue to a market participant with change in the price of the underlying asset
- It highlights the risks associated with the strategy in a simple diagram: a future has unlimited profit potential, but such a diagram also shows the potential losses
- It is easy to work with payoff profiles they are additive inferring that we can add and subtract them from one another

Useful in constructing more complex financial instruments or strategies



Linear Derivatives as simple diagrams



a future has unlimited profit potential, but such a diagram also shows the potential losses





The future: True Definition

- An investor who is buying a future (go long) is buying exposure to the underlying instrument
- The investor is not actually buying the underlying instrument
- That implies that if the underlying is a share paying dividends or a coupon bond, the investor has no right to these cash flows
- Investor is compensated through the carry cost

A legally binding agreement to sell or buy an underlying asset some time in the future





Basket Arbitrage, Basis and creation of Liquidity

- What's needed? A tradable index, a future on that index and a clever trader
- Theoretical Future value = cash index + carry cost
- Understand basis, compare theoretical price to traded futures price. If out of line, arbitrage compels trader to do.....

Theoretical price > traded price

Theoretical price < traded price



Sell future and buy the shares in correct weights in the cash market and wait

Buy future and sell shares short in correct weights in the cash market and wait CIAL



Options

- Right to buy or sell an underlying instrument
- It is just a RIGHT not an OBLIGATION
- Holder may not execute his right at all
- Just premium is paid to buy the option not the value of the underlying asset
- Margin requirements
- Strike Price / Exercise Price: Denotes the price at which the buyer of the option has a right to purchase or sell the underlying.
 - Based on the liquidity, exchange will determine
 the interval & strike prices



Payoff profiles: non-linear derivatives - options



Calls and Puts and Styles

- Call Option: It gives the holder the right but not the obligation to buy an asset by a certain date at a predetermined price.
- Put Option: It gives the holder the right but not the obligation to sell an asset by a certain date for a predetermined price.
- The Buyer of an option contract is said to be long or the holder or owner of the contract.
- The Seller of an options contract is said to be short or the writer of the contract.
- European-Style option can be exercised on it's expiry day only (remember 'E' for 'European' and 'Expiry Day')
- American-Style option is an option that the holder can exercise on any day (remember 'A' for 'American' and 'Any Day')
- Bermudan : Option lies between European and American (as Bermuda lies between Europe and America).



A Bermudan option can be exercised on any of various specified dates between original purchases of the option and expiry like at month-ends only.
Exotic Options

- Barriers: knock-in and knock-out
- □ Asians average rate options
- LookBacks best of all worlds
- Digitals/Binaries cash or nothing
- Range accruals The Range Accrual pays out a fixed amount at expiration for every observation of spot that falls within a certain prespecified range.
- □ Forward starts contract starts in the future
- Cliquets: strike price is reset periodically at the level of the underlying
- Ladders: strike is adjusted to pre-specified levels if those levels are breached





Pricing Options: The Black-Scholes Equation

OTC

$$V(S,t) = Se^{-dt}N(\phi x) - Ke^{-rt}N(\phi y)$$

where

$$x = \left[\ln \frac{S}{K} + \left(r - d + \frac{1}{2} \sigma^2 \right) t \right] \frac{1}{\sigma \sqrt{t}},$$
$$y = x - \sigma \sqrt{t}.$$

S =spot price, K =strike,

d = dividend yield, r = risk free rate, and N(x) is the cumulative standard normal distribution function

Futures

$$Future = F = Se^{(r-d)t}$$

Replace S in BS equation

$$V(F) = e^{-rt} [F N(\phi x) - KN(\phi y)]$$

where

$$x = \left[\ln \frac{F}{K} + \frac{\sigma^2}{2} t \right] \frac{1}{\sigma\sqrt{t}},$$

$$y = x - \sigma\sqrt{t}.$$

$$\phi = 1 \text{ for call and } \phi = -1 \text{ for put.}$$



Why is the Black-Scholes Equation still in use today?

The Black-Scholes equation is wrong. But why use it then?

The Black-Scholes model is a convenient translation mechanism. It is universally used by traders to ``talk" to one another; it gives unambiguous answers.

Implied Volatility

- Rebonato stated: Implied volatility is the wrong number to put into the wrong formula to get the right price of plain-vanilla options
- The Black-Scholes price of an option or actually the implied volatility is just a translation mechanism. Traders use it to talk to one another and be able to understand one another.
- Traders use the term "market volatility" because this is the volatility traded in the market and the volatility used in the BS equation
- This leads to the implied volatility surface which is a 3D representation of the volatility traded in the market
- □ The volatility skew is the market's way of getting around Black and Scholes's simplifying assumptions about how the market behaves.
- The equity skew illustrates that implied volatility is higher as put options go deeper in the money. This leads to the formation of a curve sloping downward to the right.



ALSI Implied Volatility showing Skew





28 May 2014

USDZAR Implied Volatility showing Smile





28 May 2014

Pricing SAFEX ALSI Options

OPTION PRICER	CALL		PUT
Equity price	44 901.00	Equity price	44 901.00
Strike Price	44 900.00	Strike Price	44 900.00
Current date	10-Sep-15	Current date	10-Sep-15
Maturity date	17-Mar-16	Maturity date	17-Mar-16
Interest Rate (NACA)	0.00%	Interest Rate (NACA)	0.00%
Volatility	20.2500%	Volatility	20.2500%
Dividend Yield (NACA)	0.00%	Dividend Yield (NACA)	0.00%
Call/Put	C.	Call/Put	P
T (time till expiry)	0.517808219	T (time till expiry)	0.517808219
r (interest in ccr format)	0.000%	r (interest in ccr format)	0.000%
d (div yield in ccr format)	0.000%	d (div yield in ccr format)	0.000%
X	0.073011219	X	0.073011219
N(x) (cumulative normal dist)	0.529101405	N(x) (cumulative normal dist)	0.470898595
Υ	-0.072705538	Υ	-0.07270554
N(y) (cumulative normal dist)	0.471020221	N(y) (cumulative normal dist)	0.528979779
Phi	1	Phi	-1
Value (BS option price)	26 083.74	Value (BS option price)	26 073.74
			FINANCIAL

THE

Pricing Top40 OTC Options

10

OPTION PRICER	CALL		PUT	
Equity price	44 026.00	Equity price	44 026.00	
Strike Price	44 026.00	Strike Price	44 026.00	
Current date	10-Sep-15	Current date	10-Sep-15	
Maturity date	17-Mar-16	Maturity date	17-Mar-16	
Interest Rate (NACA)	6.9899%	Interest Rate (NACA)	6.9899%	
Volatility	20.2500%	Volatility	20.2500%	
Dividend Yield (NACA)	3.00%	Dividend Yield (NACA)	3.00%	
Call/Put	C	Call/Put	P	
T (time till expiry)	0.517808219	T (time till expirv)	0.517808219	
r (interest in ccr format)	6.756%	r (interest in ccr format)	6.756%	
d (div vield in ccr format)	2.956%	d (div vield in ccr format)	2.956%	
Future	44 901.00	Future	44 901.00	
X	0.207912882	X	0.207912882	
N(x) (cumulative normal dist)	0.582351505	N(x) (cumulative normal dist)	0.417648495	
Y	0.062196125	Y	0.062196125	
N(y) (cumulative normal dist)	0.524796676	N(y) (cumulative normal dist)	0.475203324	
Phi	1	Phi	-1	
Value (BS option price)	29 388.30	Value (BS option price)	20 939.13	
			FINANCIA CHAO THEOR	LSY

Hedgers and Speculators

- Speculators understand risk and want to get exposure to it
- Hedgers are risk averse and want to reduce the risk they are exposed to

Financial derivatives are conduits used to transfer risk







Why Derivatives

- In derivatives transactions, one party's loss is always another party's gain.
- The main purpose of derivatives is to transfer risk from one person or firm to another, that is, to provide insurance.
 - facilitate the efficient allocation of risk
- Those willing to bear risk must be compensated
- Risks more precisely tailored to risk preferences and tolerances
- Most transactions still for speculating and not hedging
- Speculators provide liquidity
- Derivatives improve overall performance of the economy
 - If a farmer, before planting can guarantee a certain price



he will receive, he is more likely to plant



Derivative Strategies

- In finance, a trading strategy is a fixed plan that is designed to achieve a profitable return by going long or short in markets.
- Derivative strategies are the simultaneous, and often mixed, buying or selling of one or more derivatives that differ in one or more features
- This is often done to gain exposure to a specific type of opportunity or risk while eliminating other risks
- More than 60 well-known strategies
- Derivatives are very flexible and strategies enable us to
 - Control more assets for less money
 - Trade with leverage
 - Trade for income
 - Profit from declining markets
 - Profit from volatility
 - Protection against various factors
 - Reduce or eliminate risk





The Put Strategy

- Buying just a put is also a strategy long put
- In general investors buy a put as a hedge when they are long the underlying stock
- A bearish strategy believe price of underlying will fall
- Risk limited to premium paid
- Unlimited maximum reward up to the strike price less premium paid



Case Study 1: Competition in Asset Management Space

- Asset manager (AM) X has a general equity portfolio worth R1 billion
- Asset manager Y has a similar portfolio
- AM X's view is that shares are overpriced, markets are toppish and they need to hedge
- □ AM Y has the opposite view
- Scenarios
 - If AM X is correct and markets do come down, the hedge will ensure that they outperform Y
 - If X's view is wrong, they still want to maintain a market return
- The second point is important. Cash is very fluid. Investors look at quarterly returns and transfer their investments from one AM to another in a jiffy.



Possible Solutions I

- Solution 1: AM X buys an At the Money (ATM) put from risk taker
 - this costs money (premium). Thumb suck 1 year option = 10%
 - X needs R100 million in cash
- How can the fund manager raise cash to pay the premium
 - Needs to sell something
 - Does not want to sell shares due to exposure, dividends, voting rights and potential returns
 - Peers may outperform



Real Life Example and Solution

- Global re-insurance company has significant holdings in the South African equity markets: R2.5 billion exposure
- Halfway through their financial year, their portfolio returns match their own target for the full year
- Want to hedge to lock in their returns but retain exposure if the markets rally further
- Solution 2: Structure a zero-cost-collar
 - Buy the put they need as the hedge
 - What do they sell to earn cash?
 - Sell OTM call
- Strike of OTM call is determined by ensuring that the call premium equates that of the put
- Pros: hedge downside without paying anything
- Cons: limit potential upside

$$V = P - C = 0$$



The ALSI ATM Collar using Skew

OPTION PRICER	CALL		PUT
Equity price	44 026.00	Equity price	44 026.00
Strike Price	45 573.80	Strike Price	44 026.00
Current date	10-Sep-15	Current date	10-Sep-15
Maturity date	17-Mar-16	Maturity date	17-Mar-16
Interest Rate (NACA)	6.9899%	Interest Rate (NACA)	6.9899%
Volatility	19.7900%	Volatility	20.8600%
Dividend Yield (NACA)	3.00%	Dividend Yield (NACA)	3.00%
Call/Put	C C	Call/Put	P
T (time till expiry)	0.517808	T (time till expiry)	0.517808
r (interest in ccr format)	6.7565%	r (interest in ccr format)	6.7565%
d (div yield in ccr format)	2.9559%	d (div yield in ccr format)	2.9559%
Future	44 901.00	Future	44 901.00
X	-0.033236	X	0.206158288
N(x) (cumulative normal dist)	0.486743195	N(x) (cumulative normal dist)	0.418333635
Υ	-0.17564265	Y	0.056052038
N(y) (cumulative normal dist)	0.430287347	N(y) (cumulative normal dist)	0.477650176
Phi	1	Phi	-1
Value (BS option price)	21 682.29	Value (BS option price)	21 682.29
			FINANC



Skew: 3 Sep 2015; ATM Vol = 20.25%; Ceiling = 103.5%

AL

The ALSI OTM Collar using Skew

OPTION PRICER	CALL		PUT
Equity price	44 026.00	Equity price	44 026.00
Strike Price	47 129.82	Strike Price	41 824.70
Current date	10-Sep-15	Current date	10-Sep-15
Maturity date	17-Mar-16	Maturity date	17-Mar-16
Interest Rate (NACA)	6.9899%	Interest Rate (NACA)	6.9899%
Volatility	18.7300%	Volatility	22.4300%
Dividend Yield (NACA)	3.00%	Dividend Yield (NACA)	3.00%
Call/Put	c	Call/Put	P
T (time till expiry)	0.517808	T (time till expiry)	0.517808
r (interest in ccr format)	6.7565%	r (interest in ccr format)	6.7565%
d (div yield in ccr format)	2.9559%	d (div yield in ccr format)	2.9559%
Future	44 901.00	Future	44 901.00
x	-0.29205695	х	0.52042513
N(x) (cumulative normal dist)	0.38512154	N(x) (cumulative normal dist)	0.301383649
Y	-0.42683596	Y	0.359021334
N(y) (cumulative normal dist)	0.334749408	N(y) (cumulative normal dist)	0.359789565
Phi	1	Phi	-1
Value (BS option price)	14 635.54	Value (BS option price)	14 635.54
			FINANC

E.C.

Skew: 3 Sep 2015; ATM Vol = 20.25%; Ceiling = 112.68%

AL

Interaction between OTC and Listed Derivatives





Case Study 2: Corporate Engineering - VENFIN

- On 29 August 2002 VNF sent out a SENS
- Cautionary announcement
 - Shareholders are advised that VenFin has entered into discussions with Hosken Consolidated Investments Limited regarding the proposed purchase of the latter's interest in Vodacom Group (Proprietary) Limited. Accordingly, shareholders are advised to exercise caution when dealing in their VenFin shares.
- On 9 September 2002 VNF sent out a further SENS
- VenFin has acquired a put option from Merrill Lynch International (MLI) in respect of 51 858 000 Richemont depositary receipts held by VenFin; and MLI has acquired a call option from VenFin in respect of 51 858 000 Richemont depositary receipts held by VenFin.



The Vodacom Connection

- On 16 January 2003 VNF sent out a further SENS
- Announcement regarding exercise of the put option acquired from Merrill Lynch International (MLI)
- The total cash proceeds realised by VenFin as a result of exercising the put option are R945.2 million. The proceeds from the exercise of the put option were used in part to settle the purchase price of the 1.5% interest in Vodacom Group (Proprietary) Limited ("Vodacom") acquired from Hosken Consolidated Investments Limited (HCI).



- Speaking on Classic Business (radio program) David Shapiro (stock broker and market commentator) said the financing arrangement was called a collar and involved Venfin putting up the shares as security for a loan from Merrill Lynch.
- Shapiro described the arrangement as a "new, innovative way in which to loan money and to protect collateral".
- What happened here?

History

- In 1993 the then Rembrandt Group bought 15% of Vodacom for R100 million
- In 1995 Rembrandt sold 5% (1.5% from itself and 3.5% from Vodafone -UK) to HCI for R90 million
- It now bought that 5% stake back for R1.5 billion (again keeping 1.5% for itself and Vodafone taking 3.5%)

RETURN!!

- Venfin inherited 2% of Richemont's share capital when Rembrandt Group split into Remgro and Venfin on 26 Sep 2000
- This stake was non-strategic
- Venfin used these shares in an innovative manner to fund the purchase of HCI's Vodacom's stake

(In early 2006 Vodafone bought Venfin's 15% stake in Vodacom for R15,6bn)





Why?

- Simple solution could have been: sell shares at beginning of September 2002, put money on deposit and buy stake on 31 December 2002
- Why through such a structure as described above?
 - Uncertainty regarding the outcome of negotiations if negotiations failed they did not have to exercise the options
 - Richemont declared a dividend with LDT date on 27
 September 2002 and payable on 11 October 2002
 - Venfin kept all its rights until the deal was finalised on 31 December 2002

A Great Transaction

- Venfin received the dividend amounting to R17,076,839.40 (tax benefit)
- □ The strike of the put was at R18.22
- On 31 December 2002 Richemont's price was R15.90



Venfin financed deal at R18.22



Contact and Disclaimer

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Disclaimer

This article is published for general information and is not intended as advice of any nature. The viewpoints expressed are not necessarily that of Financial Chaos Theory. As every situation depends on its own facts and circumstances, only specific advice should be relied upon.

BUILDING AFRICAN FINANCIAL MARKETS CAPACITY BUILDING SEMINAR

THEME: ADDRESSING LIQUIDITY CONCERNS IN AFRICAN CAPITAL MARKETS

DATE: APRIL 28th-29th 2016 VENUE: THE NIGERIAN STOCK EXCHANGE, LAGOS

#BAFMSeminar



Rules Governing Central Clearing Counterparties (EMIR, MIFID II/MIFIR, Dodd Frank, Basel III)

Selloua Chakri

Head of Market Structure Strategy, MEA Bloomberg L.P.

Bloomberg



- 1. CCPs regulations Background
- 2. Rules & regulations governing CCPs and their timelines
- 3. International Regulatory differences
- 4. Why is this relevant for Africa?



Background

- Collapse of Lehman Brothers
- Global Financial Crisis
- September 2009 G20 Meeting

Aim: Mandate Execution, Clearing
 & Reporting for OTC Derivatives contracts

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What are the Rules & regulations governing CCPs and their timelines?





- Introduced on the 16th August 2012
- Mandates Central Clearing
- Reduces risk in Derivatives Markets
- RTS issued by ESMA
- Requirements to become a Qualified CPP (QCCP)



MIFID II / MIFIR

- 2010 Review of MIFID
- Key Objectives
- Impact of Open Access provision on CCPs
- Breaking Exchanges Vertical Silos
- Implementation delays

Bloomberg
Dodd Frank Act

- Similar to EMIR/MIFID II-MIFIR
- Brings transparency
- Move of OTC Derivatives to Central Clearing
- Reduces Risk in the OTC derivatives Markets
- SEC and CFTC supervision

Basel III

- Agreed by BCBS in 2010
- New capital adequacy framework post Global Financial Crisis
- Incentivises Firms to clear via a QCCP
- Less favourable treatment for non-QCCP cleared transactions



International Regulatory differences



Regulatory differences

- Regulatory Inconsistencies
- Role of the FSB
- EMIR vs Dodd Frank
- Other G20 Jurisdictions



Why is this relevant for Africa?



Why is this relevant for Africa?

- Development of Derivatives markets
- Importance to follow International Standards
- Quick look at South Africa



Further information

Bloomberg Functions:

{EMIR<GO>} {MIFID<GO>} {BASEL} {REG<GO>}

- Others:
- Links to ESMA publications
- Link to ESMA Q&A
- Link to CFTC Website
- Link to BIS



Any questions?

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ADHERING TO BEST GLOBAL REPORTING STANDARDS

Building African Financial Markets Capacity Building Seminar

Siobhan Cleary, Head of Research and Public Policy, WFE



INTRODUCTION TO THE WFE

- Established in 1961
- WFE is the global industry association for exchanges and clearing houses
- Headquartered in London
- Focus on advocacy, research and education
- Represents over 200 market infrastructure providers (exchanges and CCPs/CSDs)
- WFE members subject to full peer review process
- WFE affiliates (and correspondents) access some of the WFE benefits but not subject to peer review

WFE AND ITS DATABASE

- Over 300 indicators going back (in some instances) to 1975
- Statistical reports available via the website:
 - Monthly report
 - Monthly and annual query tool
 - IPO database
- Statistical surveys :
 - WFE/IOMA derivatives survey
 - Liquidity indicator survey
 - Cost-revenue survey
 - Annual reports
- Research using WFE data
- Monthly highlights in WFE's Focus e-zine
- Since Feb 2016, Affiliate and Correspondent data included in WFE stats

WFE FOCUS – MARCH 2016

Equity markets

Investment flows 86,859	Number of trades 1,802,406	Listed companies 51,389	Market cap 61,129,195	Value of share trading 15,371,270
(USD millions)	('000)	(domestic and foreign)	(USD millions)	(USD millions)
+23.4% from Jan'16	-8.7% from jan'16	-0.03% from Jan'16	-0.5% from Jan'16	-8.4% from Jan'16

Value of share trading (USD trillions)



American Azia - Pacific Europe - Africa - Middle East Total



Derivatives and other markets

Contracts traded (options)	Contracts traded (futures)		
715,0414	1,105,107		
('000)	('000)		
-7% from Jan '16	-5% from Jan'16		

Volume of exchange-traded derivaties (ETD) contracts over time (millions of contracts traded)



Derivatives by number of contracts traded

Number of other listed products





🔵 Feb'15 🛑 Feb'16

WFE METRICS – USAGE AND DISTRIBUTION

- +/- 8,000 users registered to access WFE monthly reports
- +3,000 monthly recipients of Focus
- WFE data used and referenced by academics, consultancies, NGOs, students and media outlets e.g. WFE IOMA Derivatives Survey covered by FT, Reuters, FOW, Risk and Bloomberg
- WFE data used in World Bank World Development Indicators



Commodity futures lead charge in exchangetraded derivatives

Exchanges hope to capture a larger share of derivatives trading, on demand from emerging markets







WHY GLOBAL STANDARDS MATTER?

- Global capital markets
- Hallmarks of good data:
 - Accurate
 - Consistent
 - Comparable / Complete
 - Timely
- Provides investors and others with cross-market insights
- Enables exchanges/regulators to benchmark against international peers

WFE METRICS - APPROACH

- Statistics Advisory Group tasked with agreeing definitions and calculation methodology
- Definitions made publicly available: <u>http://www.world-</u> <u>exchanges.org/home/index.php/statistics/statistics-definitions</u>
- As markets change, metrics occasionally need to be amended (e.g. turnover velocity, market cap in fragmented markets) or expanded (e.g. ETFs)
- Data submission a core responsibility of Membership
- WFE members (and, where desired, Affiliates and Correspondents):
 - Submit data monthly via WFE interface or through csv upload
 - Contribute to statistics surveys
- Aim to publish monthly reports by 10th working day of the following month

DEVELOPING MEANINGFUL DATA - CSFS

- Agree key metrics of market 'quality'
 - Market capitalisation
 - Number of trades
 - Value of share trading
 - Liquidity measure
 - Number of listed companies
 - Investment flows (capital raised)
- Agree standard definitions
 - Market cap all companies listed on the market or only domestic companies and foreign companies that aren't listed elsewhere? Other types of assets (e.g. investment funds, ETFs?)
 - Number of trades need to take cognisance of different market structures?
 Differentiate between central order book trades and reported trades?
 - Value of share trading differentiate between trading in domestic companies and foreign companies?

DEVELOPING MEANINGFUL DATA – CSFS CONTINUED

- Agree standard definitions:
 - Liquidity measure market overall or more segmented?
 - Number of listed companies show new listings and delistings?
 - Investment flows, capital raised distinguish between IPO capital or capital raised by already listed companies?
- Agree submission frequency and format:
 - Monthly, annually?
 - Local currency? Converted to benchmark currency?
- Agree method and form of publication:
 - Available via website? Downloadable reports?

CONCLUDING REMARKS

- No single right answer think about what is being communicated
- Would recommend use of WFE definitions but most important are:
 - Accuracy
 - Consistency
 - Comparability / Completeness
 - Timeliness

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Protecting Your Market's Digital Assets

Presenter:

Obadare Peter Adewale

Date:

29th April, 2016

To:



- Fellow British Computer Society (FBCS)
- Chartered I T Professional (CITP)
- COBIT 5 CERTIFIED ASSESSOR
- COBIT 5 Foundation Certificate
- Payment Card Industry Professional (PCIP)
- Payment Card Industry Qualified Security Assessor
- ISO 27001 Lead Implementer
- ISO 27001 Lead Auditor
- ISO 2000 Lead Auditor
- ISO 22301/ BS 25999 Lead Auditor
- Integrated Management System Lead Auditor
- Computer Hacking Forensics Investigator (CHFI)
- Ec- council Certified Secure Programmer (ECSP)
- Ec- council Licensed Penetration Tester (LPT)
- Ec- council Security Analyst (ECSA)
- Ec- council Certified Ethical Hacker (CEH)
- Master Security Analyst (MSA)
- Certified Security Analyst (CSA)
- Qualys Guard Certified Specialist (QCS)
- Cisco Certified Internetwork Expert (CCIE Written)
- Security Networks with ASA Advance (SNAA)
- Cisco Certified Design Professional (CCDP)
- Cisco Certified Network Professional (CCNP)
- Cisco Certified Network Associate (CCNA)
- Cisco Certified Design Associate (CCDA)
- Microsoft Certified Professional (MCP)

PROFESSIONAL CERTIFICATIONS



HARVARD BUSINESS SCHOOL

Executive Education

LEADING PROFESSIONAL SERVICE FIRMS

LPSF CLASS OF 2014



MITSloan Executive Education **Global Executive Academy**

GEA CLASS OF 2014

Agenda

What are we protecting?

- Company Data
- Personal Data
- Critical systems-email, network, file storage, online services

What are we protecting against?

- Information exposure
- Malicious Editing
- DOS-Denial of Service

(Confidentiality) (Integrity) (Availability)

How do these things happen?

EXTERNAL THREAT: ENEMY IN THE WILD

Black box invasion/attack and compromise

INSIDER THREAT: ENEMY BY THE WATER DISPENSER

Internal Malicious user gets remote access to email passwords

OUTSIDER THREAT: SHOW ME THE MONEY "

Hackers gets access to company's Applications

OUTSIDER with INSIDER knowledge: DEAL OR NO DEAL Social Engineering / video

Starting Thought

Billion dollar Bangladesh hack: SWIFT software hacked, no firewalls, \$10 switches

The Bangladesh Bank's internal network security was sorely lacking.

by Peter Bright - Apr 25, 2016 11:15pm WAT

The Bangladesh central bank had no firewall and was using a second-hand \$10 network when it was hacked earlier this year. Investigation by British defense contractor BAE Systems has also shown that the SWIFT software used to make payments was compromised, enabling the hackers to send money around the world without leaving any trace in Bangladesh.

69

Tweet

f Share

🔀 Email

In February, unknown hackers broke into the Bangladesh Bank and almost got away with just shy of \$1 billion. In the event, their fraudulent transactions were cancelled after they managed to transfer \$81 million when a typo raised concerns about one of the transactions. That money is still unrecovered, but BAE has published some of its findings.

Emefiele Suspends CBN Deputy Governor, 4 Others

March 13, 2016

THISDAY gathered that \$441,000 was initially lost to the scammers. \$251,000 was however blocked and recovered, leaving a balance of \$190,000, which had already been cashed by the fraudsters.

Two of the scammers were however caught in Dubai, United Arab Emirate and are currently being questioned by investigators.

From their modus operandi, the scammers apparently timed the execution of the fraud to take place when the CBN governor and other deputy governors were out of the country.

Starting Thought Contd

I will like to start with the world of the famous chinese warrior

– SUN TZU

"It is said that if you know your enemies and know yourself, you will not be imperiled in a hundred battles; if you do not know your enemies but do know yourself, you will win one and lose one; if you do not know your enemies nor yourself, you will be imperiled in every single battle."

Online Cyber Criminal Categories



Deep Web Iceberg



Academic Information Medical Records Legal Documents Scientific Reports Subscription Information

DEEP WEB

Multilingual Databases Conference Proceedings Government Resources Competitor Websites Organization-specific Repositories

Illegal Information

TOR-Encrypted sites



Drug Trafficking sites

Private Communications

Deep Web Iceberg

EXPLORING THE DEPTHS OF THE DEEP WEB

Eighty-five percent of Web users use search engines to find needed information, but nearly as high a percentage cite the inability to find desired information as one of their biggest frustrations.^[2]





[1] NEC Research Institute study, published in Nature

- [2] Tenth edition of GVU's (graphics, visualization and usability) WWW UserSurvey
- [3] Bergman, K. T. (2001). The deep web: surfacing hidden value. The Journal of Electronic Publishing http://dx.doi.org/10.3996/3336451.0007.103



Deep Web Communication



- Onion-like encryption
 - 'Alice' negotiates an AES key with each router
 - Messages are divided into equal sized cells
 - Each router knows only its predecessor and successor
 - Only the Exit router (OR3) can see the message, however it does not know where the message is from

Digital Asset Components

Each component has its own security requirements

✤ Software

Applications, operating systems, utilities Exploitation of programming errors accounts for a substantial portion of information attacks Easy target for accidental or intentional attacks

Hardware

Physical components of IS

Physical security deals with protection of physical

from theft, vandalism, destruction

Issue: security for laptop and notebook computers

Digital Asset Components (Contd)

Data

- Often the most valuable asset possessed by an organization and main target of deliberate attacks
- Proper development and use of database management systems increases data security

People

- Can be the weakest link (greatest threat) to security in an organization
- Policy, education and training, awareness and technology are all used to prevent people from accidentally or intentially damaging or losing information
- Social engineering can be used to manipulate the actions of people to obtain access information about a system

Subject and Object of Attack



Computer as an Object and Subject of Attack

Approaches to Implementing Security

An ongoing process that requires coordination, time, and patience

Bottom-up approach

- Starts as grassroots effort with system administrators attempting to improve system security
- Rarely works, lacks organizational support

Top-down approach

- Initiated by upper-level managers
 - Issue policies, procedures, and processes
 Define the goals and expected outcomes Establish
 - accountability.
- Has strong upper-management support, dedicated funding,
 *clear planning and implementation process, and means for influencing organizational culture.

Any System Can Be Digitally Invaded:

Any digital asset can be digitally invaded if there is an issue with any of the following factors: "ADIO"

Architecture



Implementation

Operation
Disclaimer

- What we are about to see now is carried out purely for educational and informative purposes and only for an intended audience of responsible individuals with a genuine interest in improving the security of financial networks.
- Digital Encode makes no claim as to the accuracy or completeness of this demo.
- Digital Encode accepts no responsibility or liability arising from this demo.

DEMO 1: TOTAL SYSTEM TAKE OVER

EXTERNEAL THREAT: ENEMY IN THE WILD

Black Box Invasion/Attack and Compromise

DEMO 2: PASSWORD SNIFFING ON THE LAN

INSIDER THREAT: ENEMY BY THE WATER DISPENSER

Network Sniffing & LAN Poisoning

DEMO 2b: KEY LOGGER

INSIDER THREAT: ENEMY BY THE WATER DISPENSER

Keylogging

DEMO 2b: KEY LOGGER



DEMO 2b: KEY LOGGER



DEMO 3: APPLICATION/DATA COMPROMISE

OUTSIDER THREAT: SHOW ME THE MONEY

Session Hijacking, Simple Phishing attack, Simple SQL Injection attack, Ransomeware, Privilege Escalation

DEMO 3: DATA COMPROMISE – Phishing & Man in The Middle

CSCS Settlement Advice of 15/04/2016

CscsOnline

Sent: Wednesday, April 20, 2016 at 2:00 PM To:
Output: Output

Bcc: wale@digitalencode.net

@: CSCS Statement.html (508.1 KB) Preview

1 To protect your privacy, some pictures in this message were not downloaded.

Download pictures

Dear Sir/Madam,

Please be informed that the net balance of your CSCS account trade settlement of 15/04/2016 is =N=1,394,287.67. Note that NSE and CSCS transaction charges have been deducted. Find attached below your settlement advice.

Thank you. CSCS PLC



DISCLAIMER

This message and any attachments are confidential and may contain proprietary information intended solely for the addressee and may also be privileged or exempt from disclosure under applicable law. If you are not the addressee, or an employee or agent responsible for delivering this message to the intended recipient, or have received this message in error, please notify the sender immediately, delete it from your system and keep confidential, do not copy, disclose or otherwise act upon any part of this message or its attachments. Internet communications are not yuarnated to be secure or virus-free. The Central Securities Clearing System Pic does not accept responsibility for any loss arising from unauthorized access to, or interference with, any Internet communications by any third party, or from the transmission of any viruses. The Central Securities Clearing System Pic does not accept reveauch or any electronic message or information sents to or from a Central Securities Clearing System Pic's employee e-mail address without informing the sender or recipient of the message or its attachments that does not relate to the business of the Central Securities Clearing System Pic senses without informing the business of the Central Securities Clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the Central Securities clearing System Pic is personal to the sender and is not given or endorsed by the

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Close

Attacks on Individuals: Ransomware

- Worm enters system through downloaded file.
- Payload encrypts user's hard drive and deletes the original files – user cannot decipher his/ her own files



 Pay \$500 in Bitcoin to get your files back!

Your computer was automatically blocked. Reason: Pirated software

Your computer is now blocked. 84 files have been temporarily blocked To regain computer access and restore files you are required to pay Blocked files will be permanently removed from your computer if the The MSB has two ways to pay a fine: 1.You can pay your fine online through BitCoin. HitCoin is available Click the tabs below to find the nearest vendor. Your computer will 2.You can come to your provincial courthouse and pay your fine at th Your computer will be unlocked within 4-5 working days. To regain access transfer bitcoins to the following address 198tX7NaLg6o8qcTT2Uv7cSHVzN3oEozpv After the payment is finalized enter Transfer ID below. Amount: Transfer ID:

BTC 0.619

PAY FINE

If the fine is not peid, a warrant will be issued for your arrest

97% Of People Cant Watch This Video For More Than 4 Seconds



WARNING: You will never use this BATH SHAMPOO after viewing this!



2,367 comments 🔻



DEMO 4: HUMAN SECURITY

OUTSIDER THREAT / INSIDER INFO: DEALOR NO DEAL

Social Engineering / Video

THE WEAKEST LINK



The Security Balancing Act

Security is a cost of doing business

Lack of Security is also a cost



The aim must be balance between the two

Information Security: Art and Science

Security as Art

- No hard and fast rules or universally accepted solutions
- Requires knowledge and experience of systems and goals to build the solution that best fits the organization's needs
- **Security as Science** Defensive, Resilience & Detection Strategies
 - Technology is a major component of information security solutions
 - Requires knowledge of technologies, and use of accepted standards and practices

Security as Social Science

- People are a critical component in the organization and in the security of the organization
- Security must consider and address human factors

TEN QUESTIONS EVERY CEO MUST ASK

- How many of the organization's cyber security policies are being actively managed?
- Are all of the organization's systems and applications being monitored in accordance with organization's policies and controls?
- 3. Does your cyber security team have an updated, consolidated list of managed assets?
- 4. How do we collect and alert on our log and security event data? What percentage of our system logs being collected?
- 5. Can you prove that your vendors are in compliance with your policies?
- 6. How do we detect and investigate network threats? Do we utilize both threat intelligence and anomaly detection?
- 7. What procedures and tools are in place for detecting and containing cyber attacks?
- List all security incidents that were either Critical or High for the past 12 months
- 9. What is the disposition of those incidents?
 - Who worked the incident?
 - Status of incident (open, closed, unworked)
 - Is the incident being handled in accordance with organization's policies and controls?
- 10. Are testing, assessments, and continuous improvement established as core elements of vour cvber security plan?

ISO 27001:2013 As A Panacea

ISO 27001:2013 is an Information Security Management Systems

(ISMS) that is predicated on Risk Assessment and a process approach

Called "PDCA" – Plan Do Check Act



Conclusion: Everything is not as it seems







WINNER

Digital Encode Limited Finance Technology Firm of the Year



BUILDING AFRICAN FINANCIAL MARKETS CAPACITY BUILDING SEMINAR

THEME: ADDRESSING LIQUIDITY CONCERNS IN AFRICAN CAPITAL MARKETS

DATE: APRIL 28th-29th 2016 VENUE: THE NIGERIAN STOCK EXCHANGE, LAGOS

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