UNDERSTANDING MARKET DATA FOR SAVVY INVESTING AND WEALTH CREATION

Exploiting Market Data for Smart Investment Decisions

Presented by

Ade Bajomo
Executives Director, Market Operations and Technology

18 October, 2016
Outline

1. The Genesis of Market Data
2. Key Market Drivers and The Market Data Leverage
3. Users of Market Data Products
4. Existing Market Data Products from The NSE
5. New Market Data Products
6. Watch This Space: The Future of Market Data (... and Trading)

October 2016

The Nigerian Stock Exchange
What is Market Data?

Market Data is the numerical price data, reported from trading activities, which takes place on an Exchange. Market data enables traders and investors to gather as much information as possible about daily trading activities on the Exchange.

Market data is the bi-product of the transaction processing of an Exchange. Also popularly known as market statistics; it includes data parameters such as volume, value, price, number of deals, etc.

Transaction Processing
*Volume, Value, Price, No. of Deals, etc.*

Market Data

- **Real-time Data**: *(Delay of less than 15 minutes from creation)*
- **Delayed Data**: *(Real-time information delivered timely at intervals)*
- **Reference Data**: *(Used to complete financial transactions and settle those transactions)*
Spot the Difference

....Or Similarity

A Flash in The Market
Stock markets plunged suddenly on May 6 of this year and gained speed as computer programs prevented losses. But almost as quickly, the market recovered much of the decline.

1:00 Volatility in some stocks increases in a down market.
2:30 Unusually nervous trading pushes overall volatility up sharply; the Dow is down 2.5 percent.
2:32 A program to sell $4.1 billion in E-Mini futures starts; other traders react by starting to sell.
2:41 Selling in the futures market spreads to stocks; automated trading programs react to the sharp drops by shutting down.
2:46 After trading in E-Mini futures is paused for five seconds, alleviating the pressure to sell, the market begins to recover.

Sources: Bloomberg (Dow industrials), Securities and Exchange Commission

Dow Jones Industrial Average (DJIA)
Source: S&P Dow Jones Indices LLC

Shaded areas indicate US recessions.
2013 research.stlouisfed.org

6 May 2010
2016 Flash in the Market

Pound Flash

USD/GBP

Time

7 Oct 2016

October 2016

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Why is Market Data Important?

1. Premium Price Differentials

Costs More in Shanghai
An index of the average price difference between the mainland and Hong Kong shares of companies listed in both markets. Over 100 indicates a premium for mainland shares.

Source: FactSet

THE WALL STREET JOURNAL

2. FT100 Rising (2015)

3. Market Data Enables you to Profit Even in a Down Cycle

Profiting from a loss
The stocks of United and American airlines fell sharply following the Sept. 11 terrorist attacks, which used hijacked jets from the two airlines. But unknown investors made a bundle using a financial derivative that increases in value when a stock goes down.

Source: Yahoo Finance
Chronicle Graphic

... of Arbitrageurs, Investors, Speculators, Hedging, Economic Trending and Regulators...........
“If you are shopping for common stocks, choose them the way you would buy groceries, not the way you would buy perfume.”

Benjamin Graham
British-born American professional investor
1894-1976
The Genesis of Market Data

Moving with the Times – History of Stock Markets

- Dates back to the 1500s when the first LLC was formed. It is generally accepted that Antwerp had the world’s first stock market system (without stocks).

- In 1602, the Dutch East India Company officially became the world’s first publically traded company when it released shares on the Amsterdam Stock Exchange.

- The LSE was officially formed in 1801 and was the main stock market for Europe, while the NYSE was the main Exchange for America.

- Today, virtually every country in the world has its own stock market. Major stock markets typically emerged in the 19th and 20th centuries.
**Market Data at The NSE**

**1960**

Founded in 1960 and today services the largest economy in Africa.

Market Services Department of the Nigerian Stock Exchange is responsible for the timely, accurate and reliable distribution of quality market data.

Evaluates current market data and creates new market data products by designing market data solutions.

In 2012 Market Data services at the NSE becomes fully operational distributing directly to vendors and subscribers.

Dissemination of quality market data to the market vendors using the open standard FIX Protocol.

As part of the drive to increase global presence and awareness of our market data, we have leveraged strategic partnerships with some of the world's leading data providers.
One promise of **Market Data** is that companies who get good at collecting, analyzing, and maximizing the value derived from Transactions, Interactions, and Observations will put themselves in the best position to be highly profitable.

Organizations using *data and analytics* show productivity rates and profitability improvements that are **5-6%** higher than those of their peers.

**Market Data**
- Research and Analytical Requirements
- Wealth Creation
- Stock Performance
- Compliance and Risk Requirements
- Regulatory Requirements

- Access to Transactional Data
- Low Latency Data Access
- Access to Predictive/Descriptive Data using Power BI
Market Data connects all the dots in successful investment strategies.
## Market Data in Nigeria

### 2016 Market Data Subscription in Nigeria

<table>
<thead>
<tr>
<th>Market Participants</th>
<th>Registered Number</th>
<th>Utilization</th>
<th>Subscription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broker-Dealer Firms</td>
<td>205</td>
<td>174</td>
<td>Excellent</td>
</tr>
<tr>
<td>PFA's</td>
<td>24</td>
<td>4</td>
<td>Poor</td>
</tr>
<tr>
<td>Asset Managers</td>
<td>48</td>
<td>12</td>
<td>Fair</td>
</tr>
<tr>
<td>Investors</td>
<td>5.9million</td>
<td>100,000</td>
<td>Poor</td>
</tr>
<tr>
<td>Market Data Vendors</td>
<td>17</td>
<td>10</td>
<td>Good</td>
</tr>
<tr>
<td>Insurance Companies</td>
<td>43</td>
<td>1</td>
<td>Poor</td>
</tr>
<tr>
<td>Listed Companies</td>
<td>171</td>
<td>2</td>
<td>Poor</td>
</tr>
<tr>
<td>Banks</td>
<td>21</td>
<td>6</td>
<td>Fair</td>
</tr>
<tr>
<td>Independent Software Vendors</td>
<td>20</td>
<td>15</td>
<td>Good</td>
</tr>
<tr>
<td>Regulatory Bodies</td>
<td>10</td>
<td>02</td>
<td>Poor</td>
</tr>
<tr>
<td>Government Agencies</td>
<td>N/A</td>
<td>2</td>
<td>Poor</td>
</tr>
</tbody>
</table>

### Subscription to NSE Market Data

![Subscription to NSE Market Data](chart)

- **Dealing Members**: Excellent
- **PFA's**: Poor
- **Asset Managers**: Fair
- **Insurance Companies**: Good
- **MDVS**: Poor
- **Issuers**: Poor
- **Banks**: Poor
- **ISVS**: Poor
- **Regulatory Bodies**: Poor
- **Government Agencies**: Poor

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The Nigerian Stock Exchange
Users of Market Data Products

- Broker Dealers
- Retail Investors
- Fund /Portfolio Managers
- Regulators

Market Data Vendors
- Independent Software Vendors
- Website Aggregators
- Financial News Media

Quoted companies
- Institutional Investors
- Investment Banks
- Students

Other Financial Professionals- Researchers/ Analyst etc.
## Existing Market Data Products from NSE

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (N) Local</th>
<th>Price ($) Int.</th>
<th>Billing Frequency</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV EOD Display</td>
<td>N148,800</td>
<td>$960</td>
<td>Annually in Advance</td>
<td>• Client is permitted to display certain End of Day fields on a television station</td>
</tr>
<tr>
<td>NSE Trading Statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real time Data for Order Routing</td>
<td>N400,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Raw data feeds provided to Authorized Clients, directly from the trading platform via connection ports for non-display use (Order Routing) only.</td>
</tr>
<tr>
<td>Real time Data for ETF Computation</td>
<td>N400,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Raw data feeds provided to Authorized Clients, directly from the trading platform via connection ports for non-display use (Computation of ETF Prices) only.</td>
</tr>
<tr>
<td>Delayed Feed for Vendor Distribution</td>
<td>N1,000,000</td>
<td>$20,000</td>
<td>Annually in Advance</td>
<td>• Delayed Feeds are delivered on timely intervals of Fifteen minutes or more. Delayed feeds are received via authorized Network Service Providers and Market Data Vendors who receive data directly from the Exchange.</td>
</tr>
</tbody>
</table>

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# Existing Market Data Products from NSE

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (N) Local</th>
<th>Price ($) Int.</th>
<th>Billing Frequency</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Portal Products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trading floor Level 1</td>
<td>N50,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Access to Real Time Full depth of Order Book, Bid/Offer, Day Traded Volume, Average Price, High Price and Low Price.</td>
</tr>
<tr>
<td>Trading floor Level 2</td>
<td>N70,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Access to Real Time Counterparty Information.</td>
</tr>
<tr>
<td>Equity Level 1 Real Time</td>
<td>N35,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Access to Real Time Price, Volume and Value Data</td>
</tr>
<tr>
<td>Equity Level 1 Historical</td>
<td>N45,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Query Engine for generation of Historical Open Price, High Price, EOD Price, Number of Trades, Volume and Value Data</td>
</tr>
</tbody>
</table>
| Equity Level 2 Real Time | N45,000         | -              | Annually in Advance | • Access to Real Time Price data (current price, high price, low price, upper circuit price, lower circuit price), Volume and Value Data, Market Capitalization, Open Orders.  
• Access to Real Time Stock YTD performance  
• Access to Real Time Top 10 Volume and Value Stocks |
| Equity Level 2 Historical| N55,000         | -              | One-off payment    | • Query engine for generation of Historical Traded Volume and Value, Number of Trades, Open Price, High Price, VWAP, Number of days Traded, Market Capitalization. |
| Customized Reports       | N120,000        | $600           | Annually in Advance | • Monthly End of Day reports are customized to fit the data needs of the client. This is provided to clients upon request e.g. Top Traded Stocks by Broker Dealer. |
Market Data Products

NSE Trading Statistics and Data Portal

- NSE website provides free access to delayed trading statistics covering all asset classes. In addition to searchable market activities and company data; periodic reference report dumps can be downloaded from the portal. Visit [www.nse.com.ng/market-data](http://www.nse.com.ng/market-data) for more information.
NSE Reports Notification

Subscribe to NSE report notification service to receive desired periodic reports (e.g. daily, week and monthly) right in your inbox. Reports can be conveniently archived and viewed later even without internet connection.
XGEN News Alert

Be the first to receive company news alert, at the same time with the Broker-Dealer community by subscribing to XGEN News Alert. Relevant trading engine company news will be delivered to your mail box in real-time. Contact the Market services department on marketdata@nse.com.ng for more information.
NSE Odata Feed

Log on to NSE Odata feed right from Microsoft Excel or Power BI to get NSE Market data and create any desired insight using tools your in-house market data analyst and research team are familiar with.
**Issuer Share Price**

Display your share price on your corporate website in real time.

**Share Price**

[NGN] 145.50

Current as of 2016-02-14 13:15:27 (WAT)

www.dangotecement.com

www.gtbank.com

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**Market Data Products**

**Ticker/Display Data**

Display your share price in your corporate offices as part of your Brand and Investor Relations Strategy.

Note: Charges are only on the data, however the Nigerian Stock Exchange has a partnership with Samsung Nigeria, and can provide you with the screens. Contact marketdata@NSE.com.ng for more information.
Video walls

Display real time market data alongside economic indicators on a robust visual display unit. Ideal for trading rooms, financial departments and corporate talent management facilities.

Note: Charges are only on the data, however the Nigerian Stock Exchange has a partnership with Samsung Nigeria, and can provide you with the screens. Contact marketdata@nse.com.ng for more information.

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### New Market Data Products from NSE...1/3

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (N) Local</th>
<th>Price ($) Int.</th>
<th>Billing Frequency</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuer-Share Price Information (Real Time)</td>
<td>N310,000</td>
<td>$2,000</td>
<td>Annually in Advance</td>
<td>Allows a company listed on the NSE to display Stock Quote: symbol, previous close, previous close date, change, percent change, open, high, low, close, volume, currency, market date and time, UTC offset, 52 week high/low, Trade Date and Last Trade Time on its own website on a near Real time basis.</td>
</tr>
<tr>
<td>Issuer-Share Price Information (Delayed)</td>
<td>N196,000</td>
<td>$1,000</td>
<td>Annually in Advance</td>
<td>Allows a company listed on the NSE to display Stock Quote: symbol, previous close, previous close date, change, percent change, open, high, low, close, volume, currency, market date and time, UTC offset, 52 week high/low, Trade Date and Last Trade Time on its own website on a delayed basis of 15 minutes.</td>
</tr>
<tr>
<td>Issuer-Share Price Information (End of Day)</td>
<td>N165,000</td>
<td>$750</td>
<td>Annually in Advance</td>
<td>Allows a company listed on the NSE to display Stock Quote: symbol, previous close, previous close date, change, percent change, open, high, low, close, 52 week high/low on its own website at the close of each trading day.</td>
</tr>
<tr>
<td>X-Gen News</td>
<td>N120,000</td>
<td>$1,200</td>
<td>Annually in Advance</td>
<td>Company disclosures from listed companies are sent directly to clients by e-mail as they are disseminated on the trading terminal.</td>
</tr>
</tbody>
</table>
### New Market Data Products from NSE...2/3

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (N) Local</th>
<th>Price ($)</th>
<th>Billing Frequency</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSE Reports Notification</td>
<td>N357,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• (subset of NSE Market Data API)</td>
</tr>
<tr>
<td>NSE Odata Feed</td>
<td>N714,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• (subset of NSE Market Data API)</td>
</tr>
<tr>
<td>Ticker/Display Data</td>
<td>N192,000</td>
<td>$1,750</td>
<td>Annually in Advance</td>
<td>• (Web Ticker License )</td>
</tr>
</tbody>
</table>
## New Market Data Products from NSE...3/3

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (N) Local</th>
<th>Price ($) Int.</th>
<th>Billing Frequency</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video Wall</strong></td>
<td></td>
<td></td>
<td></td>
<td>• Charges are only on the data, contact <a href="mailto:marketdata@NSE.com.ng">marketdata@NSE.com.ng</a> for more information.</td>
</tr>
<tr>
<td><strong>Trade Smart (FIX Data Feed)</strong></td>
<td>N1,200,000</td>
<td>$25,000</td>
<td>Annually in Advance</td>
<td>• Raw data feeds provided to Authorized Clients, directly from the trading platform. Authorized Clients get connected to the trading platform via connection ports provided by the NSE, allowing all raw data generated during a trading day pass through to these clients on a real time basis. This service is made available to all major data distributors i.e. data vendors etc.</td>
</tr>
<tr>
<td><strong>Market Data API Products</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>API Standard Subscription Band 2</strong></td>
<td>N357,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Maximum number of 19,200 hits per month on all API products with direct connection to the Exchange.</td>
</tr>
<tr>
<td><strong>API Premium Subscription Band 3</strong></td>
<td>N714,000</td>
<td>-</td>
<td>Annually in Advance</td>
<td>• Maximum number of 76,800 hits per month on all API products with direct connection to the Exchange.</td>
</tr>
</tbody>
</table>
Behind the Market Data Generator

Market Data Feed

Trading Engine

- FIX
- Secure WAN
- FIX
- Secure WAN VPN
- SDK

Market Database

CSD

Surveillance

Traders/Market Makers

- Trader Workstation
- MM/Broker OMS
- Post Trade Management

New investor access channels

- Secure WAN
- Market Displays
- Website/Portals
- Administrator Workstations

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The Nigerian Stock Exchange
NSE Market Data API and Widgets

API and Widgets

Subscribe to NSE data API to integrate market data to your web and back office solutions using simple and cost effective data interface. Contact marketdata@nse.com.ng for more information.
## Market Data Products and Users

### Market Data User Segments (New Products Launched in 2016)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Products</th>
<th>Broker Dealers</th>
<th>Retail Investors</th>
<th>Fund /Portfolio Managers</th>
<th>Listed Companies</th>
<th>Regulators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DataXplorer Reports Notification</td>
<td>✅</td>
<td>✅</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>XGEN News Alert</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>NSE Odata Feed</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Issuer Share Price</td>
<td></td>
<td>✅</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Market Data API</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ticker/Display Data</td>
<td>✅</td>
<td></td>
<td>✅</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Video Wall</td>
<td></td>
<td></td>
<td></td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>
The Future of Market Data (... and Trading)

Latency Wars will continue
“A one (1) millisecond advantage in trading applications can be worth $100 million a year to a major brokerage firm.”
-Information Week Magazine

Big Data and Analytics will offer competitive advantage
“Without big data analytics, companies are blind and deaf, wandering out onto the web like deer on a freeway.”
-Geoffrey Moore, author and consultant

Robo-Advisers will rule the day.... Eventually ....
“Artificial intelligence will reach human levels by around 2029. Follow that out further to, say, 2045, we will have multiplied the intelligence, the human biological machine intelligence of our civilization a billion-fold.”
-Ray Kurzweil

Watch This Space!
Market Data – The bedrock of Successful investing

Market Data is the bedrock of wise and successful investing.

Processed data is information, processed information is knowledge, processed knowledge is wisdom.  Ankala V. Subbarao
THANK YOU
And
Happy Investing.

Questions & Answers.

Visit our website today!

www.nse.com.ng

“A truly user-friendly experience”

NEW & IMPROVED
WEBSITE

Frequently Asked Questions

How can Market Data enhance my Investors Relations Strategy?

How will Licensing affect my redistribution of Market Data?

How much will it cost me to access reliable and timely Market Data?

Issuers

Data Vendors

Investors