Estimating Beta for Barclays Bank Shares Listed On the Zimbabwe Stock Exchange (ZSE) For the Year 2014

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Abstract: *It is believed that there is an increase of uncertainty and risk in the banking sector since the inception of the multi-currency era in Zimbabwe. Systematic factors such as liquidity risk and market instability might have led to the collapse of some indigenous banks such as Allied Bank, Royal bank and AfrAsia bank. It is on this background that the researchers estimated the systematic risk using one of the bank shares operating in Zimbabwe, that is, Barclays Bank Zimbabwe Ltd by computing its beta. Beta can generally be viewed as a standardized measure of systematic risk given that the covariance of any asset with the market portfolio is the relevant risk measure. As a result, we applied the simple regression analysis method for ZSE Barclays share prices relative to the ZSE Industrial index values that prevailed during the year of 2014. Barclays shares returns and complementing Industrial index values were computed on monthly basis in order to reduce non trading bias from January to December 2014. The findings were compared with beta value for Barclays bank shares listed in a developed stock exchange such as the London Stock Exchange.*

Key words: Market risk: *it is the risk of loss due to movements in financial market prices or volatilies.*

The Industrial Index Performance: It is a measure of the share prices, of all listed industrial companies, assessed by the total market capitalisation of these shares, relative to their market capitalisation in January 1967. **Macroeconomic variables** that affect beta variability include growth in money supply, interest rate volatility, changes in industrial production, corporate earnings and corporate cashflow etc.

I. Background To The Study

Barclays bank is one of the major commercial banks in Zimbabwe and has operated in the country since 1912. For 23 of these years Barclays Zimbabwe has been listed on the Zimbabwe Stock Exchange after offering 30% of its equity to local shareholders. It is one of the few banks that had managed to withstand amicably the adverse macroeconomic conditions both in local currency era and multiple currency era. Given the resurgent uncertainty, risk and market instability in the banking sector specifically in the multi-currency era leading to closure of 10 financial institutions such as Allied Bank, AfrAsia Bank Limited, Royal bank, Interfin Bank Limited, ..., just to mention a few, has prompted the research to estimate the Beta factor for Barclays Zimbabwe. Listed below are the major characteristics of the Barclays Zimbabwe shares versus the Barclays International shares for comparison sake.

Table 1.1: Values of the Barclays Bank Shares as at 24 April 2015

Trait	London Stock Exchange (LSE)	Zimbabwe Stock Exchange (ZSE)
Market capitalisation	$65,777,400,800	$86,125,607
Shares outstanding	16,743,390,000	2,153,140,176
Dividend	3.50	0.00
Yield (%)	2.51	-2.94
Share Price	$3.93	$0.04
Beta	1.77	?

Source: LSE, ZSE (2015)

1.2 Statement Of Problem

Given this uncertainty in the Zimbabwean banking sector, the research was carried out to determine the appropriate times to invest in Barclays shares during the year 2014 using the computed beta. To what extent is the computed beta a meaningful investment tool for investors in Barclays` securities in the Zimbabwe Stock Exchange?

1.3 Objectives Of Research: The research study intended to:

* To estimate beta of Barclays Zimbabwe
* To compare the beta of Barclays Zimbabwe with Barclays International
* To offer investment consultancy using the computed beta

1.4 Research Questions

In this study, the research questions could be stated as follows**:**

- What is the beta of Barclays Zimbabwe in 2014?
- How the beta of Barclays Zimbabwe does compares with Barclays International?
- To what extent is the estimated beta meaningful and applicable for investment decisions?

1.5 The Impact Of Beta Of A Listed Share

Prasanna (2006) defines systematic risk (aka market risk, undiversifiable risk, systemic risk) as the risk that affects all investments or classes of investments. Most systematic risk is either economic or political and cannot be diversified away by investing in different classes of assets. On the other hand, Diversifiable risk (aka unsystematic risk) affects specific companies, because of such factors as bad management, lawsuits, and labor trouble (Avandhani, 2009). Diversifiable risk can be minimised by diversification either by investing in different companies in different sectors or by investing in different asset classes, such as stocks and bonds. In addition, unsystematic risk might be lowered by investing in assets that have a negative correlation coefficient, where the lows of some assets are offset by the highs of other assets (Avandhani, 2009)

The total risk of any investment is the sum of systematic risk + unsytematic risks.

Given the fact that systematic risk affects all investment returns, some assets are more sensitive to systematic risk than others, even those in the same asset class, such as the stocks of different companies. If a particular stock, for instance, has greater volatility due to systematic risk than the general market, then it would be prudent for an investor to demand a greater return from that stock than the market return, which is the return of the market as a whole, such as the stock market, or a subclass of a market, such as the NASDAQ or the S&P 500 stock index (Prasanna, 2006).

The beta of an asset, such as a stock, measures the market risk of that particular asset as compared to the rest of the market — hence, it also measures volatility of the asset compared to the general market. The beta is calculated by comparing the historical return of an asset compared to the market return using statistical techniques (Prasanna, 2006).

The beta of the S&P 500 stock index market is considered 1. Most stocks have a positive beta, which means that most stocks move in the same direction as the general market (Muponda, 2004). If the beta is greater than 1, then the stock moves more than the market does in the same direction. For instance, if the stock market increases in value by 1%, then a stock with a beta of 2 will often increase by 2%. Likewise, if the market return decreases by 1%, then a stock with a beta of 2 will decrease by 2%. Hence, a stock with a beta of greater than 1 is riskier than the general market, but potentially more profitable; a beta of less than 1 is generally less risky than the general market, and gains will also probably be less than market gains.

Some stocks have a negative beta because they have a negative correlation to the general market— they move in the opposite direction to the general market (Muponda, 2004). For instance, a stock with a beta of -1 will decrease in value by 1% for each increase of 1% in the general stock market, and vice versa.

A beta of zero indicates that the returns of the shares are not correlated to the stock market index (Reilly and Brown, 2000).

1.3.1   Factors affecting Beta of a share (/stock) of listed company

According to Avandhani (2010), the following are the major factors that determine beta variations:

- There may happen that the performance of a company remains constant but the performance of the entire financial market changes. This might affect the beta value.
- There may also happen that the overall financial markets remain the same but that of the particular company differs. This again causes changes in beta.
- The overall changes in the performances of both the financial market and that of the company cause changes in beta.

Several scholars have come out with various pros and cons of applying beta in the field of finance. Of consideration, listed here-under are the common views by Reilly and Brown (2000).

1.3.2 Advantages of Beta

- To followers of Capital Asset Pricing Model, beta is a useful measure. A stock's price variability is important to consider when assessing risk. Indeed, if you think about risk as the possibility of a stock losing its value, beta has appeal as a proxy for risk.
- Intuitively, it makes plenty of sense. Think of an early-stage technology stock with a price that bounces up and down more than the market. It's hard not to think that stock will be riskier than, say, a safe-haven utility industry stock with a low beta.

- Besides, beta offers a clear, quantifiable measure, which makes it easy to work with. Sure, there are variations on beta depending on things such as the market index used and the time period measured, but broadly speaking, the notion of beta is fairly straightforward to understand. It's a convenient measure that can be used to calculate the costs of equity used in a valuation method that discounts cash flows.

1.3.3 Disadvantages of Beta
However, if you are investing in a stock's fundamentals, beta has plenty of shortcomings.
- For starters, beta doesn't incorporate new information, for example, many technology stocks are relatively new to the market and thus have insufficient price history to establish a reliable beta.
- Another troubling factor is that past price movements are very poor predictors of the future. Betas are merely rear-view mirrors, reflecting very little of what lies ahead.
- Furthermore, the beta measure on a single stock tends to flip around over time, which makes it unreliable. Granted, for traders looking to buy and sell stocks within short time periods, beta is a fairly good risk metric. However, for investors with long-term horizons, it is less useful.

1.6 Research Methodology
The researchers used the quantitative methodology specifically the correlational research design. In using correlational research design one seeks to establish the degree of variation between two variables or factors. The degree of variation is generally measured through some statistical correlation coefficient (Cohen and Manion, 1994). Correlation studies help to confirm or to refute suspected relationships between or among variables.

The researcher used the regression analysis to compute the Beta of Barclays Zimbabwe shares. The regression analysis is a statistical technique for modelling and investigating the relationship between two variables, that is, the returns of Barclays shares vis-a-vis the returns on the index. The regression is widely recommended for prediction, estimating parameters and investigating relationships (Muchengetwa, 2005).
Decisions were made with the respect to the length of the estimation period, the return interval and the choice of the market index in the Zimbabwe Stock Exchange as follows:

- **Estimation Period**
  A longer period is justified as it provides more data hence the researcher considered a 12 month period during the year of 2014.

- **Returns Interval**
  Returns may be calculated on an annual, monthly, weekly or even daily basis. The researchers preferred the monthly interval as it was more practical to compute, that is, closing prices for Barclays and the index were taken both at the beginning and ending day of every month during year 2014, for example, 03 February 2014 and 28 February 2014.

- **Market Index**
  The standard practise is to estimate the beta of a stock in relation to the index of the market to which it belongs. The Zimbabwe Stock Exchange has two major indexes, that is, the Mining index and the Industrial index. The researchers preferred the Industrial index so as an investigation was made on how the Barclays bank (an industrial counter) related with the industrial index during year 2014.

  The researcher then obtained the beta coefficient by regressing the returns on the shares of Barclays, (R_B) against the returns on the industrial market index (R_M) using the equation:

$R_B = a + bR_M$ which is similar to $Y = a + bX$

Where "a" is the intercept from the regression and "b" is the slope of the regression. The slope of the regression is the beta coefficient that we can then apply in estimating the required rate of return on the equity of the firm.

1.7 Research Results, Analysis And Discussion
The prices of Barclays Bank shares and the Industrial index values at the beginning and ending days of the months during year 2014 are detailed as shown in table 1.2 and table 1.3.

Table 1.2: Industrial Index Values from January to December 2014

Month in 2014	Beginning Value (BV)	Ending Value (EV)
January	02/01/14 201.99	31/01/14 189.25
February	03/02/14 190.29	28/02/14 189.45
March	03/03/14 189.65	31/03/14 176.32
April	01/04/14 176.65	30/04/14 172.91
May	02/05/14 173.59	30/05/14 174.89
June	02/06/14 174.91	30/06/14 186.56
July	01/07/14 186.49	31/07/14 188.08
August	01/08/14 189.31	29/08/14 196.43
September	01/09/14 196.92	30/09/14 195.25
October	01/10/14 194.71	31/10/14 177.88
November	01/11/14 177.73	28/11/14 171.45
December	01/12/14 171.07	31/12/14 162.79

Source: Zimbabwe Stock Exchange, 2014

There were signs of growing impatience and frustrations among Barclays Bank Zimbabwe Limited shareholders over a prolonged dividend drought of 4 years given that there were no dividend declarations and payments in year 2014.

Table 1.3: Barclays Share Prices from January to December 2014

| Month in 2014	Beginning Price in Cents (BP)	Ending Price in Cents (EP)	Dividend
January	02/01/14 4.00	31/01/14 4.40	0
February	03/02/14 4.20	28/02/14 4.00	0
March	03/03/14 4.00	31/03/14 3.43	0
April	01/04/14 3.40	30/04/14 3.50	0
May	02/05/14 3.50	30/05/14 3.52	0
June	02/06/14 3.50	30/06/14 3.75	0
July	01/07/14 3.75	31/07/14 4.11	0
August	01/08/14 4.5	29/08/14 4.53	0
September	01/09/14 4.00	30/09/14 3.50	0
October	01/10/14 3.60	31/10/14 3.2	0
November	03/11/14 3.20	28/11/14 3.00	0
December	01/12/14 3.00	31/12/14 2.50	0

Source: Zimbabwe Stock Exchange, 2014

The prices of the index and shares were used to calculate the estimated returns for the whole year which lead to table 1.4 below;

Table 1.4: Computed Effective Rates of Returns for Barclays and Industrial Index

| Month in 2014	RETURNS ON BARCLAYS SHARE (%)	RETURNS ON THE ZSE INDUSTRIAL INDEX (%)
January	10	-6.31
February	-4.7	-0.44
March	-15	-7.03
April	2.94	-2.12
May	0.57	0.75
June	7.14	6.67
July	9.6	0.85
August	0.67	3.76
September	-12.5	-0.85
October	-11.11	-8.64
November	-6.25	-3.53
December	-16.67	-4.84

Source: Zimbabwe Stock Exchange, 2014
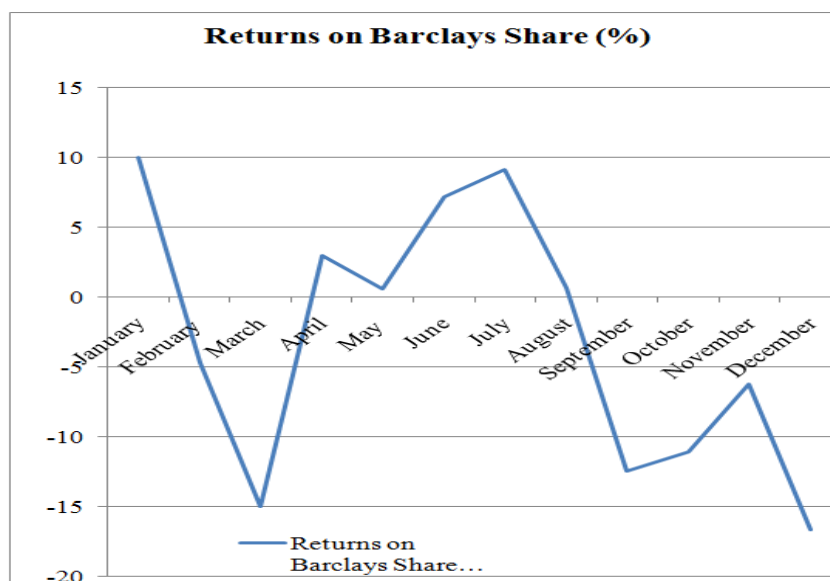
As depicted diagrammatically, the returns of the shares fell sharply in March but gained momentum from April to August. However, the trend fell haphazardly up to year end in December 2014. This was due to many factors such as;

- Interest rate ranges continued to narrow down partly reflecting a shift towards stronger quality lending in the market. Levels of non-performing loans went up to about 17% from about 15% as at December 2013 and this led to the bank more critical to focus on the quality of the loan portfolio and adhere to prudent risk practices.
- In turn the bank prioritised its customers in improving payment and service channels with the latest edition in 2014 being a re-launch of the Point of Sale offering and e-channels promotions.

- The loan product offering was widened.
- The bank registered a profit after tax of $1.7 million dollars July 2014. This is a 106% growth in net profit compared to 2013.
- The bank's balance sheet continued to be sound. The bank met the current minimum capital requirements and as at 30 June 2014, registered a total capital adequacy ratio of 17% ahead of the regulatory minimum of 12%. As required by the Reserve Bank of Zimbabwe, the bank submitted its proposals in respect of the minimum capital threshold of $100 million applicable from 2020.
- The liquidity ratio closed the period at 54%, ahead of the regulatory minimum of 30%. Global Credit Rating Company, issued its latest rating report on Barclays Bank of Zimbabwe in May 2014. The rating awarded was AA on the long-term security class, with the rating outlook assessed as Stable.
- The bank's liquidity management framework continued to be a high focus area for the Board under the turbulent economic conditions.
- There were no changes to the Board during the period.

- The Bank continued its citizenship agenda with a thrust to empower youths and young adults through training.
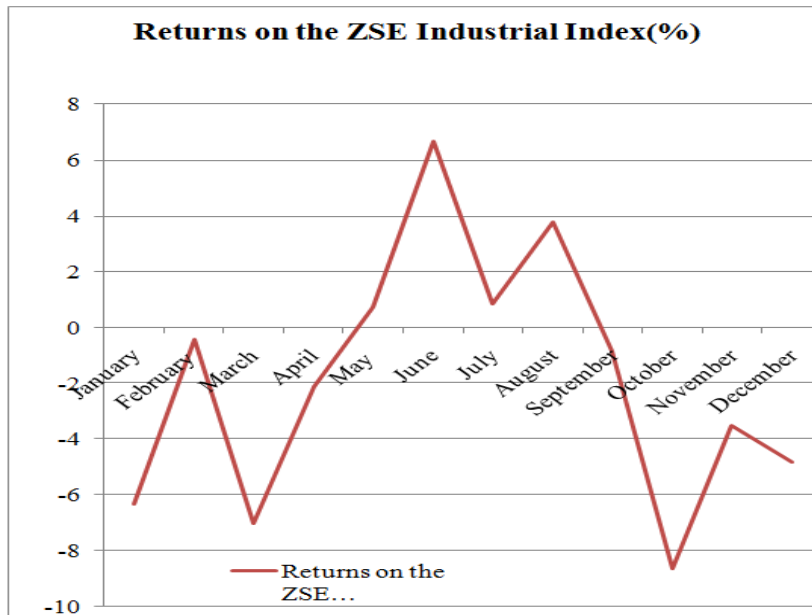
The Industrial market index began low at the start of year 2014 but showed significant momentum from May to September having to bouy down during the last quarter of the year.

Major factors that determined the trend include:
- The Ministry of Finance revised the projected 2014 GDP growth rate down to 3.1%.
- Exports continued to fall short of imports whilst Foreign Direct Investment levels remained low.
- There was need to address infrastructural deficits, to improve efficiencies across
- The various value chains in the economy and to promote local production.
- The economy required capital inflows, growth in exports and containment of the import bill to achieve desired levels of growth.
- Monthly inflation over the first half averaged 0.08%. Inflation for traded goods showed a downward trend partly due to the effect of a weaker South African Rand but also due to stagnation in demand for certain goods.
- Inflation for non-traded goods like utilities generally maintained a stable or upward trend.
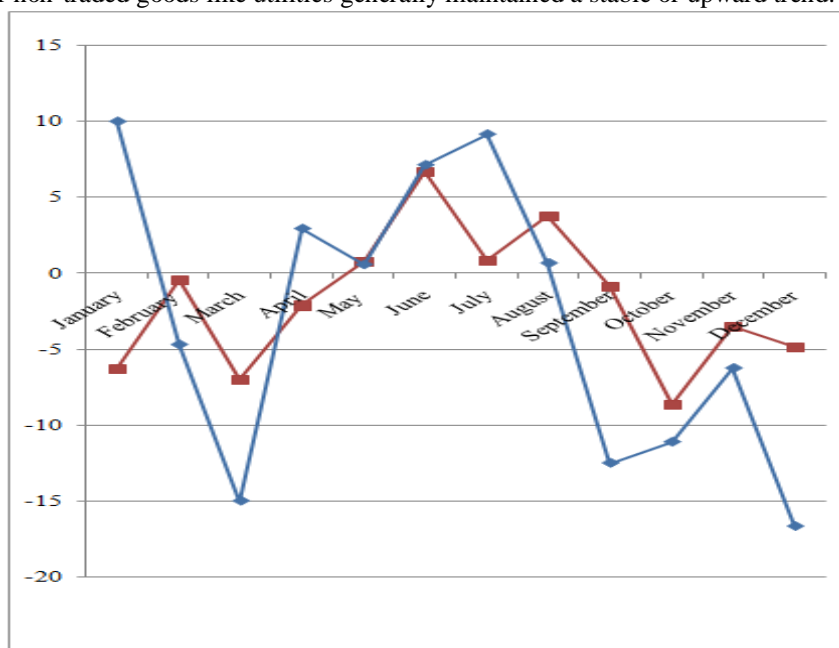
Having superimposed the returns of the Barclays shares and the Industrial market index, the trends conform that they have a positive correlation.

Table 1.5: Regression Table of the Barclays share in relation to the Industrial Index

YEAR	Barclays (Y)	ZSE Industl. Index (X)	y (Y- µY)	y^2	x (X - µX)	xy	x^2
January	10	-6.31	12.94	167.4436	-4.5	-58.23	20.25
February	-4.7	-0.44	-1.76	3.0976	1.37	-2.411	1.8769
March	-15	-7.03	-12.06	145.4436	-5.22	62.953	27.248
April	2.94	-2.12	5.88	34.5744	-0.31	-1.823	0.0961
May	0.57	0.75	3.51	12.3201	2.56	8.9856	6.5536
June	7.14	6.67	10.08	101.6064	8.48	85.478	71.91
July	9.6	0.85	12.54	157.2516	2.66	33.356	7.0756
August	0.67	3.76	3.61	13.0321	5.57	20.108	31.025
September	-12.5	-0.85	-9.56	91.3936	0.96	-9.178	0.9216
October	-11.11	-8.64	-8.17	66.7489	-6.83	55.801	46.649
November	-6.25	-3.53	-3.31	10.9561	-1.72	5.6932	2.9584
December	-16.67	-4.84	-13.73	188.5129	-3.03	41.602	9.1809
TOTAL	**296**	**180**	**-0.03**	**992.3809**	**-0.01**	**242.34**	**225.75**

Source: Survey data

The regression line will be given by $b = \frac{\sum(xY)}{\sum x^2}$

And $a = \mu Y - b\,\mu X$

We calculate "a" and "b" using the table below.
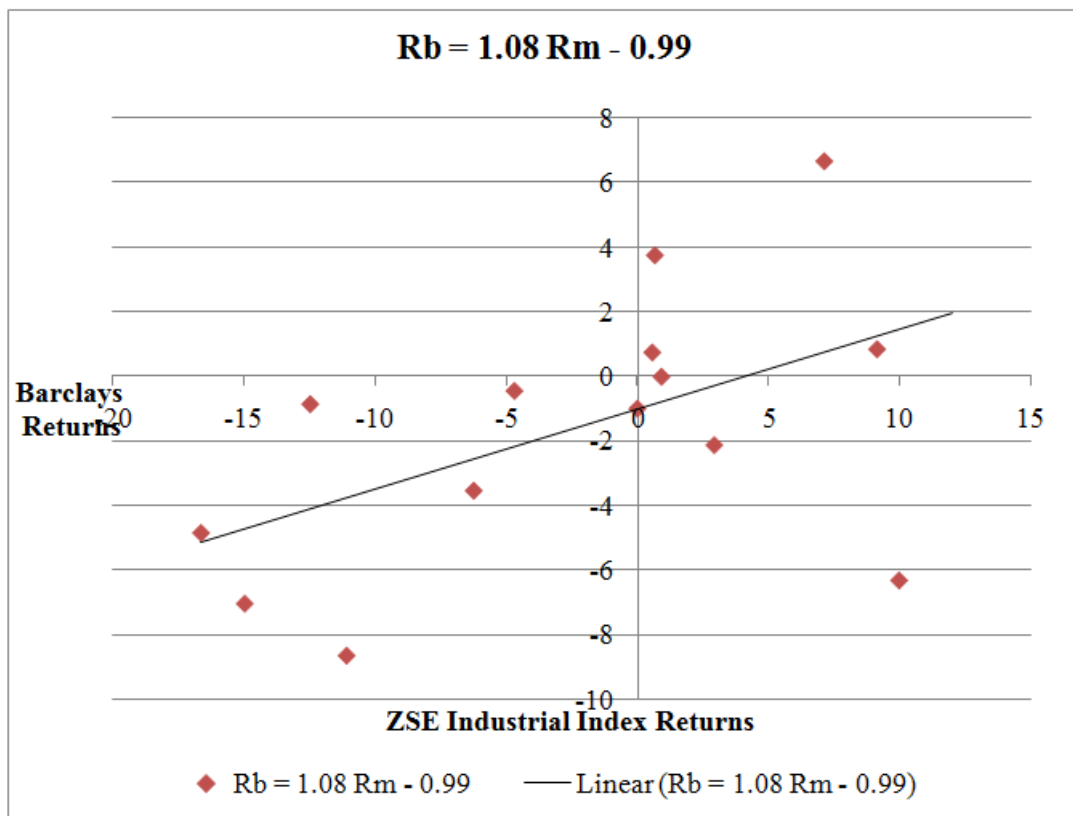
$\mu Y = \frac{-35.31}{12} = -2.94$

$\mu X = \frac{-21.73}{12} = -1.81$

$b = \frac{\sum(xy)}{\sum x^2} = \frac{242.34}{225.75} = 1.08$

$a = \mu Y - b\,\mu X = -2.94 - (1.08 \times -1.81) = -0.99$

Therefore the regression line for this company`s returns is given by

$R_B = 1.08R_M - 0.99$ and the beta coefficient is 1.08.

Interpretation of the Correlation Coefficient (r) of the Barclays share returns

$$r = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}} = \frac{12(242.34) - (-0.01)(-0.03)}{\sqrt{[12(225.75) - (-0.01)^2][12(992.3809) - (-0.03)^2]}} = 0.512$$

A correlation coefficient takes the values between -1 and 1. If it is -1, that is, a strong negative relationship and if it is +1, it implies a strong positive relationship. In terms of our findings, we deduce that is it is fairly positive correlated as shown diagrammatically.

This implies that our coefficient of determination, which measures the strength of the linear relationship between Barclays returns and Industrial market index returns to $(0.512)^2*100\% = 26.2\%$

Therefore 26.2% of the variability in the Barclays shares returns is explained by the changes in the Industrial market index returns.

1.5: Conclusions And Recommendations

The beta of the Industrial stock market index is assumed to be 1 as it is a diversified market protfolio. Given that Barclays Zimbabwe beta for 2014 was computed as 1.08, which is positive, it implies that its returns move in the same direction as the general Industrial market index. To be precise, the Barclays Zimbabwe stock moves more than the market does in the same direction by 0.08%. From the results, we deduce that investors would have made more value for their monies if they had invested in Barclays Zimbabwe shares during the period from April to August 2014.

Likewise, if the market return decreases by 1%, then the Barclays Zimbabwe will decrease by 1.08%. Hence, the Barclays Zimbabwe stock is somehow riskier than the general market, but potentially more profitable. This implied that investors were supposed to shun the Barclays Zimbabwe shares during periods from January to March 2014 and September to December 2014 as it the shares were more riskier than the industrial market index.

The beta for Barclays Zimbabwe compares very well with the beta for Barclays International listed on London Stock Exchange which is 1.77. We can therefore deduce that the Zimbabwe Stock Exchange performance somehow mirrors the major global exchanges such as the London Stock Exchange in terms of performance, that is, the shares both move in the positive direction when compared to the indexes.

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