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The Conditional Relationship between Risk and Return: An Empirical Analysis of Listed Firms in Sri Lanka

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Abstract:

The study mainly focuses on the relationship between risk and return of the firms listed in the Colombo Stock Exchange of Sri Lanka during the period from June 2003 to May 2015, which includes the civil war period ended in May 2009 as well. Accordingly the main objective of this study is to examine whether the risk-return relationship that is prescribed in the Capital Asset Pricing Model (CAPM) still holds during varying market conditions. Thus the study sought to ascertain the conditional relationship between risk and return by using monthly cross sectional data which are obtained through secondary sources such as the Central bank of Sri Lanka and Colombo stock exchange of Sri Lanka. The study sample contains 91 companies under the individual analysis whereas 18 portfolios are formed to carry out the portfolio analysis. Initially the study employs the basic CAPM model to analyze the prescribed association between risk and return of stocks and secondly the full sample period is further segregated in to different market conditions as up market and down market, by considering the nature of the excess market return within a given period. Accordingly the study basically carries both unconditional and conditional relationship tests which have been suggested by Fama and MacBeth (1973) and Pettengill et al. (1995) respectively. The study reveals a flat risk-return relationship during its full sample period whereas some inter-temporal inconsistencies have also been identified under basic risk-return tradeoff. Thus it could not reject the null hypothesis and thus the prescribed unconditional relationship has become invalid. More importantly the data sample includes a large proportion of down market months which has negative market excess return and it could be due to the low stock market performance during the civil war period. However the empirical findings under conditional risk-return relationship test during times of positive and negative excess market returns reveal that the conditional relationship only holds during the down market period, whereas the up market risk premium proved to be positive as expected, but insignificant. However these findings do not necessarily reject the conditional relationship due to the empirical nature of the study. Thus the study concludes that there is no significant evidence to prove the existence of basic positive risk-return relationship, however an inverse relationship exists between risk-return during the periods of negative excess market returns. Hence the investors have to carefully analyze that how the prescribed risk-return relationship behaves during different market situations before making their stock investment decision.

Keywords*: Risk-return tradeoff, up and down market, unconditional and conditional risk-return relationship*

1. Introduction

Investors consider the level of return and risk inherited in a stock before making their investment decisions. As per Brigham and Houston (2004), risk is the chance of some unfavorable event will occur whereas Damodaran (1999) leaves space for any positive variations by defining it as the likelihood to receive a return on an investment that is different from the expected. Accordingly as identified by Keown, Martin, Petty and Scott (2005), total risk of a financial investment consists of two types; firm- specific and industry-related risk. Further they identify beta of a stock is a measure of market risk, which captures the extent to which the returns on a given stock move with the market. Similarly Brigham (1992) identifies return as a measure of financial performance of an investment. As Jones (2004), return is yield which can be as capital gains and losses. This is also of two types; realized return which represents the return that is actually realized and expected return which represents the return that investor expects to receive in future (Jogyanto, 2003).

As per the Portfolio theory of Markowitz (1952), it assumes investors are to be risk-averse where they select mean-variance efficient portfolios in order to maximize the expected return for a given amount of portfolio risk and minimize risk for a given level of expected return. Similarly, as per Portfolio theory of Harry Markowitz (1959), the SLB model developed by Sharpe (1964), Lintner (1965) and Black (1972) states that, in equilibrium, the expected return of a security is a positive linear function of its beta and beta suffice to describe the cross section of expected returns. Accordingly the CAPM basically asserts a

linear positive risk-return tradeoff, where in equilibrium; the expected return of an asset is a function of the risk-free rate, beta and expected risk premium.

Although the risk and return of portfolio investment has been of great importance, extant literature has not been able to bring an agreement on the existence of such relationship in stock market. As per Fama and French (1992) states that the relationship between risk and return is flat where it has been later contested by several other studies which states that the beta do explain a significant proportion of the differences in returns during a period. With the empirical development on capital asset pricing model, it shows contradictory or weak results against the unconditional relation. Hence an extended version of capital asset pricing model was developed by Pettengill, et al. (1995) in which the risk-return relationship is conditional on the nature of excess market returns which is the difference between expected and realized return. It states that there exists a significant positive relationship between risk and return when excess market returns are positive and a significant negative relationship between risk and return, when excess market returns are negative. Accordingly the study focuses on examining the said relationship between risk-return by considering the civil war period also under its timeframe. Sri Lanka, as an emerging country, market tends to be much volatile and frequently changing and hence it is important for the investors to keep an eye on these market fluctuations, since these market fluctuations can create realized returns which are different from the expected returns. This is reflected through the identification of large proportion of down market months than the up market months. This could be due to the poor stock market performance during civil war period in the country and thus the study fulfills a research gap of finding the risk-return relationship on the grounds of different market conditions.

2. Statement of Problem

The risk-return relationship as a more fundamental concept within the finance discipline is crucial for the risk-averse investors to execute sound investment decisions. However the prescribed positive risk-return relationship proved to be flat under different studies such as Fama and French (1992), Jagannathan, Kubota and Takehara (1998), Theriou, Aggelidis and Maditinos (2004), Refai (2009) and negative under studies such as Havawini and Miechel (1983), Haugen and Baker (1991). In support to the above contradictions, Tang (2010) suggests that beta does not suffice to explain the cross-sectional variations of returns, thus beta as a single factor to measure risk has been seriously challenged. However Pettengill et al. (1995) developed a new model which states that there is a positive relationship between beta and stock returns during positive excess market return periods (up market periods) and a negative relationship between beta and stock returns during negative excess market return periods (down market periods). Accordingly, many scholars such as Isakov (1995; 1999), Fletcher (1997; 2007), Hodoshima et al. (2000) have proven similar findings whereas some of the scholars have found the negative effect during down market period to be much stronger (Fletcher, 1977; Hodoshima, Gomez and Kunimura, 2000; Tang and Shum, 2003; Lam, 2001). Hence the risk-return relationship still proves to be conflicting as well as inconsistent between different time periods. In Sri Lankan context, Nimal (2006), Fernando (2005) and Anuradha (2006) identify the existence of the conditional risk-return relationship. Further Sriyalatha (2008) finds the conditional relation to be a better fit in Colombo Stock Exchange than the unconditional. However a steeper negative relation is again being identified in consistent with Fletcher (1997) and Tang and Shum (2003) resulting in mixed findings. However many of the above scholars have looked upon the risk-return relationship during normal market performance whereas the current study seeks to contribute to extant literature by assessing whether the same conditional relationship between risk-return exists even during an adverse market performance as well. This has been captured by including the civil war period within its sample period.

3. Objectives of the Study

The general objective of the study is to assess the relationship between risk and return of stock investments and examine the power of beta in forecasting the stock returns. However the specific objectives are:

- To examine the relationship between beta and stock return.
- To examine the conditional relationship between beta and stock return.

4. Data & Methodology

The study incorporates listed companies in the Colombo Stock Exchange, excluding banks and financial institutions and between the periods of June 2003 to May 2015. The sample contains 91 companies under the individual analysis whereas 18 portfolios are formed to carry out the portfolio analysis. Basically the secondary data is used in the study where daily stock prices and all share price index (ASPI) are obtained from the Colombo stock exchange to represent stock return and the market return respectively. Further 3 month Treasury bill rates published by the Central bank of Sri Lanka are being used to proxy the risk-free rate of return.

The study estimates the following regression model under ordinary least squares method using E-views statistical software.

$$R_{it} = \alpha_i + \beta_i (R_{mt} - R_f) + e_{it}$$

The following table reflects a summary of the variables and the proxies used to measure each variable in the study.

Variable	Notation	Proxy Variable
Dependent Variable		
Expected Stock return	R_{it}	Realized monthly stock return $R_{it} = (P_{it} – P_{it-1}) / P_{it-1}$
Independent Variables		
Risk-free rate of return	R_f	Government Treasury bill rate (Three Month rate converted in to monthly rate)
Market rate of return	R_m	Realized ASPI return $R_{mt} = (ASPI_t – ASPI_{t-1}) / ASPI_{t-1}$
Stock beta	B_i	Using first pass regression $(R_{it} - R_f) = \alpha_i + \beta_i (R_{mt} - R_f) + e_{it}$

Table 1: Summary Variables
Source: Authors' Construction

4.1. Usage of Individual Stocks

The twelve year sample period is divided in to four, continuing a six-year period and it takes four years under beta estimation and the remaining two years as the test period to capture the time variation in stock beta and its impact on the test period results.

Estimation Period (Beta)	Test period
06/2003-05/2007	06/2007-05/2009
06/2005-05/2009	06/2009-05/2011
06/2007-05/2011	06/2011-05/2013
06/2009-05/2013	06/2013-05/2015

Table 2: Separation of the Sample Period
Source: Authors' Construction

All stocks are included in the six year estimation period, given that the trade data for each stock is available at least for the last 24 months. Full sample period (96 observations) was then divided in to two sub samples, each containing 48 observations. The first sample period is from June 2003 through May 2011 whereas the second sample period is from June 2007 through May 2015.

4.2. Usage of Portfolios

The study intends to minimize the estimation error in variables by way of forming portfolios in carrying out both unconditional and conditional regression tests and the sample period is divided as follows.

Portfolio formation	Estimation	Test period
06/2003-05/2006	06/2006-05/2009	06/2009-05/2011
06/2005-05/2008	06/2008-05/2011	06/2011-05/2013
06/2007-05/2010	06/2010-05/2013	06/2013-05/2015

Table 3: Separation of the Sample Period
Source: Authors' Construction

Each of the eight-year periods is subdivided in to three year portfolio formation, three year portfolio beta estimation and another two year testing period. This is to capture the time variation in individual betas as well as portfolio betas and its impact on the test period results. During portfolio beta estimation period, stocks are included in the eight year period under three step approach of Fama and MacBeth (1973), provided that the trade data for each stock is available at least for the last 24 months (Theriou et al, 2005). The full test period carries 72 monthly observations (six years) starting from June 2009 to May 2015.

4.3. Test of Unconditional beta-return relationship

The study carries two regression tests using both individual stock beta as well as portfolio beta in order to estimate the relationship between beta and the expected stock return.

4.3.1. First Pass Regression- Estimation of Beta

$$(R_{it} - R_f) = \alpha_i + \beta_i (R_{mt} - R_f) + e_{it} \quad (1)$$

Where $(R_{it} - R_f)$ is the excess return of stock *i* in the time period *t*, $(R_{mt} - R_f)$ is the excess market return in time period *t*, e_{it} is the error term.

The individual analysis uses the above equation (1) for the regression whereas three-step approach of FM (1973) is being applied for the portfolio analysis. The sampling procedure follows the table 3. During portfolio formation stage, individual stock betas will be calculated and then 18 portfolios will be formed in the ascending order of each individual stock beta, allocating five companies under a single portfolio. The portfolio beta will be derived using data obtained for monthly excess portfolio return (equal weighted portfolio return- risk free rate) and the monthly excess market returns (market return on ASPI- risk free rate).

4.3.2. Second Pass Regression- Significance Test of Risk Premium

During this stage, the expected sign and significance of risk premium will be tested using the below equation.

$$R_{it} = \gamma_0 + \gamma_1 \beta_i + e_i \quad (2)$$

Where R_{it} is the return of stock i in period t, γ_0 is the zero beta return or the risk free rate of return, γ_1 is the market risk premium of each stock *i* in period *t*, β_i is the stock beta under individual analysis and the portfolio beta under portfolio analysis. Individual analysis uses the individual stock betas estimated during first pass regression and excess monthly stock return during second pass regression whereas equally weighted monthly portfolio return and the monthly excess portfolio returns are used in the portfolio beta method. Accordingly the parameter values for γ_0 and γ_1 are obtained for each month during the test period.

Then the study calculates the $\overline{\gamma_1}$ as;

Cumulative average market risk premium $(\overline{\gamma_1}) = (1/n) * \sum (\gamma_1)$ (3)

Where n is the number of monthly observations during test period.

4.3.3. Hypothesis Testing

To test the unconditional relationship, the following hypotheses will be tested.

$H_0: \gamma_1 = 0$

$H_1: \gamma_1 > 0$

4.3.4. Test of Significance

The study calculates the t-statistic as,

$$\text{T-statistic} = \frac{(\overline{\gamma 1})}{\text{Standard error } (\overline{\gamma 1})} \quad (4)$$

$$\text{Standard error} = \frac{\text{Std. deviation of } (\overline{\gamma 1})}{\sqrt{n}} \quad (5)$$

If the cumulative monthly average risk premium value finds to be significant with a coefficient of greater than zero, the null hypothesis will get rejected and the model concludes the existence of a positive relationship between beta and stock return in the market whereas a value equals to zero will accept the null hypothesis, leaving the unconditional model to be invalid.

4.4. Test of Conditional Beta-Return Relationship

As identified by Pettengill et al. (1995), the market model used during first pass regression identifies the existence of a conditional relationship between beta and stock return when the nature of market excess returns are taken in to consideration. Hence the model was extended to capture the conditional beta-return relationship by using the following regression equation.

$$R_{it} = \gamma_{0t} + \gamma_{1t} * \delta * \beta_i + \gamma_{2t} * (1-\delta) * \beta_i + e_{it} \quad (6)$$

Where γ_{1t} is the up market risk premium and γ_{2t} is the down market risk premium. It also uses a dummy variable, denoted as δ; where $\delta = 1$ in up markets with positive market excess returns; $(R_m - R_f) > 0$ and $\delta = 0$ in down markets with

negative market excess reruns; $(R_m-R_f) < 0$. Since the study identifies two distinct markets as up market and down market, the following equations will be separately tested on each of them.
During up market months, it examines the relationship between beta and realized stock return by using the following equation in which the γ_{1t} represents the up market risk premium.

$$R_{it} = \gamma_{0t} + \gamma_{1t} * \delta * \beta_i \quad (7)$$

Similarly during down market months, it examines the relationship between beta and realized stock return by using the following equation in which the γ_{2t} represents the down market risk premium.

$$R_{it} = \gamma_{0t} + \gamma_{2t} * (1-\delta) * \beta i \quad (8)$$

Risk premiums of both up and down markets represents the cumulative average of monthly market risk premium values obtained during unconditional test, using both stock beta and portfolio beta method as follows.

Cumulative average of up market risk premium $(\overline{\gamma_1}) = (1/n) * \sum (\gamma_1)$ (9)

Cumulative average of down market risk premium $(\overline{\gamma_2}) = (1/n) * \sum (\gamma_2)$ (10)

Accordingly the same method is applied on each sub sample period to obtain cumulative averages of up and down market premiums separately.

4.4.1. Hypotheses Testing

The following hypotheses are separately tested on up market and down market periods.
Where,
In Up markets;

$H_0: \gamma_{1t} = 0$

$H_1: \gamma_{1t} > 0$

In Down markets;

$H_0: \gamma_{2t} = 0$

$H_1: \gamma_{2t} < 0$

4.4.2. Test of Significance

The significance of the up and down market risk premiums are tested on the basis of t-statistic obtained for each coefficient value. Accordingly if the t-statistic is greater than two for up market risk premium with a positive sign, the null hypothesis will get rejected and thus the model concludes a positive relationship between risk and return when the excess returns in market are positive. In contrast if the t-statistic is greater than two for down market risk premium with a negative sign, the null hypothesis will get rejected and thus the model concludes a negative relationship between risk and return when the excess returns in market are negative. These results determine the extent to which beta can be used to capture market risk and then predict the stock return more reliably.

5. Results

5.1. Descriptive Statistics

Descriptive statistics of variables are given in the below tables. It exhibits the results obtained under both unconditional and conditional tests using individual stock beta method as well as portfolio beta which tries to capture any improvement in regression results (BJS, 1972).

5.1.1. Unconditional Test Results

Description	$\overline{\gamma_1}$ (Mean)	SD	SE	t ($\overline{\gamma_1}$)
Full Period 06/2007-05/2015	-0.003	0.053	0.005	-0.578
Sub sample 1 06/2007-05/2011	0.004	0.062	0.009	0.491
Sub sample 2 06/2011-05/2015	-0.011 *	0.042	0.006	-1.768

Table 4: Estimates of Slope Coefficients – Individual Stock Beta Method
$R_{it} = \Gamma_0 + \Gamma_1 B_i + E_i$
Note: $\overline{\gamma_1}$ Denotes Market Risk Premium, SD Is Standard Deviation, SE Is Standard Error, T ($\overline{\Gamma_1}$) Is the T Statistic Value of Market Risk Premium
**** Significant at 1% Level, ** Significant at 5% Level and * Significant at 10% Level*

As per Table 4, it shows a negative slope coefficient of 0.003 during full sample period which means when beta coefficient increases by 1%, stock return reduces by 0.003%. This is different from the positive beta-return relationship introduced under basic CAPM. Furthermore the coefficient values during first and second sub sample periods have obtained a positive and a negative signs respectively due to the reason being more up market months are within the sub sample 1 and more down market months are within the sub sample 2. However only the coefficient obtained second sub sample period has become marginally significant at 10% level which concludes the beta and return to have a marginal negative relationship.

Description	$\overline{\gamma_1}$ (Mean)	SD	SE	t ($\overline{\gamma_1}$)
Full period 06/2007-05/2015	-0.007	0.072	0.009	-0.872

Table 5: Estimates of Slope Coefficients– Portfolio Beta Method
$R_{it} = \Gamma_0 + \Gamma_1 B_i + E_i$
Note: $\overline{\gamma_1}$ Denotes Market Risk Premium, SD Is Standard Deviation, SE Is Standard Error, T ($\overline{\gamma_1}$) Is the T Statistic Value of Market Risk Premium
**** Significant at 1% Level, ** Significant at 5% Level and * Significant at 10% Level*

As per portfolio method also, an insignificant negative coefficient has been obtained which creates contradictions with basic CAPM findings.

5.1.2. Conditional Test Results

		All months	Up months	Down months
Full sample	Number of months	96	48	48
2007 June-2015 May	Excess market return	0.302%	5.57%***	- 4.97%***
		(0.392)	(6.820)	(-6.699)
Period 1	Number of months	48	26	22
2007 June- 2011 May	Excess market return	1.23%	7.50%***	- 6.18%***
		(0.896)	(5.820)	(- 4.328)
Period 2	Number of months	48	22	26
2011 June- 2015 May	Excess market return	-0.63%	3.28%***	- 3.94%***
		(-0.910)	(4.844)	(- 6.520)

Table 6: Average Monthly Excess Market Returns- Individual Stock Beta Method
T-Statistics Are in Parentheses
**** Significant at 1% Level, ** Significant at 5% Level and * Significant at 10% Level*

Table 6 shows an insignificant positive excess market return of 0.302 during full sample period whereas significant positive and negative premiums were obtained as expected under up and down markets respectively. Similarly when considered all monthly observations, the values have obtained a sign as expected, but with a high level of insignificance for all three test periods. However when all monthly observations are considered under the division of up and down market, the market excess returns have obtained the expected sign as well as a high level of significance at 1% for all three test periods. Accordingly the results indicate an improvement in the regression results when it considers the nature of market excess returns as up and down market periods.

Description	$\overline{\gamma_1}$ and $\overline{\gamma_2}$	SD	SE	t ($\overline{\gamma_1}$)
Up marekt	0.008	0.045	0.006	1.308
Down market	-0.012***	0.026	0.003	-3.123
Sub sample 1				
06/2007-05/2011				
Up market	0.013	0.056	0.011	1.14
Down market	-0.008*	0.023	0.005	-1.641
Sub sample 1				
06/2011-05/2015				
Up market	0.004	0.029	0.006	0.694
Down market	-0.015***	0.028	0.005	-2.761

Table 7: Estimates of Slope Coefficients for up and down Markets – Individual Stock Beta Method

$R_{it} = \gamma_{0t} + \gamma_{1t} *\delta* \beta_i + \gamma_{2t} *(1-\delta)* \beta_i + e_{it}$

Note: γ_1 and γ_2 Indicates the Market Risk Premium Estimated in the up Market and down Market Respectively up Markets (down Markets) Are Periods of Positive (Negative) Market Excess Returns.

**** Significant at 1% level, ** Significant at 5% level and * Significant at 10% level*

Table 7 depicts the conditional test results obtained using the individual stock beta and it shows insignificant coefficient values for all up market periods in all three test samples. However the down market coefficient during full period, sub sample one and sub sample two have become highly significant at 1%, 10% and 1% level respectively. This concludes the existence of a strong down market effect during the periods with negative excess market returns (Tang and Shum, 2003; Fletcher, 1997).

		All months	Up months	Down months
Full Sample-	Number of Months	72	40	32
2007 June-2015 May	Excess Market Return	1.156%	5.237%***	-3.946%***
		(1.574)	(6.573)	(-7.620)

Table 8: Average Monthly Excess Market Returns- Portfolio Beta Method

T-Statistics Are in Parentheses

**** Significant at 1% Level, ** Significant at 5% Level and * Significant at 10% Level*

Table 7 shows an insignificant positive coefficient of 1.156 when consider all months. However during up and down markets, it generates a positive and negative coefficient values that are highly significant at 1% level, concluding that there exists a positive beta-return relationship during positive excess market returns and there exists a negative beta-return relationship during negative excess market returns.

Description	$\overline{\gamma_1}$ and $\overline{\gamma_2}$ (Mean)	SD	SE	t ($\overline{\gamma_1}$)
Full period 2009 June to 2015 May				
Up market	0.013	0.078	0.012	1.093
Down market	-0.033***	0.056	0.01	-3.390

Table 9: Estimates of Slope Coefficients for up and down Markets – Portfolio Beta Method

$R_{it} = \gamma_{0t} + \gamma_{1t} *\delta* \beta_i + \gamma_{2t} *(1-\delta)* \beta_i + e_{it}$

Note: Γ1 and Γ2 Indicates the Market Risk Premium Estimated in the Up Market and Down Market Respectively up Markets (down Markets) Are Periods of Positive (Negative) Market Excess Returns

**** Significant at 1% Level, ** Significant at 5% Level and * Significant at 10% Level*

The descriptive statistics under portfolio method shows similar results to individual stock beta method during up and down market periods and at the same time the regression results has obtained a higher level of significance as well. Down market coefficients has become highly significant at 1% level, which emphasizes a significant down market effect (Fletcher, 1997; Hodoshima, Gomez and Kunimura, 2000; Tang and Shum, 2003) whereas up market coefficients are still proven to be insignificant.

This could be due to the study identifies 40% and 37.5% of observations to have negative excess returns whereas 40% and 37.5% of observations to have positive excess market returns respectively under individual stock beta and portfolio beta method. Furthermore, the market excess returns that have become significant during up or down market contains both positive and negative values which may lead the findings presented in the conditional model to be contradicting.

Similarly, the study identifies 10/48 and 8/32 of monthly observations to have positive coefficients during down markets respectively under stock beta and portfolio beta method. Further under stock beta method, all coefficient values have become negative and significant except in March 2014 whereas in portfolio beta method, all coefficients have become negative and significant. This again emphasizes on portfolio usage for stronger results instead of using individual stocks (BJS, 1972) in which a strong down market effect is being identified similarly to the findings by Fletcher (1997) and Tang and Shum (2003).

5.1.3. Test of Seasonality Effect

The study attempts to examine the existence of any seasonal effect during the sample period by considering a time-series of monthly data for coefficients obtained under market risk premium by using the equations exhibited as (2) and (6).

5.1.3.1. Unconditional Test

Month	γ_1	SD	SE	t-stat (γ_1)
Full period	-0.003	0.053	0.005	-0.578
January	0.002	0.013	0.004	0.461
February	-0.001	0.007	0.002	-0.27
March	-0.001	0.008	0.003	-0.417
April	0.001	0.017	0.006	0.252
May	0.002	0.019	0.007	0.279
June	0.003	0.025	0.009	0.358
July	0	0.013	0.005	-0.083
August	0.001	0.019	0.007	0.08
September	0.003	0.02	0.007	0.431
October	-0.002	0.013	0.004	-0.35
November	-0.003	0.014	0.005	-0.584
December	0.002	0.015	0.005	0.384

Table 10: Estimates of Slope Coefficients – Individual Stock Beta Approach

$R_{it} = \Gamma_0 + \Gamma_1 B_i + E_i$

Note: Estimates of Month by Month Slope Coefficients for Markets Returns

None of the above coefficients show significance for any of the twelve months whereas five months have obtained negative coefficients including the full period, which contradicts with the view of Tinic and West, 1984. Further a zero coefficient has been identified during the month of July, indicating no premium during that month.

Month	γ_1	SD	SE	t-stat (γ_1)
Full period	-0.007	0.083	0.010	-0.872
January	0.001	0.014	0.006	0.148
February	0.001	0.013	0.005	0.233
March	-0.003	0.017	0.007	-0.379
April	0.001	0.008	0.003	0.259
May	-0.003	0.016	0.006	-0.457
June	-0.002	0.023	0.009	-0.232
July	-0.003	0.013	0.005	-0.478
August	0.001	0.034	0.014	0.055
September	0.004	0.042	0.017	0.213
October	0.000	0.014	0.006	0.032
November	-0.004	0.019	0.008	-0.531
December	0.000	0.011	0.005	-0.103

Table 11: Estimates of Slope Coefficients - Portfolio Beta Approach

$R_{it} = \Gamma_0 + \Gamma_1 B_i + E_i$

Note: Estimates of Month by Month Slope Coefficients for Markets Returns

Similarly none of the monthly coefficients has shown significance even under using portfolio beta method whereas the months of October and December indicate insignificant zero premiums.

5.1.3.2. Conditional Test

		Up Market				**Down market**		
Month	γ_1	SD	SE	t-stat	γ_2	SD	SE	t-stat
Full period	0.008	0.045	0.006	1.308	-0.012	0.026	0.004	-3.123
January	0.002	0.014	0.006	0.345	-0.002	0.009	0.005	-0.370
February	0.001	0.003	0.002	0.312	-0.003	0.013	0.006	-0.418
March	0.000	0.001	0.001	0.145	-0.003	0.013	0.005	-0.526
April	0.001	0.020	0.008	0.151	0.000	0.003	0.003	-0.145
May	0.000	0.015	0.006	-0.037	-0.003	0.018	0.012	-0.221
June	0.007	0.033	0.015	0.505	-0.001	0.003	0.002	-0.427
July	-0.002	0.013	0.009	-0.204	-0.001	0.004	0.002	-0.284
August	0.003	0.028	0.012	0.256	0.000	0.004	0.002	-0.041
September	0.004	0.031	0.015	0.229	0.000	0.009	0.004	-0.005
October	0.000	0.010	0.005	-0.086	-0.002	0.010	0.005	-0.416
November	0.000	0.000	0.000	0.000	-0.007	0.021	0.007	-0.884
December	0.001	0.011	0.005	0.245	-0.003	0.012	0.007	-0.405

Table 12: Estimates of Slope Coefficients for up and Down Markets – Individual Stock Beta Approach

$R_{it} = \Gamma_{0t} + \Gamma_{1t} *\Delta* B_i + \Gamma_{2t} *(1-\Delta)* B_i + E_{it}$

Note: Estimates of Month by Month Slope Coefficients for up and Down Markets Returns

The above descriptive statistics show zero coefficient values in March, May, October and November within up market months and in April, August and September within down market months. However in full period, it shows a significant down market effect at 1% level of significance. But there is no any significance under monthly results which contradicts with the view of Tinic and West (1984).

	Up Market					Down Market		
Month	γ_1	SD	SE	t-stat	γ_2	SD	SE	t-stat
Full period	0.013	0.078	0.012	1.093	-0.033	0.056	0.010	-3.390
January	0.003	0.015	0.008	0.427	-0.001	0.007	0.005	-0.188
February	0.003	0.013	0.008	0.451	-0.001	0.008	0.004	-0.165
March	0.001	0.005	0.005	0.158	-0.003	0.017	0.007	-0.419
April	0.001	0.011	0.005	0.280	0.000	0.001	0.001	0.118
May	-0.003	0.017	0.007	-0.429	-0.001	0.010	0.010	-0.118
June	-0.002	0.028	0.014	-0.129	-0.001	0.010	0.007	-0.167
July	0.000	0.002	0.001	-0.294	-0.002	0.013	0.007	-0.364
August	-0.003	0.035	0.017	-0.159	0.002	0.022	0.015	0.151
September	0.009	0.054	0.027	0.346	-0.002	0.011	0.008	-0.199
October	0.003	0.012	0.007	0.464	-0.002	0.010	0.006	-0.271
November	0.000	0.000	0.000	0.000	-0.004	0.019	0.008	-0.531
December	0.000	0.014	0.006	0.022	-0.001	0.005	0.005	-0.118

Table 13: Estimates of Slope Coefficients for up and Down Markets - Portfolio Beta Approach

$$R_{it} = \Gamma_{0t} + \Gamma_{1t} * \Delta * B_i + \Gamma_{2t} * (1-\Delta) * B_i + E_{it}$$

Note: Estimates of Month by Month Slope Coefficients for up and down Markets Returns

During full sample period, the suggested market premium has become significant at 1% only for down market months whereas none of the other months show premiums that are significant.

6. Conclusion

The study intended to examine the basic relationship prescribed between beta and stock returns as well as to examine the same relationship by taking the nature of excess market returns in to account. Accordingly, the study has carried out both unconditional and conditional test models that are suggested by FM (1973) and Pettengill et.al (1995) respectively. Further the risk-return relationship has been tested under both individual stock beta method as well as portfolio beta method to identify any improvements in the regression results.

The study used cross sectional regression under ordinary least squares method and incorporated monthly data from June 2003 to May 2015. However the results have indicated contradictions with FM (1973), which states that the relationship between beta and stock return during full period to be flat, but consistent with the findings of Fama and French (1992).

Many studies have found that the systematic relationship between beta and risk is to be weak and results are to be inter-temporarily inconsistent. Similarly the study also shows inconclusive results where the full period shows an insignificant negative market premium under both stock beta and portfolio beta approaches, but the second sub sample shows a significant negative coefficient which indicates the beta and the stock return to be negatively related as the final outcome under unconditional model. However the sign for the up market premium is as expected by the traditional CAPM, but still with insignificance.

With these inconsistent results under unconditional test, the study examined the relationship between beta and return considering the nature of excess market return. That is because the inconsistencies identified under the unconditional model could be due to the aggregation of positive and negative market excess return periods, as suggested by Pettengill et al. (1995) and hence the conditional model takes the realized returns as to proxy the market return. Accordingly two distinct market types are identified as up markets and down markets.

The cross sectional regression analysis carried under conditional model revealed that during full sample period as well as both sub sample periods, the positive premiums have identified during up market periods under both the individual stock beta method and the portfolio beta method. However all of them have proven high level of insignificance which contradicts with the prescribed positive beta-return relationship during up markets. However during down markets, the stated negative risk-return relationship has become significant with a negative market risk premium, proving that the stocks with higher beta values have lower market returns whereas stocks with lower betas have higher market returns during negative excess market returns. This implies that a conditional relationship is being identified only during down market periods and the study identifies a significant down market effect in line with the findings of Fletcher (1997) and Tang and Shum (2003).

However these inconclusive results cannot simply reject the conditional beta-return relationship due to the empirical nature of the study. Because during the post war period, which is after May of 2009, the study has identified many of the down market periods compared to up market periods. This is in line with Black (1972) which states that during a post war period,

the traditional relationship prescribed in CAPM could have contradicting results. Quite importantly the results were significant enough to reflect the higher portion of down markets during the study period in concern, in which the Sri Lankan community was undergoing the civil war. Hence this could clearly justify the strong down market effect identified by this research.
In conclusion, the conditional risk-return relationship has not been fully supported during up markets and however the study supports the existence of a conditional relationship, but only during the down market periods. Hence it can be concluded that this model can still be partially acceptable during a downturn in a given economy.

7. References

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