

STOCK MARKET RETURNS AND INFLATION: Sri Lankan Evidence

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ABSTRACT

This paper investigates the relationship between stock returns and inflation in Sri Lanka using monthly and quarterly data for the period January 1985 to August 1996 with a view to provide empirical evidence on the generalized Fisher Hypothesis which states that nominal stock returns are positively related to expected inflation in a one-to-one correspondence. The results indicate that both lagged inflation and expected inflation are significantly positively related to stock returns in a manner predicted by the Fisher Hypothesis suggesting that stocks in Sri Lanka, different from evidence in most other countries including the U.S., are an effective hedge against expected inflation. Stock returns and unexpected inflation have negative relation indicating that stocks do not appear to be hedges against unexpected inflation.

Introduction

The relationship between stock returns and inflation has been extensively studied in developed capital markets. These studies were primarily motivated to examine whether common stocks provide an effective hedge against inflation as

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postulated in the Fisher Hypothesis. Fisher (1930) asserted that the expected nominal return consists of an expected real return and an expected inflation rate. It implies that investors will be fully compensated for the expected loss of purchasing power, and that nominal interest rates and expected inflation will have a one-to-one positive relationship. The empirical evidence, however, is largely inconsistent with the Fisher Hypothesis. In most countries, the relationship appears to be negative suggesting that common stocks do not provide an effective hedge against inflation. It is useful to examine the nature of this relationship in an emerging stock market such as Sri Lanka. Further, there have been no published studies on this issue using Sri Lankan data. The purpose of this paper is to extend such work to Sri Lanka by examining the relationship between nominal stock returns of the Colombo Stock Exchange and inflation during the 1985-1996 period.

Previous Studies

The literature on stock returns and inflation dates back to the late 1970s. Nelson (1976) examined the relationship between monthly stock returns and inflation in the post-war period from 1953 to 1974 using the U.S. data, and found a negative relationship between stock returns, and both expected and unexpected inflation. Stock returns were found to be negatively related to contemporaneous leads and lags of inflation. Nelson employed concurrent and lagged inflation to proxy for expected inflation, while unexpected inflation was estimated through a Box and Jenkins model for inflation. Using monthly data for the period 1953 to 1971, Jaffe and Mandelker (1977) reported results similar to those contained in Nelson. Jaffe and Mandelker used lagged inflation as well as one-month risk-free interest rate as estimates of expected inflation, while the unexpected inflation was computed as the difference between actual inflation and one-month interest rate. However, in annual data for the 1875 to 1970 period, their results showed no relationship between stock returns and past inflation. Using monthly, quarterly and half yearly data, Fama and Schwert (1977) also reported a negative relationship between common stock returns, and expected inflation, unexpected inflation and changes in expected inflation.¹

International evidence on the issue has been documented in Gultekin (1983). In a study of the relation between stock returns and inflation in twenty-five countries during the 1947-1979 period, Gultekin found a negative relation in 18 countries.

¹ Evidence of a negative relationship between stock returns and inflation has been shown in Lintner (1973), and Bodie (1976) as well.

However, for most countries the relation was not statistically significant. The estimates were significantly negative for Germany, Italy, Switzerland and Venezuela while they were significantly positive for Israel and the U.K.²

In all the studies cited above, the explanatory power of contemporaneous, past, expected or unanticipated inflation, individually as well as jointly, is very low. Regressions on monthly data generally show R^2 s less than 4% while quarterly data (See Fama and Schwert) show R^2 s less than 9%. Empirical evidence largely indicates that, contrary to the Fisher Hypothesis, inflation is negatively related to returns in most countries, and that such relations do not explain much of the variation in stock returns.

This paper investigates the relationship between stock returns and inflation in Sri Lanka. Specifically, it examines the relationship between a) stock returns and contemporaneous inflation, b) stock returns and lagged inflation, c) stock returns and expected inflation, and d) stock returns, and expected and unexpected inflation.

The Theory: the Fisher Hypothesis

The Fisher Hypothesis asserts that the nominal interest rate is the sum of an expected real return and expected inflation rate. Fisher (1930) hypothesized that the expected real return is determined by real factors such as productivity of capital, investor time preferences, and tastes for risk, and that the expected real return and expected inflation are unrelated. This can be generalized to all assets in an efficient market. The generalized Fisher Hypothesis that the market is efficient, and that the expected real return on stocks and expected inflation vary independently can be tested from the estimates of the following regression model:

$$R_t = \alpha + \beta E(I_t/\phi_{t-1}) + \varepsilon_t$$

where R_t is the nominal return on common stocks and $E(I_t/\phi_{t-1})$ is the expected inflation which is based on the information set available at time period $t-1$. An estimate of β that is statistically indistinguishable from 1.0 is consistent with the hypothesis of one-to-one correspondence between expected nominal return and expected inflation. An estimate of β which is not statistically different from unity implies that common stocks are a complete hedge against inflation.

2 Consistent with the Fisher hypothesis, Firth (1979) found a reliably positive relationship between nominal stock returns and inflation in the U.K.

Further, the relationship between returns, and expected and unexpected inflation can be estimated from the following regression model:

$$R_t = \alpha + \beta_1 E(I_t/\phi_{t-1}) + \beta_2 (UI_t/\phi_{t-1}) + \varepsilon_t$$

where I_t is the realized rate of inflation, and β_2 measures the effect of unanticipated inflation which is the difference between realized inflation and expected inflation. When β_2 is equal to 1.0, common stocks are a complete hedge against unexpected inflation. When both $\beta_1 = \beta_2 = 1.0$, then common stocks are a complete hedge against inflation [See Fama and Schwert (1977) for a detailed description].

The Data

The two value-weighted indices available for measuring returns on the Sri Lankan stock market are the All Share Index (ASI) which includes all the stocks, and the Sensitive Price Index (SPI) which includes only twenty-five blue chip stocks. These indices are not adjusted for dividends. The market indices are from the Colombo Stock Exchange. The study is carried out for both indices for the period January 1985 to August 1996, but to conserve space only results for the ASI are reported. Monthly and quarterly returns are defined as the natural logarithm of the ratio of the ASI at t and $t-1$.

Inflation is measured by changes in the Colombo Consumer Price Index (CCPI) which is collected from Annual Reports of the Central Bank of Sri Lanka, and publications of the Department of Census and Statistics. The CCPI index for month t is reported on the first day of month $t+1$ by the Department of Census and Statistics. The monthly and quarterly changes in CCPI are computed as the natural logarithm of the ratio of the CCPI at t and $t-1$. The quarterly data are overlapping monthly observations.

The time-series behaviour of monthly and quarterly returns, and inflation is depicted in Figures 1 and 2, while summary statistics are provided in Table 1. After examining the time-series behaviour of inflation, December 1989 is chosen as the cut-off date to form two sub-periods, namely January 1985 to December 1989 (Sub-period 1), January 1990 to August 1996 (Sub-period 2). As can be seen from the summary statistics, both the returns and inflation are higher in the second sub-period. The standard deviation of monthly returns has increased from 5.43% in the first sub-period to 8.41% in the second sub-period, which represents a 55% increase in volatility. The standard deviation of monthly inflation has also increased from 1.08% in the first sub-

period to 1.81% in the second sub-period, representing a 68% increase in volatility of inflation. Quarterly data show a similar picture. Therefore, the two sub-periods can be appropriately named as periods of low and high volatility in both returns and inflation.

Tests of Stocks as Hedges Against Inflation

This section presents the main results of regressions on monthly and quarterly data for the January 1985 - August 1996 period, and the two sub-periods³. The relation between stock returns and expected inflation is estimated using three alternative proxies for expected inflation; Contemporaneous inflation, lagged inflation, and expected inflation estimated from an ARIMA procedure.

Stock returns and expected inflation

a) Contemporaneous inflation as proxies for expected inflation

Similar to the approach used in previous studies, this study first tests the relationship between contemporaneous inflation and stock returns.⁴ We are assuming that realized inflation is a perfect forecast of expected inflation. Table 2 shows a positive relation between monthly stock returns and contemporaneous inflation (Panel A), but the magnitude of the coefficient is very small. It is not statistically different from zero, and is reliably different from unity. In the sub-period results concurrent inflation is negatively related in the January 85 - December 1989 period, while it is positively related in the January 90 - August 96 period. Here also, as in the case of the full period, the coefficients are not statistically significant. Quarterly regression results in Panel B show a weak negative relation in the full period as well as in the first sub-period, and a weak positive relation in the second sub-period. These coefficients also are reliably different from zero. These results mean that contemporaneous inflation does not have a strong relationship with stock returns and do not provide support for the Fisher Hypothesis.

3 Estimation was also done for shorter sub-periods during the January 1990 - August 1996 period, and results are not very different from what is reported. The results for the Sensitive Price Index are also fairly similar and are not reported here. These results can be obtained directly from the author.

4 The Durbin-Watson statistic indicated a severe problem of positively autocorrelated residuals of Ordinary Least Squares regressions. In order to correct the problem of autocorrelated disturbances, regressions are estimated by the Estimated Generalized Least Squares (EGLS) procedure which transforms original variables using the autocorrelation coefficient estimated from the residuals of the OLS regression [See Kennedy (1992)].

Figure 1: MONTHLY STOCK RETURNS AND INFLATION: Jan. 85 - Aug. 96

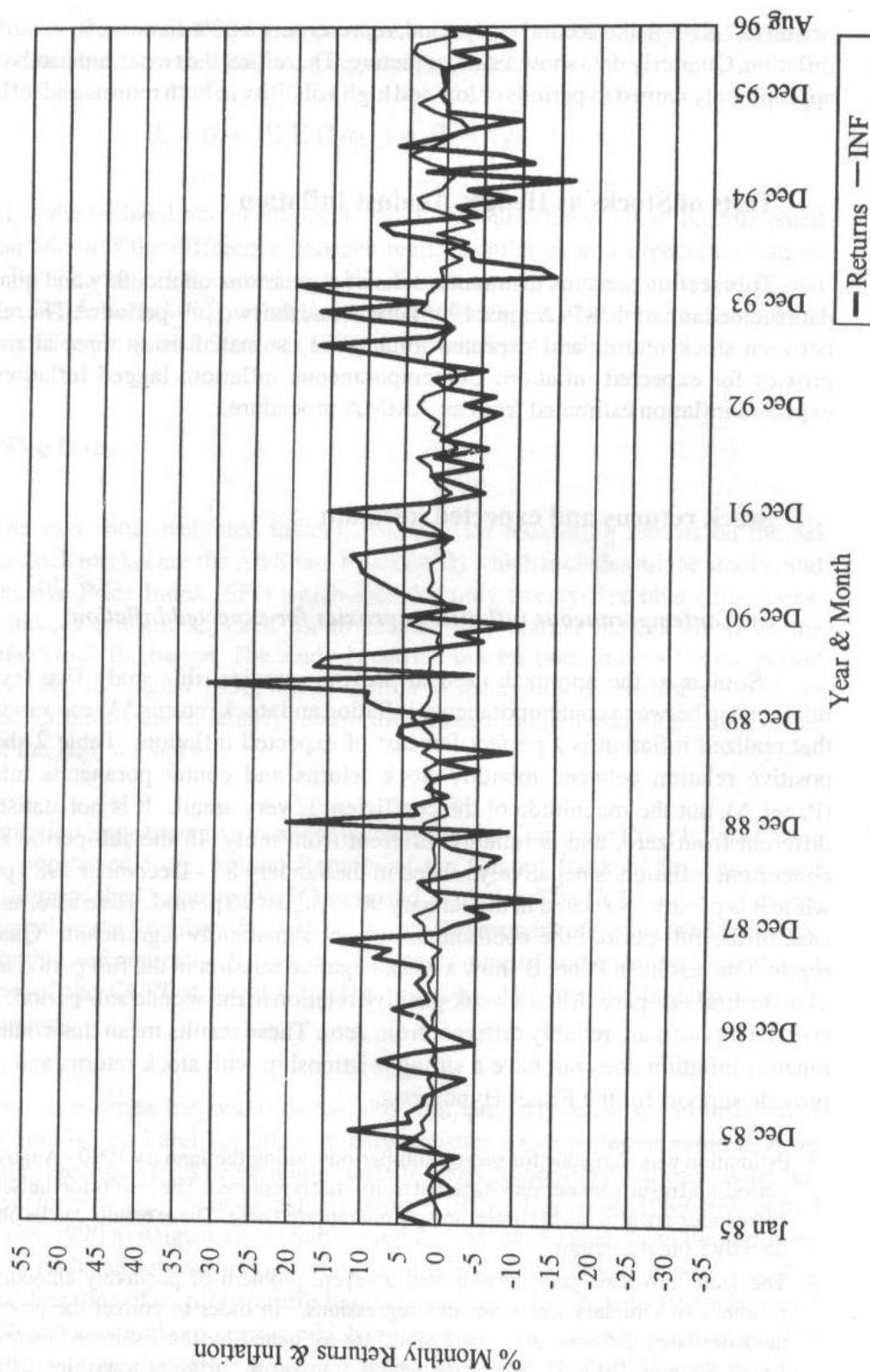


Figure 2: OVERLAPPING QUARTERLY STOCK RETURNS AND INFLATION: Mar. 85 - Aug. 96

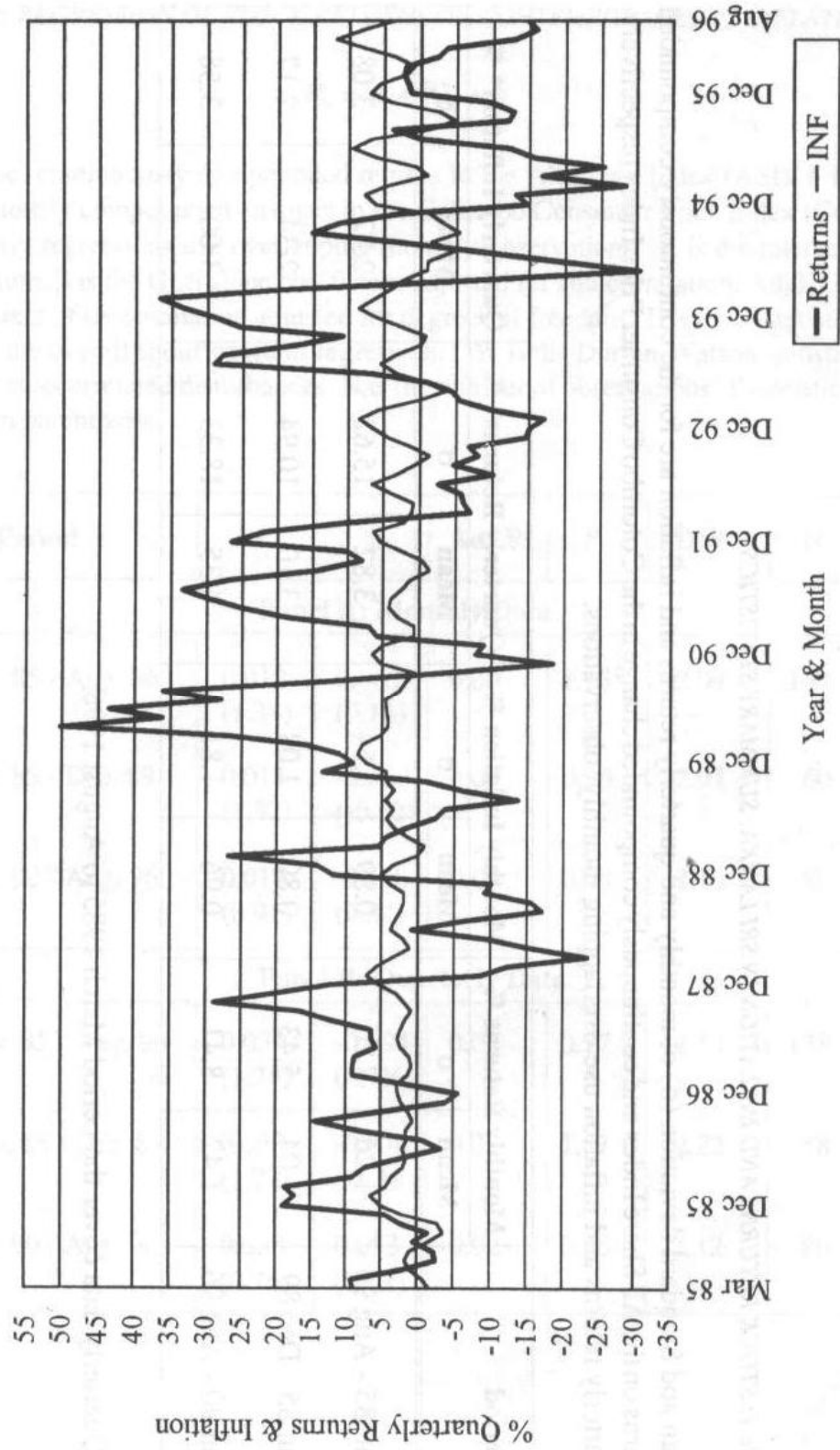


Table 1: STOCK RETURNS AND INFLATION IN SRI LANKA: SUMMARY STATISTICS

Mean and Standard deviation (σ) of monthly and quarterly returns and inflation are for the continuously compounded returns on the All Share Index and continuously compounded change in the Colombo Consumer Price Index respectively. Quarterly returns and inflation use overlapping monthly observations.

Period	Monthly Returns %		Monthly Inflation %		Quarterly Returns* %		Quarterly Inflation* %	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ
Jan 85 - Aug 96	1.26	7.26	0.89	1.54	3.82	15.62	2.72	3.08
Jan 85 - Dec 89	1.04	5.43	0.80	1.08	3.10	10.94	2.34	2.17
Jan 90 - Aug 96	1.42	8.41	0.96	1.81	4.35	18.33	3.00	3.58

* Quarterly data cover the period March 1985 to August 1996.

Table 2: REGRESSION OF STOCK RETURNS ON CONTEMPORANEOUS INFLATION

$$R_t = \alpha + \beta I_t + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). I_t is the continuously compounded changes in the Colombo Consumer Price Index (CCPI). Quarterly regressions use overlapping monthly observations. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Period	α	β	Adj R^2	F	DW	N
Panel A: Monthly Data						
Jan. 85 - Aug. 96	0.012 (1.34)	0.065 (0.16)	0.00	1.18	2.09	140
Jan. 85 - Dec. 89	0.013 (1.32)	-0.353 (-0.52)	0.00	0.90	2.03	60
Jan. 90 - Aug. 96	0.013 (0.91)	0.178 (0.34)	-0.01	0.68	2.10	80
Panel B: Quarterly Data						
Mar. 85 - Aug. 96	0.039 (1.24)	-0.094 (-0.26)	0.00	0.77	2.13	138
Mar. 85 - Dec. 89	0.053 (1.72)	-0.876 (-1.18)	0.02	1.51	2.22	58
Jan. 90 - Aug. 96	0.038 (0.76)	0.053 (0.12)	-0.02	0.35	2.12	80

b) Lagged inflation as proxies for expected inflation

One issue that concerns the use of realized inflation to proxy for expected inflation is the timing of the public announcement of CCPI data. Theoretically, the CCPI for a given month is announced on the first day of the following month, although administrative delays, and holidays could delay the announcement by a few days. It is likely that expectations for month t are largely based on the information conveyed through the inflation rate for month $t-1$ which is announced at the beginning of month t . In the case of quarterly data, expected inflation for quarter t is likely to be based on the inflation rate for quarter $t-1$ which can be determined by incorporating the CCPI for the latest month which is announced at the beginning of quarter t . To investigate this possibility, this study estimates the relation between stock returns and one-month, and one-quarter lagged values of inflation respectively.

Table 3 provides results for regressions of stock returns on one-month, and one-quarter lagged inflation. In monthly regressions, only the full period results are significant with a β estimate of 0.708 which is different from zero at 10% significance level. Although the estimates of β s for sub-periods are large in magnitude, they are not different from zero. In quarterly regressions, the estimates of β are almost equal to 1.0 in magnitude while they are significantly different from zero in the full period, and in the second sub-period. The strongest result is found for the full period where β is equal to 0.966 and significant at 1%. The adjusted R^2 of this regression is 5%. In all cases, the relation is positive and the β estimates are not reliably different from 1.0, as implied by the Fisher Hypothesis. Thus, using past inflation as the proxy for expected inflation, strong results are found to support the hypothesis that common stocks are effective hedges against inflation in Sri Lanka.

Given the above strong evidence using one lag, a question arises as to the importance of longer lags in predicting stock returns. To answer this question, this study estimates the regressions using inflation at lags of 2, 3 and 4, separately and jointly. The results are shown in Table 4. In univariate regressions (Models 1 through 3), all the β estimates have negative values, and all of them except one are not different from zero. In quarterly regressions, I_{t-4} is significantly negative at 1%, and explains 6% of return variation. Except that, there is no evidence of predictability using longer lags of inflation separately.

To test the joint importance of both contemporaneous and lagged inflation, a regression is run using all five variables in Model 4. None of the variables is significant in monthly regressions, but the one-month lag remains positive and is not reliably different from unity. Both I_{t-2} and I_{t-4} are significantly negative in the quarterly regressions while one-quarter lag remains positive and different from unity statisti-

cally. The one-lag inflation, which is found to be different from zero separately, is not significant in joint regressions due the effects of multicollinearity among regressors. In a nutshell, these results using longer lags of inflation show, that longer lags do not have information to predict future monthly returns while some lags, particularly lag 4, is important in predicting future quarterly returns.

c) *ARIMA models of expected inflation*

In regression results reported so far, the expected inflation is proxied by either contemporaneous or lagged inflation rate without estimating the expected inflation explicitly. Following Nelson (1976) and Gultekin (1983), this study decomposes the actual inflation into expected and unexpected inflation using the Box and Jenkins (1970) procedures which employ Auto Regressive Integrated Moving Average (ARIMA) parameters. The autocorrelation and partial autocorrelation functions of the inflation series indicate that a non-seasonal autoregressive process of order 2 [AR(2)] adequately describes both monthly and quarterly series of inflation. An AR(2) process for inflation is specified in the following form:

$$I_t = \delta + \phi_1 I_{t-1} + \phi_2 I_{t-2} + a_t$$

where δ is the constant term, I is inflation rate and a_t is the error term. Fitted values of the above AR(2) process are used as estimates of expected inflation while forecast errors are used as estimates of unexpected inflation. The results of regressions of stock returns on expected inflation are given in Table 5, and these results are robust to alternative specifications of the time-series process.

In monthly regressions, expected inflation is strongly positively related to stock returns during the full period. Examination of sub-period results reveals that this strong positive relation is limited to only the first sub-period of low volatility. Although the β s are large in magnitude, because of large standard errors they are not statistically different from unity. In quarterly regressions, a strong positive relation is observed in the full period as well as in both sub-periods, and consistent with the Fisher Hypothesis, β s are not reliably different from unity. Thus, results based on expected inflation estimated from an autoregressive process provide strong support for the hypothesis that common stocks are hedges against inflation. The explanatory power of these regressions are higher than those obtained with lagged inflation as a proxy for expected inflation. For example, $E(I_t)$ has an R^2 of 3% in monthly regressions, and 6% in quarterly regressions, while larger R^2 s are observed in sub-periods.

Table 3: REGRESSIONS OF STOCK RETURNS ON LAGGED INFLATION

$$R_t = \alpha + \beta I_{t-1} + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). I_{t-1} is the first lag of the continuously compounded changes in the Colombo Consumer Price Index (CCPI). Quarterly regressions use overlapping monthly observations. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Period	α	β	Adj R^2	F	DW	N
Panel A: Monthly Data						
Jan. 85 - Aug. 96	0.006 (0.71)	0.078 (1.75) ^c	0.02	2.70	2.09	139
Jan. 85 - Dec. 89	0.005 (0.43)	0.804 (1.09)	0.01	1.31	2.02	59
Jan. 90 - Aug. 96	0.008 (0.58)	0.638 (1.25)	0.01	1.40	2.10	80
Panel B: Quarterly Data						
Mar. 85 - Aug. 96	0.011 (0.35)	0.966 (2.68) ^a	0.05	4.35 ^b	2.15	137
Mar. 85 - Dec. 89	0.011 (1.72)	0.959 (-1.18)	0.01	1.41	2.18	57
Jan. 90 - Aug. 96	0.010 (0.20)	0.943 (2.20) ^b	0.04	2.78	2.14	80

^a - Significant at 1%^b - Significant at 5%^c - Significant at 10%

Table 4 : REGRESSIONS OF STOCK RETURNS ON CONTEMPORANEOUS AND LAGGED INFLATION: JAN 1985 - AUG 1996

$$R_t = \alpha + \beta_1 I_t + \beta_2 I_{t-1} + \beta_3 I_{t-2} + \beta_4 I_{t-3} + \beta_5 I_{t-4} + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). I_t is the continuously compounded changes in the Colombo Consumer Price Index (CCPI). Quarterly regressions use overlapping monthly observations. I_{t-n} represents lagged inflation where $n=1,2,3,4$. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Model	Intercept	β_1	β_2	β_3	β_4	β_5	Adj R^2	F	DW	N
Panel A: Monthly Regressions										
1	0.016 (1.75) ^c			-0.407 (-0.98)			0.01	1.57	2.08	138
2	0.012 (1.34)			-0.018 (-0.04)			0.00	1.06	2.09	137
3	0.018 (1.92) ^c					-0.656 (-1.54)	0.02	2.21	2.09	136
4	0.015 (1.12)	-0.113 (-0.25)	0.671 (1.51)	-0.613 (-1.41)	0.230 (0.56)	-0.562 (-1.21)	0.02	1.39	2.09	136
Panel B: Quarterly Regressions										
1	0.045 (1.39)			-0.352 (-0.95)			0.00	1.11	2.14	136
2	0.038 (1.15)			-0.146 (-0.39)			-0.00	0.67	2.13	135
3	0.062 (1.80) ^c					-1.121 (-3.06) ^a	0.06	5.19 ^b	2.13	134
4	0.074 (1.52)	-0.496 (-1.00)	0.621 (1.251)	-0.709 (-1.86) ^c	-0.022 (-0.04)	-0.896 (-1.76) ^c	0.07	2.60	2.14	134

^a - Significant at 1%

^b - Significant at 5%

^c - Significant at 10%

Table 5: REGRESSIONS OF STOCK RETURNS ON EXPECTED INFLATION

$$R_t = \alpha + \beta E(I_t) + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). $E(I_t)$ is the expected inflation calculated by fitting an autoregressive model of order 2 [AR(2)] to continuously compounded changes in the Colombo Consumer Price Index (CCPI). Quarterly regressions use overlapping monthly observations. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Period	α	β	Adj R^2	F	DW	N
Panel A: Monthly Data						
Jan. 85 - Aug. 96	-0.003 (-0.31)	1.799 (2.15) ^b	0.03	3.46	2.08	140
Jan. 85 - Dec. 89	-0.021 (-1.31)	3.531 (2.31) ^b	0.07	3.34	2.02	60
Jan. 90 - Aug. 96	0.002 (0.13)	1.390 (1.32)	0.04	1.49	2.09	80
Panel B: Quarterly Data						
Mar. 85 - Aug. 96	0.011 (0.35)	0.952 (3.09) ^a	0.06	5.53 ^b	2.16	138
Mar. 85 - Dec. 89	-0.009 (-0.30)	1.583 (2.29) ^b	0.08	3.38	2.25	58
Jan. 90 - Aug. 96	0.015 (0.31)	0.856 (2.33) ^a	0.05	3.07	2.14	80

^a - Significant at 1% ^b - Significant at 5%

Stock Returns and Unexpected Inflation

In order to examine whether stocks act as hedges against unexpected inflation as well, this study estimates the relationship between stock returns and unexpected inflation which is derived from the residuals of the autoregressive process. The results are reported in Table 6. In monthly regressions, unexpected inflation is negatively related to returns and β estimates are not significant. In quarterly data, unexpected inflation seems to be strongly negatively related to stock returns. Thus, stock returns do not appear to be hedges against unexpected inflation. These results are similar to those found in Fama and Schwert (1977) in the post-war U.S. data.

Stock Returns, Expected Inflation and Unexpected Inflation

Table 7 reports the results of regressions which include both expected inflation and unexpected inflation as regressors. These series are the ones derived from the ARIMA procedure. In the monthly regressions, expected inflation is significantly different from zero and not reliably different from unity even when unexpected inflation is included. But unexpected inflation continues to be negative and insignificant. Thus, unexpected inflation does not add much information when it is combined with expected inflation in monthly regressions. In quarterly regressions, although β estimates of expected inflation remain positive and statistically indistinguishable from unity, they are not different from zero. Statistical significance of unexpected inflation also disappears in quarterly data, except in the first sub-period. In terms of explanatory power, inclusion of unexpected inflation to the relation between returns and expected inflation does not add much information.

Table 6 Regressions of Stock Returns on Unexpected Inflation			
	Monthly	Quarterly	Sub-periods
Dependent Variable	Stock Returns	Stock Returns	Stock Returns
Independent Variable	Unexpected Inflation	Unexpected Inflation	Unexpected Inflation
Estimate	-0.001	-0.002	-0.001
t-statistic	(-0.12)	(-0.25)	(-0.12)
Adjusted R ²	0.00	0.00	0.00
F-statistic	0.00	0.00	0.00
Significance Level	0.05	0.05	0.05

Table 6: REGRESSIONS OF STOCK RETURNS ON UNEXPECTED INFLATION

$$R_t = \alpha + \beta UI_t + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). UI_t is the unexpected inflation calculated from the forecast errors of an autoregressive model of order 2 [AR(2)] fitted to continuously compounded changes in the Colombo Consumer Price Index (CCPI). Quarterly regressions use overlapping monthly observations. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Period	α	UI_t	Adj R^2	F	DW	N
Panel A: Monthly Data						
Jan. 85 - Aug. 96	0.012 (1.51)	-0.339 (-0.85)	0.01	1.50	2.08	140
Jan. 85 - Dec. 89	0.009 (1.12)	-1.046 (-1.51)	0.03	1.88	2.03	60
Jan. 90 - Aug. 96	0.014 (1.12)	-0.149 (-0.29)	-0.01	0.65	2.09	80
Panel B: Quarterly Data						
Mar. 85 - Aug. 96	0.036 (1.20)	-0.815 (-2.98) ^a	0.06	5.20 ^b	2.14	138
Mar. 85 - Dec. 89	0.028 (1.16)	-1.557 (-2.87) ^a	0.12	4.95 ^b	2.22	58
Jan. 90 - Aug. 96	0.041 (0.87)	-0.658 (-1.99) ^b	0.03	2.33	2.12	80

^a - Significant at 1% ^b - Significant at 5% ^c - Significant at 10%

Table 7: REGRESSIONS OF STOCK RETURNS ON EXPECTED INFLATION AND UNEXPECTED INFLATION

$$R_t = \alpha + \beta_1 E(I_t) + \beta_2 UI_t + \varepsilon_t$$

R_t is the continuously compounded returns to the All Share Index (ASI). $E(I_t)$ is the expected inflation calculated by fitting an autoregressive model of order 2 [AR(2)] to continuously compounded changes in the Colombo Consumer Price Index (CCPI). UI_t is the unexpected inflation estimated as the forecast errors of the AR(2) process. Quarterly regressions use overlapping monthly observations. α is the intercept of regression. β is the GLS slope coefficient adjusted for autocorrelation. Adj R^2 is the coefficient of determination adjusted for degrees of freedom. F is the F-statistic for testing the overall significance of regression. DW is the Durbin-Watson statistic for testing autocorrelated disturbances. N is the number of observations. T-statistics are given in parenthesis.

Period	α	β_1	β_2	Adj R^2	F	DW	N
Panel A: Monthly Data							
Jan 85 - Aug 96	-0.003 (-0.25)	1.728 (1.98) ^b	-0.123 (-0.30)	0.03	2.32	2.08	140
Jan 85 - Dec 89	-0.019 (-1.15)	3.167 (2.03) ^b	-0.803 (-1.17)	0.08	2.70	2.04	60
Jan 90 - Aug 96	0.002 (0.11)	1.419 (1.28)	0.046 (0.09)	-0.00	0.98	2.09	80
Panel B: Quarterly Data							
Mar 85 - Aug 96	0.020 (0.62)	0.605 (1.45)	-0.454 (-1.23)	0.06	4.18	2.15	138
Mar 85 - Dec 89	0.016 (0.47)	0.515 (0.57)	-1.285 (-1.77) ^c	0.11	3.37	2.24	58
Jan 90 - Aug 96	0.022 (0.43)	0.645 (1.32)	-0.277 (-0.60)	0.04	2.14	2.14	80

^a - Significant at 1%

^b - Significant at 5%

^c - Significant at 10%

Conclusion

This paper investigated the relationship between stock returns and inflation in Sri Lanka using monthly and quarterly data for the period January 1985 to August 1996 with a view to providing empirical evidence on the generalized Fisher Hypothesis which states that nominal stock returns are positively related to expected inflation in a one-to-one correspondence. Three alternative measures of expected inflation were used; contemporaneous inflation, lagged inflation and expected inflation estimated from an ARIMA procedure.

The results indicated that both lagged inflation and expected inflation were significantly positively related to stock returns in a manner predicted by the Fisher Hypothesis. Evidence was stronger in quarterly data. The slope coefficients for lagged inflation and expected inflation are statistically indistinguishable from unity indicating that stocks in Sri Lanka are an effective hedge against expected inflation. Unexpected inflation was found to be negatively related to stock returns, and it is significant only in quarterly data. Thus, stocks do not appear to be hedges against unexpected inflation. Past inflation beyond the first lag did not show a significant relationship with stock returns, except in quarterly data where second and fourth lags of inflation were significantly negatively related to stock returns.

While documented empirical results largely find evidence inconsistent with the generalized Fisher Hypothesis and are considered anomalous, the evidence presented in this study provides strong results consistent with the predictions of the Fisher Hypothesis.

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