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Inflation and rates of return on stocks: evidence from high inflation countries

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Abstract

This article investigates the relationship between stock returns and inflation in four high inflation (Latin and Central American) countries: Argentina, Chile, Mexico and Venezuela. Compared to the bulk of the previous research (involving low inflation) this article provides evidence of a positive relationship between current stock market returns and current inflation. This result confirms that stock returns act as a hedge against inflation. Results also show that past rates of inflation also influence the current rate of stock returns. Similar tests are conducted using real rate of stock returns. Some evidence of an inverse relationship between current real returns and current and one-period lagged inflation is found. © 2001 Elsevier Science B.V. All rights reserved.

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JEL classification: E31; G1; G15

1. Introduction

Fisher (1930) claims that the nominal interest rate fully reflects the available information concerning the possible futures values of the rate of inflation. This hypothesis has come to be known as "the Fisher effect" in the economic literature; it states that expected nominal rates of interest on financial assets should move one-to-one with expected inflation. Nelson (1976) and Boudoukh and Richardson (1993) claim the extension of the Fisher effect to returns in the stock market has

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suffered considerable empirical set backs due to contradictory evidence. It is a common empirical finding that stock returns and the inflation rate has a negative relationship.[1] This negative relationship is surprising for stocks, which, as claims against real assets, should compensate for movement in inflation (Boudoukh and Richardson, 1993 and Boudoukh et al. 1994). Bodie (1976) claims that there are two distinct ways to define stocks as a hedge against inflation. First, a stock is a hedge against inflation if it eliminates or at least reduces the possibility that the real rate of return on the security will fall below some specific floor value. Secondly, it is a hedge if and only if its real return is independent of the rate of inflation. Jaffe and Mandelker (1976) claim that a negative relationship between stock returns and inflation suggest that the stock market is not even a partial hedge against inflation. A negative relationship implies that investors whose real wealth is diminished by inflation can expect this effect to be compounded by a lower than average return on the stock market.

This article empirically investigates the relationship between stock returns and inflation in four high inflation countries during 1980s and 1990s. The countries are Argentina, Chile, Mexico and Venezuela. Given the large size of the (empirical and theoretical) literature in this field, to our knowledge, no other study investigates exclusively the Fisher effect for risky assets for high inflation countries. Nichols (1976) advocates the study of stock returns and inflation relationship for high inflation countries. Solnik (1983) and Gultekin (1983) conduct an international investigation of the Fisher effect for stock returns. They find ample evidence of a negative relationship between stock returns and inflation.[2] Cagan (1974) is able to find a positive relationship between common stock returns and inflation for several countries between 1939 and 1969.

2. The Fisher effect for stocks returns

The following section relies heavily on Nelson (1976) in describing the relationship between rate of return on a portfolio of stocks and the expected rate of inflation. The difference between the expected rate of return on stocks and the expected rate of inflation is defined as the ex ante real rate of return on stocks. Thus ex ante real rate can be presented as

$$r_t = E(R_t|I_{t-1}) - E(\pi_t|I_{t-1}), \tag{1}$$

where r_t is the real rate of return on stocks, R_t is the actual rate of return, π_t is the rate of inflation, I_{t-1} is the set information available in time $t-1$ and E is the

[1] Jaffe and Mandelker (1976) and Boudoukh and Richardson (1993) provide some evidence of a positive relationship using long series of data for the United States. (See also Lintner (1975), Bodie (1976), Jaffe and Mandelker (1976), Nelson (1976), Fama and Schwert (1977), Kaul (1987), Marshall (1992)).

[2] Gultekin (1983) investigation includes Venezuela along with twenty-five other countries.

mathematical expectations operator. The difference between the actual and the expected value are the prediction errors. Thus,

$$R_t = E(R_t | I_{t-1}) + \mu_t, \tag{2}$$

$$\pi_t = E(\pi_t | I_{t-1}) + \varepsilon_t, \tag{3}$$

where μ_t and ε_t are prediction errors which are uncorrelated with the predicted values.[3] The ex ante real rate of return can be separated into average and variable parts such that

$$r_t = r + \bar{r}_t, \tag{4}$$

where r is the average and $\bar{r}_t$ is the variable part of the real rate of return. Using Eqs. (1)–(4), the relationship between observed stock return and rates of inflation may be expressed as

$$R_t = r + \beta\pi_t + \eta_t, \tag{5}$$

where η_t is equal to $(\bar{r}_t + \mu_t - \beta\varepsilon_t)$ and according to the Fisher effect β is equal to unity in Eq. (5). Boudoukh and Richardson (1993) claim that though the Fisher effect is ex ante, Eq. (5) can be interpreted in the context of the Fisher effect. The properties of the compound disturbance η_t will determine the properties of the least square estimates of r and β. According to Nelson (1976), the correlation between the inflation rate and each element of the error term is important for the relationship. There will be a positive correlation between the inflation rate and its prediction errors (ε). Correlation between the inflation rate and the unanticipated portion of the stock returns (μ) will depend on the correlation between μ_t and ε_t. The two will be correlated if stock prices react systematically to new information (represented by ε_t) about the inflation (Nelson 1976).[4] Finally, if the Fisher effect is to hold, then $\bar{r}_t$ and the inflation rate must be uncorrelated.

Several reasons have been provided for the negative relationship so commonly found in the empirical literature. The errors in the measurement of expected inflation will work to reduce the slope of the regression (β) (Nelson 1976). If the market reacts negatively to unanticipated increases in the rate of inflation, then the slope estimate could in fact be negative. Nelson further claims that a negative slope is also possible if the ex ante stock return is negatively correlated with the expected rate of return. Fama (1981) and Kaul (1987) provide a further reason for the

[3] According to Taylor (1991, p. 330) assumption of stationary forecasting errors implies that expectations of a time series are not hopelessly different from the actual outcome, even when the series has accelerated growth rates. The forecasting errors will only be stationary under backward-looking expectations formation, that is, adaptive expectations, when the process being forecast is integrated of the order one, I(1), whereas in the case of forward-looking expectations, that is, rational expectations, the forecast errors are always stationary regardless of the order of integration of the process being forecasted.

[4] If the firms have assets and liabilities in nominal terms then based on classical valuation theory, stock prices will respond to new information about inflation (see Lintner, 1973).

negative relationship between stock returns and expected inflation rate. They argue that the main determinant of stock prices is the company's future earning potential. If inflation and future expected output in the economy are negatively correlated, then inflation may proxy for future real output. This may lead to a (spurious) negative relationship between stock returns and inflation.[5] Fama (1981) and Kaul (1987) claim that including both inflation and a measure of future real output as explanatory variables eliminates the stated negative relationship. Balduzzi (1995) using a VAR method and the US data finds very little evidence supporting Fama (1981) and Kaul (1987), whereas Lee (1992) using a similar approach provides support for the theory. Boudoukh et al. (1994) show that a negative coefficient on expected inflation is also possible if the unconditional correlation between conditional expectations of dividend growth and inflation is negative and smaller than the ratio of the inflation standard deviation and expected output growth standard deviation. Nelson (1976) further claims that this negative relationship is eliminated if the contemporaneous rate of inflation is replaced by a past rate of inflation since past rates contain no new information for the market to react.[6] In a test between the stock returns and past rates of inflation, the estimate of the slope will depend on the strength of the correlation between the past rate and expected rate of inflation at time *t*. Since the stated correlation should be positive, the slope coefficient of the regression between stock returns and past rate of inflation should be positive.[7] Similar arguments are also presented by Jaffe and Mandelker (1976).

The generalized Fisher effect for risky assets assumes a one-to-one relationship between nominal stock returns and expected inflation. In other words, the expected real rate of returns on stock are statistically uncorrelated with the inflation rate (Boudoukh and Richardson, 1993). The foundations underlying this model imply that the real and monetary sectors of the economy are independent. This type of money neutrality implies that the price level has no real effects and, thus, is causally unrelated to real variables (Boudoukh et al., 1994). Thus, the real return is unrelated to the monetary sector, instead being determined solely by real factors like the productivity of capital, time preference and risk aversion. Also as stated

[5] Boudoukh et al. (1994) claim that the Fama and Kaul hypothesis is unclear as to whether it describes the relationship between stock returns and expected inflation, stock returns and unexpected inflation or both. Geske and Roll (1983) provide an extension of the Fama (1981) theory stating that the counter cyclical fiscal policy of the United States during the post WWII period induced a procyclical behaviour of money supply, due to deficit monetization. This behaviour, in turn, reinforced the mechanism of Fama's theory because of higher inflation rates during recessions.

[6] Such a relationship may be tested by means of the following linear regression,

$$R_t = r + \beta'\pi_{t-1} + \eta_t, \tag{5a}$$

where each variable is defined as before. According to the generalized Fisher effect β' should be positive. Jaffe and Mandelker (1976) claim the actual theoretical value of β' is not known simply because the manner in which the market uses rates of past inflation to predict future inflation is unknown.

[7] As suggested by the referee replacing the current inflation with lagged inflation may act, as a specification test of the model as lagged inflation would not contain the current innovation in inflation.

earlier, a security is an inflation hedge if and only if its real returns is independent of the inflation rate (Bodie, 1976). A test of the relationship between real rate of returns and the rate of inflation may provide further evidence on the ability of stock returns to act as a hedge against high inflation and thus, provide support for the Fisher effect in the equity market. Lintner's (1975) theoretical work suggests a possible negative relationship of both the expected real and nominal rate of returns with the expected and the unexpected rate of inflation. Lintner's theory focuses on dynamic and financial repercussions of changes in inflation rates on stock returns. The theory assumes that companies could maintain their real growth and real profit margins. This article further investigates the relationship between real rate of return on stocks and the rate of inflation in the countries under study.[8]

Table 1
Basic statistics

Monthly	Nominal returns (%)	Inflation rate (%)	Real returns (%)
	Argentina (January 1981–June 1998)		
Mean	9.0197	8.2786	0.7411
Maximum	130.5370	108.7311	88.8821
Minimum	−49.5536	−0.5409	−97.5307
	Chile (January 1981–June 1998)		
Mean	1.6400	1.2127	0.4274
Maximum	19.9572	7.8760	18.8067
Minimum	−30.7118	−0.8104	−30.8062
	Mexico (January 1981–June 1998)		
Mean	3.3923	3.0155	0.3769
Maximum	35.8036	14.4014	30.8203
Minimum	−53.4950	0.0000	−67.2554
	Venezuela (January 1985–June 1998)		
Mean	3.4770	2.9983	0.4787
Maximum	37.7063	19.2830	36.1799
Minimum	−29.5117	−1.9534	−43.4037

[8] The real rate (r_t) is defined as $(1 + R_t)/(1 + \pi_t) - 1$. Test of a relationship between real rate and inflation is based on the Jaffe and Mandelker (1976) method. The following equation is applied to study the relationship between the contemporaneous rate of inflation and real rate of return.

$$r_t = \alpha_0 + \alpha_1 \pi_t + v_t, \tag{5b}$$

Eq. (6) is obtained by using Eqs. (1)–(5). As stated earlier, if the Fisher effect holds in the equity market and stocks are a true hedge against inflation than there should be no significant relationship between real rate and the inflation rate.

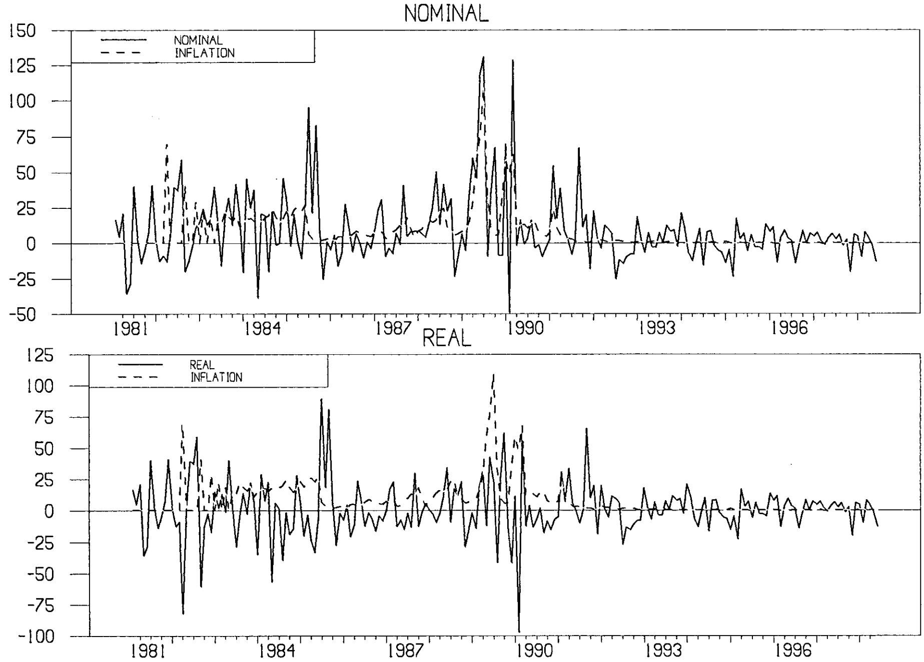

Fig. 1. The stock returns (both nominal and real) against inflation for Argentina.

3. The stochastic structure of the data

Monthly data from Argentina, Chile, Mexico and Venezuela are applied in the article. The data range from January 1981 to June 1998 for Argentina, Chile and Mexico and from January 1985 to June 1998 for Venezuela. The length of the data is dictated by the availability of the data. Given the length of the data, this article basically investigates the relationship between stock returns and expected inflation during a short horizon. In all four cases, the *International Financial Corporation* (IFC) stock price index in local currency is used to create the stock returns. Stock returns are simply defined as the first difference of the log of the stock indices. The inflation rate in all cases is calculated similarly by using the Consumer Price Index (CPI). All data are obtained from *Datastream*. Table 1 contains the monthly average (along with the maximum and minimum values) of all three series for all countries. Argentina has the highest average monthly stock returns (9.02%) and inflation rate (8.28%). Chile, on the other hand, has the lowest returns and inflation rate. The highest real rate of stock return per month is also found in Argentina (0.74%). Real rates are approximately same in the remaining cases. The variation between the maximum and the minimum values for all three series is extremely high in all four countries. Along with high inflation rates, these countries also undergo conditions of high variations in stock returns and inflation. Figs. 1–4 present the stock returns (both nominal and real) against inflation for Argentina, Chile, Mexico and Venezeula, respectively. Visual inspection of the graphs seems to show some co-movement between the stated variables.

Detecting whether a time series is nonstationary (contains a unit root) is extremely important regarding regression estimations. Granger and Newbold (1974, 1977) outline three major consequences of using nonstationary series in regression: (1) estimates of the regression coefficient are inefficient; (2) forecasts based on the regression equations are suboptimal; and (3) the usual significance tests on the coefficients are invalid. For our purposes, all stock nominal returns, inflation rates and real rates of stock returns need to be stationary in levels or lack unit root(s). Bulk of the previous studies fail to take into consideration, the stochastic structure of the variables. Three different tests are applied to check for stationarity (unit root) of the series in question.

3.1. Unit root test

3.1.1. KPSS test

There are several different types of unit root tests in the literature. This article applies the KPSS test Kwiatkowski et al. (1992). The KPSS test statistics (η_t), which test the null of trend stationarity against the alternative of non-stationarity, are calculated as

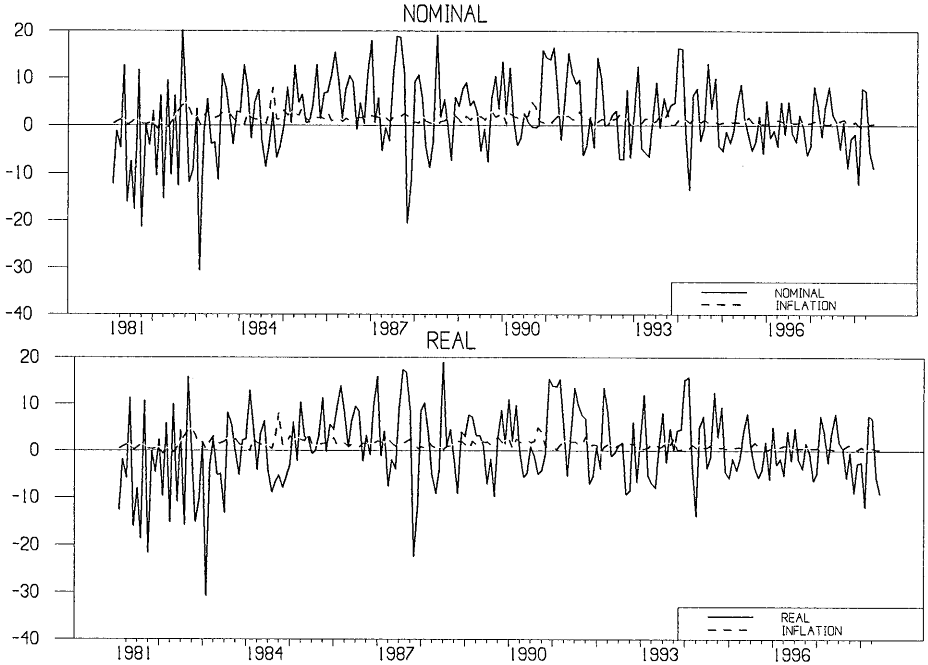

Fig. 2. The stock returns (both nominal and real) against inflation for Chile.

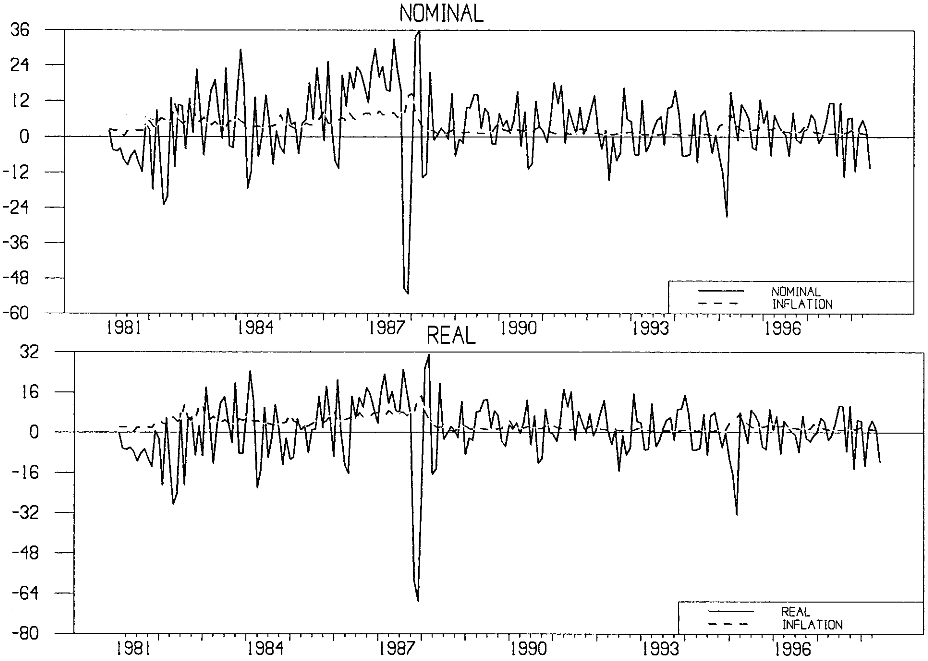

Fig. 3. The stock returns (both nominal and real) against inflation for Mexico.

$$\eta_t(q) = T^{-2} \sum_{t=1}^{T} s_t^2/\sigma^2(q), \tag{6}$$

where S_t^2 is the partial sum process of the residuals from the regression of Y_t on an intercept and a time trend, $\sigma^2(q)$ is a consistent estimate of the error variance from the same regression, q is the lag truncation parameter and T is the number of observations. The long run variance is calculated following the Newey and West (1987) procedure, which utilises Barlett window adjustment using the first q sample autocovariances. A test for the null of the level stationarity can be performed by utilizing the error term from the regression of Y_t on an intercept alone and calculating the test statistics as above. Kwiatkowski et al. (1992) show that the asymptotic validity of this test holds even for small samples. Moreover, Lee and Schmidt (1996) show that KPSS tests are also consistent against the stationary fractional alternative. Lee and Amsler (1997) show that KPSS tests are able to consistently distinguish short memory from stationary long memory, and these processes from nonstationary long-memory and unit root. However, they are not able to consistently distinguish between nonstationary long memory and unit root. The critical values required in the KPSS tests are provided by Kwiatkowski et al. (1992). The standard unit root tests including the KPSS test are based on the discrete integrated values of 0 and 1 for the differencing operator. However, there is no reason why the differencing operator should be restricted only to integer values; Diebold and Rudebusch (1991) point out that such restrictions are arbitrary.

3.2. Fractional-integration tests

A fractionally integrated process nests both the autoregressive moving average (ARMA) and the random walk processes as its special cases. An autoregressive-integrated moving average (ARIMA) process can be postulated as

$$\Phi(L)(1-L)^d Y_t = \Theta(L)\varepsilon_t, \varepsilon_t \sim (0,\sigma^2), \tag{7}$$

where d is the difference operator, $\Theta(L)$ and (L) are the usual autoregressive and moving average polynomials in the lag operator with roots outside the unit circle. It is well known that an integer value of $d = 0$ gives rise to the standard ARMA processes whereas $d = 1$ implies the unit-root nonstationary process. The autocovariances between observations separated in time die off rapidly (approximately geometrically) for the ARMA process but they do not die for a unit-root nonstationary process. If $0 < d < 1$, the series is a fractionally integrated process and known as a long memory process. In the case of a fractionally integrated process, an innovation has no permanent effect on the series, but its mean-reversion properties are persistent.

The non-integer value, $d < 1$, gives rise to autoregressive fractionally-integrated moving average (ARFIMA) processes which are known as long-memory processes (Granger and Joyeux, 1980 and Hosking, 1981). They exhibit slowly decaying (at hyperbolic rate) autocorrelation coefficients in their moving average representation.

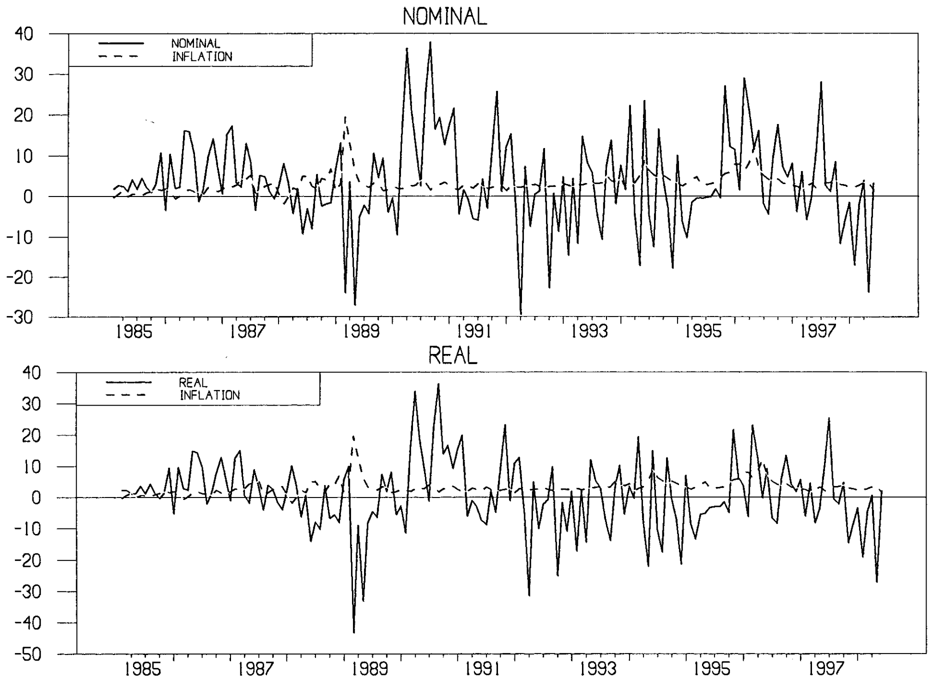

Fig. 4. The stock returns (both nominal and real) against inflation forVenezeula.

For any process $Y_t \sim (d)$ and for $d < 1$ implies that the process is mean-reverting; however, $d > 0.5$ causes the covariance of the process to be infinite.[9] The point estimate of 'd' also provides a direct measure of the size of persistence. Two different tests are applied to estimate the size of d.

3.2.1. The spectral regression method

Geweke and Porter-Hudak, (1983)(GPH) suggest the semi-parametric estimator of d based on the following OLS-based estimating equation:

$$\ln(I(\omega_j)) = \beta_0 + \beta_1 \ln(4\sin^2(\omega_j/2)) + \delta_t; \quad j = 1,\ldots,n, \tag{8}$$

with $\beta_1 = -d$, where $I(w_j)$ is the periodogram of a series at frequency w_j, and $w_j = 2\pi_j/T$ ($j = 1,\ldots,T-1$).[10] The number of low frequency ordinates (n) used in this test is $n = T^{\mu}$, where T is the number of observations. According to Cheung and Lai (1993), a large number of n will contaminate the estimate of d, while too few will produce imprecise estimates of d. Geweke and Porter-Hudak (1983) recommends the value of μ to be 0.50 or above. The value of d can be used to test the null hypothesis of a unit root. By testing the one sided test with the null $d = 1$ (alternate null being $d < 1$), the presence of a unit root in a series may be investigated. Under the unit root hypothesis, the levels of the data follow a nonstationary process, hence $d = 1$ for such a process. So, if d is significantly different from unity in this test, it implies that the null of unit-root is rejected. Hypothesis testing regarding d can be conducted by means of the t-statistics of the regression coefficients. The GPH test is implemented in the first difference of the series to obtain the estimated fractional parameter d^*.[11] The slope coefficient β_1 provides a consistent and asymptotically normal estimate of d^*. The d for the level series would then be given by $1 + d^*$. The variance of the estimate of β_1 is given by the usual OLS estimator, while the theoretical asymptotic variance of ε_t is shown to provide a more reliable confidence interval. The value of d can be used to test the null of the unit root. In this article, the GPH test is conducted with two different values of μ, 0.55 and 0.60.

3.2.2. The Gaussian semiparametric method

Robinson (1995) proposes a Gaussian semiparametric estimate of the self-similarity parameter H. The self-similarity parameter H relates to the long memory parameter d by $H = d + 1/2$. The estimate for H is obtained through minimization of the function

[9] For $-0.5 < d < 0.5$ the process is both mean-reverting and covariance stationary. The autocorrelation coefficients of the process would all be positive if $0 < d < 0.5$; for $-0.5 < d < 0$ they would all be negative. The latter is also known as 'anti-persistent'.

[10] According to Booth and Tse (1995), the main advantage of the GPH method is that it permits estimation of d without knowledge of p and q in ARFIMA(p,d,q). Furthermore, this method is robust for short-term dependence, conditional heteroscedastic effects, and variance shift.

[11] In other words the GPH test is implemented with the first difference of the nominal and real stock returns and the rate of inflation.

Table 2
KPSS test results[a]

Lags	Nominal monthly stock returns			
	Argentina	Chile	Mexico	Venezuela
0	0.0031	0.0090	0.0052	0.0040
3	0.0140	0.0358	0.0154	0.0157
6	0.0191	0.0567	0.0268	0.0242
	Monthly inflation rate			
0	0.0086	0.0080	0.0189	0.0187
3	0.0160	0.0186	0.0314	0.0378
6	0.0367	0.0363	0.0410	0.0529
	Monthly real stock returns			
0	0.0029	0.0087	0.0049	0.0041
3	0.0095	0.0324	0.0142	0.0157
6	0.0209	0.0516	0.0246	0.0243

[a] *Notes:* Critical values for KPSS test; 10% (0.347), 5% (0.463), 1% (0.739).

$$R(H) = \ln\left((1/n)\sum_{j=1}^{n} w_j^{2H-1} I(w_j)\right) - (2H-1)1/n\sum_{j=1}^{n} \ln w_j. \tag{9}$$

The number of low frequency ordinates n are also important in this method. According to Barkoulas and Baum, (1998), the Robinson method has several advantages over the GPH method. The Robinson method is consistent under mild conditions and, under stronger conditions, it is asymptotically normal and more efficient. Gaussianity is not assumed in the asymptotic theory. The estimator is $n^{1/2}$ consistent and the variance of the limiting distribution is free of nuisance parameters and equals $1/4n$. The Robinson method is also implemented with the first difference of the series under study. It is also applied with the values of 0.55 and 0.60 for μ.

3.3. Results from stochastic structural tests

Table 2 shows the KPSS test results and Table 3 presents the results from the two fractional integration tests. Based on the evidence provided by Kwiatkowski et al. (1992), the maximum number of lags applied is six. Results using 0, 3 and 6 lags are presented. The null hypothesis of stationarity is not rejected for all three series for all countries. In other words, all fifteen series are found to be stationary or mean reverting. These results are further backed by the 2 fractional tests. As stated earlier, both tests are conducted using $\mu = 0.55$ and 0.60. Using the Robinson Gaussian method using both values of μ, the null hypothesis of $d = 1$ is rejected (and alternate null $d < 1$ is accepted) for all series. The GPH spectral regression method provides very similar results except for the nominal stock returns and real stock returns of Venezuela, when μ is equal to 0.55. Both series reject the null, when μ is equal to 0.60. Both the fractional integration tests show that all series are integrated of the order less than one ($d < 1$) implying long memory process. A

Table 3
Fractional integration tests

μ	Argentina	Chile	Mexico	Venezuela
GPH test results				
	Nominal monthly stock returns d			
0.55	-0.5629^{a} (-8.0237)	0.7162^{c} (-1.457)	0.2786^{a} (-3.704)	0.9388 (-0.290)
0.60	-0.6016^{a} (-9.878)	0.4587^{a} (-3.338)	-0.0261^{a} (-6.329)	0.7129^{c} (-1.572)
	Monthly inflation rate d			
0.55	-0.2328^{a} (-6.329)	-0.2871^{a} (-6.608)	0.0216^{a} (-5.023)	0.6346^{b} (-1.731)
0.60	-0.5396^{a} (-9.500)	-0.3848^{a} (-8.541)	-0.1163^{a} (-6.885)	0.3567^{a} (-3.524)
	Monthly real stock returns d			
0.55	-0.6275^{a} (-8.356)	0.6876^{c} (-1.604)	0.2978^{a} (-3.605)	0.9305 (-0.330)
0.60	-0.8740^{a} (-11.559)	0.4544^{a} (-3.365)	0.0225^{a} (-6.029)	0.6900^{b} (-1.698)
Robinson test results				
	Nominal monthly stock returns d			
0.55	0.5500^{a} (-3.818)	0.4100^{a} (-5.006)	0.8200^{c} (-1.527)	0.5300^{a} (-3.760)
0.60	0.2700^{a} (-7.153)	0.2700^{a} (-7.153)	0.4900^{a} (-5.000)	0.3800^{a} (-5.545)
	Monthly inflation rate d			
0.55	-0.4000^{a} (-11.880)	-0.4100^{a} (-11.964)	-0.1600^{a} (-9.843)	-0.2800^{a} (-10.240)
0.60	-0.4900^{a} (-14.600)	-0.4500^{a} (-14.207)	-0.1500^{a} (-11.268)	-0.3900^{a} (-12.432)
	Monthly real stock returns d			
0.55	0.7800^{b} (-1.867)	0.4000^{a} (-5.091)	0.7600^{b} (-2.036)	0.5400^{a} (-3.680)
0.60	0.3700^{a} (-6.173)	0.2800^{a} (-7.054)	0.4900^{a} (-5.000)	0.3700^{b} (-5.635)

[a] Rejection of the null $d = 1$ at 1%.
[b] Rejection of the null $d = 1$ at 5%.
[c] Rejection of the null $d = 1$ at 10%.

large number of the d estimated are between 0.5 and -0.5 indicating both mean reverting and covariance stationary. Given these results, it is safe to assume that all series under consideration are mean reverting and applicable in linear regressions.

4. Empirical tests results of the stock returns and inflation relationship

Tables 4–7 present the estimates of the stock returns and inflation relationships for the four countries. As stated earlier, these relationships are tested for both the nominal and the real rate of stock returns. Part A of Tables 4–7 present the results using the nominal returns and part B presents the real returns results.

For both rates of returns four different tests are conducted. Using the nominal returns the first test investigates whether stocks act as a hedge against inflation by means of Eq. (5) which includes a contemporaneous rate of return and inflation.[12]

[12] The Plosser-Schwert-White (Plosser et al., 1982) differencing test for model specification is applied to check for estimates' consistency. Results show that the models have not been mis-specified.

Table 4
Argentinean results[a]

Part A: Nominal stock returns

$R_t = 0.0227\ (1.285) + 0.8153^{b}\pi_t\ (7.665)$
$\bar{R}^2 = 0.217$, D.W. $= 2.083$, SEE $= 0.222$, SSR $= 10.156$

$R_t = 0.0415^{c}\ (2.187) + 0.5815^{b}\pi_{t-1}\ (5.107)$
$\bar{R}^2 = 0.109$, D.W. $= 2.162$, SEE $= 0.237$, SSR $= 11.570$

$R_t = 0.0245\ (1.217) + 0.2692^{d}\pi_{t-1}\ (1.858) + 0.3207^{d}\pi_{t-2}\ (1.946) + 0.2566\pi_{t-3}$
$(1.557) + -0.0500\pi_{t-4}\ (-0.344)$
$\bar{R}^2 = 0.145$, D.W. $= 2.108$, SEE $= 0.232$, SSR $= 10.742$, F-test: 13.110**

$R_t = 0.0017\ (0.080) + -0.1747\pi_{t-1}\ (-1.026) + 0.2144\pi_{t-2}\ (1.275) + 0.3406^{c}\pi_{t-3}$
$(2.054) + -0.0944\pi_{t-4}\ (-0.624) + 0.6617^{b}\pi_t\ (4.000) + 0.1391\pi_{t+1}\ (0.817) + -0.0003\pi_{t+2}$
$(-0.002) + -0.0659\pi_{t+3}\ (-0.400) + 0.0494\pi_{t+4}\ (0.327)$
$\bar{R}^2 = 0.232$, D.W. $= 2.165$, SEE $= 0.221$, SSR $= 9.349$, F-test: 44.430***

Part B: Real stock returns

$r_t = 0.0240\ (1.562) + -0.1680^{d}\pi_t\ (-1.819)$
$\bar{R}^2 = 0.011$, D.W. $= 1.964$, SEE $= 0.192$, SSR $= 7.660$

$r_t = 0.0139\ (0.897) + -0.0552\pi_{t-1}\ (-0.592)$
$\bar{R}^2 = -0.003$, D.W. $= 1.965$, SEE $= 0.194$, SSR $= 7.750$

$r_t = -0.0006\ (-0.037) + -0.2615^{c}\pi_{t-1}\ (-2.210) + 0.1004\pi_{t-2}\ (0.746) + 0.3094^{c}\pi_{t-3}$
$(2.300) + -0.0224\pi_{t-4}\ (-0.189)$
$\bar{R}^2 = 0.036$, D.W. $= 2.051$, SEE $= 0.189$, SSR $= 7.169$, F-test: 8.789*

$r_t = 0.0055(0.307) + -0.1733\pi_{t-1}\ (-1.179) + 0.1509\pi_{t-2}\ (1.038) + 0.3192^{c}\pi_{t-3}$
$(2.229) + -0.0587\pi_{t-4}\ (-0.449) + -0.2665^{d}\pi_t\ (-1.863) + 0.1166\pi_{t+1}\ (0.793) + -0.0469\pi_{t+2}$
$(-0.323) + -0.0372\pi_{t+3}\ (-0.260) + 0.0536\pi_{t+4}\ (0.410)$
$\bar{R}^2 = 0.034$, D.W. $= 2.037$, SEE $= 0.192$, SSR $= 6.975$, F-test: 13.53

[a] *Notes:* D.W. = Durbin–Watson; SEE = Standard error of estimate; SSR = Sum of squared residuals.
[b] Significance at 1%.
[c] Significance at 5%.
[d] Significance at 10%.
* Rejection of the null hypothesis at 10%.
** Rejection of the null hypothesis at 5%.
*** Rejection of the null hypothesis at 1%.

In this test based on Fisher effect, a unit coefficient on the inflation rate is expected. Then second tests are conducted which include one period past rate of inflation instead of a contemporaneous rate of inflation. A positive (but an unknown size) inflation rate coefficient is expected in this test.[13] Replacing the nominal rate of return by the real rate and based on the Fisher effect, the coefficient on current and past rate of inflation should be insignificant.[14] As stated earlier, Lintner's (1975)

[13] The value of the coefficient in this relationship will depend on the correlation between past rate of inflation and the expected inflation rate. Since the correlation should be positive, the coefficient on the contemporaneous rate of inflation should be positive.

[14] See footnote 8.

theory suggests a possible negative relationship between real rate and inflation. According to Nelson (1976), it is reasonable to assume that much of the information about future inflation rates available to the market is contained in past rates of inflation. This could especially be true if investors formulated expectations of future inflation rate by means of adaptive expectations.[15] Both Nelson (1976) and Jaffe and Mandelker (1976) claim that it is of some importance to consider a test of stock returns on past inflation rates. According to Nelson use of a better proxy for an anticipated inflation than just the observed rate could provide more

Table 5
Chilean results[a]

Part A: Nominal stock returns

$R_t = 0.0010\ (0.102) + 1.3250^{c}\pi_t\ (2.399)$
$\bar{R}^2 = 0.036$, D.W. $= 2.016^{e}$, SEE $= 0.080$, SSR $= 1.300$

$R_t = 0.0270^{b}\ (2.771) + -0.8108\pi_{t-1}\ (-1.390)$
$\bar{R}^2 = 0.019$, D.W. $= 2.017^{e}$, SEE $= 0.080$, SSR $= 1.320$

$R_t = 0.0124\ (0.991) + -1.1220^{d}\pi_{t-1}\ (-1.825) + -0.1679\pi_{t-2}\ (-0.266) + 0.5700\pi_{t-3}\ (0.901) + 1.1558^{d}\pi_{t-4}\ (1.875)$
$\bar{R}^2 = 0.040$, D.W. $= 2.029^{e}$, SEE $= 0.079$, SSR $= 1.231$, F-test: 1.955

$R_t = -0.0020\ (-0.132) + -1.600^{c}\pi_{t-1}\ (-2.421) + -0.2230\pi_{t-2}\ (-0.343) + 0.1725\pi_{t-3}\ (0.263) + 1.2900^{c}\pi_{t-4}\ (2.046) + 1.610^{c}\pi_t\ (2.415) + -0.034591\pi_{t+1}\ (-0.052) + 0.0178\pi_{t+2}\ (0.027) + 0.3185\pi_{t+3}\ (0.486) + 0.0712\pi_{t+4}\ (0.113)$
$\bar{R}^2 = 0.054$, D.W. $= 2.029^{e}$, SEE $= 0.078$, SSR $= 1.160$, F-test: 1.717*

Part B: Real stock returns

$r_t = 0.0008\ (0.082) + 0.3352\pi_t\ (0.588)$
$\bar{R}^2 = 0.015$, D.W. $= 2.016^{e}$, SEE $= 0.079$, SSR $= 1.274$

$r_t = 0.0186^{d}\ (1.962) + -1.1261^{c}\pi_{t-1}\ (-1.984)$
$\bar{R}^2 = 0.032$, D.W. $= 2.017^{e}$, SEE $= 0.078$, SSR $= 1.252$

$r_t = 0.0053\ (0.435) + -1.4135^{c}\pi_{t-1}\ (-2.361) + -0.1868\pi_{t-2}\ (-0.303) + 0.3677\pi_{t-3}\ (0.597) + 1.244^{c}\pi_{t-4}\ (2.073)$
$\bar{R}^2 = 0.053$, D.W. $= 2.029^{e}$, SEE $= 0.077$, SSR $= 1.167$, F-test: 2.49**

$r_t = -0.0022\ (-0.143) + -1.5860^{c}\pi_{t-1}\ (-2.427) + -0.2216\pi_{t-2}\ (-0.344) + 0.1163\pi_{t-3}\ (0.256) + 1.2820^{c}\pi_{t-4}\ (2.057) + 0.6207\pi_t\ (0.941) + -0.0380\pi_{t+1}\ (-0.058) + 0.0087\pi_{t+2}\ (0.014) + 0.3187\pi_{t+3}\ (0.492) + 0.0780\pi_{t+4}\ (0.125)$
$\bar{R}^2 = 0.038$, D.W. $= 2.030^{e}$, SEE $= 0.077$, SSR $= 1.134$, F-test: 1.267

[a] *Notes:* D.W. = Durbin–Watson; SEE = Standard error of estimate; SSR = Sum of squared residuals. ***, ** and * implies rejection of the null hypothesis at 1%, 5% and 10% level, respectively.
[b] Significance at 1%.
[c] Significance at 5%.
[d] Significance at 10%.
[e] Regression corrected for serial correlation.

[15] This was pointed out to us by the referee. Adaptive expectations are expectations adjusted by a fraction of past forecasting errors.

Table 6
Mexican results[a]

Part A: Nominal stock returns

$R_t = 0.0311^{d}\ (1.804) + 0.0861\pi_t\ (0.206)$
$\bar{R}^2 = 0.092$, D.W. $= 1.910^{e}$, SEE $= 0.116$, SSR $= 2.745$

$R_t = 0.0061\ (0.367) + 0.9295^{c}\pi_{t-1}\ (2.284)$
$\bar{R}^2 = 0.115$, D.W. $= 1.923^{e}$, SEE $= 0.114$, SSR $= 2.672$

$R_t = 0.0038\ (0.204) + 0.0718\pi_{t-1}\ (0.121) + 2.014^{b}\pi_{t-2}\ (3.002) + -0.0699\pi_{t-3}\ (-0.104) + -0.9646\pi_{t-4}\ (-1.628)$
$\bar{R}^2 = 0.151$, D.W. $= 1.949^{e}$, SEE $= 0.112$, SSR $= 2.501$, F-test: 4.411***

$R_t = 0.0077\ (0.451) + 0.6462\pi_{t-1}\ (0.944) + 2.4521^{b}\pi_{t-2}\ (3.605) + 0.2299\pi_{t-3}\ (0.337) + -1.0113^{c}\pi_{t-4}\ (-1.757) + -1.0510\pi_t\ (-1.522) + -0.6817\pi_{t+1}\ (-0.981) + -1.720^{c}\pi_{t+2}\ (-2.488) + -0.0693\pi_{t+3}\ (-0.100) + 2.1500^{b}\pi_{t+4}\ (3.704)$
$\bar{R}^2 = 0.246$, D.W. $= 1.978^{e}$, SEE $= 0.107$, SSR $= 2.149$, F-test: 5.614***

Part B: Real stock returns

$r_t = 0.0276^{d}\ (1.7116) + -0.7884^{c}\pi_t\ (-2.010)$
$\bar{R}^2 = 0.095$, D.W. $= 1.920^{e}$, SEE $= 0.110$, SSR $= 2.475$

$r_t = -0.0022\ (-0.138) + 0.2158\pi_{t-1}\ (0.547)$
$\bar{R}^2 = 0.078$, D.W. $= 1.920^{e}$, SEE $= 0.111$, SSR $= 2.516$

$r_t = -0.0013\ (-0.070) + -0.4532\pi_{t-1}\ (-0.789) + 1.9520^{b}\pi_{t-2}\ (3.002) + -0.2442\pi_{t-3}\ (-0.376) + -1.0323^{d}\pi_{t-4}\ (-1.795)$
$\bar{R}^2 = 0.118$, D.W. $= 1.960^{e}$, SEE $= 0.109$, SSR $= 2.356$, F-test: 3.280**

$r_t = 0.0074\ (0.459) + 0.5732\pi_{t-1}\ (0.874) + 2.324^{b}\pi_{t-2}\ (3.568) + 0.1969\pi_{t-3}\ (0.301) + -0.9550^{d}\pi_{t-4}\ (-1.743) + -1.8436^{b}\pi_t\ (-2.789) + -0.5715\pi_{t+1}\ (-0.860) + -1.6855^{c}\pi_{t+2}\ (-2.546) + -0.30725\pi_{t+3}\ (-0.109) + 1.9980^{b}\pi_{t+4}\ (3.616)$
$\bar{R}^2 = 0.247$, D.W. $= 1.982^{e}$, SEE $= 0.102$, SSR $= 1.948$, F-test: 6.001***

[a] *Notes:* D.W. = Durbin–Watson; SEE = Standard error of estimate; SSR = Sum of squared residuals. ***, ** and * implies rejection of the null hypothesis at 1%, 5% and 10% level, respectively.
[b] Significance at 1%.
[c] Significance at 5%.
[d] Significance at 10%.
[e] Regression corrected for serial correlation.

favourable support for the Fisher effect for stocks. The third test in this article applies four lags of the inflation rates against the nominal and real rates of stock return.[16] Negative coefficient on these lagged inflation rates would be difficult to reconcile with the Fisher effect since past rates of inflation contain no surprises (Nelson, 1976).[17] Both Nelson, and Jaffe and Mandelker also advocate conducting

[16] Tests were also conducted using different length of lags ranging from 3 to 6. Results obtained were quite similar to the ones from four lag tests. These results are not provided in order to save space but are available on request.

[17] Nelson (1976) further claims that the value of the coefficients on past inflation rates should be positive since it depends upon the correlation between current and past inflation rates and, given that correlation between inflation rates is positive. Both Nelson, (1976) and Jaffe and Mandelker, (1976) in their studies find negative coefficients on the past inflation rates.

Table 7
Venezuelan results[a]

Part A: Nominal stock returns

$R_t = 0.0478^{b}\ (2.871) + -0.4568\pi_t\ (-1.073)$
$\bar{R}^2 = 0.037$, D.W. $= 2.052^{e}$, SEE $= 0.110$, SSR $= 1.903$

$R_t = 0.0345^{c}\ (2.020) + 0.0159\pi_{t-1}\ (0.037)$
$\bar{R}^2 = 0.030$, D.W. $= 2.050^{e}$, SEE $= 0.111$, SSR $= 1.917$

$R_t = 0.0429^{d}\ (1.957) + 0.4235\pi_{t-1}\ (0.815) + -0.8693\pi_{t-2}\ (-1.518) + 0.3346\pi_{t-3}\ (0.584) + -0.1454\pi_{t-4}\ (-0.282)$
$\bar{R}^2 = 0.026$, D.W. $= 2.042^{e}$, SEE $= 0.112$, SSR $= 1.887$, F-test: 0.587

$R_t = 0.0403\ (1.510) + 1.068^{d}\pi_{t-1}\ (1.737) + -1.3206^{c}\pi_{t-2}\ (-2.217) + 0.5390\pi_{t-3}\ (0.922) + -0.2876\pi_{t-4}\ (-0.556) + -1.2952^{c}\pi_t\ (-2.130) + 0.8502\pi_{t+1}\ (1.382) + -0.0016\pi_{t+2}\ (-0.003) + 0.5848\pi_{t+3}\ (0.996) + -0.2639\pi_{t+4}\ (-0.506)$
$\bar{R}^2 = 0.036$, D.W. $= 2.024^{e}$, SEE $= 0.111$, SSR $= 1.729$, F-test: 0.982

Part B: Real stock returns

$r_t = 0.0443^{b}\ (2.703) + -1.2944^{b}\pi_t\ (-3.156)$
$\bar{R}^2 = 0.094$, D.W. $= 2.049^{e}$, SEE $= 0.106$, SSR $= 1.762$

$r_t = 0.0204\ (1.235) + -0.5059\pi_{t-1}\ (-1.214)$
$\bar{R}^2 = 0.044$, D.W. $= 2.041^{e}$, SEE $= 0.109$, SSR $= 1.859$

$r_t = 0.0305\ (1.437) + -0.1245\pi_{t-1}\ (-0.242) + -0.6839\pi_{t-2}\ (-1.201) + 0.1434\pi_{t-3}\ (0.252) + -0.1747\pi_{t-4}\ (-0.344)$
$\bar{R}^2 = 0.036$, D.W. $= 2.032^{e}$, SEE $= 0.111$, SSR $= 1.837$, F-test: 0.757

$r_t = 0.0388\ (1.500) + 0.9351\pi_{t-1}\ (1.580) + -1.2626^{c}\pi_{t-2}\ (-2.202) + 0.5224\pi_{t-3}\ (0.928) + -0.3029\ \pi_{t-4}\ (-0.608) + -2.0240^{b}\pi_t\ (-3.459) + 0.7801\pi_{t+1}\ (1.317) + 0.0196\pi_{t+2}\ (0.034) + 0.5358\pi_{t+3}\ (0.948) + -0.2623\pi_{t+4}\ (-0.522)$
$\bar{R}^2 = 0.092$, D.W. $= 2.021^{e}$, SEE $= 0.107$, SSR $= 1.605$, F-test: 1.862*

[a] *Notes:* D.W. = Durbin–Watson; SEE = Standard error of estimate; SSR = Sum of squared residuals. ***, ** and * implies rejection of the null hypothesis at 1%, 5% and 10% level, respectively.
[b] Significance at 1%.
[c] Significance at 5%.
[d] Significance at 10%.
[e] Regression corrected for serial correlation.

tests that include both the past and the future rates of inflation. Van Horne and Glassmire (1972) emphasize the effect of leads and lags in price cost adjustment on the present value of stocks. Nelson (1976, p. 473) claims the timing of the price index measurement, their public announcement and the actual rate of flow of the information to the market suggest that the leads and lags along with the current rate of inflation may convey some information regarding stock returns. Thus, if the amount of information available about the future rates of inflation exceeds that contained in the past rates then both lags and leads of inflation rate may be required in the relationship between stock returns and inflation. The fourth test applied includes four leads, four lags and the current rate of inflation.[18]

[18] Once again, tests with different length of lag ranging from 3 to 6 were also conducted. Results were similar to the four lag results. These results are available on request.

Table 4 shows the results using the Argentina data. The test between current nominal returns and inflation indicate a direct relationship. The coefficient on inflation is close to unity (0.82) and highly significant.[19] The diagnostic statistics of the regression are quite satisfactory with the $\bar{R}^2$ (coefficient of determination) being relatively high at 22%. This one-to-one relationship provides evidence for the Fisher effect for risky assets. In other words, the result implies that the Argentinean stock returns are a good (if not a perfect) hedge against the inflation rate. Replacing the current rate of inflation with one period past rate, once again a direct relationship is found. The coefficient on the lagged inflation rate is positive and highly significant as expected. The size of the coefficient 0.58 is less than unity indicating that 1% rise in the inflation rate implies a rise in the expected rate of returns by 0.58%. The diagnostics are again satisfactory with the coefficient of determination (11%) lower than in the last test. The second test backs the claims of Nelson (1976) and Jaffe and Mandelker (1976) that the relationship between stock returns and past rate of inflation should be positive given that past and expected rate of inflation should be positively correlated. Thus, both anticipated and unanticipated inflation seems to directly affect the nominal stock returns. The third test, which includes four lags of the inflation rate, shows significant effect of the first and the second lag on stock returns. Both significant coefficients are found to be positive, but less than unity. All four lag coefficients are found to be jointly significant at the 5% level by means of the F-test. Using four lags and four leads of inflation rate shows no significant effect by the leads, and among the lags, only the third lag imposes a significant positive effect. The coefficient on the current rate of inflation is significantly positive but less than unity (0.66). The F-test shows all inflation rate coefficients to be jointly significant from zero. Both tests again show satisfactory diagnostic statistics.

Results using the Argentinean real rate are shown in part B of Table 4. The test between current rate of real return and current inflation shows an inverse relationship. The coefficient on the inflation rate is negative and significant only at the 10% level. In absolute value, the size of the coefficient (0.17) is small. The $\bar{R}^2$ is also small (1.1%) suggesting that the real rate of returns is also affected by factors other than inflation. This weak inverse relationship may provide some evidence against the Fisher effect and provide support for Lintner's theory. Tests between current real rate and the one period past rate of inflation show no form of a significant relationship. Adding three more lags of inflation induces a significant negative effect of the first lag and a significant positive effect of the third lag. All coefficients are jointly significant at the 10% level. Adding leads and lags of inflation, at the same time indicates no significant relationship. The coefficients fail to be significant jointly. Diagnostics of all four tests are satisfactory though the coefficient of determination is low in all cases.

Results using the Chilean data are provided in Table 5. Once again, the test between current nominal returns and inflation indicate a direct relationship. The

[19] The coefficient is found to be equal to unity by means of the standard F-test.

inflation coefficient is greater than unity and significant.[20] The Chilean result also provides evidence favourable to the Fisher effect, implying that stock returns are a good hedge against inflation. The coefficient of determination is low (3.6%) compared to the Argentina result and in this test, the Cochrane–Orcutt transformation is performed in order to reduce the serial correlation in the residuals. In the second test, the coefficient on the lagged inflation rate is negative but insignificant. Thus, no relationship is found between the current rate of stock returns and past rate of inflation. Adding three more lags of inflation does not add much to the relationship. Inflation lags one and four are significant (at the 10% level), but jointly these four coefficients are insignificant. A test using four leads and four lags indicates jointly significant coefficients but none of the leads are significant. This result is similar to the Argentinean result. These three regressions are also corrected for serial correlation by means of Cochrane–Orcutt. In all four tests, the $\bar{R}^2$ is less than 10% implying that along with inflation other factors may be affecting the rate of return.

No significant effect of the current inflation rate on the current real rate of returns is found (part B of Table 5). This result may provide more evidence in favour of the Fisher effect for risky assets. A significant inverse relationship is indicated between current real returns and one period past inflation rate. In absolute value, the coefficient on the lagged inflation rate is greater than unity. A negative effect of anticipated inflation on real returns is within the theory provided by Lintner (1975). Adding the extra three lags of inflation, all coefficients are found to be jointly significant, the first lag imposing a significant negative effect and the fourth lag a positive effect. In the test including both leads and lags, coefficients are not found to be jointly significant. Once again, none of the coefficients on the leads are significant. All regressions are corrected for serial correlation. The $\bar{R}^2$ in each test is again low.

The contemporaneous relationship in the case of Mexico (Table 6) indicates an insignificant influence of inflation on nominal stock returns. Replacing the current inflation rate with the lagged rate, the coefficient on inflation is close to unity and significant. The size of the coefficient 0.93 indicates that a 1% rise in the inflation implies a rise in the expected stock returns by 0.93%, close to a one-to-one relationship.[21] Adding three more lags of inflation, the coefficients are found to be jointly significant with only the second lag being large and highly significant. Adding leads and the current rate along with lags, once again the coefficients are jointly significant. The Mexican test provides evidence of a significant effect of inflation leads; the fourth and second leads along with the second lag are highly significant. Both Argentina and Chile provided no evidence of a direct effect of the inflation leads. The Mexican result may provide evidence supportive of Nelson (1976) and Jaffe and Mandelker (1976), who advocate conducting tests that include both the past and the future rates of inflation. If the amount of information

[20] Again the F-test indicates that the coefficient is equal to unity.

[21] The coefficient is found to be equal to unity by means of the standard F-test.

available about the future rates of inflation exceeds that contained in the past rates, then both lags and leads of inflation rate may be required in the relationship between stock returns and inflation. Among the four Mexican tests, the largest coefficient of determination is found in the last test. All tests are corrected for serial correlation.

The Mexican real rate results (part B of Table 6) show a significant inverse relationship between the current real rate and current inflation. Given that the Mexican current inflation has no significant influence on current nominal rate (part A of Table 6), the real rate result reinforces the lack of Fisher effect in the Mexican stock market. Replacing the current inflation with one period lag the relationship is no longer significant. Adding three more lags of the inflation rate, all coefficients are found to be jointly significant. The leads and lags test of real rate is similar to the nominal rate test, and once again, a significant effect of the inflation leads is found. All regressions were corrected for serial correlation.

Results from the Venezuela tests (Table 7) are the weakest. No significant effect of current inflation and one period past inflation is found on nominal returns. Adding more inflation lags or leads and lags also fail to produce a significant relationship. The $\bar{R}^2$ is smaller than 10% in all cases and all regressions are again corrected for serial correlation. The Venezuelan real rate has a significant inverse relationship with the current inflation but has no relationship with the lagged inflation. This result is similar to the Mexican result. The three extra lags of inflation do not improve the relationship. The leads and lags coefficients are jointly significant at the 10% level. Once again, the $\bar{R}^2$ are low and regressions are corrected for serial correlation.

So, what do the results presented in this article show and imply? Results provide evidence of a positive one-to-one relationship between current nominal stock returns and current inflation. This implies that stocks are a good hedge against high inflation rates. Results also provide a positive relationship between current returns and one period past inflation rate. This result backs Nelson's (1976) claim that the relationship between current nominal returns and one period lagged inflation should be direct due to the positive correlation between past and expected inflation rates. Results further show that longer lags of inflation also impose an influence on the current rate of return. This may indicate that past rates of inflation contains information regarding the future inflation rate. Very little evidence is found favouring the effects of inflation leads on stock returns indicating that future rates of inflation may not contain much information. The nominal return results indicate that empirical evidence supportive of the Fisher effect for risky assets in a short horizon is possible under high inflation conditions.

Tests using real rate of stock return provide evidence of an inverse relationship between current returns and inflation. These results back the lack of Fisher effect and also provide evidence of Lintner's theory. Little evidence is found regarding the effect of one period lagged inflation and some evidence is provided for the effects of the past and lead rates. Results presented in this article advocate further research in this field.

5. Conclusion

One of the controversial empirical findings in Finance is the negative relationship between stock returns and inflation. This article empirically investigates the relationship between stock returns (both nominal and real) and inflation in four high inflation countries of Central and Latin America during 80s and 90s. The countries are Argentina, Chile, Mexico and Venezuela. In other words, this article investigates the Fisher effect for risky assets in high inflation countries. The stated relationship is tested by means of linear regressions once it is confirmed that all series involved are mean-reverting in levels.

Compared to previous studies, results in this article show a direct one-to-one relationship between the current rate of nominal returns and inflation for Argentina and Chile. This result indicates that stocks act as a hedge against inflation. Further tests are conducted to check for the effects of the leads and lags of inflation. Evidence of a direct relationship between current nominal returns and one-period inflation is also found. Results also show that significant influence on nominal returns is imposed by lags but not by leads of inflation. This result backs the claim that the past rate of inflation may contain important information regarding the future inflation rate. These significant results presented may show that a positive relationship between stock returns and inflation is possible during short horizon under conditions of high inflation.

According to Lintner (1975), negative relationship between real stock return and expected (and unexpected) inflation is possible. This is in contrast to the Fisher theory, which claims no significant relationship between real returns and inflation. This article further investigates the relationship between real returns and inflation. A significant negative effect of current inflation and one-period lagged inflation on real returns is found thus providing support for Lintner's theory. Similar to the nominal returns leads of inflation impose very little effect and lags impose substantial effect on real returns. Given the contrasting results presented here compared to previous studies, this article advocates further research in the area of the Fisher effect for risky assets.

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