First Draft: 06/30/94
This Draft: 01/01/95

Global Return Variation

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Abstract

This paper extends Kothari and Shanken's (1992) exploration of stock market movements to international data, (1) to assess the efficiency of global markets and (2) to check the robustness of Kothari and Shanken's findings. We find that Kothari and Shanken's proxies for changes in expected future cash flow growth and changes in discount rates explain a substantial amount of annual returns in 26 markets. In time-series regressions these proxies, the dividend yield, current and future growth in dividends, and future returns, explain on average 75% of annual returns in emerging markets and 65% of annual returns in developed markets. In cross-sectional regressions they explain on average 60% of annual variation across both emerging and developed stock markets. Moreover, the evidence suggests that growth in the real money supply significantly adds to the explanatory power of Kothari and Shanken's variables.

[1] Thanks to Cliff Asness, John Cochrane, Kent Daniel, Eugene Fama, Ken French, Andy Hanssen, Campbell Harvey, Doug Huggins, John Huizinga, Antti Ilmanen, S.P. Kothari, Anthony Lynch, Guillermo Mondino, Rudi Schadt, Ross Stevens and Ingrid Tierens for helpful comments and the Center for Research in Security Prices and the Center for International Business Education and Research for financial assistance.

I. Introduction

A central question in finance regards whether or not capital markets are efficient. Fama (1976) sums up the relevance of this issue:

> An efficient capital market is an important component of a capitalist system. In such a system, the ideal is a market where prices are accurate signals for capital allocation. That is, when firms issue securities to finance their activities, they can expect to get 'fair' prices, and when investors choose among the securities that represent ownership of firms' activities, they can do so under the assumption that they are paying 'fair' prices. In short, if the capital market is to function smoothly in allocating resources, prices of securities must be good indicators of value.

Some argue that global equity markets are inefficient. For instance, many characterize the recent rise and fall of the Japanese stock market as a bursting bubble. Or on the other hand, many argue that the volatile returns in emerging markets reflect psychology and market sentiment instead of changes in "fair" value. This paper presents evidence on the efficiency or rationality of global equity markets.

In order to do this we follow the methodology developed by Fama(1990) and Kothari and Shanken (1992). This approach begins with Campbell's (1991) decomposition of continuously compounded returns,

$$
\begin{aligned}
r_{t+1} &= E(r_{t+1} \mid \phi_t^m) + \sum_{j=0}^{\infty} \rho^j [E(\Delta d_{t+1+j} \mid \phi_{t+1}^m) - E(\Delta d_{t+1+j} \mid \phi_t^m)] \\
&\quad - \sum_{j=1}^{\infty} \rho^j [E(r_{t+1+j} \mid \phi_{t+1}^m) - E(r_{t+1+j} \mid \phi_t^m)]
\end{aligned} \tag{1}
$$

where $E(.|\phi^m_k)$ represents the expectation operator conditional on the market's information set at time k, ϕ^m_k; $r_k = \ln(1+R_k)$ where R_k represents the return to the market from period k-1 to k; $\Delta d_k = \ln(D_k/D_{k-1})$ where D_k represents the cash flow to shareholders; and ρ represents a discount factor. Let,

$$
\eta_{d,t+1} = \sum_{j=0}^{\infty} \rho^j [E(\Delta d_{t+1+j} \mid \phi_{t+1}^m) - E(\Delta d_{t+1+j} \mid \phi_t^m)] \text{ and}
$$

$$\eta_{r,t+1} = \sum_{j=1}^{\infty} \rho^j [E(r_{t+1+j} | \phi^m_{t+1}) - E(r_{t+1+j} | \phi^m_t)].$$

We call $\eta_{d,t+1}$ news about future cash flows and $\eta_{r,t+1}$ news about future discount rates. Equation (1) states that the return from period t to t+1 is due to three factors: (i) the return that is expected at time t, (ii) news about future cash flows, and (iii) news about future discount rates.

In and of itself this return decomposition says nothing about market efficiency. However, it represents the manner in which markets transform sets of information into returns. We follow Fama in saying that an efficient market uses all available information in determining prices. More formally, suppose ϕ_t represents all available information at period t and ϕ^m_t represents the information that the market uses in determining the price of the asset at time t ($\phi^m_t \subseteq \phi_t$). In an efficient market, $\phi^m_t = \phi_t$.

Since information sets are not observable, we cannot directly test whether or not markets are efficient. However, we can indirectly test for market efficiency given proxies for the three factors (conditional on all available information, i.e. $\phi^m_t = \phi_t$) on the right hand side of equation (1). Under the joint hypothesis that markets are efficient and the proxies are perfect, regressions of actual returns on the proxies should produce R-squareds equal to 100%.

Fama (1990) and Schwert (1990) run regressions of this type to present evidence on the efficiency of the U.S. stock market. They use lagged dividend yields and interest rates to proxy for $E(r_{t+1}|\phi_t)$, realized future growth in industrial production to proxy for $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$, and shocks to dividend yields and interest rates to proxy for $[E(r_{t+1+j}|\phi_{t+1})- E(r_{t+1+j}|\phi_t)]$. They find that regressions of annual U.S. stock returns on these proxies produce R-squareds of around 50% to 60%. Kothari and Shanken (1992) conduct a similar study but they replace future growth in industrial production with future growth in dividends as their proxies for $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$. In addition, they introduce a new technique for handling the measurement error inherent in using realized future growth in dividends to proxy for changes in current expectations. These innovations lead to regression R-squareds of over 70%.

This paper extends Kothari and Shanken's analysis globally. Extending this analysis is worthwhile for at least two reasons. First, we provide evidence regarding the efficiency of international markets. Second, we provide a robustness check on the results of Kothari and Shanken.

Given the potential danger of obtaining data mined proxies, robustness checks of these results are especially important. In these tests, we base our assessment of market efficiency on the magnitude of the regression R-squareds. Hence, Kothari and Shanken's results for the U.S. are indicative of an efficient market. However, their findings may overstate the degree of efficiency as their proxies for the conditional expectations in equation (1) are in part chosen on the basis of goodness-of-fit.

Our results show that (a) international stock markets are at least as efficient as the U.S. stock market and (b) Kothari and Shanken's results for the U.S. are robust overseas. Time-series regressions of annual dollar returns on Kothari and Shanken's variables produce average R-squareds of 75% for emerging markets and 65% for developed markets. Cross-sectional regressions of stock returns on these variables produce average R-squareds of 60%.

Finally, we examine the impact of an additional proxy, growth in the real money supply. Liew (1994) argues that growth in the real money supply should proxy for $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$. Because of insufficient macro data in emerging markets, we only conduct this analysis using developed markets. In time-series and cross-sectional regressions we find that growth in the real money supply significantly adds to the explanatory ability of Kothari and Shanken's variables: the addition of growth in the real money supply to the time-series regressions increases the average R-squareds from 65% to over 70%.

The next section discusses the proxies that we employ in this study. Section III describes the data sources and presents some summary statistics. Section IV and V present the time-series and cross-sectional evidence.

II. Proxies for Changing Conditional Expectations

Although, the goal of this paper is to provide evidence on the efficiency of global equity markets, we can only test the joint hypothesis that markets are efficient and that our proxies for the conditional expectations in equation (1) are correct. The degree to which we can determine market efficiency depends on the accuracy of our proxies for the conditional expectations. Equation (1) states that returns from period t to t+1 equal a function of the expected return from period t to t+1, $E(r_{t+1}|\phi_t)$, changes in expectations of future growth in cash flow from periods t+j to t+1+j (j=1,..,∞), $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$, and changes in expectations of future returns from periods t+j to t+1+j (j=1,..,∞), $[E(r_{t+1+j}|\phi_{t+1})- E(r_{t+1+j}|\phi_t)]$. Recall that the tests that we perform involve regressing returns from period t to t+1 on proxies for these expectations. In this section we discuss our proxies.

Expected Returns

Our proxy for $E(r_{t+1}|\phi_t)$ is the dividend yield observed at time t. Assuming that expected future returns are constant, i.e. $E(r_{t+j}|\phi_t) = E(r|\phi_t)$ for j=1,...,∞, and that expected growth in future cash flows is constant, i.e., $E(\Delta d_{t+j}|\phi_t) = E(\Delta d|\phi_t)$ for j=1,..., ∞, we can show that:

$$DY_t = E(r|\phi_t) - E(\Delta d|\phi_t) \tag{2}$$

Hence, dividend yields should be positively related to expected returns. However, any variation through time in expected future growth in cash flows will impair the ability of divided yields to track expected returns.

Due to its simplistic assumptions, most researchers view equation (2) as little more than a heuristic. Nevertheless, dividend yields appear to track expected returns. Fama and French (1988), Cutler, Poterba, and Summers (1988), and Harvey (1994) and others present evidence that dividend yields have ability to forecast future stock returns in the U.S., other developed markets, and emerging markets. Although researchers have found other variables that have power to forecast future stock returns, for the sake of simplicity and parsimony, in this paper we restrict ourselves to the dividend yield.

Changes in Expected Future Growth in Cash Flows

Our proxy for $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$ is Δd_{t+1+j}. That is, our proxy for changes in expected future growth in cash flows is realized growth in future cash flows.

By simply adding and subtracting expected future growth in cash flows to realized future growth in cash flows, we can write:

(3) $\Delta d_{t+1+j} = E(\Delta d_{t+1+j}|\phi_t) + [E(\Delta d_{t+1+j}|\phi_{t+1}) - E(\Delta d_{t+1+j}|\phi_t)] + [\Delta d_{t+1+j} - E(\Delta d_{t+1+j}|\phi_{t+1})]$.

Equation (3) shows that realized future growth in cash flows equals changes in expected future growth in cash flows (the middle term) plus two sources of measurement error. One source (the first term) is due to growth in future cash flows that is expected at the beginning of the return interval (time t). The other source (the third term) is due to growth in future cash flows not expected at the end of the return interval (time t+1). If we ignore the two measurement error terms for the moment, equations (1) and (3) state that returns from t to t+1 should be positively related to Δd_{t+1+j} ($j=1,..,\infty$).

Kothari and Shanken point out an interesting measurement error correction involving both the dividend yield and realized future growth in dividends. Consider the first measurement error term in equation (3), expected growth in future cash flows, $E(\Delta d_{t+1+j}|\phi_t)$. Equation (2) shows that the measurement error in DY_t also stems from $E(\Delta d_{t+1+j}|\phi_t)$. However, equation (2) shows that $E(\Delta d_{t+1+j}|\phi_t)$ negatively affects DY_t and equation (3) shows $E(\Delta d_{t+1+j}|\phi_t)$ positively affects Δd_{t+1+j}. Hence, if we put DY_t and Δd_{t+1+j} together in a multiple regression, the measurement error in each due to $E(\Delta d_{t+1+j}|\phi_t)$ could offset each other. Whether or not this source of measurement error completely drops out, the argument suggests that these two variables may be more effective proxies for their respective expectations when used together rather than alone.

Changes in Expected Future Returns

Our proxy for $[E(r_{t+1+j}|\phi_{t+1})- E(r_{t+1+j}|\phi_t)]$ is r_{t+1+j}. That is, our proxy for changes in expected future returns is actual future returns. If we decompose future returns in the same manner as we did future growth in dividends we can see that future returns can be attributed to three sources,

(4) $$r_{t+1+j} = E(r_{t+1+j}|\phi_t) + [E(r_{t+1+j}|\phi_{t+1}) - E(r_{t+1+j}|\phi_t)] + [r_{t+1+j} - E(r_{t+1+j}|\phi_{t+1})].$$

The first component of future returns tracks future returns expected at time t, the second component tracks changes from time t to t+1 in expectations of future returns, and the third component tracks future returns that are unexpected as of time t+1. As in the case above, the first and last terms represent sources of measurement error. Campbell's decomposition given in equation (1) states that the second term, $[E(r_{t+1+j}|\phi_{t+1}) - E(r_{t+1+j}|\phi_t)]$, should negatively correlate with returns from period t to t+1.

As in the case with dividend yields and future growth in cash flows, Kothari and Shanken point out an important measurement error correction involving future returns and future growth in cash flows. Recall that unexpected growth in future cash flows, $[\Delta d_{t+1+j} - E(\Delta d_{t+1+j}|\phi_{t+1})]$, represents a source of measurement error in Δd_{t+1+j}. Kothari and Shanken argue that unexpected returns, $[r_{t+1+j} - E(r_{t+1+j}|\phi_{t+1})]$, should positively correlate with $[\Delta d_{t+1+j} - E(\Delta d_{t+1+j}|\phi_{t+1})]$. Therefore, subtracting some component of r_{t+1+j} out of Δd_{t+1+j} should lead to a better proxy for changes in expected future growth in cash flows. According to this logic, the predicted negative relation between current returns and future returns and the predicted positive relation between current returns and future growth in dividends should be stronger when future returns and future growth in dividends are included in the regression together.

Growth in the Real Money Supply

Finally, we present growth in the real money supply as an addition to those variables used by Kothari and Shanken. As mentioned above, the use of future changes in cash flows to proxy for changes in current expectations suffers from measurement error due to any future changes that are not currently expected (the third term in equation (5)). Kothari and Shanken's methods provide some interesting measurement error corrections to this problem. Another way around this problem is to identify a variable that is observed contemporaneously with the return that contains information about expectations. Changes in this variable should tell us about changes in expectations.

A large body of literature links inflation and changes in the nominal money supply to growth in future real activity. To the extent that the cash flows to holding stocks are related to real activity, these variables may contain information about $[E(\Delta d_{t+1+j}|\phi_{t+1}) - E(\Delta d_{t+1+j}|\phi_t)]$. Based on Fama's (1981) model for the demand for money, Liew (1994) argues and provides empirical support for the proposition that shocks to the real money supply from t to t+1 contain information regarding $[E(\Delta d_{t+1+j}|\phi_{t+1}) - E(\Delta d_{t+1+j}|\phi_t)]$. Liew shows that in the U.S. shocks to the real money supply significantly add to the explanatory ability of regressions of stock returns on Kothari and Shanken's variables.

In sum, the tests presented in this paper regress stock returns on proxies for the various expectations given in equation (1). Our proxy for expected returns is the dividend yield. Our proxy for news about future growth in cash flows is future growth in cash flows and contemporaneous growth in the real money supply. Our proxy for news about future returns is realized future returns. Under the null hypothesis that global markets are efficient and that our proxies are perfect, regressions of returns on these proxies should produce R-squareds = 1. We next discuss the data and then present both time-series and cross-sectional evidence on this hypothesis.

III. Data sources and summary statistics

Dollar returns including dividends and dividend yields are obtained for 26 stock market indices. We employ 8 emerging markets from the International Finance Corporation's (IFC) Emerging Markets Database and 18 developed markets from Morgan Stanley Capital International. Although the IFC database contains 20 emerging markets most have available data only from 1984. The eight countries that we choose have data monthly from December 1975 to December 1992. The developed markets data begins in December 1969 and ends in May 1993. In emerging markets we construct growth in dividends following Fama and French (1988) from total return and price indices. In the developed markets we find that growth in dividends constructed from dividend yields and price indices are less sensitive to data errors in total return and price indices.

We obtain data on inflation and M1 for the 18 developed markets from the International Monetary Fund tapes. We do not acquire inflation and M1 data for the 8 emerging markets since the time over which the data are available for some of the countries is too short for annual analysis. In some of the developed countries only quarterly data are available on these series. In these cases we create monthly series from the quarterly series by repeating the last available observation.

Table 1 presents averages and standard deviations for annual dollar returns, annual dollar growth in dividends, and dividend yields. Note that the statistics are based on overlapping monthly observations. Annual growth in dividends are calculated following Kothari and Shanken assuming that all dividends in a given year are paid out at the end of the year. As other authors have found, emerging market returns tend to be higher and more volatile than developed market returns. The average annual returns across emerging markets is 51% versus 14% for developed markets. The average standard deviation for emerging markets is 59% versus 27% for developed markets. The high returns in emerging markets are in part a consequence of a selection bias where the markets that have not "emerged" are not included in the IFC database.

Like returns, growth in dividends is higher and more volatile in emerging markets. Average growth in dividends in emerging markets is 47% versus 7% in developed markets. The average standard deviation in emerging markets is 50% versus 17% in developed markets. If the higher volatility in realized growth in dividends implies higher volatility in changes in expectations about future growth in dividends, then these statistics suggest that the higher volatility found in emerging market returns could be a result of more volatile expectations of future growth in dividends.

Table 2 presents averages, standard deviations, and first order autocorrelations for annual inflation, growth in the nominal money supply (M1), and growth in the real money supply (growth in M1 minus inflation). Note that the statistics are based on overlapping monthly observations. Average inflation ranges from 4% for Germany, Singapore/Malaysia, and Switzerland to 12% for Spain. Average growth in the nominal money supply ranges from 4% for Switzerland to 16% for the U.K. In general, growth in the nominal money supply is higher and more volatile than inflation. The first order autocorrelation coefficients for annual growth in the nominal money supply and inflation are high. In many countries these variables tend to slowly wander and in some cases may not be stationary. However, the autocorrelations for the growth in the real money supply appears substantially smaller.[2]

One of the goals of this paper is to provide out-of-sample checks of Kothari and Shanken's results in the U.S. using international data. However, there exists substantial evidence that global markets are highly correlated. Hence, it is important to verify that international data do provide additional information. Table 3 presents correlations of annual returns, growth in dividends, dividend yields, growth in the nominal money supply, growth in inflation, and growth in the real money supply for each of the 26 countries with its counterpart in the U.S. First notice that emerging market returns are less correlated to U.S. returns than developed market returns. Average correlations for emerging markets are 14% versus 47% for developed markets.

The table also indicates that the average correlation between growth in dividends in emerging markets and the U.S. is higher than that between developed markets and the U.S.: average correlation for emerging markets is 25% versus 8% for developed markets. However, further analysis reveals that this is due to the fact that the sample periods are not the same for the emerging and developed markets. If we recalculate the correlations for the developed markets over the same time period as the emerging markets the average

[2]The results that are reported use the growth in the real money supply. We also conducted the tests using first differences and residuals from an AR(1) and found that the results are not seriously affected by these changes. In general, the first differences produced weaker relations and AR(1) residuals produced slightly stronger relations between stock returns and growth in the real money supply.

correlation becomes 25%. The correlation of growth in dividends in developed markets has increased from the beginning of the sample.

If the correlation between realized growth in dividends tells us anything about the correlation between changes in expectations of future growth in dividends, then these statistics suggest an intuitively appealing story. Notice that returns in developed markets are more highly correlated to U.S. returns than those in emerging markets. However, the correlation between growth in dividends in emerging and developed markets with that in the U.S. is the same. In a rational world, returns are due to changes in expectations of future growth in cash flows and changes in discount rates. Thus, the higher returns correlation in developed markets suggests that in developed markets, changes in discount rates must be more highly correlated to changes in discount rates in the U.S. Common variation in discount rates is consistent with many international asset pricing models that assume that markets are integrated. Hence, these statistics suggest that developed markets are more integrated than emerging markets.

Further support for this story comes from the correlation between dividend yields. Dividend yields should contain information regarding expected returns or discount rates. The third column of table 3 shows that dividend yields in developed markets are more correlated with dividend yields in the U.S. than are dividend yields in emerging markets. The average correlation between developed markets and the U.S. is 52% compared to 16% between emerging markets and the U.S.

Finally, the last three columns show that although the correlation of growth in the nominal money supply between the 18 developed countries and the U.S. is not high, the correlation of inflation between the developed countries and the U.S. is exceptionally high.

IV. Time-series evidence

In this section we perform time-series regressions in 26 countries of annual dollar returns on our proxies for the expectations given in equation (1). In order to gauge the relative importance of each of the proxies and to disentangle the complex set of interactions between the proxies we first present separate regressions of annual returns on each of the proxies individually.

Dividend Yields

We begin with evidence on the ability of dividend yields to track time varying expected returns. Recall that according to equation (2) above, dividend yields should be positively related to expected returns. In addition to using local dividend yields we present results using the U.S. dividend yield. Harvey (1991) provides evidence that U.S. dividend yields do a better job of forecasting some foreign country returns than local dividend yields.

Tables 4.a. and 4.b. present the results of regressions of annual dollar returns on lagged local and U.S. dividend yields for emerging and developed countries. In the emerging markets half of the countries produce a significant relation between local dividend yields and future returns. For these markets the U.S. dividend yields do not appear to do a very good job. All of the coefficients on the U.S. dividend yields are the wrong sign (negative). The results for the developed markets are about the same. Five of eighteen of the regressions produce a significant relation between local dividend yields and future returns while none of the foreign country regressions produce a significant relation between U.S. dividend yields and future returns[3].

In sum, as other authors have found dividend yields do appear to contain some information regarding time variation in expected returns. Moreover, local dividend yields appear better than U.S. dividend yields for forecasting country returns. Local dividend yields explain an average of 10% of emerging market returns and 6% of developed market returns. To the extent that divided yields capture a significant amount of variation in expected returns, these results suggest that time variation in expected returns accounts for a relatively small amount of total return variation.

Future Growth in Cash Flows

Next we examine the ability of current and future growth in dividends to explain return variation. As discussed above, current and future growth in dividends should be positively related to current returns. Tables 5.a. and 5.b. present regressions of annual returns on current and three leads of growth in dividends. The results suggest that a substantial amount of return variation in both emerging and developed markets can be explained by growth in dividends. In emerging markets 17 of 32 coefficients on growth in dividend terms are greater than 2 standard errors above zero and R-squareds average 44%. In developed markets 22 of 72 of the coefficients on the growth in dividend terms are greater than 2 standard errors above zero and R-squareds average 32%. Curiously the weakest country is the U.S.

[3]These results stand in contrast to those found by Harvey (1991). However, Bekaert (1994) presents

Future Returns

Next we examine the ability of future returns to explain annual variation in current returns. Recall that realized future returns are our proxy for changes in expectations of future returns. According to equation (1) we should see a negative relation between current returns and future returns.

However, this proxy contains a large source of measurement error due to unexpected future returns (third term in equation (4)). The results of Fama and French (1988) and many others suggest that typically over 90% of r_{t+1+j} can be attributed to $[r_{t+1+j} - E(r_{t+1+j}|\phi_{t+1})]$. Hence, the measurement error in this proxy may render it close to useless as a proxy for $[E(r_{t+1+j}|\phi_{t+1}) - E(r_{t+1+j}|\phi_t)]$. However, as mentioned above, unexpected future returns may be positively correlated to one source of measurement error in future growth in dividends. If this is true, future returns alone should explain little variation in current returns but in conjunction with future growth in dividends will be important as a measurement error correction.

Tables 6.a. and 6.b. present regressions of annual returns on three leads of annual returns for emerging and developed markets. For both the emerging and developed markets few of the coefficients are significantly different from zero and appear randomly positive or negative. The R-squareds are generally low, averaging 13% and 11% for emerging and developed markets respectively. Hence, these results confirm our suspicions that the measurement error component of future returns is the most dominant.

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evidence that after 1985 predictability in general is weaker and the power of U.S. dividend yields is

Dividend Yields, Future Returns, and Future Growth in Cash Flows

Finally, we combine all three proxies. Recall that individually dividend yields and future returns have very little ability to explain current return variation. However, as discussed above, in addition to the information these variables directly contain regarding current returns, they both contain information that serves as important measurement error corrections to future growth in dividends. According to this story, the significance of both dividend yields and future returns should increase when placed in regressions with future growth in dividends.

Tables 7.a. and 7.b. present the results. For emerging markets these corrections appear to make a big difference. R-squareds average 75% and range from 93% for Chile to 42% for Thailand. With the corrections, 26 of the 32 growth in dividend coefficients have t-statistics greater than 2. For developed markets the corrections make an equally impressive difference. With the corrections average R-squareds jump to 65% and 51 of 72 coefficients on the growth in dividend terms have t-statistics greater than 2.

In contrast to the regressions of returns on dividend yields and future returns alone, in tables 7.a. and 7.b. both the dividend yield and the future return terms enter significantly. In accordance with the measurement error correction interpretation of the dividend yield and future return terms, the coefficients on the dividend yields are all positive and the coefficients on the future return terms are generally negative. Recall that in regressions of returns on dividend yields alone only 8 of 26 coefficients had t-statistics greater than 2. In the regressions presented in tables 7.a. and 7.b., 19 of 26 coefficients on the dividend yields are greater than 2 standard errors above 0. Likewise, regressions

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especially weak. Our results appear consistent with these findings.

of returns on future returns alone produced 7 of 78 coefficients with t-statistics less than -2. In tables 7.a. and 7.b., 50 of 78 coefficients are more than 2 standard errors below 0.

In sum, the evidence presented suggests that Kothari and Shanken's results are robust globally. The magnitudes of the R-squareds and the signs of the regression coefficients are consistent with the results that they obtain for the U.S.

Growth in the Real Money Supply

We next examine the ability of growth in the real money supply to explain annual return variation. Here we present time-series regressions of annual returns on inflation, growth in the nominal money supply and growth in the real money supply. Many of the stories linking these variables to changes in expectations of future real activity or cash flows to holding stocks require the unexpected component or shock.[4] However, instead of modeling expectations of each of these variables in each of the 18 countries, here we simply present results using realized rates of growth.

Table 8.a. presents univariate regressions of stock returns on each of the variables. The first column shows that annual returns are negatively related to inflation in all 18 developed markets. However, only 5 of the 18 coefficients have t-statistics less than -2. The second column shows that annual returns are in general positively related to growth in the nominal money supply. But again the relation is weak, only 5 of 17 coefficients have t-statistics greater than 2. The last column presents regressions of annual returns on growth in the real money supply. In these regressions all 17 coefficients are positive and 12 of 17 coefficients are greater than 2 standard errors above

[4]See Liew (1994) for discussions of these stories.

zero. In contrast to the regressions employing financial variables, these variables explain relatively small amounts of variation in annual returns. Average R-squareds for inflation, growth in the nominal money supply, and growth in the real money supply are 15%, 7%, and 16% respectively.

As mentioned above, Liew (1994) argues that even after accounting for the measurement error corrections employed above, future growth in dividends is not a perfect proxy. Hence, unexpected growth in the real money supply may add to the explanatory ability of the regressions run in table 7.a. and 7.b. Liew presents evidence from the U.S. in favor of this point. Table 8.b. presents the global evidence. In 10 of the 17 countries that we examine the coefficient on growth in the real money supply[5] is greater than two standard errors above zero in the presence of the financial variables.

In sum, this section provides time-series evidence that a substantial amount of annual return variation can be explained by Kothari and Shanken's proxies for rational variation in returns in 26 countries. Dividend yields, growth in dividends, and future returns explain 75% of annual return variation in emerging markets and 65% of return variation in developed markets. Alone macroeconomic variables explain less variation in annual returns. However, growth in the real money supply adds to the explanatory ability of the financial variables in most cases.

V. Cross-sectional evidence

In this section we present evidence on the ability of financial and macroeconomic variables to explain cross-sectional variation in global returns. The time-series

[5]Note that Liew (1994) employs unexpected growth in the real money supply here we use actual growth. See footnote 3 for more discussion.

regressions test the proposition that differences in returns from year to year are due to differences in $E(r_{t+1}|\phi_t)$, differences in $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$, and differences in $[E(r_{t+1+j}|\phi_{t+1})- E(r_{t+1+j}|\phi_t)]$ from year to year. Cross-sectional regressions test the proposition that in a given year differences in returns across markets are due to differences in $E(r_{t+1}|\phi_t)$, differences in $[E(\Delta d_{t+1+j}|\phi_{t+1})- E(\Delta d_{t+1+j}|\phi_t)]$, and differences in $[E(r_{t+1+j}|\phi_{t+1})- E(r_{t+1+j}|\phi_t)]$ from market to market.

At the end of each month we perform cross-sectional regressions of annual returns on the financial and macroeconomic variables used above. These regressions produce a time-series of coefficients for each of the independent variables.[6] The tables present time-series averages of these coefficients along with t-statistics based on the standard errors of these averages. Note that as we use overlapping monthly observations of annual returns, standard errors are calculated accounting for autocorrelation of up to 11 lags.

Since the emerging and developed markets data cover different time periods we conduct two sets of regressions. The first set uses only the 18 developed markets which run from January 1970 to May 1989. The second set uses both the 26 developed and emerging markets which run from January 1976 to January 1989. In addition, since the cross-sectional regressions are based on only 18 or 26 observations, we cannot use as many independent variables as in the time-series regressions. To alleviate this problem we replace the three leads of future growth in dividends with the three year growth in

[6]Equation (2) states that returns should be positively related to expected returns, positively related to changes in expected future growth in cash flows, and negatively related to unexpected changes in discount rates. According to the decomposition, the exact magnitudes of some of the relations depend on ρ which is the average ratio of the stock price to the sum of the stock price and the dividend. In general ρ will be slightly less that one but does not necessarily have to be equal across countries. Hence, strictly speaking

future dividends and replace the three leads of future returns with the three year future return.

Tables 9.a. and 9.b. present the results. The first regression in each table shows that although a positive cross-sectional relation exists between returns and lagged dividend yields, it is not statistically significant. The second regression shows that current and future growth in dividends significantly explain cross-sectional variation in returns. These variables explain on average 22% of cross-sectional return variation among developed markets and 52% among developed and emerging markets. The addition of the dividend yield increases the average R-squareds to 26% (developed) and 55% (developed + emerging). Note that in the presence of the growth in dividend terms, the lagged dividend yield now enters the regressions significantly. The last row adds future returns as an additional measurement error correction. This addition increases average R-squareds to 35% (developed) and 60% (developed + emerging).

Table 10 presents cross-sectional evidence for the macroeconomic variables. The first and second regressions show that growth in the nominal money supply is positively related and inflation is negatively related to annual returns. However, the coefficient on each variable is statistically insignificant. The third regression shows that the difference, that is, growth in the real money supply significantly explains cross-sectional variation in annual returns. On average, variation in growth in the real money supply explains 12% of cross-sectional return variation. The fourth regression shows that the addition of the dividend yield increases the average R-squared to 15%.

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our cross-sectional regressions will not be well-specified. However, the degree of cross-sectional variation in ρ should be small relative to that in the independent variables.

Based on Fama's model for the demand for money, Liew (1994) argues that shocks to the real money supply should contain information regarding changes in expected future cash flows to holding stocks that is clouded by the measurement error inherent in proxies based on variables observed in the future such as growth in dividends. Above we presented time-series evidence that, for most countries, changes in the real money supply has additional explanatory power even in the presence of dividend yields, current and future growth in dividends, and future returns. The last two regressions in table 10 present cross-sectional evidence on this issue. Note that the addition of current and future growth in dividends does not drive out growth in the real money supply. Moreover, even with the future returns correction, growth in the real money supply maintains its explanatory ability.

In sum, the cross-sectional evidence suggests that Kothari and Shanken's proxies for changes in expected future growth in cash flows and changes in discount rates explain a substantial amount of cross-sectional variation in global returns. Moreover, growth in the real money supply adds to the explanatory power of dividend yields, current and future growth in dividends and future returns.

VI. Conclusion

This paper extends Kothari and Shanken's exploration of stock market movements to international data. The aim is (1) to assess the efficiency of international markets and (2) to check the robustness of Kothari and Shanken's findings. We find that Kothari and Shanken's proxies for expected returns, changes in expected future growth in cash flows and changes in expected future returns explain a substantial amount of both time-series and cross-sectional annual returns in 26 markets. In time-series regressions these proxies, the dividend yield, current and future growth in dividends, and future returns, explain around 75% of annual variation in emerging markets and around 65% of annual variation in developed markets. In cross-sectional regressions they explain an average of 60% of annual variation across both emerging and developed stock markets.

In addition, we find that in both time-series and cross-sectional regressions growth in the real money supply significantly adds to the explanatory ability of Kothari and Shanken's proxies. Liew (1994) argues that growth in the real money supply should serve as a proxy for changes in expected future growth in cash flows to holding stocks. The evidence presented here supports this point.

Whether or not the magnitude of these R-squareds indicates that global markets are efficient is left for the reader to decide. Ultimately, this analysis cannot provide direct evidence on market efficiency. R-squareds less than 100% can be a consequence of either an inefficient market or poor proxies. However, rejecting the hypothesis that markets are efficient is not the goal of this analysis. Market efficiency is a point hypothesis which we know is false. This analysis tries to determine to what degree the markets are inefficient. High R-squareds are consistent with minimal inefficiency.

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Table 1
Summary Statistics for Financial Variables

	RET(t,t+12)		GD(t,t+12)		DY(t)	
Country	**avg**	**std**	**avg**	**std**	**avg**	**std**
Argentina	1.36	1.15	1.57	1.28	0.01	0.01
Brazil	0.99	0.94	0.87	0.54	0.07	0.04
Chile	0.48	0.58	0.39	0.55	0.05	0.02
Greece	0.09	0.31	0.16	0.41	0.07	0.04
India	0.20	0.24	0.13	0.18	0.04	0.01
Mexico	0.54	0.67	0.45	0.41	0.06	0.04
Thailand	0.22	0.30	0.07	0.21	0.08	0.03
Zimbabwe	0.19	0.50	0.13	0.38	0.11	0.06
Average for Emerging Markets	0.51	0.59	0.47	0.50	0.06	0.03
Australia	0.09	0.27	0.09	0.17	0.04	0.01
Austria	0.14	0.28	0.06	0.20	0.03	0.01
Belgium	0.16	0.25	0.06	0.18	0.09	0.03
Canada	0.11	0.20	0.06	0.11	0.04	0.01
Denmark	0.15	0.26	0.04	0.16	0.04	0.02
France	0.13	0.30	0.07	0.22	0.05	0.02
Germany	0.13	0.23	0.09	0.20	0.04	0.01
Hong Kong	0.17	0.43	0.13	0.17	0.04	0.01
Italy	0.08	0.36	0.04	0.29	0.03	0.01
Japan	0.21	0.27	0.07	0.14	0.02	0.01
Netherlands	0.15	0.18	0.09	0.14	0.06	0.01
Norway	0.14	0.34	0.08	0.19	0.04	0.01
Singapore/Malaysia	0.16	0.35	0.09	0.15	0.02	0.01
Spain	0.09	0.30	0.03	0.15	0.07	0.04
Sweden	0.17	0.24	0.09	0.14	0.04	0.01
Switzerland	0.12	0.21	0.09	0.17	0.03	0.00
U.K.	0.13	0.26	0.09	0.15	0.05	0.01
U.S.	0.11	0.16	0.06	0.06	0.04	0.01
Average for Developed Markets	0.14	0.27	0.07	0.17	0.04	0.01

RET(t,t+12) represents the annual total return denominated in dollars for the country's stock market index, GD(t,t+12) represents the annual growth in dividends paid on the index, and DY(t) represents the dividend yield on the index. For RET and GD, averages and standard deviations are based on monthly observations of overlapping annual rates of change. Statistics for emerging markets are based on data from t = 1977:1 to t = 1989:1. Statistics for the developed markets are based on data from t = 1970:1 to t = 1989:5.

Table 2
Annual Averages, Standard Deviations, and First Order Autocorrelations for Growth in the Nominal Money Supply, Inflation, and Growth in the Real Money Supply
Developed Markets
1970:1 to 1989:5

	GM			INF			GRM		
Country	**avg**	**std**	**ρ(1)**	**avg**	**std**	**ρ(1)**	**avg**	**std**	**ρ(1)**
Australia	0.11	0.07	0.74	0.09	0.03	0.45	0.02	0.08	-0.05
Austria	0.07	0.06	0.79	0.05	0.02	0.71	0.02	0.06	-0.13
Belgium	0.06	0.04	0.83	0.06	0.03	0.68	0.00	0.04	0.39
Canada	0.09	0.07	0.82	0.07	0.03	0.67	0.03	0.08	0.52
Denmark	0.11	0.06	0.80	0.08	0.03	0.50	0.03	0.08	-0.11
France	0.10	0.06	0.87	0.08	0.03	0.74	0.03	0.06	-0.11
Germany	0.07	0.04	0.81	0.04	0.02	0.77	0.04	0.05	0.20
Hong Kong	na	na		0.08	0.05	0.28	na	na	
Italy	0.14	0.05	0.85	0.11	0.05	0.62	0.03	0.07	0.31
Japan	0.09	0.07	0.81	0.05	0.05	0.64	0.04	0.07	0.19
Netherlands	0.08	0.06	0.83	0.05	0.03	0.83	0.03	0.06	-0.03
Norway	0.13	0.06	0.60	0.08	0.02	0.35	0.05	0.07	0.19
Singapore/Malaysia	0.12	0.07	0.84	0.04	0.07	0.35	0.07	0.09	-0.18
Spain	0.15	0.05	0.78	0.12	0.05	0.68	0.03	0.07	0.51
Sweden	0.09	0.04	0.85	0.08	0.03	0.41	0.01	0.04	-0.10
Switzerland	0.04	0.08	0.76	0.04	0.03	0.63	0.00	0.09	0.12
U.K.	0.16	0.14	0.71	0.10	0.05	0.62	0.06	0.17	0.26
U.S.	0.07	0.03	0.84	0.06	0.03	0.66	0.01	0.05	0.44
Average	0.10	0.06	0.80	0.07	0.04	0.59	0.03	0.07	0.14

INF represents the annual rate of inflation based on the changes in the logged CPI from month t to month t+12, GM represents the annual rate of growth in the money supply based on changes in the logged level of M1 from month t to month t+12, and GRM(t,t+12) represents the annual rate of growth in the real money supply given by the difference between GM(t,t+12) and INF(t,t+12) from month t to month t+12. Averages, standard deviations and annual autocorrelations are based on monthly observations of overlapping annual rates of change from t = 1970:1 to t = 1989:5. Note that Norway has missing observations for GM and GRM from t = 1987:1 to t = 1987:8. GM and GRM are unavailable for Hong Kong.

Table 3
Correlation of Foreign Variables with U.S. Variables

Country	RET	GD	DY	GM	INF	GRM
Argentina	0.22	0.34	-0.03			
Brazil	0.05	0.02	0.57			
Chile	-0.11	0.54	-0.42			
Greece	0.14	0.24	-0.26			
India	0.12	0.16	0.55			
Mexico	0.43	0.05	0.36			
Thailand	-0.04	0.33	0.37			
Zimbabwe	0.33	0.29	0.14			
Average for Emerging Markets	0.14	0.25	0.16			
Australia	0.57	0.20	0.54	-0.20	0.47	0.01
Austria	0.29	0.08	0.39	-0.03	0.55	0.38
Belgium	0.41	0.00	0.86	0.09	0.50	0.52
Canada	0.70	0.36	0.67	0.61	0.81	0.78
Denmark	0.41	0.13	0.25	0.26	0.78	0.49
France	0.49	-0.04	0.72	0.11	0.80	0.26
Germany	0.46	0.18	0.79	0.15	0.61	0.49
Hong Kong	0.49	0.27	0.46	na	0.52	na
Italy	0.45	-0.20	-0.04	0.18	0.74	0.38
Japan	0.41	0.09	-0.09	0.02	0.56	0.48
Netherlands	0.71	0.10	0.76	0.07	0.52	0.54
Norway	0.29	-0.06	0.66	-0.32	0.42	0.09
Singapore/Malaysia	0.44	-0.02	0.18	-0.12	0.49	0.19
Spain	0.19	0.02	0.82	-0.25	0.58	0.15
Sweden	0.52	-0.03	0.53	-0.01	0.66	0.17
Switzerland	0.55	0.00	0.71	0.17	0.39	0.41
U.K.	0.63	0.23	0.66	0.33	0.73	0.56
Average for Developed Markets	0.47	0.08	0.52	0.07	0.60	0.37

The table presents correlations of annual returns (RET), annual growth in dividends (GD), dividend yields (DY), annual growth in the money supply (GM), annual inflation (INF), and annual growth in the real money supply (GRM) with the corresponding variable for the U.S. Correlations are based on monthly observations of overlapping annual data where the variable represents a rate of growth. Correlations for emerging markets are based on data from t = 1977:1 to t = 1989:1. Correlations for developed markets are based on data from t = 1970:1 to t = 1989:5. Note that Norway has missing observations for GM and GRM from t = 1987:1 to t = 1987:8. GM and GRM are unavailable for Hong Kong.

Table 4.a.
Regressions of Annual Returns on Lagged Local and U.S. Dividend Yields
Emerging Markets
1977:1 to 1992:1

RET(t,t+12) = a + b DY(t)

	local DY		**U.S. DY**	
	b	R-sq.	b	R-sq.
Argentina	53.25 (3.29)	*0.35*	-24.24 (-0.87)	*0.03*
Brazil	-6.63 (-1.19)	*0.06*	-53.54 (-2.50)	*0.23*
Chile	8.88 (2.31)	*0.14*	-21.28 (-1.58)	*0.14*
Greece	4.02 (2.43)	*0.14*	-15.62 (-1.79)	*0.14*
India	-1.37 (-0.24)	*0.00*	-2.03 (-0.32)	*0.00*
Mexico	5.25 (2.12)	*0.10*	-17.98 (-1.29)	*0.07*
Thailand	0.95 (0.68)	*0.01*	-11.24 (-1.63)	*0.13*
Zimbabwe	1.28 (0.56)	*0.01*	-5.85 (-0.43)	*0.01*

Each cell reports the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom in italics. Regressions are based on monthly data from t = 1977:1 to t = 1992:1.

Table 4.b.
Regressions of Annual Returns on Lagged Local and U.S. Dividend Yields
Developed Markets
1970:1 to 1992:6

RET(t,t+12) = a + b DY(t)

	local DY		U.S. DY	
	b	R-sq.	b	R-sq.
Australia	7.52 (3.99)	*0.11*	5.53 (0.98)	*0.04*
Austria	-2.13 (-0.30)	*0.00*	-4.76 (-0.98)	*0.02*
Belgium	-0.20 (-0.13)	*0.00*	-2.22 (-0.44)	*0.00*
Canada	8.41 (2.09)	*0.09*	5.82 (1.37)	*0.08*
Denmark	2.44 (1.00)	*0.03*	0.32 (0.06)	*0.00*
France	-0.39 (-0.11)	*0.00*	3.65 (0.64)	*0.01*
Germany	-1.35 (-0.30)	*0.00*	2.13 (0.52)	*0.00*
Hong Kong	10.22 (1.50)	*0.11*	-1.28 (-0.12)	*0.00*
Italy	7.18 (0.93)	*0.02*	9.26 (1.58)	*0.06*
Japan	6.24 (1.18)	*0.06*	0.42 (0.08)	*0.00*
Netherlands	1.34 (0.49)	*0.01*	3.86 (1.04)	*0.04*
Norway	7.11 (1.36)	*0.08*	0.90 (0.12)	*0.00*
Singapore/Malaysia	19.48 (3.40)	*0.19*	1.24 (0.16)	*0.00*
Spain	0.61 (0.47)	*0.00*	-4.98 (-1.20)	*0.02*
Sweden	2.09 (0.74)	*0.01*	6.41 (1.63)	*0.07*
Switzerland	0.70 (0.10)	*0.00*	0.25 (0.06)	*0.00*
U.K.	7.60 (2.46)	*0.13*	8.07 (1.71)	*0.10*
U.S.	6.18 (2.39)	*0.16*	6.18 (2.39)	*0.16*

Each cell reports the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom in italics. Regressions are based on monthly data from t = 1970:1 to t = 1992:6.

Table 5.a.
Regressions of Returns on Future Growth in Dividends
Emerging Markets
1977:1 to 1989:1

RET(t,t+12) = a + d0 GD(t,t+12) + d1 GD(t+12,t+24) + d2 GD(t+24,t+36) + d3 GD(t+36,t+48)

	a	d0	d1	d2	d3	R-Sq.
Argentina	1.00 (1.69)	0.60 (3.43)	-0.18 (-3.21)	-0.23 (-2.77)	0.12 (1.48)	0.50
Brazil	0.01 (0.03)	1.34 (4.85)	0.35 (3.12)	-0.18 (-0.88)	-0.21 (-1.15)	0.70
Chile	0.22 (3.66)	0.50 (5.60)	0.16 (3.30)	0.15 (2.60)	-0.42 (-4.85)	0.68
Greece	-0.04 (-0.55)	0.10 (0.69)	0.35 (2.23)	0.39 (3.54)	0.18 (1.37)	0.17
India	-0.03 (-0.24)	0.42 (1.79)	0.42 (1.16)	0.77 (2.82)	0.59 (2.13)	0.27
Mexico	-0.15 (-0.41)	0.05 (0.24)	0.71 (1.41)	0.62 (2.15)	0.15 (0.56)	0.27
Thailand	0.07 (1.09)	0.30 (2.09)	0.89 (3.44)	0.55 (2.76)	0.52 (3.08)	0.29
Zimbabwe	0.02 (0.25)	0.16 (1.42)	0.82 (4.70)	0.48 (3.25)	-0.24 (-3.33)	0.64

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1977:1 to t = 1989:1.

Table 5.b.
Regressions of Returns on Future Growth in Dividends
Developed Markets
1970:1 to 1989:5

RET(t,t+12) = a + d0 GD(t,t+12) + d1 GD(t+12,t+24) + d2 GD(t+24,t+36) + d3 GD(t+36,t+48)

	a	d0	d1	d2	d3	R-Sq.
Australia	0.00 (-0.07)	0.55 (2.18)	0.43 (1.94)	0.04 (0.14)	0.10 (0.48)	0.20
Austria	0.06 (1.75)	0.75 (4.25)	0.46 (2.80)	0.09 (0.80)	-0.03 (-0.19)	0.52
Belgium	0.08 (1.95)	0.71 (2.57)	0.39 (2.93)	0.19 (1.32)	-0.11 (-0.54)	0.41
Canada	0.05 (1.06)	0.30 (1.11)	0.91 (3.32)	-0.24 (-0.88)	-0.02 (-0.08)	0.31
Denmark	0.13 (2.75)	0.46 (1.54)	-0.24 (-0.74)	0.07 (0.35)	0.31 (1.92)	0.06
France	0.03 (0.50)	0.87 (6.22)	0.18 (1.09)	0.24 (1.44)	0.17 (1.04)	0.45
Germany	0.02 (0.59)	0.72 (3.57)	0.22 (1.80)	0.08 (0.64)	0.27 (1.95)	0.40
Hong Kong	-0.07 (-0.78)	0.41 (1.10)	1.25 (3.64)	0.74 (9.60)	-0.74 (-2.98)	0.44
Italy	0.04 (0.62)	0.74 (3.25)	0.42 (1.88)	0.09 (0.55)	-0.36 (-1.78)	0.36
Japan	0.09 (1.54)	1.34 (11.02)	0.33 (2.00)	0.10 (0.42)	-0.20 (-0.80)	0.50
Netherlands	0.03 (0.64)	0.58 (3.74)	0.25 (2.14)	0.23 (1.09)	0.30 (1.34)	0.28
Norway	0.05 (0.71)	0.49 (1.60)	0.64 (2.26)	0.23 (0.85)	-0.20 (-0.69)	0.20
Singapore/Malaysia	0.04 (0.67)	0.29 (1.20)	0.62 (2.04)	0.87 (2.00)	-0.48 (-1.49)	0.28
Spain	0.05 (0.70)	0.77 (2.12)	0.40 (1.44)	0.07 (0.19)	0.26 (0.82)	0.25
Sweden	0.10 (1.54)	0.66 (1.77)	0.00 (-0.01)	-0.28 (-1.26)	0.44 (1.69)	0.19
Switzerland	-0.01 (-0.26)	0.85 (5.49)	0.34 (2.96)	0.06 (0.60)	0.18 (1.77)	0.54
U.K.	0.01 (0.17)	0.77 (5.42)	0.00 (0.02)	0.44 (1.36)	0.13 (0.93)	0.25
U.S.	0.15 (3.13)	-0.51 (-1.69)	0.66 (1.23)	-0.47 (-0.82)	-0.41 (-0.68)	0.11

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1970:1 to t = 1989:5.

Table 6.a.
Regressions of Returns on Future Returns
Emerging Markets
1977:1 to 1989:1

RET(t,t+12) = a + r1 RET(t+12,t+24) + r2 RET(t+24,t+36) + r3 RET(t+36,t+48)

	a	r1	r2	r3	R-Sq.
Argentina	1.70	0.14	-0.16	-0.20	0.10
	(3.53)	(1.09)	(-3.11)	(-1.12)	
Brazil	0.32	0.34	0.01	0.16	0.20
	(0.82)	(1.80)	(0.07)	(0.71)	
Chile	0.33	0.48	0.05	-0.16	0.17
	(1.32)	(1.85)	(0.32)	(-0.64)	
Greece	0.04	0.05	0.02	0.28	0.14
	(0.68)	(0.47)	(0.18)	(1.26)	
India	0.43	-0.44	-0.48	-0.11	0.28
	(4.24)	(-3.34)	(-2.15)	(-0.53)	
Mexico	0.47	0.17	-0.14	0.09	0.02
	(1.85)	(0.91)	(-1.03)	(0.64)	
Thailand	0.25	0.09	-0.07	-0.23	0.04
	(2.00)	(0.45)	(-0.30)	(-1.47)	
Zimbabwe	0.18	0.16	-0.01	-0.17	0.05
	(1.16)	(1.03)	(-0.07)	(-1.08)	

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1977:1 to t = 1989:1.

Table 6.b.
Regressions of Returns on Future Returns
Developed Markets
1970:1 to 1989:5

RET(t,t+12) = a + r1 RET(t+12,t+24) + r2 RET(t+24,t+36) + r3 RET(t+36,t+48)

	a	r1	r2	r3	R-Sq.
Australia	0.13	-0.18	-0.26	0.09	0.09
	(1.85)	(-1.28)	(-1.74)	(0.53)	
Austria	0.16	0.10	-0.23	-0.04	0.06
	(1.81)	(0.63)	(-1.98)	(-0.26)	
Belgium	0.13	0.23	-0.11	0.05	0.04
	(2.65)	(1.45)	(-0.99)	(0.63)	
Canada	0.17	-0.31	-0.30	-0.22	0.13
	(2.91)	(-1.59)	(-1.79)	(-1.47)	
Denmark	0.28	-0.45	-0.30	-0.08	0.17
	(2.95)	(-2.48)	(-1.48)	(-0.49)	
France	0.16	-0.06	-0.21	0.07	0.04
	(2.08)	(-0.46)	(-1.28)	(0.41)	
Germany	0.18	-0.12	-0.34	0.07	0.13
	(2.41)	(-0.79)	(-1.39)	(0.67)	
Hong Kong	0.32	-0.24	-0.42	-0.40	0.21
	(3.48)	(-1.74)	(-2.78)	(-4.62)	
Italy	0.08	0.18	-0.18	-0.01	0.04
	(0.82)	(1.11)	(-1.00)	(-0.09)	
Japan	0.20	0.17	-0.11	-0.09	0.03
	(2.51)	(1.28)	(-0.73)	(-0.65)	
Netherlands	0.15	-0.03	-0.20	0.23	0.08
	(4.10)	(-0.18)	(-1.24)	(1.69)	
Norway	0.22	-0.22	-0.28	-0.21	0.11
	(1.88)	(-1.16)	(-1.49)	(-1.02)	
Singapore/Malaysia	0.22	-0.16	-0.26	-0.08	0.05
	(1.98)	(-0.97)	(-1.08)	(-0.42)	
Spain	0.06	0.42	0.11	-0.24	0.21
	(1.01)	(3.05)	(1.32)	(-2.06)	
Sweden	0.19	-0.21	-0.17	0.29	0.17
	(2.91)	(-1.80)	(-0.82)	(1.64)	
Switzerland	0.15	-0.01	-0.30	0.04	0.08
	(2.50)	(-0.04)	(-1.69)	(0.38)	
U.K.	0.17	-0.15	0.04	-0.16	0.05
	(2.31)	(-0.62)	(0.36)	(-1.70)	
U.S.	0.13	-0.19	-0.12	0.03	0.03
	(2.90)	(-0.87)	(-0.92)	(0.17)	

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1970:1 to t = 1989:5.

Table 7.a.
Regressions of Returns on Dividend Yields, Future Growth in Dividends, and Future Returns
Emerging Markets
1977:1 to 1989:1

RET(t,t+12) = a + b DY(t)
+ d0 GD(t,t+12) + d1 GD(t+12,t+24) + d2 GD(t+24,t+36) + d3 GD(t+36,t+48)
+ r1 RET(t+12,t+24) + r2 RET(t+24,t+36) + r3 RET(t+36,t+48)

	a	b	d0	d1	d2	d3	r1	r2	r3	R-Sq.
Argentina	0.28	86.72	0.51	0.21	0.34	0.23	-0.18	-0.45	-0.38	0.85
	(1.03)	(8.09)	(7.10)	(5.00)	(4.70)	(4.32)	(-3.50)	(-5.71)	(-4.04)	
Brazil	-1.28	13.43	1.57	0.77	0.42	0.46	-0.57	-0.46	-0.38	0.92
	(-7.20)	(9.69)	(19.03)	(6.01)	(3.78)	(5.13)	(-4.41)	(-4.54)	(-7.20)	
Chile	-0.57	16.39	0.79	0.66	0.43	0.09	-0.74	-0.44	-0.42	0.93
	(-6.60)	(8.66)	(11.43)	(9.91)	(9.22)	(1.85)	(-8.15)	(-7.48)	(-6.92)	
Greece	-0.85	10.38	0.83	0.85	0.62	0.32	-0.41	-0.17	0.05	0.72
	(-5.90)	(5.59)	(4.44)	(6.35)	(9.04)	(5.59)	(-4.64)	(-5.95)	(0.74)	
India	0.30	4.92	-0.13	-0.19	0.37	0.37	-0.56	-0.63	-0.18	0.58
	(2.73)	(1.42)	(-0.77)	(-0.77)	(3.45)	(2.63)	(-4.39)	(-5.83)	(-1.21)	
Mexico	-0.92	14.03	1.05	1.27	0.86	-0.04	-0.51	-0.36	-0.45	0.71
	(-3.14)	(3.99)	(4.38)	(6.44)	(4.14)	(-0.18)	(-4.38)	(-2.57)	(-2.79)	
Thailand	-0.45	5.01	0.96	1.33	0.65	0.50	0.17	0.03	0.00	0.42
	(-1.43)	(1.76)	(3.12)	(4.84)	(1.93)	(3.58)	(0.89)	(0.21)	(-0.02)	
Zimbabwe	-0.59	5.32	0.73	0.96	0.61	-0.14	-0.31	0.00	-0.09	0.86
	(-4.44)	(4.59)	(4.74)	(13.20)	(4.77)	(-1.34)	(-2.29)	(-0.01)	(-1.38)	

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1977:1 to t = 1989:1.

Table 7.b.
Regressions of Returns on Dividend Yields, Future Growth in Dividends, and Future Returns
Developed Markets
1970:1 to 1989:5

RET(t,t+12) = a + b DY(t)
+ d0 GD(t,t+12) + d1 GD(t+12,t+24) + d2 GD(t+24,t+36) + d3 GD(t+36,t+48)
+ r1 RET(t+12,t+24) + r2 RET(t+24,t+36) + r3 RET(t+36,t+48)

	a	b	d0	d1	d2	d3	r1	r2	r3	R-Sq.
Australia	-0.92	21.42	0.97	0.81	0.54	0.46	-0.66	-0.44	-0.21	0.86
	(-10.42)	(9.01)	(9.75)	(6.62)	(4.90)	(6.44)	(-8.29)	(-4.66)	(-3.11)	
Austria	-0.27	12.06	0.84	0.77	0.59	0.49	-0.45	-0.42	-0.24	0.70
	(-1.09)	(1.81)	(5.59)	(4.61)	(3.98)	(3.06)	(-2.83)	(-2.76)	(-2.15)	
Belgium	-0.06	1.28	0.82	0.48	0.30	-0.19	-0.06	-0.09	0.22	0.47
	(-0.29)	(0.64)	(2.95)	(2.30)	(1.21)	(-0.77)	(-0.40)	(-0.59)	(1.38)	
Canada	-0.52	16.11	0.64	0.85	0.50	0.25	-0.65	-0.43	-0.21	0.69
	(-3.75)	(4.89)	(3.69)	(3.72)	(3.15)	(1.05)	(-5.69)	(-2.98)	(-1.63)	
Denmark	0.07	4.12	0.47	-0.10	0.23	0.44	-0.44	-0.35	-0.11	0.29
	(0.32)	(1.07)	(1.45)	(-0.39)	(0.76)	(2.73)	(-2.91)	(-1.73)	(-0.44)	
France	-0.60	11.46	1.06	0.94	0.67	0.21	-0.46	-0.19	0.18	0.75
	(-5.53)	(6.58)	(7.80)	(4.70)	(4.86)	(1.61)	(-3.63)	(-1.46)	(1.47)	
Germany	-0.64	14.95	0.95	0.69	0.60	0.34	-0.44	-0.35	0.03	0.74
	(-4.10)	(4.65)	(4.42)	(3.65)	(5.09)	(3.10)	(-3.67)	(-4.03)	(0.28)	
Hong Kong	-1.06	24.15	1.09	1.00	1.15	0.41	-0.77	-0.59	-0.35	0.90
	(-7.22)	(7.39)	(9.64)	(9.63)	(8.65)	(4.56)	(-11.42)	(-6.06)	(-4.72)	
Italy	-1.20	45.06	1.19	0.88	0.63	0.40	-0.72	-0.53	-0.37	0.87
	(-13.46)	(13.95)	(15.28)	(7.85)	(6.08)	(2.84)	(-7.46)	(-6.64)	(-6.37)	
Japan	-0.07	6.99	1.46	0.69	0.45	-0.09	-0.18	-0.20	0.06	0.58
	(-0.71)	(1.58)	(9.12)	(1.84)	(1.94)	(-0.44)	(-1.29)	(-1.56)	(0.55)	
Netherlands	-0.51	8.95	0.88	0.75	0.58	0.38	-0.45	-0.29	0.06	0.66
	(-3.04)	(3.72)	(5.32)	(5.89)	(3.14)	(3.15)	(-4.24)	(-2.58)	(1.01)	
Norway	-0.36	12.94	0.63	0.67	0.28	-0.05	-0.34	-0.21	-0.16	0.40
	(-1.66)	(3.45)	(1.76)	(2.10)	(0.87)	(-0.21)	(-2.01)	(-1.07)	(-1.00)	
Singapore/Malaysia	-0.57	29.10	0.42	0.77	0.78	0.26	-0.69	-0.50	-0.22	0.70
	(-3.85)	(4.97)	(1.66)	(3.20)	(2.93)	(0.75)	(-5.53)	(-4.97)	(-2.71)	
Spain	-0.65	9.42	1.74	1.01	0.69	0.72	-0.14	-0.31	-0.14	0.64
	(-4.83)	(5.47)	(4.69)	(3.27)	(2.40)	(2.04)	(-0.98)	(-3.07)	(-0.99)	
Sweden	-0.33	9.34	0.97	0.39	0.26	0.52	-0.28	-0.27	0.08	0.38
	(-1.19)	(1.82)	(2.30)	(1.49)	(0.98)	(2.04)	(-1.97)	(-1.56)	(0.37)	
Switzerland	-0.71	26.09	1.06	0.85	0.55	0.28	-0.57	-0.38	-0.07	0.85
	(-5.90)	(6.75)	(9.39)	(6.63)	(3.97)	(3.51)	(-4.59)	(-3.28)	(-0.92)	
U.K.	-0.71	15.37	0.92	0.67	0.68	0.47	-0.60	-0.51	-0.36	0.81
	(-5.25)	(6.20)	(8.23)	(4.47)	(3.94)	(3.97)	(-6.18)	(-5.13)	(-4.93)	
U.S.	-0.26	10.49	-0.17	0.57	-0.15	-0.08	-0.41	-0.29	-0.23	0.40
	(-1.86)	(3.69)	(-0.49)	(1.53)	(-0.30)	(-0.16)	(-2.84)	(-2.21)	(-1.67)	

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1970:1 to t = 1989:5.

Table 8.a.
Regressions of Returns on Inflation, Growth in the Nominal Money Supply, and Growth in the Real Money Supply
Developed Markets
1970:1 to 1989:5

RET(t,t+12) = a + b X(t,t+12)

X	INF		GM		GRM	
RET	b	*R-sq.*	b	*R-sq.*	b	*R-sq.*
Australia	-2.34 (-1.38)	*0.06*	1.73 (2.52)	*0.20*	1.59 (2.77)	*0.23*
Austria	-4.04 (-1.48)	*0.10*	-0.21 (-0.25)	*0.00*	0.40 (0.60)	*0.00*
Belgium	-4.44 (-3.11)	*0.32*	1.06 (1.18)	*0.02*	3.05 (3.10)	*0.29*
Canada	-2.22 (-1.47)	*0.09*	0.51 (0.97)	*0.02*	0.60 (1.08)	*0.06*
Denmark	-3.19 (-2.94)	*0.16*	1.40 (2.40)	*0.12*	1.39 (3.41)	*0.19*
France	-3.88 (-1.98)	*0.20*	0.96 (1.39)	*0.03*	2.30 (4.49)	*0.20*
Germany	-4.07 (-1.39)	*0.13*	1.74 (3.14)	*0.10*	1.90 (2.79)	*0.17*
Hong Kong	-2.27 (-1.52)	*0.05*	na na	*na*	na na	*na*
Italy	-1.47 (-0.80)	*0.04*	-0.45 (-0.35)	*0.00*	0.52 (0.49)	*0.01*
Japan	-2.54 (-3.41)	*0.22*	0.87 (1.45)	*0.05*	2.05 (3.18)	*0.30*
Netherlands	-2.54 (-1.98)	*0.19*	0.84 (1.68)	*0.06*	1.66 (3.16)	*0.25*
Norway	-8.50 (-6.42)	*0.34*	0.46 (0.61)	*0.00*	1.36 (2.43)	*0.07*
Singapore/Malaysia	-0.26 (-0.21)	*0.00*	2.78 (4.23)	*0.33*	1.86 (4.29)	*0.24*
Spain	-4.26 (-4.56)	*0.41*	0.45 (0.42)	*0.00*	2.14 (3.27)	*0.23*
Sweden	-3.42 (-1.77)	*0.13*	-0.26 (-0.45)	*0.00*	1.14 (1.29)	*0.03*
Switzerland	-3.06 (-1.98)	*0.14*	0.32 (0.72)	*0.01*	0.53 (1.31)	*0.04*
U.K.	-0.64 (-0.63)	*0.01*	0.65 (2.38)	*0.12*	0.54 (2.23)	*0.11*
U.S.	-1.98 (-1.47)	*0.14*	1.90 (1.60)	*0.12*	1.51 (2.38)	*0.20*

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1970:1 to t = 1989:5. Note that Norway has missing observations for GM and GRM from t = 1987:1 to t = 1987:8. GM and GRM are unavailable for Hong Kong.

Table 8.b.
Regressions of Returns on Dividend Yields, Future Growth in Dividends, Future Returns, and Growth in the Real Money Supply
Developed Markets
1970:1 to 1989:5

RET(t,t+12) = a + b DY(t)
+ d0 GD(t,t+12) + d1 GD(t+12,t+24) + d2 GD(t+24,t+36) + d3 GD(t+36,t+48)
+ r1 RET(t+12,t+24) + r2 RET(t+24,t+36) + r3 RET(t+36,t+48) + m GRM(t,t+12)

	a	b	d0	d1	d2	d3	r1	r2	r3	m	R-Sq.
Australia	-0.91	21.26	0.95	0.79	0.52	0.47	-0.64	-0.44	-0.21	0.13	0.86
	(-11.03)	(9.10)	(8.82)	(6.33)	(6.47)	(5.28)	(-8.17)	(-4.75)	(-3.36)	(0.41)	
Austria	-0.25	11.74	0.78	0.81	0.55	0.57	-0.48	-0.46	-0.29	0.50	0.70
	(-1.03)	(1.80)	(3.90)	(4.55)	(3.51)	(2.77)	(-2.83)	(-2.71)	(-2.17)	(1.03)	
Belgium	-0.14	2.08	0.71	0.34	-0.01	-0.27	-0.07	0.05	0.38	3.26	0.68
	(-0.75)	(1.19)	(2.82)	(1.82)	(-0.07)	(-1.54)	(-0.73)	(0.52)	(3.28)	(4.78)	
Canada	-0.69	19.50	0.99	0.60	0.24	-0.17	-0.50	-0.23	-0.08	1.22	0.82
	(-7.62)	(9.00)	(8.81)	(3.62)	(2.15)	(-0.74)	(-6.13)	(-2.01)	(-0.73)	(6.00)	
Denmark	0.01	4.85	0.54	-0.12	-0.06	0.37	-0.37	-0.35	-0.22	1.50	0.46
	(0.03)	(1.33)	(2.38)	(-0.61)	(-0.18)	(2.19)	(-3.23)	(-1.84)	(-0.96)	(3.05)	
France	-0.53	9.75	0.99	0.89	0.57	0.12	-0.42	-0.14	0.27	0.69	0.76
	(-3.86)	(3.67)	(6.32)	(4.13)	(3.67)	(0.94)	(-3.50)	(-1.54)	(2.35)	(1.36)	
Germany	-0.64	15.01	0.94	0.69	0.59	0.34	-0.44	-0.35	0.03	0.07	0.74
	(-3.74)	(4.45)	(4.47)	(3.46)	(3.24)	(2.42)	(-2.90)	(-2.50)	(0.28)	(0.11)	
Italy	-1.17	43.29	1.16	0.90	0.70	0.49	-0.76	-0.57	-0.37	0.69	0.88
	(-13.49)	(11.85)	(19.34)	(10.28)	(7.92)	(3.29)	(-7.86)	(-7.92)	(-6.04)	(2.10)	
Japan	-0.02	1.86	1.22	0.62	0.20	-0.17	-0.17	-0.12	0.26	1.78	0.72
	(-0.32)	(0.69)	(9.46)	(2.83)	(1.23)	(-1.28)	(-2.32)	(-1.44)	(2.48)	(5.98)	
Netherlands	-0.52	8.61	0.84	0.68	0.32	0.21	-0.40	-0.10	0.12	1.13	0.73
	(-4.01)	(4.79)	(6.26)	(6.65)	(2.64)	(1.79)	(-4.41)	(-1.14)	(1.97)	(3.02)	
Norway	-0.64	17.10	0.92	0.64	0.37	0.02	-0.38	-0.31	-0.13	1.85	0.58
	(-3.24)	(4.44)	(4.59)	(3.10)	(1.46)	(0.13)	(-2.28)	(-1.71)	(-0.94)	(6.13)	
Singapore/Malaysia	-0.53	25.31	0.51	0.73	0.66	0.12	-0.63	-0.42	-0.18	0.71	0.73
	(-4.55)	(5.91)	(1.78)	(2.76)	(3.54)	(0.33)	(-4.89)	(-4.30)	(-1.98)	(1.62)	
Spain	-0.78	10.64	1.34	0.73	0.55	0.72	-0.16	-0.25	-0.22	2.40	0.77
	(-5.91)	(5.86)	(3.95)	(2.53)	(2.29)	(3.49)	(-1.13)	(-3.07)	(-1.75)	(4.13)	
Sweden	-0.50	12.33	1.09	0.49	0.36	0.74	-0.26	-0.28	0.03	0.24	0.42
	(-1.82)	(2.36)	(2.82)	(1.86)	(1.40)	(2.78)	(-1.58)	(-1.63)	(0.17)	(0.43)	
Switzerland	-0.71	25.91	1.05	0.85	0.52	0.25	-0.56	-0.36	-0.05	0.09	0.85
	(-6.19)	(7.07)	(9.10)	(6.95)	(4.57)	(3.55)	(-5.01)	(-3.44)	(-0.84)	(0.42)	
U.K.	-0.74	15.84	0.85	0.55	0.63	0.34	-0.53	-0.48	-0.35	0.31	0.83
	(-6.29)	(7.17)	(7.64)	(4.13)	(4.14)	(2.98)	(-6.22)	(-5.30)	(-4.90)	(2.82)	
U.S.	-0.26	10.42	0.15	0.55	-0.35	-0.21	-0.35	-0.29	-0.31	1.51	0.60
	(-1.87)	(4.30)	(0.44)	(1.79)	(-0.90)	(-0.55)	(-3.81)	(-3.36)	(-3.28)	(4.70)	

The cells report the estimated slope coefficient, t-statistic adjusted for heteroscedasticity and autocorrelation of a MA(11) form in parentheses, and R-squared adjusted for degrees of freedom. Regressions are based on monthly data from t = 1970:1 to t = 1989:5. Note that Norway has missing observations for GM and GRM from t = 1987:1 to t = 1987:8. GM and GRM are unavailable for Hong Kong.

Table 9.a.
Cross-Sectional Regressions of Annual Returns on Dividend Yields, Growth in Dividends, Future Growth in Dividends, and Future Returns
Developed Markets (18 countries)
1970:1 to 1989:5

const	DY	GD	FGD	FRET	R-Sq.
0.09 (1.64)	1.24 (1.91)				0.08 (4.24)
0.05 (1.45)		0.50 (4.84)	0.14 (4.37)		0.22 (4.94)
-0.03 (-0.64)	1.84 (3.47)	0.55 (5.25)	0.16 (4.72)		0.26 (5.75)
-0.03 (-0.53)	2.58 (4.06)	0.53 (5.43)	0.26 (6.13)	-0.17 (-3.51)	0.35 (8.57)

Table 9.b.
Cross-Sectional Regressions of Annual Returns on Dividend Yields, Growth in Dividends, Future Growth in Dividends, and Future Returns
Developed & Emerging Markets (26 countries)
1976:1 to 1989:1

const	DY	GD	FGD	FRET	R-Sq.
0.24 (3.05)	0.38 (0.39)				0.05 (3.71)
0.06 (1.44)		0.50 (5.16)	0.16 (3.78)		0.52 (6.95)
-0.05 (-1.10)	2.31 (3.25)	0.55 (5.65)	0.15 (3.72)		0.55 (7.53)
-0.05 (-1.18)	3.08 (3.37)	0.59 (6.38)	0.28 (7.31)	-0.15 (-4.96)	0.60 (8.77)

At the end of each month t, a cross-sectional regression is run of annual returns, RET(t,t+12) on the following variables,

DY: the dividend yield at time t,
GD: the growth in dividends from time t to t+12,
FGD: the growth in dividends from time t+12 to t+48
FRET: the return from time t+12 to t+48.

The cells present the time-series averages of these cross-sectional regression coefficients based on data from t = 1970:1 to t = 1989:5 (9.a.) and t = 1976:1 to t = 1989:1 (9.b.). T-statistics given in parentheses are based on the standard errors of the average coefficients adjusted for autocorrelation of up to 11 lags. R-squareds are adjusted for degrees of freedom.

Table 10
Cross-Sectional Regressions of Annual Returns on Macroeconomic and Financial Variables
Developed Markets (18 countries)
1970:1 to 1989:5

const	DY	GM	INF	GRM	GD	FGD	FRET	R-Sq.
0.09 (1.95)		0.41 (1.72)						0.09 (5.20)
0.17 (4.26)			-0.46 (-1.08)					0.11 (4.15)
0.12 (3.08)				0.74 (3.49)				0.12 (4.18)
0.07 (1.59)	1.20 (2.27)			0.78 (3.69)				0.15 (5.18)
-0.02 (-0.64)	1.58 (3.34)			0.76 (4.55)	0.51 (5.90)	0.15 (4.40)		0.31 (8.62)
-0.01 (-0.36)	1.93 (4.39)			0.67 (4.17)	0.50 (5.52)	0.21 (5.36)	-0.11 (-2.92)	0.39 (10.89)

At the end of each month t, a cross-sectional regression is run of annual returns, RET(t,t+12) on the following variables,

DY: the dividend yield at time t,
GM: the growth in the nominal money supply from t to t+12,
INF: inflation from t to t+12,
GRM: the growth in the real money supply from t to t+12,
GD: the growth in dividends from time t to t+12,
FGD: the growth in dividends from time t+12 to t+48
FRET: the return from time t+12 to t+48.

The cells present the time-series averages of these cross-sectional regression coefficients based on data from t = 1970:1 to t = 1989:5. T-statistics given in parentheses are based on the standard errors of the average coefficients adjusted for autocorrelation of up to 11 lags. R-squareds are adjusted for degrees of freedom. Note that Norway has missing observations for GM and GRM from t = 1987:1 to t = 1987:8. GM and GRM are unavailable for Hong Kong.