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Stock Market Predictability: Global Evidence and an Explanation

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Stock Market Predictability:

Global Evidence and an Explanation[1]

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Abstracts: Using a comprehensive dataset covering 34 countries from Datastream, we find that dividend-price ratio has a broad spectrum of forecasting abilities internationally. In some countries, such as the US, the dividend-price ratio is a powerful predictor of exclusively stock returns, whereas in others it is a powerful predictor of exclusively dividend growth rates. For many countries, however, the dividend-price ratio has some predictive power for both stock returns and dividend growth rates, although the relative degree of predictive power differs. We have provided an explanation for these differences in stock market predictabilities between countries. When a firm with a dominant shareholder is publicly traded, then the dominant shareholder determines cash-flow policy but the stochastic discount factor contained in the stock price may reflect the minority shareholders' stochastic discount factor. For this reason, the correlation between cash-flow and stochastic discount factor approaches zero as the disparity between voting rights and cash-flow rights increases. As a result, the stock price becomes more dependent on expected dividends than expected stock returns, and, therefore, the dividend-price ratio has a stronger predictive power for dividend growth. Consistent with our explanation, we find a strong positive relation between dividend growth predictability and disparity, but a significantly negative one between stock return predictability and disparity. These relations are found to be consistent across various robust tests.

Key Words: Dividend-price ratio, Stock returns, Dividend growth, Predictability, Disparity

JEL Classification: G12, G32, E44

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I. Introduction

The view that changes in expected dividends are the main source of fluctuations in stock prices had been questioned by Shiller (1981) who shows that the aggregate stock price is too volatile to be explained by changes in dividends. Subsequent studies such as Campbell and Shiller (1988) and Fama and French (1988) further report that the dividend-price ratio has strong predictive power for future stock returns. The findings of these studies have attracted enormous attention from economists because they imply that changes in expected stock returns (or changes in the discount rate) play a much more important role in the understanding of stock price movements than changes in expected dividend growth. However, evidence of stock return predictability became weak during the middle of the 1990s, and the debate over whether the ability of the dividend-price ratio to predict stock returns is merely a statistical illusion has continued since then.[2]

Meanwhile, other interesting and important findings have been reported. Lettau and Ludvigson (2005) and Binsbergen and Koijen (2010) demonstrate that dividend growth rates as well as stock returns have a predictable component. Chen (2009) shows that while the dividend-price ratio had strong predictive power for dividend growth rates but no predictive power for stock returns in the US before World War II, it gained predictive power for stock returns but lost it for dividend growth rates after World War II. Park (2010) argues that the ability of the dividend-price ratio to predict stock returns differs greatly over time and between countries, and depends on its persistence. Engsted and Pedersen (2010) report that the dividend-price ratio has predictive power for stock returns in countries like the UK and the US, and for dividend growth rates in others, such as Demark and Sweden.

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[2] For a survey of stock return predictability, see Chapter 20 in Cochrane (2005).

We attempt to address the inconsistent and controversial forecasting ability of the dividend-price ratio across time periods or countries by making two contributions to the literature. First, using a comprehensive dataset covering 34 countries from Datastream, we show that the dividend-price ratio has a broad spectrum of forecasting abilities across countries. While the dividend-price ratio has significant power to predict real stock returns exclusively in countries such as the UK and the US, it can predict only real dividend growth in countries such as Canada and Italy. In others, however, the dividend-price ratio has some predictive power for both stock returns and dividend growth rates, although the relative degree of that predictive power varies. For example, in Belgium and Hong Kong the dividend-price ratio can predict both stock returns and dividend growth rates. However, while in Belgium it has better predictive power for dividend growth rates than stock returns, in Hong Kong it has better predictive power for stock returns than dividend growth rates.[3] Furthermore, in almost all cases, the predictions of stock returns and of dividend growth are of the correct sign consistently with the Campbell-Shiller's log linearized present value relation.

Second, once observing the difference in the predictive power of the dividend-price ratio across countries, we provide an explanation about why the ability of the dividend-price ratio in predicting stock returns or dividend growth rates differs across countries. Menzly et al. (2004) relate time-varying risk preference and expected dividend growth to the cross-sectional differences in stock return predictability and dividend growth predictability between industries. We suggest an additional explanation for the cross-sectional differences in predictabilities between countries by noting the coexistence of a dominant shareholder and minority

[3] Hjalmarsson (2010) rejects the null of homogeneous coefficient of the dividend-price ratio in the predictive regression of stock returns in a country-level panel analysis.

shareholders for many of the stocks making up stock markets.[4] A dominant shareholder, defined as an individual or family holding a substantial portion of the voting rights of a firm, has the ability to extract corporate resources that would have been shared with numerous minority shareholders.[5] Hence, when a firm's cash-flow or dividend policy is determined in consideration of a dominant shareholder's interest, the firm's dividend process may have weak correlation with minority shareholders' (or a marginal investor's) consumption process or stochastic discount factor. As a result, the stock price of such a firm will have a small risk adjustment component, and its movement will depend more heavily on changes in expected dividends rather than on changes in expected discount rates. In contrast, for widely-held firms with no dominant shareholder, cash-flow is expected to have a greater correlation with the macroeconomic state or the marginal investor's stochastic discount factor than with an extremely wealthy owner's stochastic discount factor, and thus the stock prices of such firms tend to reflect changes in the risk adjustment component as well as in expected dividends.

Since, according to our explanation, the dominant shareholder must have substantial influence over the firm, but equity shares should be publicly traded so that the stock price must reflect the marginal investor's stochastic discount factor rather than dominant shareholder's one. Hence, in order to empirically investigate our hypothesis we consider a measure of disparity between voting rights and cash-flow rights rather than the concentration of ownership. As the

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[4] La Porta et al. (1999) report that publicly traded firms have a dominant shareholder possessing significant power over firms in most countries, and that these dominant shareholders are often wealthy individuals or families.

[5] There exist extensive studies reporting that a dominant shareholder diverts corporate resources for his/her interest and sacrifices minority shareholders' interests. For example, Tufano (1996) shows that managers having greater equity stakes in gold-mining firms more actively engage in costly gold price risk hedging. Also, Bae et al. (2002) and Bertrand et al. (2002) document that dominant shareholders seem to divert resources to themselves through related party transactions (RPTs).

disparity increases, the dominant shareholder's control will be enhanced or at least maintained, and the stocks will be held more widely.[6] As a result, the portion of the risk adjustment component in the stock price will approach zero because the cash-flow reflects the dominant shareholder's interest more than marginal investor's ones, and movements of the stock price become more dependent on expected dividends than on expected stock returns. This proposed relation is highly pronounced in our data. We show that the disparity measure has a negative relation with the ability of the dividend-price ratio to predict stock returns and a positive relation with the ability of the dividend-price ratio to predict dividend growth rates. Moreover, these relations survive even after varied rigorous checks controlling for macroeconomic variables or for variables related to other characteristics of firms with dominant shareholders across countries. The relation also holds robustly with alternative measures of the predictive power of the dividend-price ratio, the consideration of possible small-sample biases in predictive regressions, or alternative measures of the disparity.

The rest of this paper is organized as follows: Section II presents the wide spectrum of the ability of the dividend-price ratio to forecast stock returns or dividend growth rates across different countries. Section III contains our presentation of and explanation for the empirical relation between disparity and the ability of the dividend-price ratio to predict the stock market. Section IV checks the results for robustness. Section V offers concluding remarks.

II. Stock Market Predictability Across Different Countries

[6] Pyramids, cross-holdings and different classes of shares can cause discrepancies between voting rights and cash-flow rights. These practices help dominant shareholders with small cash-flow rights control firms and more equities be circulated in the market.

A. Data

Since we attempt to establish the general pattern of the predictive power of the dividend-price ratio across countries, we require the stock market data of a large number of national markets. Therefore, we use Datastream, which currently contains the stock market data of 40 countries, as the dataset for our empirical analysis. After calculating the dividend levels using the product of the dividend yield and the price index, next the annual dividend-price ratios, stock returns, and dividend growth rates are constructed, as in Campbell and Shiller (1988). To construct real variables for stock returns and dividend growth rates, these variables are deflated by the Consumer Price Index (CPI) for individual countries. CPI data are obtained from the International Financial Statistics (IFS) CD-ROM. An advantage of the use of Datastream is that since Datastream constructs dividends on the basis of their own methodology, differences in the behavior of the dividend-price ratio or dividends resulting from different legal systems across countries are expected to be mitigated. In order to obtain more accurate estimates for the predictive ability of the dividend-price ratio, we exclude countries with a Datastream sample period spanning less than 20 years, leaving 34 national markets in our data set.

Table 1 presents descriptive summary statistics for stock returns, dividend growth rates, and the dividend-price ratios of those 34 countries along with their sample periods. National stock markets differ greatly by country. Observing annual real stock returns first, we note that over the sample periods they range from 0.4% in the case of Greece to 13.6% in the case of Chile. The average annual real dividend growth rates vary more widely, from -4% in the case of Turkey to 10.1% in the case of Sri Lanka. Although the dividend-price ratio is known to be extremely persistent, we can also find large differences between countries. The most persistent dividend-price ratio can be found in the US where the estimated AR(1) coefficient of the dividend-price ratio is about 0.94. In contrast, the dividend-price ratio of Korea is not persistent at all. There, the estimated AR(1) coefficient of the dividend-price ratio is merely 0.02.

B. The Predictive Power of the Dividend-Price Ratio Across Different Countries

The Campbell and Shiller's log linearized present value relation can be expressed as follows:

$$d_t - p_t = -\frac{k}{1-\rho} + E_t\left[\sum_{i=0}^{\infty} \rho^i \left(r_{t+1+i} - \Delta d_{t+1+i}\right)\right] \tag{1}$$

where d_t, p_t, and r_t denote log dividends, log stock price, and log returns, respectively. k is a constant from log-linearization, and $\rho = \frac{1}{\log(1+\exp(\overline{d-p}))}$. Since Equation (1) is derived from the log stock return identity, $r_{t+1} \equiv log(P_{t+1} + D_{t+1}) - \log(P_t)$, it is often used as a rationale for the predictive ability of the dividend-price ratio. Equation (1) states that the dividend-price ratio contains information on future stock returns or dividend growth rates or both. According to Equation (1), a high dividend-price ratio predicts high future stock returns or low future dividend growth rates or both. Conversely a low dividend-price ratio predicts low future stock returns or high future dividend growth rates or both.

Based on Equation (1), there have been an enormous number of studies on what the dividend-price ratio can predict. Most of them concentrate on stock return predictability in the US, and Cochrane (2005) concludes that it is a stylized fact that the dividend-price ratio has significant predictive power for stock returns but not for dividend growth rates. However, some evidence indicates that Cochrane's conclusion might be correct only for the US after World War II, and not for other countries or periods. In his international study, Campbell (2003) finds some evidence that the dividend-price ratio can predict dividend-growth. Chen (2009) demonstrates that the dividend-price ratio in the US had strong predictive power for dividend growth only before World War II but that the predictability by the dividend-price ratio reversed after World War II. Park (2010) conducts an international study, and reports that the dividend-price ratio has no power to predict stock returns when it becomes I(1). Engsted and Pedersen (2010) find that the dividend-price ratio predicts stock return in the US and the UK, but dividend growth in Denmark and Sweden.

To address the inconsistent forecasting ability of the dividend-price ratio over time and between countries, we conduct a comprehensive international study with the use of data from Datastream to find the general patterns of its predictive power. Utilizing the stock market data of each individual country, the following predictive regression is run:

$$y_{t,t+k} = \alpha_k + \beta_k(d_t - p_t) + \varepsilon_{t,t+k} \qquad (2)$$

where $y_{t,t+k}$ is either the cumulated and annualized k-period returns, $\frac{1}{k}\sum_{i=1}^{k} r_{t+i}$, or the cumulated and annualized k-period dividend growth rates, $\frac{1}{k}\sum_{i=1}^{k} \Delta d_{t+i}$. Considering the fact that some countries in our dataset have a relatively short sample period, the forecast horizon k is set at one, two and three years.

Tables 2 and 3 present estimates of β_k, the Newey-West standard errors, and R^2 from the regression of Equation (2). The dividend-price ratio in the US has significant predictive power for stock returns but not dividend growth, and its predictive power for stock returns seems to improve as the forecast horizon increases, consistent with previous studies. This pattern of significant stock return predictability and no dividend growth predictability by the dividend-price ratio can be seen only in Indonesia, Mexico, Singapore, the UK and the US. However, the same result is not found for other countries. We can find the opposite case, predictive power for dividend growth and not stock return by the dividend-price ratio, in Canada, Finland, Germany, Italy, and Switzerland. However, for most countries, the dividend-price ratio can predict both stock returns and dividend growth rates, although the extent of this predictability differs greatly by country. For example, in Belgium and Hong Kong the dividend-price ratio can predict both stock returns and dividend growth rates. However, while in Belgium it has better predictive power for dividend growth rates than stock returns, in Hong Kong it has better predictive power for stock returns than dividend growth rates. In Denmark and Sweden, in which the dividend-price ratio is reported by Engsted and Pedersen (2010) to have significant predictive power for dividend growth only, the dividend-price ratio is found during our sample periods to have strong predictive power for dividend growth and some predictive power for stock return. In fact, Hjalmarsson (2010) rejects the null of the homogeneous slope coefficient of the dividend-price ratio in the predictive regression of stock returns through a country-level panel analysis. Furthermore, the signs of predictabilities for either stock returns or dividend growth are consistent with the direction implied by Equation (1). In almost all countries, the slope coefficient is positive with $y_{t,t+k} = \frac{1}{k}\sum_{i=1}^{k} r_{t+i}$, but becomes negative with $y_{t,t+k} = \frac{1}{k}\sum_{i=1}^{k} \Delta d_{t+i}$.

According to Equation (1), the variation of the dividend-price ratio must be related to changes in expected stock returns and/or changes in expected dividend growth. Therefore, Cochrane (2008) argues that the joint test, using both the stock return and dividend growth regression coefficients, is more powerful than the separate tests shown in Tables 2 and 3. Hence, we also conducted joint tests to ascertain the robustness of the results shown in Tables 2 and 3. From the 1-year horizon results in Tables 4 and 5, the null hypothesis of no dividend growth predictability can be rejected exclusively for Canada, Finland, Italy, Sri Lanka and Switzerland, whereas the null hypothesis of no stock return predictability can be rejected exclusively for India, Indonesia, Mexico, and Singapore.[7] The results with long-run coefficients state that the dividend-price ratio predicts either stock returns or dividend growth exclusively in more countries than stated in Tables 2 and 3, possibly due to the greater power of the test.

Nevertheless, the results presented in Tables 4 and 5 are qualitatively identical to those presented in Tables 2 and 3, regardless of forecast horizon. In other words, the results in Tables 4 and 5 confirm those in Tables 2 and 3 in that the dividend-price ratio can significantly predict stock returns in the US but not universally, and that the ability of the dividend-price ratio to predict stock returns or dividend growth differs greatly between countries.

III. Cross-sectional Stock Market Predictabilities and Disparity between Voting Rights and Cash-flow Rights

The results given in the previous section show that the ability to predict stock return and dividend growth from the dividend-price ratio differs greatly across countries. In this section, we provide an explanation for this finding theoretically and empirically in this section.

A. Discussion

Suppose that there are two types of stock market investors, a dominant shareholder and minority shareholders. Minority shareholders are assumed to behave as price-takers in the stock market,

[7] The result that both null hypotheses are rejected in the US with a 1-year horizon is consistent with the result for the US without dividend reinvestment, which is the result with the S&P data, in Engsted and Pedersen (2010) because dividends are not reinvested in our data.

whereas the dominant shareholder with substantial influence in a firm can choose a cash-flow stream for the firm which suits his/her interest. Since a dominant shareholder of a firm is often a wealthy family (see La Porta et al. (1999), Claessens et al. (2000), Faccio and Lang (2002), and Carney and Child (2013)), we assume that the dominant shareholder's stochastic discount factor is independent of that of minority shareholders.

When a minority shareholder maximizes his/her utility by adding a publicly traded equity share into the portfolio, the first-order condition can be written as follows:

$$p_t = E_t[m_{t,t+1}(d_{t+1} + p_{t+1})] \tag{3}$$

where $m_{t,t+1} \equiv \delta \frac{u'(c_{t+1})}{u'(c_t)}$, δ denotes the time discount rate, and c_t denotes consumption. If we solve Equation (3) forwardly under the no bubble condition, then we can obtain the following expression:

$$p_t = E_t[m_{t,t+1} \cdot d_{t+1} + m_{t,t+2} \cdot d_{t+2} + m_{t,t+3} \cdot d_{t+3} + \cdots]$$

$$= \{E_t[m_{t,t+1}] \cdot E_t[d_{t+1}] + E_t[m_{t,t+2}] \cdot E_t[d_{t+2}] + \cdots\}$$

$$+\{cov_t(m_{t,t+1}, d_{t+1}) + cov_t(m_{t,t+2}, d_{t+2}) + \cdots\}$$

$$= \left\{\frac{E_t[d_{t+1}]}{R_{f1}} + \frac{E_t[d_{t+2}]}{R_{f2}} + \cdots\right\} + \{cov_t(m_{t,t+1}, d_{t+1}) + cov_t(m_{t,t+2}, d_{t+2}) + \cdots\} \tag{4}$$

where R_{fi} is the product of risk-free rate or the risk-free rate with the maturity of i periods. If a minority shareholder holds an equity share of a firm in which the dominant shareholder perfectly hedges the risk of his/her consumption by choosing the stream of dividends, then the covariance terms (risk adjustment terms) in Equation (4) will be zero. This is because dividends are perfectly correlated with the dominant shareholder's stochastic discount factor but independent of minority shareholders'. As a result, the stock price is the present value of future dividends discounted by the risk-free rate, and fluctuations of the stock price are tightly related to changes in expected dividends instead of changes in expected stock returns (or the discount rate).

However, if a minority shareholder holds an equity share of a firm which is widely-held and does not have a dominant shareholder, then the covariance terms (risk adjustment terms) survive, and the stock price responds to expected stock returns as well as expected dividends. Depending on risk preferences and the firm's payout policy, the covariance terms (risk adjustment terms) could be more influential in understanding movements of the stock price as in Campbell and Cochrane (1999).

Dominant shareholders' decisions which sacrifice minority shareholders' interests are well documented. The diversion of a firm's resources through RPTs, which is often called 'tunneling' behavior, is reported in Bae et al. (2002), Bertrand et al. (2002), and Dahya et al. (2008), and costly hedging activity for dominant shareholders is shown in Tufano (1996). Possibly for this reason, in countries with weak legal protection for minority shareholders, the values of firms are discounted compared to those in otherwise comparable countries (see La Porta et al. (2002), Claessens et al. (2002), and Durnev and Kim (2005)).

Since the gap between a dominant shareholder's stochastic discount factor and minority shareholders' stochastic discount factor is more pronounced for a firm which is widely-held but has a dominant shareholder, we relate stock market predictability to the disparity between voting rights and cash-flow rights. If a firm adopts the one-share-one-vote rule and a dominant shareholder only holds direct ownership, then both rights are equal and the disparity becomes zero. In this case, the dominant shareholder could be reluctant to trade equity shares to maintain his/her influence over the firm, and the firm may not be publicly traded. However, discrepancy between voting rights and cash-flow rights arises when a dominant shareholder reinforces voting rights over cash-flow rights through various means, such as multiple classes of shares, a pyramid structure, multiple control chains, and cross–holdings. In this latter case, in spite of the firm being widely-held, the dominant shareholder may possess power over the firm. Thus, a testable hypothesis relating stock market predictability and disparity based on our explanation could be stated as follows:

Hypothesis: *The disparity between voting rights and cash-flow rights has a positive relation with dividend growth predictability by the dividend-price ratio, whereas it has a negative relation with stock return predictability by the dividend-price ratio.*

B. Empirical Analysis

This sub-section examines whether the above hypothesis is supported empirically. We utilize Newey-West t-statistics for the slope coefficient in regression Equation (2) to measure the degree of the dividend-price ratio's predictive power. For the measure of stock return predictability by the dividend-price ratio, we use the constructed t-statistics since a positive slope coefficient is implied by Equation (1). For the measure of dividend growth predictability, however, we multiply the constructed t-statistics by -1 so that a higher value reflects higher dividend growth predictability.

Disparity in this study is defined as the difference between voting rights and cash-flow rights as in other studies, such as La Porta et al. (2002)[8] and Kim et al. (2011). We obtain data for disparity from Dahya et al. (2008) which constructed the disparity measure for 22 countries mainly using data from the Worldscope database.[9] Since all countries except Australia and Brazil in Dahya et al. (2008) are covered by this study, using their disparity measure for 20 countries[10], we can conduct an empirical analysis of the relationship between disparity and stock market predictability by the dividend-price ratio.

Table 6 presents the results from the following regressions of stock market predictability on disparity:

$$\text{Stock return predictability: } T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i \qquad (5)$$

$$\text{Dividend growth predictability: } (-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i \qquad (6)$$

where $T_{i,k}$ denotes T-statistics for the slope coefficient in the *k*-horizon predictive regression for country i, and $Disparity_i$ denotes the disparity score for country i. Consistent with the testable hypothesis, there is a significantly negative relation between the stock return predictability measure and the disparity measure, but a significantly positive one between the dividend growth predictability measure and the disparity measure. The coefficient of $Disparity_i$ is always significant at the 5% level or above, regardless of whether the dependent variable is the predictive power of the dividend-price ratio for stock returns or for dividend growth rates. The

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8 La Porta et al. (2002) call the difference between voting rights and cash-flow rights a wedge.

9 For a detailed description of the data's construction, see Table A 1 in Dahya et al. (2008).

10 These 20 countries are Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, India, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, South Africa, Spain, Sweden, the UK and the US.

results are also robust regardless of forecast horizon. $\bar{R}^2$ for the regression of dividend growth predictability is about 30%. $\bar{R}^2$ for the regression of stock return predictability lies between 12% and 35%, with $\bar{R}^2$ decreasing as the forecast horizon increases. Figures 1 and 2 show plots of the regression results for stock return predictability and dividend growth predictability, respectively, implying that the results are not dominated by a few outliers.

IV. Robust Checks

We have shown significant relations between stock market predictabilities and disparity in the previous section. In this section, we investigate whether those results are robust and not sensitively dependent on the assumptions or choices made in the previous section.

A. Other Measures of Stock Market Predictabilities

We use T-statistics of the slope coefficient in the predictive regression as the measure for stock return predictability by the dividend-price ratio, and negative T-statistics as the measure for dividend growth predictability by the dividend-price ratio. However, the T-statistics could be large when standard errors are extremely small even though the predictive power of the dividend-price ratio is negligible. Hence, we employ two alternative measures of the predictive power of the dividend-price ratio to check whether extremely small standard errors have driven the results of the previous section.

First, we employ R^2 of the predictive regression of stock returns (or dividend growth rates) on the dividend-price ratio as an alternative measure of the predictive ability of the dividend-price ratio. Table 7 shows the regression results when $R_{i,k}^2$ (the R^2 from the k-horizon predictive regression for country i) is regressed on $Disparity_i$. Qualitatively identical to the results in Table 6, $Disparity_i$ has a significantly negative coefficient when $R_{i,k}^2$ from the predictive regression of stock returns is used as the regressand. Also, $Disparity_i$ has a significantly positive coefficient when $R_{i,k}^2$ from the predictive regression of dividend growth is used as the regressand.

We also consider $\beta_{i,k}$, which is the slope coefficient from the k-horizon predictive regression for country i, as another measure of stock return predictability, as shown in Table 8, and find that it is strongly negatively related with $Disparity_i$. As for the T-statistics in Table 6, we multiply $\beta_{i,k}$ by -1 for the measure of the dividend growth predictability by the dividend-price ratio, and find that this measure is also greatly positively related with $Disparity_i$.

Finally, we also consider the p-values of the joint tests for the 1-year horizon and long-run coefficients as alternative measures of the predictive power of the dividend-price ratio. More specifically, we use $(100 - p_{i,k})$, where $p_{i,k}$ is the percentage p-value from the k-horizon test for country i, as the measure of the forecasting ability of the dividend-price ratio so that the predictive power and the measure are in tandem. Similar to previous results, in Table 9, $Disparity_i$ continues to be negatively correlated with stock return predictability by the dividend-price ratio and positively correlated with dividend growth predictability by the dividend-price ratio.

Therefore, results in Tables 7, 8 and 9 suggest that our main results are robust in terms of the choice of stock market predictability measure.

B. Correction for Small-sample Bias

It is well known that the estimate for the slope coefficient of the predictive regression (2) is subject to a small-sample bias problem. According to Stambaugh (1999), the bias arises from the extreme persistence of the dividend-price ratio and the correlation between innovations for the dividend-price ratio and for the dependent variable of the predictive regression, which is either stock returns or dividend growth rates. Hence, we employ the Amihud and Hurvich (2004) method to correct for any possible small-sample bias, and check whether the significant relations between stock market predictabilities and disparity are unchanged even after the bias has been corrected for.

When the Amihud and Hurvich (2004) method is applied, the bias-corrected AR(1) coefficient for the dividend-price ratio is greater than unity in the US for all forecast horizons. It is also greater than unity in Canada, Italy, and Japan for the three-year horizon. Hence, we exclude the US from all analyses and Canada, Italy and Japan from the three-year analysis. After correcting the small-sample bias for other countries, T-statistics are constructed. We use the bias-corrected T-statistics obtained from the predictive regression of stock returns as the measure of stock return predictability by the dividend-price ratio, and the bias-corrected T-statistics from the predictive regression of dividend growth multiplied by -1 as the measure of dividend growth predictability by the dividend-price ratio.

The results are shown in Table 10. Qualitatively identical to the previous results, we can find a significantly negative relation between stock return predictability and disparity and a significantly positive relation between dividend growth predictability and disparity. Although the loss of observations from four countries (Canada, Italy, Japan, and the US) deteriorates the significance of the t-statistics for $Disparity_i$ slightly for the three-year horizon cases,[11] the correction of small-sample bias does not bring into question the validity of our main conclusions at all.

C. Robust Checks with Macroeconomic Variables

Our explanation for the significant relations between stock market predictabilities and disparity is that the disparity measure shows the problem arising from the stock price containing the stochastic discount factor from the minority shareholders and the cash-flow stream determined by the dominant shareholder. As the discrepancy increases, the correlation between the cash-flow stream and the stochastic discount factor approaches zero, and the stock price becomes more dependent on the expected dividends than on the expected discount rate. In this sub-section, we check whether the cross-sectional differences in stock market predictabilities are indeed due to disparity or in fact due to other macroeconomic factors that could affect stock market predictability and disparity simultaneously. For example, the disparity measure might be related to economic growth or living standards. Also, Engsted and Pedersen (2010) show that inflation plays an important role in revealing stock market predictabilities. Hence, we regress stock market predictability measures (T-statistics or negative T-statistics) on the disparity and another macroeconomic variable as follows:

Stock return predictability: $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$

[11] When we correct the small-sample biases and conduct the same analysis after assigning arbitrarily 0.999 as the AR(1) coefficient for Canada, Italy, Japan, and the US, the three-year relations are still significant at the 1% level for both stock returns and dividend growth rates.

Dividend growth predictability: $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$

where X_i denotes a macroeconomic variable for country i. Considering the limited number of observations in the cross-sectional regression, we have added only one macroeconomic variable along with the disparity measure in each regression. The average growth of per capita GDP or the average growth of GDP is used as a proxy for economic growth, and average per capita GDP is used as a proxy for living standards.[12]

The results with one-year-horizon predictabilities are shown in Table 11.[13] The results are unchanged even after the addition of macroeconomic variables. $Disparity_i$ continues to have a significantly negative coefficient in the regression of stock return predictability, and a significantly positive one in the regression of dividend growth predictability. These results imply that our main finding is not related to the macroeconomic environment.

D. Robust Checks with Other Variables for Firms with a Dominant Shareholder

We also examine whether other variables reflecting other characteristics of firms with a dominant shareholder can affect the relation between stock return predictabilities and disparity. The variables considered are the quality of legal protection for minority shareholders (LEGAL), the percentage of independent directors on multiple boards (INDEPENDENT), board size (BS), and Tobin's Q (Q). Data for all these variables are also obtained from Dahya et al. (2008).

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[12] Macroeconomic variables except the inflation rate are taken from the World Bank database. The inflation rate is calculated as the log difference of the CPI from the IFS CD-ROM. The average is taken over the same sample period as the stock market data of each country.

[13] We find qualitatively identical patterns with two or three-year-horizon predictabilities, but do not report them to conserve space. Those results are available upon request.

According to our explanation, LEGAL and INDEPENDENT could be related with stock return predictability because these variables might indicate restrictions on the power of dominant shareholders. At the same time, however, these variables could be quite noisy and complicating. For example, LEGAL may not reflect the quality of legal protection for minority shareholders correctly because the enforcement of laws differs greatly between countries. For example, in Japan despite cross-shareholdings by subsidiaries in their parents being prohibited by the Japanese Commercial Code (Kita (1996)), modest cross-holdings are still widely used (see La Porta (1999)). Also, Dahya et al. (2008) show that the effect of independent directors is strong in countries with weak legal protection for shareholders, which implies a complex connection between LEGAL and INDEPENDENT. The regression results when we replace a macroeconomic variable with either LEGAL or INDEPENDENT are shown in Table 12. The ability of $Disparity_i$ to explain differences in stock market predictabilities between counties is hardly affected by the addition of these variables in terms of significance level or adjusted R^2. At the same time, neither LEGAL nor INDEPENDENT has significant explanatory power for differences in stock market predictabilities between countries. We also test BS but find that the coefficient of $Disparity_i$ continues to be significant, whereas the coefficient of BS is insignificant, regardless of whether the dependent variable is the measure of stock return predictability or dividend growth predictability.

Finally, we also add Tobin's Q to the regression of stock market predictabilities on $Disparity_i$ to see whether the relation between stock market predictabilities and $Disparity_i$ is related with mispricing. However, the inclusion of Q hardly impacts the power of $Disparity_i$ to explain the cross-country differences in stock market predictabilities, as shown in the last column of Table 12.

E. Robust Checks with Other Measures of Disparity

The disparity data used in this study is obtained from Dahya et al. (2008) that assemble the ownership information of the 70 largest listed industrial companies of each country in terms of market capitalization at the end of 2002.[14] Dominant shareholders in Dahya et al. (2008) are defined as shareholders who control at least 10% of voting rights. Although the disparity in Dahya et al. (2008) covers 22 countries globally in a consistent manner and the ownership structure changes extremely slowly (see La Porta (1999)), some arbitrary choices are unavoidable in the construction of disparity measure even in Dahya et al. (2008). Hence, we also try another measure of disparity constructed in other studies.

Claessens et al. (2000) and Faccio and Lang (2002) examine ownership structure to identify the ultimate shareholders of publicly traded firms in East Asia and Western Europe, respectively. While doing so, both studies also construct disparity measures for countries they study. Even though three studies (Dahya et al. (2008), Claessens et al. (2000) and Faccio and Lang (2002)) share the same concept of disparity, the difference between controlling rights and cash-flow rights, there are differences in their construction of disparity data. Those differences stem from (i) different data sources, (ii) different sample firms and sample periods, (iii) differences in the rules used to exclude firms from the analysis, (iv) differences in the definition of ultimate shareholder types, (v) differences in the rules used to calculate voting rights, and (vi) differences in the voting right thresholds used to define a dominant shareholder. Nevertheless,

[14] For Korea, Mexico, and South Africa, Dahya et al. (2008) collect 29, 40, and 56 firms' data, respectively due to a lack of data availability. For some countries, they also move to the data at the end of 2001, if data at the end of 2002 is unavailable.

we merge the disparity measures from Claessens et al. (2000) and Faccio and Lang (2002), and investigate whether the strong relation between stock market predictabilities and disparity is still evident.[15]

After replacing the disparity data from Dahya et al. (2008) with the merged set from Claessens et al. (2000) and Faccio and Lang (2002), regressions (5) and (6) are run again. Consistent with the results presented in previous sections, the upper panel of Table 13 shows that the coefficient of $Disparity_i$ is negative when the stock predictability measure is the regressand, and positive when dividend growth predictability is the regressand. However, the significance level becomes weakened. The coefficient of $Disparity_i$ is significant at the 10% level when the three-year stock return predictability measure is regressed on $Disparity_i$. The coefficient of $Disparity_i$ is also significant at the 10% level when one-year and two-year dividend growth predictability measures are regressed on $Disparity_i$.

Since many studies like Mitton (2002), Rahman (1998) and Morris et al. (2004) argue that Asian countries had undergone improvements in accounting transparency and changes in ownership structure (possibly due to political reasons) after the Asian crisis, we conjecture that data for Asian countries before the Asian crisis might be contaminated by bad disclosure quality. In fact, the disparity in Claessens et al. (2000) is constructed based on data for Asian countries as close to 1996 as possible, which is before the Asian crisis. Moreover, Carney and Child (2013) show that due to the crisis, ownership and disparity in Asia have changed greatly.[16] Hence, we

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[15] The countries included in the regression using data from Claessens et al. (2000) are Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, and, Thailand, and those using data from Faccio and Lang (2002) are Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, and the UK.

[16] Dahya et al. (2008) use data centered on 2002, which is after the crisis.

exclude Asian countries from the analysis to ascertain whether the mitigated relation between stock market predictabilities and disparity is due to possible noise in the data for Asian countries. The lower panel of Table 13 presents the results when only 13 European countries from Faccio and Lang (2002) are analyzed. Qualitatively identical to previous results, $Disparity_i$ has a strong negative relation with the measure of stock return predictability and a significant positive one with the measure of dividend growth predictability. R^2s from all regressions lie in the range of 0.22 to 0.50, which implies that, at least for European countries, even with this alternative disparity measure, the relation between stock market predictabilities and disparity robustly holds.

V. Conclusion

The debatable stylized fact that stock returns can be predicted by the dividend-price ratio may be true in the US but is not so globally. We find that the dividend-price ratio has some predictive power for both stock returns and dividend growth in the majority of countries analyzed in this study. We also show that internationally there are great variations in the dividend-price ratio's ability to predict both stock returns and dividend growth. Our proposed explanation for those international differences is as follows: if a firm has a dominant shareholder and is publicly traded, important policies of the corporation, such as that of cash-flow, are determined by the dominant shareholder, but the stochastic discount factor contained in the stock price is likely to reflect that of minority shareholders. Since a dominant shareholder maximizes his or her interests, the correlation between cash-flow and the stochastic discount rate approaches zero as the firm with the dominant shareholder becomes more widely-held through pyramids, cross-holdings, and multiple classes of shares. As a result, the stock price becomes more dependent on expected dividends than expected stock returns or the corresponding risk-adjusted terms.

We provide empirical evidence for the proposed explanation. We have found a strong positive relation between dividend growth predictability and disparity and a significantly negative relation between stock return predictability and disparity. We show that these relations remain robust through various checks.

Our findings in this study warrant a reconsideration of the stock market predictability issue. The phenomena observed in the US stock market may not be universal, and an effort should be made to establish and explain a general global empirical pattern. Further studies in this direction are expected.

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Table 1. Summary Statistics

Country	Sample period	Average annual r_t	Standard Deviation of r_t	Average annual Δd_t	Standard Deviation of Δd_t	AR(1) coefficient of $d_t - p_t$
Austria	1973-2010	0.0528	0.3037	0.0319	0.2032	0.4419
Belgium	1973-2010	0.0571	0.2466	0.0021	0.2325	0.6216
Canada	1973-2010	0.0619	0.1618	0.0210	0.1038	0.8815
Chile	1989-2010	0.1356	0.2538	0.0394	0.2601	0.4033
Denmark	1973-2010	0.0705	0.2778	0.0346	0.1840	0.6368
Finland	1988-2010	0.0816	0.3957	0.0701	0.4064	0.5379
France	1973-2010	0.0723	0.2602	0.0337	0.1229	0.7458
Germany	1973-2010	0.0593	0.2236	0.0198	0.1168	0.7503
Greece	1990-2010	0.0040	0.3804	0.0298	0.2647	0.3894
Hong Kong	1981-2010	0.0906	0.3187	0.0409	0.1224	0.4802
Hungary	1991-2010	0.0600	0.3308	-0.0113	0.3463	0.4253
India	1990-2010	0.0937	0.3784	0.0484	0.1990	0.4607
Indonesia	1991-2010	0.0443	0.4182	0.0301	0.2908	0.4190
Ireland	1973-2010	0.0597	0.3572	-0.0112	0.2207	0.7375
Italy	1986-2010	0.0095	0.2464	0.0152	0.1793	0.7176
Japan	1973-2010	0.0259	0.2258	0.0030	0.1037	0.8683
Korea	1987-2010	0.0465	0.3544	0.0020	0.2909	0.0183
Malaysia	1986-2010	0.0881	0.2934	0.0390	0.1645	0.5158
Mexico	1990-2010	0.1156	0.2852	0.0604	0.2681	0.5328
Netherlands	1973-2010	0.0781	0.2322	0.0127	0.1354	0.7748
Norway	1980-2010	0.0896	0.3009	0.0609	0.2653	0.3441
Philippines	1988-2010	0.0670	0.3868	0.0657	0.2569	0.6178
Portugal	1990-2010	0.0446	0.2550	0.0629	0.2024	0.3893
Singapore	1973-2010	0.0664	0.3209	0.0341	0.1533	0.5677
S. Africa	1973-2010	0.0890	0.1967	0.0419	0.1533	0.7768
Spain	1987-2010	0.0611	0.2262	0.0502	0.1217	0.7937
Sri Lanka	1987-2010	0.0664	0.3970	0.1080	0.6058	0.4619
Sweden	1982-2010	0.1044	0.2858	0.0672	0.2005	0.4266
Switzerland	1973-2010	0.0648	0.2091	0.0435	0.1332	0.7978
Taiwan	1988-2010	0.0315	0.3693	0.0887	0.2972	0.6241
Thailand	1987-2010	0.0780	0.3999	0.0190	0.3934	0.4453
Turkey	1990-2010	0.0629	0.5930	-0.0401	0.3554	0.6348
U.K.	1965-2010	0.0655	0.2344	0.0064	0.0684	0.6690
U.S.	1973-2010	0.0612	0.1826	0.0139	0.0633	0.9393

Notes: This table shows sample periods, the average of annual real stock returns, the standard deviation of annual real stock returns, the average of annual dividend growth rates, and the standard deviation of annual real dividend growth rates for individual national markets. The AR(1) coefficient for $d_t - p_t$ shows estimates of ϕ in $d_t - p_t = \phi_0 + \phi(d_{t-1} - p_{t-1}) + u_t$.

Table 2. Stock Return Predictability

Country	1 Year			2 Year			3 Year		
	β	s.e.	R^2	β	s.e.	R^2	β	s.e.	R^2
Austria	0.233[b]	0.116	0.068	0.200[b]	0.103	0.093	0.170[c]	0.116	0.083
Belgium	0.111[c]	0.067	0.037	0.110[b]	0.058	0.080	0.109[b]	0.060	0.103
Canada	-0.004	0.063	0.000	-0.004	0.056	0.000	-0.009	0.042	0.002
Chile	0.402[a]	0.112	0.405	0.328[a]	0.036	0.595	0.235[a]	0.030	0.551
Denmark	0.167[b]	0.093	0.056	0.120[c]	0.072	0.079	0.081	0.063	0.063
Finland	0.023	0.098	0.001	0.094	0.090	0.029	0.121	0.104	0.060
France	0.146	0.112	0.041	0.141[c]	0.087	0.093	0.141[b]	0.067	0.153
Germany	0.076	0.079	0.016	0.083	0.079	0.039	0.071	0.075	0.047
Greece	0.245[c]	0.161	0.084	0.268[b]	0.104	0.187	0.370[a]	0.101	0.413
Hong Kong	0.383[a]	0.134	0.186	0.321[a]	0.058	0.370	0.233[a]	0.037	0.465
Hungary	0.270[b]	0.138	0.132	0.214[c]	0.148	0.166	0.141	0.119	0.105
India	0.463[b]	0.231	0.236	0.341[a]	0.106	0.373	0.252[a]	0.063	0.370
Indonesia	0.514[a]	0.142	0.323	0.390[a]	0.087	0.462	0.238[a]	0.072	0.272
Ireland	0.172[b]	0.087	0.073	0.142[b]	0.074	0.131	0.143[b]	0.062	0.190
Italy	0.014	0.118	0.001	-0.004	0.094	0.000	-0.033	0.135	0.005
Japan	0.067	0.073	0.023	0.093[b]	0.052	0.086	0.112[b]	0.047	0.164
Korea	0.377[b]	0.214	0.168	0.365[a]	0.102	0.397	0.226[a]	0.065	0.300
Malaysia	0.383[a]	0.114	0.263	0.302[a]	0.070	0.420	0.239[a]	0.052	0.467
Mexico	0.478[b]	0.187	0.287	0.286[a]	0.067	0.294	0.211[b]	0.091	0.213
Netherlands	0.114[c]	0.081	0.039	0.134[b]	0.078	0.123	0.137[b]	0.073	0.184
Norway	0.240[b]	0.121	0.079	0.226[a]	0.082	0.158	0.221[a]	0.081	0.262
Philippines	0.252[b]	0.115	0.134	0.157[b]	0.080	0.127	0.157[a]	0.059	0.171
Portugal	0.204[c]	0.138	0.060	0.201[b]	0.107	0.122	0.219[b]	0.093	0.170
Singapore	0.385[a]	0.099	0.178	0.270[a]	0.047	0.321	0.183[a]	0.039	0.293
S. Africa	0.113[b]	0.061	0.050	0.105[b]	0.049	0.106	0.102[a]	0.036	0.181
Spain	0.135	0.115	0.045	0.125[c]	0.083	0.075	0.187[b]	0.084	0.201
Sri Lanka	0.129[c]	0.089	0.074	0.105[b]	0.057	0.115	0.017	0.062	0.009
Sweden	0.241[b]	0.113	0.081	0.188[b]	0.102	0.108	0.148	0.126	0.090
Switzerland	0.007	0.085	0.000	0.031	0.072	0.006	0.019	0.069	0.004
Taiwan	0.147	0.138	0.061	0.138[a]	0.053	0.194	0.098[c]	0.067	0.141
Thailand	0.326[a]	0.075	0.217	0.244[a]	0.074	0.253	0.135[c]	0.093	0.117
Turkey	0.259	0.200	0.105	0.153[c]	0.102	0.141	0.122[b]	0.063	0.214
U.K.	0.324[a]	0.102	0.175	0.285[a]	0.063	0.304	0.230[a]	0.039	0.349
U.S.	0.069[c]	0.053	0.037	0.074[c]	0.047	0.099	0.069[b]	0.037	0.140

Notes: This table shows the results of the predictive regression of the cumulated and annualized k-period returns on the dividend-price ratio (i.e. $\frac{1}{k}\sum_{i=1}^{k} r_{t+i} = \alpha_k + \beta_k(d_t - p_t) + \varepsilon_{t,t+k}$). Superscripts ‘a’, ‘b’, and ‘c’ denote the significance level at the 1%, 5%, and 10% level, respectively.

Table 3. Dividend Growth Predictability

Country	1 Year			2 Year			3 Year		
	β	s.e.	R^2	B	s.e.	R^2	β	s.e.	R^2
Austria	-0.333[a]	0.061	0.309	-0.240[a]	0.071	0.291	-0.259[a]	0.087	0.324
Belgium	-0.290[b]	0.161	0.284	-0.229[a]	0.087	0.334	-0.073[a]	0.029	0.075
Canada	-0.147[a]	0.048	0.278	-0.132[a]	0.042	0.328	-0.122[a]	0.036	0.365
Chile	-0.216	0.181	0.111	-0.184[a]	0.049	0.246	-0.129[a]	0.041	0.240
Denmark	-0.211[a]	0.072	0.203	-0.131[a]	0.043	0.154	-0.098[a]	0.040	0.131
Finland	-0.450[a]	0.165	0.422	-0.383[a]	0.094	0.562	-0.311[a]	0.100	0.420
France	-0.137[a]	0.044	0.163	-0.099[b]	0.043	0.160	-0.068[b]	0.039	0.134
Germany	-0.192[a]	0.040	0.368	-0.155[a]	0.037	0.345	-0.103[a]	0.042	0.210
Greece	-0.376[a]	0.117	0.408	-0.248[a]	0.094	0.309	-0.084	0.078	0.062
Hong Kong	-0.155[a]	0.045	0.206	-0.068[b]	0.029	0.091	-0.038	0.033	0.041
Hungary	-0.318[b]	0.124	0.167	-0.143	0.127	0.085	-0.108	0.098	0.065
India	-0.082	0.122	0.027	-0.157[c]	0.107	0.159	-0.103	0.099	0.118
Indonesia	-0.076	0.119	0.015	-0.012	0.080	0.001	0.006	0.093	0.000
Ireland	-0.120[b]	0.068	0.094	-0.065[c]	0.041	0.044	0.006	0.052	0.001
Italy	-0.289[a]	0.061	0.404	-0.272[a]	0.053	0.470	-0.262[a]	0.093	0.379
Japan	-0.076[a]	0.031	0.143	-0.058[a]	0.022	0.121	-0.037[c]	0.022	0.065
Korea	-0.604[a]	0.088	0.641	-0.350[a]	0.065	0.466	-0.143[a]	0.031	0.153
Malaysia	-0.113[c]	0.079	0.073	-0.025	0.039	0.010	0.029	0.044	0.019
Mexico	0.000	0.265	0.000	-0.114	0.130	0.043	-0.126	0.101	0.067
Netherlands	-0.141[a]	0.056	0.177	-0.110[a]	0.041	0.177	-0.026	0.028	0.022
Norway	-0.424[a]	0.142	0.317	-0.161[a]	0.063	0.152	-0.034	0.092	0.010
Philippines	-0.138[c]	0.081	0.091	-0.050	0.043	0.039	-0.025	0.047	0.012
Portugal	-0.417[a]	0.098	0.398	-0.218[b]	0.095	0.241	-0.121[b]	0.053	0.109
Singapore	-0.062	0.053	0.020	-0.036	0.033	0.017	-0.020	0.029	0.007
S. Africa	-0.141[a]	0.052	0.128	-0.116[a]	0.046	0.138	-0.070[c]	0.045	0.086
Spain	-0.096[c]	0.067	0.078	-0.068	0.076	0.069	-0.051	0.078	0.043
Sri Lanka	-0.419[b]	0.214	0.334	-0.420[a]	0.057	0.693	-0.296[a]	0.055	0.697
Sweden	-0.344[a]	0.114	0.337	-0.298[a]	0.104	0.399	-0.218[b]	0.122	0.257
Switzerland	-0.211[a]	0.046	0.284	-0.146[a]	0.043	0.258	-0.116[b]	0.047	0.235
Taiwan	-0.244[b]	0.113	0.259	-0.109[b]	0.049	0.150	-0.034	0.047	0.024
Thailand	-0.239[b]	0.126	0.120	-0.283[b]	0.114	0.228	-0.244[b]	0.096	0.213
Turkey	-0.133	0.116	0.077	-0.073	0.111	0.038	-0.092	0.083	0.087
U.K.	-0.035	0.045	0.024	-0.016	0.034	0.007	0.017	0.031	0.011
U.S.	-0.017	0.022	0.019	-0.006	0.021	0.004	-0.006	0.019	0.007

Notes: This table shows the results of the predictive regression of the cumulated and annualized k-period dividend growth rates on the dividend-price ratio (i.e. $\frac{1}{k}\sum_{i=1}^{k}\Delta d_{t+i} = \alpha_k + \beta_k(d_t - p_t) + \varepsilon_{t,t+k}$). Superscripts 'a', 'b', and 'c' denote the significance level at the 1%, 5%, and 10% level, respectively.

Table 4. Simulated p-values for Joint Tests under No Stock Return Predictability

Country	1-year horizon			Long-run coefficients
	$P(b_r > \hat{b}_r)$	$P(b_d > \hat{b}_d)$	$P(b_r > \hat{b}_r \& \, b_d > \hat{b}_d)$	$P(lb_r > \widehat{lb}_r)$
Austria	11.9	0.4	0.15	2.95
Belgium	23.7	1.7	0.5	11.45~11.9
Canada	78.65	40.95	34.65	78.2
Chile	1.1	0.25	0	0.1~0.2
Denmark	16	0.25	0.1	2.9~3.2
Finland	58.45	29.35	19.6	58~58.55
France	27.7	1.1	1.05	10.8~11.8
Germany	46.7	5.1	4.45	38.45~38.7
Greece	24.1	2.75	2.15	12.45~12.55
Hong Kong	3.5	0	0	0
Hungary	11.5	1.9	0.75	4.35
India	3.95	0	0	0
Indonesia	2.1	0	0	0
Ireland	16.9	0.25	0.15	1.45~1.8
Italy	68	35.15	27.95	68.25~68.7
Japan	53.8	5.85	5.5	33.8~34.7
Korea	2.05	0	0	0.25
Malaysia	2.8	0	0	0.05
Mexico	3.6	0.7	0.35	0.65
Netherlands	31.4	0.4	0.3	12.1~12.25
Norway	12	1.5	0.5	3.55
Philippines	15.3	0.15	0.1	0.6
Portugal	21.5	2	0.55	10.65~10.8
Singapore	2.65	0	0	0
S. Africa	26.8	1.1	0.5	6.1~7.35
Spain	41.3	2.1	1.55	12.25~12.3
Sri Lanka	22.45	14.45	6.55	16.4~16.75
Sweden	14.05	0.75	0.4	4~4.15
Switzerland	71.15	42.7	36	68.45~68.6
Taiwan	31.2	4.3	2.15	16.2~17.2
Thailand	3.1	0.45	0.25	0.2
Turkey	25.75	2.2	1.9	5.15~6
U.K.	2.2	0	0	0
U.S.	55.95	0.85	0.8	6.75~7

Notes: This table shows the percentage p-value of the joint test in Cochrane (2008). The null hypothesis is no stock return predictability. b_r denotes the slope coefficient in the regression of r_{t+1} on $d_t - p_t$, and b_d denotes the slope coefficient in the regression of Δd_{t+1} on $d_t - p_t$. The range of probability values is given over the three ways of computing the long-run coefficient in the regression of $\sum_{i=0}^{\infty} \rho^i r_{t+1+i}$ on $d_t - p_t$.

Table 5. Simulated p-values for Joint Tests under No Dividend Growth Predictability

	1-year horizon			Long-run coefficients
	$P(b_r > \hat{b}_r)$	$P(b_d > \hat{b}_d)$	$P(b_r > \hat{b}_r \& b_d > \hat{b}_d)$	$P(lb_d > \widehat{lb}_d)$
Austria	0.05	0.05	0	0~0.05
Belgium	0	0.7	0	0
Canada	0.1	1.95	0	0.15
Chile	4.6	19.7	2.2	9.8~11.4
Denmark	0.25	0.85	0	0
Finland	0	0.25	0	0
France	1.8	1.35	0.1	0.55~0.6
Germany	0.15	0.1	0	0.15
Greece	1.35	0.45	0.15	0.6
Hong Kong	5.15	1.25	0.1	0.1
Hungary	1.4	8.7	0.65	2~2.05
India	19.1	32.4	7.8	25.35~25.5
Indonesia	21.8	40.75	12.95	33.95~34.25
Ireland	2.4	8.4	0.35	1.3~1.7
Italy	0.05	0.85	0	0.2
Japan	3.25	7.95	0.3	1.15
Korea	0	0	0	0
Malaysia	11.2	18.45	2.2	9.8~9.9
Mexico	43.5	61.45	36.85	61.8~62.05
Netherlands	0.65	3.25	0.05	0.2
Norway	0	0.1	0	0
Philippines	6.3	18.55	1.55	6.8~6.85
Portugal	0	0.1	0	0
Singapore	19.2	23.85	7.25	21.25
S. Africa	0.85	7.6	0.1	0.35~0.45
Spain	5.15	17.85	1.55	5.25
Sri Lanka	0	3.7	0	0.15
Sweden	0.25	0.2	0	0
Switzerland	0.05	0.65	0	0.25~0.3
Taiwan	0.9	5.55	0.25	0.7
Thailand	1.6	11.25	0.4	2.45
Turkey	10.75	18.25	4.85	10.5~11.95
U.K.	20.05	19.65	3.7	16.2~16.7
U.S.	7.5	34.6	3.05	15.85~16.35

Notes: This table shows the percentage p-value of the joint test in Cochrane (2008). The null hypothesis is no dividend growth predictability. b_r denotes the slope coefficient in the regression of r_{t+1} on $d_t - p_t$, and b_d denotes the slope coefficient in the regression of Δd_{t+1} on $d_t - p_t$. The range of probability values is given over the three ways of computing the long-run coefficient in the regression of $\sum_{i=0}^{\infty} \rho^i \Delta d_{t+1+i}$ on $d_t - p_t$.

Table 6. Predictive Ability by the Dividend-Price Ratio and Disparity

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.1031	0.0311	0.0019	0.3453
2 year	-0.1330	0.0549	0.0130	0.2043
3 year	-0.1298	0.0676	0.0354	0.1238
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.1529	0.0580	0.0084	0.2385
2 year	0.1522	0.0493	0.0032	0.3102
3 year	0.1353	0.0440	0.0033	0.3077

Notes: This table shows the results of regressions of the stock market predictability measure on the disparity measure. For the stock return predictability, the regression equation is $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes T-statistics for the slope coefficient in the k-horizon predictive regression of stock returns for country i, and $Disparity_i$ denotes the disparity score for country i. For dividend growth predictability, the regression equation is $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes T-statistics for the slope coefficient in the k-horizon predictive regression of dividend growth for country i. For the dividend growth predictability measure, T-statistics are multiplied by (-1) so that dividend growth predictability by the dividend-price ratio is in tandem with the dividend growth predictability measure. Data for $Disparity_i$ is obtained from Dahya et al. (2008).

Table 7. Alternative Predictive Ability by the Dividend-Price Ratio and Disparity: $\mathbf{R^2}$ and Disparity

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.0081	0.0034	0.0132	0.2036
2 year	-0.0100	0.0054	0.0403	0.1133
3 year	-0.0110	0.0057	0.0339	0.1276
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.0158	0.0061	0.0096	0.2285
2 year	0.0161	0.0061	0.0082	0.2401
3 year	0.0099	0.0048	0.0279	0.1435

Notes: This table shows the results of the following regression: $R^2_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $R^2_{i,k}$ denotes the value of R^2 from *k*-horizon predictive regression of either stock returns or dividend growth rates for country i, and $Disparity_i$ denotes the disparity score for country *i*. Data for $Disparity_i$ is obtained from Dahya et al. (2008).

Table 8. Alternative Predictive Ability by the Dividend-Price Ratio and Disparity: Slope Coefficient and Disparity

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.0136	0.0056	0.0130	0.2046
2 year	-0.0090	0.0043	0.0258	0.1496
3 year	-0.0077	0.0036	0.0226	0.1604
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.0097	0.0061	0.0656	0.0731
2 year	0.0064	0.0044	0.0795	0.0575
3 year	0.0044	0.0035	0.1154	0.0276

Notes: This table shows results of regressions of the alternative stock market predictability measure on the disparity measure. For the stock return predictability, the regression equation is $\beta_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $\beta_{i,k}$ denotes the estimates of the slope coefficient in the k-horizon predictive regression of stock returns for country i, and $Disparity_i$ denotes the disparity score for country i. For dividend growth predictability, the regression equation is $(-\beta_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $\beta_{i,k}$ denotes the estimates of the slope coefficient in the k-horizon predictive regression of dividend growth for country i. For the dividend growth predictability measure, the slope coefficient estimate is multiplied by (-1) so that the dividend growth predictability by the dividend-price ratio is in tandem with the dividend growth predictability measure. Data for $Disparity_i$ is obtained from Dahya et al. (2008).

Table 9. Alternative Predictive Ability by the Dividend-Price Ratio and Disparity: p-values from the Simulated Joint Test

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.9186	0.3636	0.0106	0.2208
Long-run	-2.6608 ~-2.6410	0.8063 ~ 0.8112	0.0020 ~ 0.0022	0.3356 ~ 0.3423
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.5219	0.3240	0.0623	0.0774
Long-run	1.1076 ~ 1.1156	0.5642 ~ 0.5663	0.0322 ~ 0.0326	0.1306 ~ 0.1316

Notes: This table shows results of regressions of the alternative stock market predictability measure on the disparity measure. For both null hypotheses, the regression equation is $(100 - p_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $p_{i,k}$ denotes the percentage p-values from the simulated joint test for country i, and $Disparity_i$ denotes the disparity score for country i. Data for $Disparity_i$ is obtained from Dahya et al. (2008). The ranges of statistical values for long-run analysis are given because there are three different ways of computing the long-run coefficient in the regression of $\sum_{i=0}^{\infty} \rho^i r_{t+1+i}$(or $\sum_{i=0}^{\infty} \rho^i \Delta d_{t+1+i}$) on $d_t - p_t$.

Table 10. Bias-corrected Predictability by the Dividend-Price Ratio and Disparity: Amihud and Hurvich Method

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.1055	0.0344	0.0035	0.3181
2 year	-0.1232	0.0495	0.0118	0.2238
3 year	-0.0688	0.0614	0.1409	0.0166
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.1408	0.0511	0.0067	0.2684
2 year	0.1437	0.0491	0.0047	0.2962
3 year	0.0912	0.0602	0.0760	0.0795

Notes: This table shows results of regressions of the bias-corrected stock market predictability measure on the disparity measure. For the stock return predictability, the regression equation is $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes bias-corrected T-statistics by the Amihud and Hurvich (2004) method from k-horizon predictive regression of stock returns for country i, and $Disparity_i$ denotes the disparity score for country i. For dividend growth predictability, the regression equation is $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes bias-corrected T-statistics by the Amihud and Hurvich (2004) method from k-horizon predictive regression of dividend growth for country i. Data for $Disparity_i$ is obtained from Dahya et al. (2008). The U.S. is excluded from the analysis for all horizons, and Canada, Italy, and Japan are excluded from the analysis for the three-year horizon, because the bias-corrected AR(1) coefficient for the dividend-price ratio is greater than unity in these cases.

Table 11. Robust Test: Predictive Ability by the Dividend-Price Ratio and Disparity with Macroeconomic Variables

Stock return predictability					
Disparity	GDP growth rate	Growth rate of per capita GDP	GDP level	Inflation	$\bar{R}^2$
-0.1104*** (-3.4160)	0.0603 (0.8846)				0.3373
-0.1146*** (-3.2804)		0.0593 (0.7530)			0.3291
-0.0866*** (-2.9068)			-0.00004 (-2.0300**)		0.4420
-0.0969*** (-2.7303)				0.0343 (0.3978)	0.3132
Dividend growth predictability					
Disparity	GDP growth rate	Growth rate of per capita GDP	GDP level	Inflation	$\bar{R}^2$
0.1400** (2.3142)	0.1065 (0.8350)				0.2254
0.1288** (1.9839)		0.1250 (0.8542)			0.2268
0.1438** (2.3381)			0.00002 (0.5438)		0.2074
0.1299** (1.9877)				-0.1262 (-0.7953)	0.2226

Notes: This table shows results of bivariate regressions of stock market predictability measures (T-statistics or negative T-statistics) on disparity and another macroeconomic variable. For the stock return predictability, the regression equation is $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$ where X_i denotes a macroeconomic variable. For dividend growth predictability, the regression equation is $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$. T-statistics for α_1 and α_2 are reported in parentheses, and '**', and '***' denote the significance level at the 5%, and 1% levels, respectively.

Table 12. Robust Test: Predictive Ability by the Dividend-Price Ratio and Disparity with Variables for Firms with a Dominant Shareholder

Stock return predictability					
Disparity	Legal	Percentage of independent directors on multiple boards	Board size	Tobin's Q	$\bar{R}^2$
-0.1085***(-3.6133)	-0.0193 (-1.5861)				0.3961
-0.1118***(-36884)		0.0354 (1.5957)			0.3971
-0.1031***(-3.1480)			-0.0007 (-0.0074)		0.3068
-0.0870***(-2.7351)				-0.9286 (-1.5220)	0.3899
Dividend growth predictability					
Disparity	Legal	Percentage of independent directors on multiple boards	Board size	Tobin's Q	$\bar{R}^2$
0.1471**(2.5037)	-0.0208 (-0.8759)				0.2285
0.1573***(2.6061)		-0.0181 (-0.4091)			0.2015
0.1671***(2.8300)			-0.1792 (-1.1090)		0.2481
0.1797***(2.9830)				-1.5411 (-1.3335)	0.2700

Notes: This table shows results of bivariate regressions of the stock market predictability measures (T-statistics or negative T-statistics) on disparity and another variable for firms with a dominant shareholder. For the stock return predictability, the regression equation is $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$ where X_i denotes another variable for firms with a dominant shareholder taken from Dahya et al. (2008). For dividend growth predictability, the regression equation is $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + \alpha_2 X_i + e_i$. T-statistics for α_1 and α_2 are reported in parentheses, and '**', and '***' denote the significance level at the 5%, and 1% levels, respectively.

Table 13. Predictive Ability by the Dividend-Price Ratio and Disparity from Other Studies

A) Disparity from Faccio and Lang (2002) and Claessens et al. (2000)

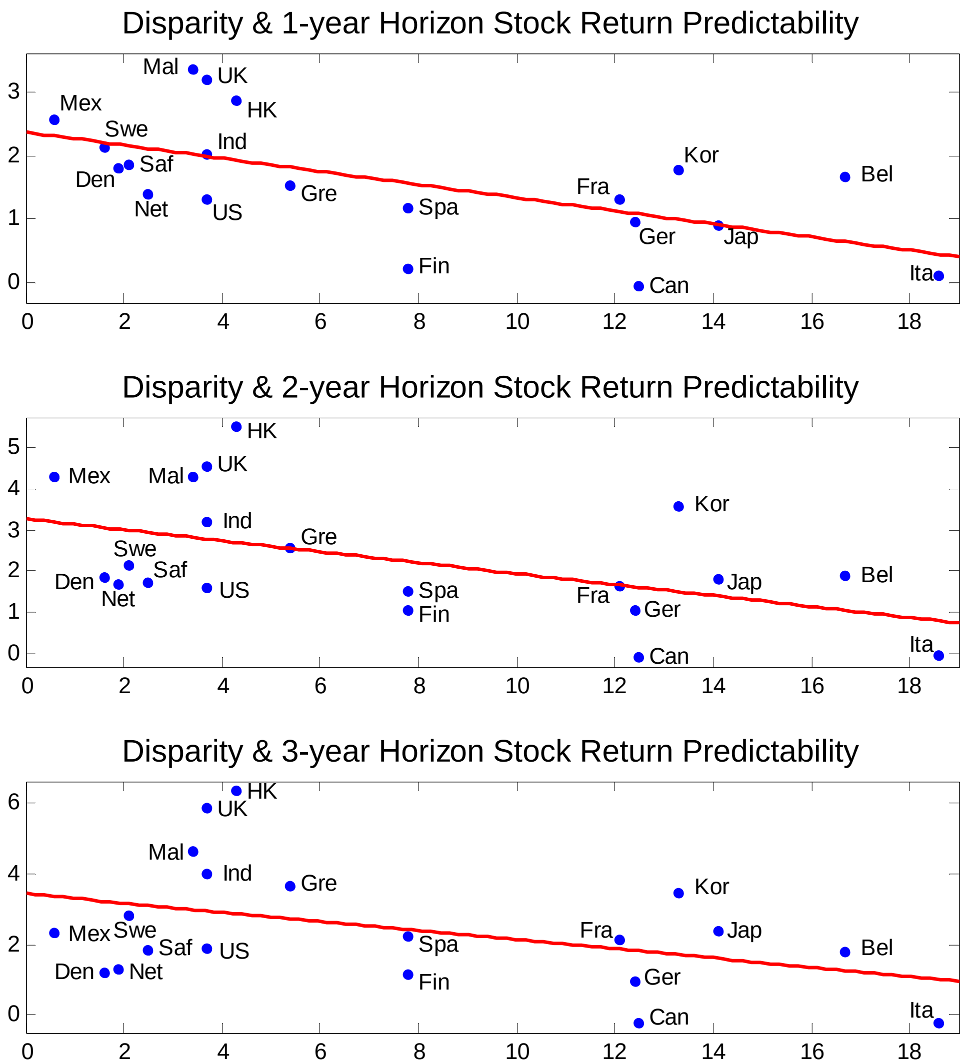
Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.0929	0.0962	0.1730	-0.0033
2 year	-0.1078	0.1262	0.2015	-0.0130
3 year	-0.2093	0.1286	0.0596	0.0728
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.1754	0.1281	0.0930	0.0400
2 year	0.1664	0.1095	0.0722	0.0587
3 year	0.0919	0.1092	0.2049	-0.0141

B) Disparity from Faccio and Lang (2002) (European countries only)

Stock return predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	-0.1464	0.0725	0.0342	0.2041
2 year	-0.1878	0.0883	0.0285	0.2269
3 year	-0.2971	0.1056	0.0084	0.3654
Dividend growth predictability				
Horizon	α_1	Standard error for α_1	p-value	$\bar{R}^2$
1 year	0.2883	0.1093	0.0115	0.3320
2 year	0.2891	0.0872	0.0034	0.4543
3 year	0.1794	0.1026	0.0542	0.1462

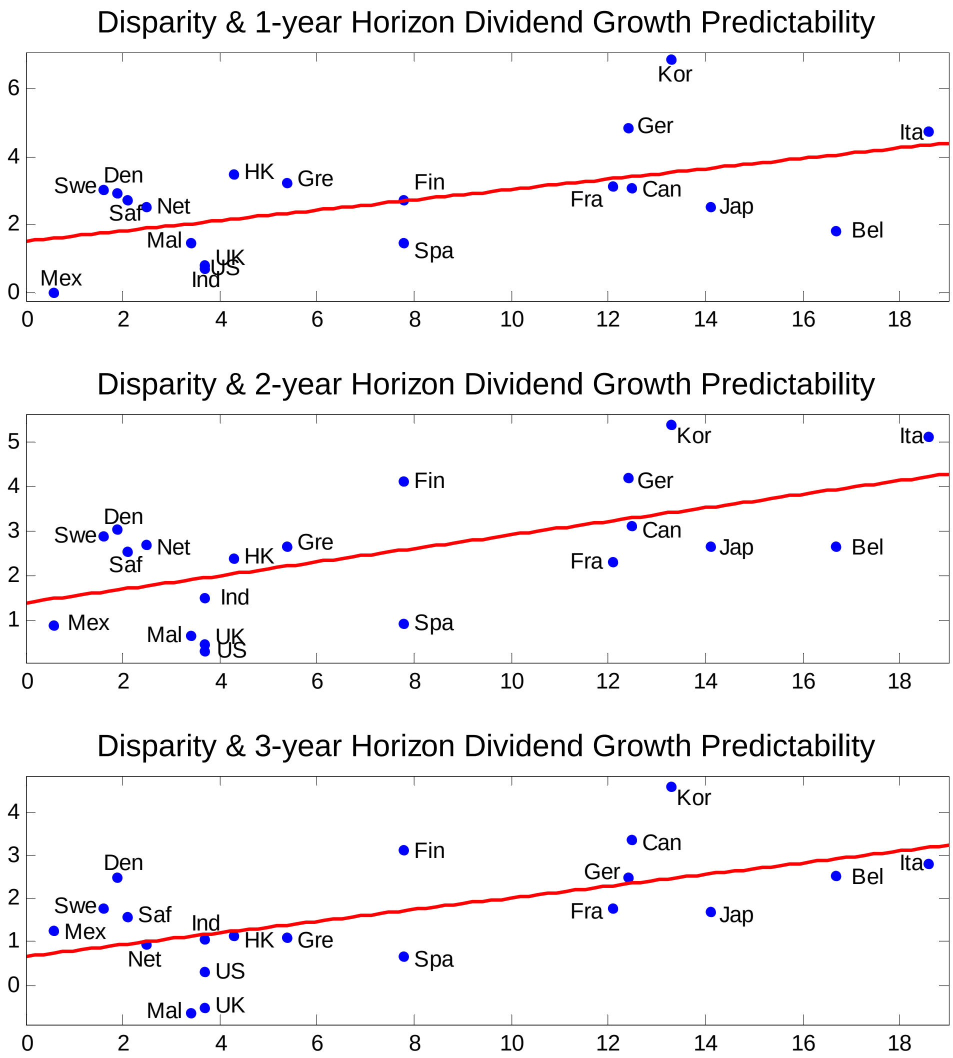
Notes: This table shows results of regressions of the stock market predictability measures (T-statistics or negative T-statistics) on disparity taken from other studies. Disparity data is obtained from Faccio and Lang (2002) for European countries and Claessens et al. (2000) for Asian countries. For the stock return predictability, the regression equation is $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$. For dividend growth predictability, the regression equation is $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$.

Figure 1. Stock Return Predictability and Disparity



Notes: This figure shows plots from the regression: $T_{i,k} = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes T-statistics for the slope coefficient in the k-horizon predictive regression of stock returns for country i, and $Disparity_i$ denotes the disparity score for country i. Data for $Disparity_i$ is obtained from Dahya et al. (2008). Abbreviations of sample countries are as follows: Belgium: Bel / Canada: Can / Denmark: Den / Finland: Fin / France: Fra / Germany: Ger / Greece: Gre / Hong Kong: HK / India: Ind / Italy: Ita / Japan: Jap / Korea: Kor / Malaysia: Mal / Mexico: Mex / Netherlands: Net / South Africa: Saf / Spain: Spa / Sweden: Swe / the United Kingdom: UK / the United States: US.

Figure 2. Dividend Growth Predictability and Disparity



Notes: This figure shows plots from the regression: $(-T_{i,k}) = \alpha_0 + \alpha_1 Disparity_i + e_i$ where $T_{i,k}$ denotes T-statistics for the slope coefficient in the k-horizon predictive regression of dividend growth for country i. For the dividend growth predictability measure, T-statistics is multiplied by (-1) so that dividend growth predictability by dividend-price ratio is in tandem with dividend growth predictability. $Disparity_i$ is obtained from Dahya et al. (2008). Abbreviations of sample countries are as follows: Belgium: Bel / Canada: Can / Denmark: Den / Finland: Fin / France: Fra / Germany: Ger / Greece: Gre / Hong Kong: HK / India: Ind / Italy: Ita / Japan: Jap / Korea: Kor / Malaysia: Mal / Mexico: Mex / Netherlands: Net / South Africa: Saf / Spain: Spa / Sweden: Swe / the United Kingdom: UK / the United States: US.