Country Governance and International Equity Returns

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Abstract

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JEL Classification Codes: G11, G14

Keywords: Governance, Return Predictability, International Equity Markets, Information Diffusion, Slow Moving Capital

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1. Introduction

We investigate whether monthly equity returns in countries with strong governance (*STRONG_GOV*) lead equity returns in weak governance (*WEAK_GOV*) countries. Prices are more informative in *STRONG_GOV* countries[1], raising the possibility of governance-based, cross-country return predictability.[2] However, global equity markets have become much more integrated over the last few decades (e.g., Pukthuanthong and Roll, 2009), which indicates against lead–lag return relationships. Our results indicate strong and consistent predictability. A one standard deviation increase in *STRONG_GOV* country returns leads to a 9.2% annualized increase in *WEAK_GOV* country returns, while the overall monthly out-of-sample R^2 is 3.4%, which compares favorably to the best predictors documented in the literature.[3]

We show that stock returns in *STRONG_GOV* countries react faster to new information, which has value implications across all countries, just as Brennan, Jegadeesh, and Swaminathan (1993) find that some stocks within the same market adjust more quickly to economy-wide information than others. The resulting *STRONG_GOV* country leading *WEAK_GOV* country relation is consistent with two explanations in the literature. First, we show information gradually diffuses from *STRONG_GOV* countries to *WEAK_GOV* countries in accordance with the predications of Hong and Stein (1999) and Hong, Torous, and Valkanov (2007). Second, we find it is related institutional impediments, such as market opaqueness which Duffie (2010) suggests can result in slow moving capital. We show the predictive relation is stronger when

[1] For instance, Morck, Yeung, and Yu (2000) find more informed arbitrage and Haw, Hu, Lee, and Wu (2012) find greater price informativeness regarding future earnings in countries with stronger governance.

[2] *STRONG_GOV* country equity returns reacting more quickly to information than *WEAK_GOV* country equity returns is necessary for *STRONG_GOV* returns leading *WEAK_GOV* returns. However, this does not necessarily imply statistically and economically significant cross-country predictability.

[3] Goyal and Welch (2008) show many well-known predictors have negative out-of-sample R^2, while Kelly and Pruitt (2013) show cross-sectional book-to-market ratios are an excellent predictor, with a monthly out-of-sample R^2 of 0.9%.

there is higher relative information based trading (*PIN*) and lower relative financial disclosure and analyst coverage in *WEAK_GOV* countries.

This predictability is not due to the segmentation of *WEAK_GOV* countries and it is not driven by trade linkages, geographic distance between countries, short-selling constraints, different market closing times, or other frictions such as a lack of liquidity. This predictability is also distinct from the ability of U.S. equity returns to predict returns in 10 developed markets (e.g., Rapach, Strauss, and Zhou, 2013).

Our tests are based on the World Bank Worldwide Governance Indicators (WGI).[4] As Kaufmann, Kraay, and Mastruzzi (2010) note, the WGI consist of six composite indicators of governance, including "Voice and Accountability," "Political Stability and Absence of Violence/Terrorism," "Government Effectiveness," "Regulatory Quality," "Rule of Law," and "Control of Corruption." These WGI data cover a broad spectrum of country governance indicators shown to impact equity prices in the literature, such as minority shareholder rights, creditor rights, and judicial efficiency (e.g., Johnson, Boone, Breach, and Friedman, 2000), political instability (e.g., Berkman, Jacobsen, and Lee, 2011), corruption (e.g., Lee and Ng, 2006), media freedom (e.g., Pantzalis, Stangeland, and Turtle, 2000), and terrorism (e.g., Karolyi and Martell, 2010). We obtain WGI data for the 61 countries that are in either the Griffin, Kelly, and Nardari (2010) or Griffin, Hirschey, and Kelly (2011) samples. For each year, we then assign a country to *STRONG_GOV*, *MEDIUM_GOV*, or *WEAK_GOV* based on its average ranking across the six WGI categories. Our primary focus is the relation between the *STRONG_GOV* and *WEAK_GOV* countries, in much the same way as researchers in areas such as momentum (e.g., Jegadeesh and Titman, 1993) focus on "winner" and "loser" portfolios. However, we also find that

[4] Others using WGI data include Beck, Lin, and Ma (2014), Doidge, Karolyi, and Stulz (2013) and De Haas and Van Horen (2012).

STRONG_GOV country returns lead *MEDIUM_GOV* returns, and that *MEDIUM_GOV* countries lead returns in *WEAK_GOV* countries.

Our results also hold when we use a range of alternative governance measures, including: 1) an average governance measure derived from La Porta, Lopez-de-Silanes, Shleifer (2006) (hereafter LLS) variables, 2) the anti-directors right index of Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) and the other LSS variables, 3) the Spamann (2010) anti-directors right index and the other LSS variables, 4) the "Protecting Minority Investors" World Bank data, 5) the "Good Governance Index" of Morck, Yeung, and Yu (2000) and Karolyi, Lee, and van Dijk (2012), 6) the "Horizontal Governance" measure of Acemoglu and Johnson (2005) and Lin, Massa, and Zhang (2014), 7) the "Vertical Governance" measure of Acemoglu and Johnson (2005) and Lin, Massa, and Zhang (2014), and 8) the Corruption Perceptions Index from Transparency International.

This paper proceeds as follows. Section 2 describes the data. Our method and predictability results are presented in Section 3. Explanations for the returns predictability are considered in Section 4. Finally, Section 5 presents the conclusions.

2. Data

2.1. WGI

Kaufmann, Kraay, and Mastruzzi (2010) note that the WGI includes six composite governance measures from 1996 onwards for in excess of 200 countries. The indicators, which include (p. 2) "Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption" are based

on hundreds of variables from 31 data sources, including (p. 2) "survey respondents, nongovernmental organizations, commercial business information providers, and public sector organizations worldwide."

While the WGI measures are country- level rather than stock-level indicators, the seminal La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) has resulted in it becoming well accepted that country-level governance indicators play an important role in firm corporate governance and capital markets. There is also evidence that weak country-level governance may detract from other governance mechanisms. Institutional investors play a valuable governance role (e.g., Gillan and Starks, 2000) and Gelos and Wei (2005) find there is less international fund investment in less transparent countries.

WGI data are particularly useful in our setting because of the breadth of coverage over a large number of country governance measures, the number of countries they are available for, and the annual frequency of the data. They allow us to consider a sample of all 61 countries in either Griffin, Kelly, and Nardari (2010) or Griffin, Hirschey, and Kelly (2011). Others that use WGI data include Beck, Lin, and Ma (2014), who investigate the relation between tax evasion and country information sharing systems; De Haas and Van Horen (2012), who study the international transmission of shocks in syndicated lending following the Lehman Brothers Collapse; and Doidge, Karolyi, and Stulz (2013), who consider IPO activity around the world.

According to Kaufmann, Kraay, and Mastruzzi (2010, p. 4), the first two WGI indicators, Voice and Accountability and Political Stability, capture the "process by which governments are selected, monitored, and replaced." Voice and Accountability measures "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media," while Political Stability captures "perceptions

of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism." There are numerous examples in the literature of these variables influencing equity markets. For instance, Tetlock (2007) documents the important role played by the media in the stock market in general. Dai, Parwada, and Zhang (2015) show that the media has a vital corporate governance role of disciplining management, while Dyck, Volchova, and Zingales (2008) find media coverage in the Anglo-American press plays an important role in reversing corporate governance violations in Russia. Berkman, Jacobsen, and Lee (2011) show that political crisis risk is priced, with more sensitive industries having larger returns. Bittlingmayer (1998) uses the transition from Imperial to Weimar Germany to show that political uncertainty results in higher stock market volatility, while Karolyi and Martell (2010) find terrorism has a statistically significant negative impact on stock returns.

The third and fourth WGI measures, Government Effectiveness and Regulatory Quality, reflect the "capacity of the government to effectively formulate and implement sound policies." Government Effectiveness captures "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies," while Regulatory Quality captures "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development." Perotti and van Oiijen (2001, p. 43) suggest "a sustained privatization program represents a major political test that gradually resolves uncertainty over political commitment to a market-oriented policy as well as to regulatory and private property rights." Moreover, these authors' results indicate that the reduction in political risk following privatization has a strong impact on stock returns.

The final WGI measures, Rule of Law and Control of Corruption, reflect (p. 4) "the respect of citizens and the state for the institutions that govern economic and social interactions among them." Rule of Law captures "perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence." In particular, Control of Corruption measures "capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests." Johnson, Boone, Breach, and Friedman (2000) show variation in governance factors such as rule of law, minority shareholder risks, and creditor rights are a determinant of the extent of exchange rate depreciation and stock market decline of countries during the 1997–1998 Asian Crisis. Moreover, Lee and Ng (2006) find companies in more corrupt countries have lower valuations due to lower expected future cash flows.

Some may take the view that one or more of the six WGI indices capture country governance better than the rest. However, we find each of the six indices is highly correlated with the average WGI index. The correlations for Voice and Accountability, Political Stability, and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption are 0.91, 0.90, 0.98, 0.96, 0.98, and 0.97, respectively. We repeat our core analysis using each of the six indices and find our results hold.

Our results also hold when we measure governance in a range of alternative ways. First, we use the LLS indices. Second we use the LLS indices but substitute the LLS anti-directors rights index with that from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008). Third, we use the Spamann (2010) anti-directors rights index and the other LLS indices. Fourth, we use the "Protecting Minority Investors" World Bank governance data. Fifth, we use the "Good

Governance Index" of Morck, Yeung, and Yu (2000) and Karolyi, Lee, and van Dijk (2012). Sixth, we use the "Horizontal Governance" measure of Acemoglu and Johnson (2005) and Lin, Massa, and Zhang (2014). Seventh, we use the "Vertical Governance" measure of Acemoglu and Johnson (2005) and Lin, Massa, and Zhang (2014). Finally, we use the Corruption Perceptions Index from Transparency International.

2.2. Other Data

We obtain stock index data from Thomson Reuters Datastream. Where available, we use the Thomson Reuters Datastream index for each country. If these data do not exist, we use S&P country series. Neither of these series types is available for Zimbabwe, so we use MSCI data. Following Rapach, Strauss, and Zhou (2013), local currency returns are used for our core analysis. However, our results also hold when US$ returns are used. As Solnik (1993) notes, interest rate parity means this return is approximately equal to the currency hedged return for international investors. Risk-free data are from Global Financial Data. We measure risk-free rates from T-bill total return series in the first instance, and where these are unavailable, we use T-bill yield, then short-term deposit rate data. Dividend yields are calculated as the difference between total return and price appreciation stock series. We source the bilateral trade data from the Directions of Trade Statistics database of the International Monetary Fund. The final data we use are the distances between capital cities of each *STRONG_GOV* and *WEAK_GOV* country.[5]

[5] This data is sourced from: http://privatewww.essex.ac.uk/~ksg/data-5.html

2.3. Country Classification and Summary Statistics

Table 1 shows average score over the 1996–2014 period for each of the six WGI measures and the country cross-sectional average of these averages. We present the data for the 61 countries in our sample by ranking these cross-sectional averages in ascending order. The five countries with the lowest scores are (in order from lowest) Zimbabwe, Venezuela, Pakistan, Bangladesh, and Kenya, while the other countries in the *WEAK_GOV* subset are likely consistent with most people's priors. The five countries with highest scores (in order from highest) are Finland, Denmark, New Zealand, Sweden, and Switzerland.

[Please Insert Table 1 About Here]

Appendix 1 reports summary statistics for average monthly excess stock returns for each country in the three governance groups. There is a clear trend of larger excess returns and risk-free rates for countries with weaker governance legislation. Average excess returns by governance grouping are 0.8% for *STRONG_GOV*, 0.9% for *MEDIUM_GOV*, and 1.6% for *WEAK_GOV*. The average risk-free rates are 0.2% for *STRONG_GOV*, 0.4% for *MEDIUM_GOV*, and 1.1% for *WEAK_GOV*. These results are consistent with the notion that investors in t-bills and equities require larger returns for investing in countries with weaker governance. There is also more variation in excess returns, with cross-country average standard deviations ranging from 5.3% for *STRONG_GOV* countries to 7.4% for *MEDIUM_GOV* countries to 8.5% for *WEAK_GOV* countries.

3. Core Results and Robustness Checks

3.1. In-sample Group Predictability

We investigate the ability of the returns of *STRONG_GOV* countries to predict the returns of *WEAK_GOV* by estimating the predictive regression model in equation 1:

$$R_{WEAK\_GOV,i,t+1} = \alpha_i + \beta_{1,i} R_{STRONG\_GOV,i,t} + \beta_{2,i} R_{WEAK\_GOV,i,t} + \beta_{3,i}\, Bill_{WEAK\_GOV,i,t} + \beta_{4,i}\, DY_{WEAK\_GOV,i,t} + \varepsilon_{i,t+1} \quad (1)$$

for i = 1, …., 400 country pairs between 20 *WEAK_GOV* and 20 *STRONG_GOV* countries, where $R_{WEAK\_GOV,i,t+1}$ is the monthly excess return from *WEAK_GOV* countries in month t+1 in local currency, $R_{STRONG\_GOV,i,t}$ is the monthly local currency excess return of *STRONG_GOV* countries in month t, $R_{WEAK\_GOV,i,t}$ is the monthly local currency excess return of *WEAK_GOV* countries in month t, and $Bill_{WEAK\_GOV,i,t}$ ($DY_{WEAK\_GOV,i,t}$) is the three-month Treasury bill rate (dividend yield) for the *WEAK_GOV* countries in month t.

We follow the Ang and Bekaert (2007) and Hjalmarsson (2010) approach and impose slope homogeneity restrictions ($\beta_i = \bar{\beta}$), but impose no restriction on country pair-specific constants. Hjalmarsson (2010) and Rapach, Strauss, and Zhou (2013) note that pooled estimates can give meaningful average relationships even if the slope homogeneity constraints do not hold exactly.

We estimate equation 1 using three alternative approaches so as to ensure the results are robust. First, we follow Ang and Bekaert (2007) and use a GMM technique that controls for heteroskedasticity and contemporaneous correlation among country returns. In this framework, we use Hodrick (1992) standard errors. Second, we use the multi-predictor augmented regression

(mARM) approach of Amihud, Hurvich, and Wang (2009), which accounts for the Stambaugh (1999) bias. Third, we use Pedersen (2009) standard errors, which account for country and time clustering in the 20 × 20 panel.

In Table 2, we report results for the regression specification provided in equation 1. The coefficient of the $R_{STRONG\_GOV,i,t}$ variable is highly statistically significant in the univariate specification and when control variables are included under all three regression approaches. The coefficient ranges from 0.138 to 0.144 in the presence of control variables, suggesting that a one standard deviation increase in the returns of *STRONG_GOV* countries results in a 8.8–9.7% annualized increase in the monthly returns of *WEAK_GOV* countries. The one-month lag *WEAK_GOV* dividend yields predict positive returns, while the one-month lag *WEAK_GOV* country Treasury bills predict negative *WEAK_GOV* country returns. Moreover, *WEAK_GOV* country returns are positively correlated with the past-month returns.

[Please Insert Table 2 About Here]

3.1.1. Different Governance Classifications

We conduct a number of robustness checks around our core results. Appendix 2, Panel A results indicate that our conclusions continue to hold when countries are classified as *STRONG_GOV* and *WEAK_GOV* based on the nine alternative governance measures we test. The coefficient of the $R_{STRONG\_GOV,i,t}$ variable ranges from 0.059 based on the "Protecting Minority Interests" index to 0.147 when the "Good Governance Index" of Morck, Yeung, and Yu (2000) is applied, (compared to 0.144 with WGI data) and is statistically significant at the 1% level in each instance.

The high correlation of the six WGI components with the overall WGI index implies that cross-country variation in each of these individual indices should predict equity returns. The Appendix 2, Panel B results confirm this is the case. The coefficients are larger for the Government Effectiveness, Control of Corruptions, and Rule of Law series. However, all six indices generate statistically significant predictability.

3.1.2. Medium Governance Country Predictability, Reverse Causality, and China Predictability

A consistent link between the level of governance and return predictability may be expected to result in *STRONG_GOV* country returns predicting *MEDIUM_GOV* country returns and/or *MEDIUM_GOV* country returns predicting *WEAK_GOV* country returns. We investigate each of these scenarios in Appendix 3. The Panel A results show *STRONG_GOV* country returns do predict *MEDIUM_GOV* country returns, while the Panel B results show *MEDIUM_GOV* country returns predict *WEAK_GOV* country returns. It is also evident that the size of this predictability in terms of the coefficient is lower than that documented in Table 2 for *STRONG_GOV* country returns predicting *WEAK_GOV* country returns.

In Appendix 3, Panel C we check for reverse causality, for which the results indicate no evidence. *WEAK_GOV* country returns do not predict *STRONG_GOV* country returns. In Panel D, we check whether monthly Chinese excess returns lead *STRONG_GOV* country returns. Since China is the second largest economy, it is possible that while *WEAK_GOV* countries in general do not predict *STRONG_GOV* country returns, Chinese returns do. However, the Panel D results indicate no evidence to support this proposition.[6] It is important to note that our results do not refute the suggestion that Chinese equity returns are important for *STRONG_GOV* country and

[6] In unreported results, we also find no evidence of Chinese predictability in the second half of our sample, when the Chinese economy was considerably larger.

global equity returns. After all, it is possible that information from Chinese equity returns is reflected in equity returns in other countries contemporaneously. However, our results do show there is no reverse causality in the monthly predictive relation based on Chinese returns or *WEAK_GOV* returns in general.

3.1.3. U.S. Predictability, Different Market Closing Times, Dynamic Reclassification, and US$ Robustness

Given that Rapach, Strauss, and Zhou (2013) show U.S. returns predict returns in 10 developed countries and the U.S. is in the *STRONG_GOV* country subset of our sample, there is the possibility that all the predictability we document comes from U.S. returns. In Appendix 4, Panel A, we rerun equation 1 but exclude U.S. returns. The outcome clearly indicates our results are not driven solely by U.S. returns and are therefore different from those documented by Rapach, Strauss, and Zhou (2013). The $R_{STRONG\_GOV,i,t}$ variable coefficient is 0.153 compared to 0.144 in Table 2.

Another potential explanation for the monthly predictability we document in Table 2 is the different closing times of international markets. The close of each day's trading in Asian equities occurs before the close of trading in European markets, which in turn occurs before the close of U.S. and Canadian markets. Given there are more Asian markets in the *WEAK_GOV* sample than in the *STRONG_GOV* sample, it is therefore possible that Asian markets have already closed when information such as a macroeconomic announcement data releases with global implications are released. This would mean that European and North American markets could impound this information during the day's trading (e.g., day *t*), while the first opportunity for Asian markets to reflect this news would be day *t+1*. This would, in turn, create the

impression of a lead–lag relation between *STRONG_GOV* and *WEAK_GOV* countries that is in fact spurious.

We adjust for this possibility by removing the return from the last day of the month from the monthly return for each *STRONG_GOV* country and use this modified "monthly" return to predict the following month's *WEAK_GOV* monthly return. This approach is conservative in that not every *WEAK_GOV* market closes prior to each *STRONG_GOV* market close, but a finding of predictability following this adjustment will prove that different market closing times are not the explanation.

The Appendix 4, Panel B results provide strong evidence against the market closing time explanation. The $R_{STRONG\_GOV,i,t}$ variable coefficient is 0.157 compared to 0.144 using the unadjusted monthly excess return in Table 2. Moreover, statistical significance is stronger when adjusted monthly returns are used. Since it makes no material difference to the results, we use standard monthly returns throughout the remainder of this paper, as these are more accessible to other researchers.

Our core analysis is based on whether a country is *STRONG_GOV* or *WEAK_GOV* at the beginning of the sample period. In Appendix 4, Panel C we present results relating to the classification of countries based on their governance status at the beginning of each year. These are very similar to those in Table 2 which indicates that dynamic reclassification has little impact. Similarly, using US$ rather than local currency has little impact, as shown in the Appendix 4, Panel D results.

3.1.4. Predictability in Good and Bad Times and Risk

A number of papers, including Rapach, Strauss, and Zhou (2010), Henkel, Martin, and Nadari (2011), and Dangl and Halling (2012) find that predictability is much weaker or non-existent in good times. Given that Huang, Jiang, Tu, and Zhou (2015) highlight that good times in financial markets or the economy prevail approximately 70–80% of the time, it is possible that many traditional predictors do not have predictive power for long periods of time. We follow Cooper, Gutierrez, and Hameed (2004) and define bad times as periods following a three-year negative return in the *WEAK_GOV* stock returns, and good times as periods following a three-year non-negative *WEAK_GOV* stock return. Huang, Jiang, Tu, and Zhou (2015) show this definition of good and bad times is broadly consistent with alternative approaches, such as good (bad) times being periods when stock returns are above (below) their 200-day average.

Appendix 5 results indicate *STRONG_GOV* stock returns lead *WEAK_GOV* stock returns in both good and bad times. In both market states, the $R_{STRONG\_GOV,i,t}$ variable is statistically significant at the 1% level. There is also meaningful economic significance in both states. However, the coefficient is larger in bad times (0.244) than good times (0.132). Appendix 5 also shows there is no evidence that higher return volatility in *WEAK_GOV* countries explains the predictive relation based on governance.

3.2. Out-of-Sample Group Predictability

3.2.1. Out-of-sample R^2, Mean Squared Forecast Errors, and Encompassing Tests

Goyal and Welch (2008) highlight the importance of testing whether variables have out-of-sample predictive power. It is important to ensure that out-of-sample tests are not subject to hindsight bias; thus, we start them in 2008. While the Kaufmann, Kraay, and Mastruzzi (2010) variables are available back to 1996, the first version of their paper we are aware of, is July 2007. We therefore classify countries as *STRONG_GOV* and *WEAK_GOV* from 2008. We report results for three alternative out-of-sample techniques. First, we compute the out-of-sample (R_{OS}^2) performance of governance-based predictability following the proposed procedure of Campbell and Thompson (2008). This method compares the fitted value generated from the predictive regression model with the forecasts based on historical average return. The R_{OS}^2 statistic is calculated as follows:

$$R_{OS}^2 = 1 - \frac{\sum_{t=1}^{T} (r_t - \hat{r}_t)^2}{\sum_{t=1}^{T} (r_t - \bar{r}_t)^2} \quad (2)$$

where $\hat{r}_t$and $\bar{r}_t$ are the values from the governance predictive regression and the average historical return, respectively, and both these values are estimated for the period *t-1*. The R_{OS}^2 statistic shows the reduction in forecasting error of the predictive regression model relative to the historical average forecast. That is, the forecast from the predictive governance regression model outperforms the historical average forecast when $R_{OS}^2 > 0$. To determine the statistical significance of R_{OS}^2, we compute the bootstrapping critical values of R_{OS}^2 consistent with Goyal and Welch (2008). As these authors note, this approach follows the work of Mark (1995) and Kilian (1999).

According to Goyal and Welch (2008), this bootstrapping procedure not only controls for Stambaugh (1999) bias, it also maintains the cross-correlation structure of estimated residuals.

In contrast to the Goyal and Welch (2008) finding that many traditional predictor variables do not generate R_{OS}^2 that are positive and statistically significant, we find consistent evidence of out-of-sample predictability for our governance model. The overall R_{OS}^2 for all 400 *STRONG_GOV* and *WEAK_GOV* country pairs is 3.4%. Annual forecasts typically have much larger R_{OS}^2. However, we are unable to forecast at this frequency due to the length of available data. It is clear however, that our monthly forecasts compare favorably to recent studies, such as Kelly and Pruitt (2013), who show that the cross-section of book-to-market ratios generates R_{OS}^2 of 0.9% at the monthly frequency and 13% at the annual frequency.

We also show the Root Mean Squared Forecast Error (RMSFE) difference; $RMSFE_{Mean}$ - $RMSFE_{GOV}$, is positive overall. The Clark and West (2007) statistics reject the null hypothesis that $RMSFE_{Mean}$ is less than or equal to $RMSFE_{GOV}$. This indicates a larger prediction error when the historical mean is used for forecasts rather than the governance model. We also apply an encompassing test, as in equation 3, to determine whether a combination forecast based on the historical mean forecast encompasses the governance model forecast.

$$\hat{r}_{t:t+h}^{*} = (1-\lambda)\hat{r}_{t:t+h}^{Mean} + \lambda\hat{r}_{t:t+h}^{GOV} \tag{3}$$

where $\hat{r}_{t:t+h}^{Mean}$ is the regression forecast based on the historical mean model and $\hat{r}_{t:t+h}^{GOV}$ is the regression forecast based on the governance model. λ takes a value between 0 and 1, with $\lambda = 0$ indicating that the optimal combination forecast does not include the governance-based forecast. Under this scenario, the governance model contains no useful information beyond the historical

mean model for predicting returns. However, a $\lambda > 0$ suggests the optimal combination forecast includes the governance-based forecast. The governance model provides useful information beyond the historical mean model, and the historical mean forecast does not encompass the governance-based forecast. The results, presented in Table 3, Panel A, indicate that the λ estimate gives a strong indication of the value of the governance model forecasts. We use the Harvey, Leybourne, and Newbold (1998) approach to test the null hypothesis $\lambda = 0$, and find that it can be strongly rejected.

[Please Insert Table 3 About Here]

3.2.2. Certainty Equivalent Return Gains and Sharpe Ratios

A measure of the economic significance of a predictive model involves investing in the market if the predicted stock return is greater than the risk-free return and investing in the risk-free asset on other occasions. Following Campbell and Thompson (2008) and Rapach, Ringgenberg, and Zhou (2016), we consider a mean–variance investor who allocates a portion of a portfolio to equities (with the remainder to t-bills) at the end of each month *t*, for the following month based on the following:

$$w_t = \frac{1}{\gamma}\frac{\hat{r}_{t+1}}{\hat{\sigma}^2_{t+1}} \tag{4}$$

where γ is the investor's risk aversion coefficient, and $\hat{r}_{t+1}$ ($\hat{\sigma}^2_{t+1}$) are excess return and variance forecast, respectively. Following Rapach, Ringgenberg, and Zhou (2016), we assume $\gamma = 3$ and

allow w_t to vary between between -0.5 and 1.5. The variance forecast is computed from the 10-year moving window of excess returns. The investor who allocates a portfolio using equation 4 receives a certainty equivalent return (CER) of:

$$CER = \bar{R}_p - 0.5\gamma\sigma_p^2 \quad (5)$$

where $\bar{R}_p$ is the mean and σ_p^2 is the variance of the portfolio over the evaluation period. We also calculate the CER for an investor using the mean excess return forecast instead of the predictive regression in equation 1 and calculate the CER gain as the difference between these two CER numbers. Following Rapach, Ringgenberg, and Zhou (2016) we annualize the CER gain, which allows us to interpret it as (p. 57) "the annual portfolio management fee that the investor would be willing to pay to have access to the predictive regression forecast in place of the prevailing mean forecast." We also present Sharpe Ratios for the predictive regression model, the prevailing mean forecast, and a buy-and-hold approach.

The Table 3, Panel B results indicate that the CER gain from the governance-based model is 4.5%. This compares favorably to the 4.2% CER gain at the monthly level for short interest, which Rapach, Ringgenberg, and Zhou (2016) show has strong predicative ability compared to other predictor variables, such as those examined by Goyal and Welch (2008). The -1.2% CER Gain for the buy-and-hold approach indicates that the buy-and-hold strategy underperforms the historical mean forecast approach. The overall governance model Sharpe Ratio is 0.597, compared to 0.373 for the buy-and-hold approach, and 0.259 for the historical mean forecast model.

3.3. In-sample and Out-of-Sample Individual Country Predictability

We now present results relating to individual country predictability. The first five columns of Table 4 Panel A relate to the ability of each of the 20 *STRONG_GOV* country monthly excess returns in month *t* to predict the 20 *WEAK_GOV* country returns in month *t*+1. We present "pairwise average" results which are the average coefficient across the 20 *WEAK_GOV* countries being predicted by each *STRONG_GOV* country, and "pooled" results which are based on coefficients from a pooled regression across the 20 *WEAK_GOV* countries. The results are based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. The second five columns present results for each of the 20 *WEAK_GOV* country returns to be predicted by *STRONG_GOV* country returns. The "pairwise average" result are the average coefficient across the 20 *STRONG_GOV* countries, while "pooled" result is from the pooled regression across the 20 *STRONG_GOV* countries. The control variables from equation 1 are included in each instance.

The Table 4 results indicate all *STRONG_GOV* country returns can predict in a manner that is statistically significant (at the 10% level or more), based on the pairwise average approach, and in the majority of instances when the pooled approach is adopted. Moreover, *WEAK_GOV* returns can be predicted in all but two instances based in the pairwise average approach and in many instances based on the pooled approach. We conclude there is strong evidence of in-sample predictability at the individual country level.

[Please Insert Table 4 About Here]

In Table 4, Panel B we present out-of-sample results at the individual country level. The results, which relate to individual *STRONG_GOV* countries predicting all *WEAK_GOV* countries, indicate 19 of the 20 R^2_{OS} are positive and statistically significant. The average of these is 3.3%, with the U.K., Switzerland, and Sweden having the largest values at 4.9%, 4.7%, and 4.7%, respectively. The predictability is consistent and strong in Panel B as well, where results for all *STRONG_GOV* countries predicting individual *WEAK_GOV* country returns are presented. Sixteen of the 20 *WEAK_GOV* countries generate R^2_{OS} that are positive and statistically significant. These average 1.8%, with the largest values for Argentina (6.8%), Columbia (4.8%), and Morocco (4.8%).

Consistent CER gains are shown in Panel B, ranging from 2.9% for predictions based on New Zealand returns to 6.2% for predictions from Hong Kong. In this situation, the buy-and-hold CER gain is the same for each *STRONG_GOV* predictor country, as the same 20 *WEAK_GOV* countries are being predicted in each instance. The results also indicate that 13 of the 20 governance model CER gains are larger than their buy-and-hold equivalents. The overall governance model Sharpe Ratio is 0.597, compared to 0.373 for the buy-and-hold approach, and 0.259 for the historical mean forecast model. The superiority of governance-based forecasts is confirmed when each of the individual *STRONG_GOV* countries is used to predict *WEAK_GOV* countries. Sharpe Ratios range from 0.512 for Norway to 0.687 for Singapore. There is more variability in the Sharpe Ratios in Panel C. However, 16 of the 20 are larger than those generated by the historical mean forecast. Overall, we conclude there is strong evidence of economic significance.

4. Explanations for Return Predictability

In this section we consider various explanations for the predictability we document in Section 4. We first rule out the possibility it is driven by microstructure biases or permanent impediments to arbitrage. We then show that there is evidence of a possible pre-condition for governance induced cross-country predictability in that *STRONG_GOV* country returns react more quickly than those in their *WEAK_GOV* country counterparts to global return innovations. We then present evidence that the predictability is consistent with both the theories of gradual information diffusions and slow moving capital. Finally, we rule out other possible explanations such as market segmentation, short selling constraints, liquidity differences, segmentation between markets, and trade linkages.

4.1. Microstructure Biases and Permanent Impediments to Arbitrage

The fact that we use monthly return data for value-weighted market indices from 1996 onwards minimizes the chance of our result being due simply to illiquid, stale prices. However, we test for this by investigating whether the returns to governance-based predictability diminish over time. Given that technology and globalization have resulted in markets becoming more liquid over time, a finding of less governance-based predictability in more recent times could suggest that the predictability evident in earlier periods is illusory in the sense it is due to microstructure biases.

Another possible explanation for a decline in predictive power through time is that investors trade away the arbitrage opportunity as they become aware of it. Goyal and Welch (2008) find many popular predictors lose power over time, while McLean and Pontiff (2016) show that academic publication of predictive variables results in their predictive ability declining.

A reduction in microstructure biases, less segmented markets, and investors learning of predictability and trading it away are each alterative explanations for a decline in the predictive relation between *STRONG_GOV* and *WEAK_GOV* countries. However, a finding of no reduction in predictability can be interpreted as indicating that it is not due to microstructure biases and segmented markets, and that investors have not learned of it and traded the predictability away.

We investigate whether the predictive relation has changed as follows:

$$R_{WEAK\_GOV,i,t+1} = \alpha_i + (\beta_{1,i} + \delta_{1,i} * Trend)R_{STRONG\_GOV,i,t} + \delta_{2,i}Trend + \beta_{2,i}R_{WEAK\_GOV,i,t} + \beta_{3,i}Bill_{WEAK\_GOV,i,t} + \beta_{4,i}\, DY_{WEAK\_GOV,i,t} + \varepsilon_{i,t+1} \quad (6)$$

for $i = 1,\ldots,400$ country pairs and where *Trend* is $1,\ldots,t$.

We follow Ang and Bekaert (2007) and Hjalmarsson (2010) and impose slope homogeneity restrictions ($\beta_i = \bar{\beta}$) and ($\delta_i = \bar{\delta}$) but have no restriction on α_i.

Neither the Trend variable nor the interaction variable are statistically significant, which indicates there is no decline in forecasting ability over time.

As a further test, we investigate whether two-month-lag *STRONG_GOV* stock returns predict *WEAK_GOV* stock returns. The results in Table 5 indicate this is not the case. The fact that information from *STRONG_GOV* stock returns is reflected in *WEAK_GOV* returns before the end of two months is further indication there are no permanent impediments to arbitraging this relation away.

[Please Insert Table 5 About Here]

4.2. Timeliness of Reaction to World Stock Market Innovations

A possible factor behind the cross-country predictability differences is the speed of response to world stock market innovations by *STRONG_GOV* and *WEAK_GOV* countries. We investigate this by appling the Brennan, Jegadeesh, and Swaminathan (1993) framework and running the following regression:

$$R_{STRONG\_GOV,i,t} - R_{WEAK\_GOV,i,t} = \alpha + \sum_{k=1}^{2} \beta_k I_{t-k} + \delta I_t + \sum_{k=1}^{2} \theta_k I_{t+k} + \varepsilon_t \quad (7)$$

where *I* refers to the MSCI World stock market innovations and cash flow and discount rate innovations. Campbell (1990, 1991) shows unexpected stock returns, η_{t+1}^{ER}, are related to changes in expected future dividends (cash flows), η_{t+1}^{CF}, or expected future returns (discount rates), η_{t+1}^{DR}. We follow the approach of Campbell (1990, 1991) and use a VAR model to estimate η_{t+1}^{CF} and η_{t+1}^{DR} from the residuals and coefficients of the following models:

$$R_{WORLD,t+1} = \beta_0 + \beta_1 R_{WORLD,t} + \beta_2 DY_{WORLD,t} + \beta_3 TBILL_{WORLD,t} + \varepsilon_{1,t+1}, \quad (8a)$$

$$DY_{WORLD,t+1} = \gamma_0 + \gamma_1 R_{WORLD,t} + \gamma_2 DY_{WORLD,t} + \gamma_3 TBILL_{WORLD,t} + \varepsilon_{2,t+1}, \quad (8b)$$

$$TBILL_{WORLD,t+1} = \delta_0 + \delta_1 R_{WORLD,t} + \delta_2 DY_{WORLD,t} + \delta_3 TBILL_{WORLD,t} + \varepsilon_{3,t+1}, \quad (8c)$$

where $R_{WEAK\_GOV,t+1}$ is monthly excess return for the *WORLD* index; $DY_{WORLD,t}$ is dividend yield for the *WORLD* index; $TBILL_{WORLD,t}$ is the U.S. T-bill rate; β_1, β_2, β_3, γ_1, γ_2 and γ_3, $\delta_1, \delta_2,$ and δ_3 are estimated coefficients from the VAR model; and $\varepsilon_{1,t+1}$, $\varepsilon_{2,t+1}$, and $\varepsilon_{3,t+1}$ are the estimated residuals.

We then construct a matrix of constant parameters and a vector of shocks (denoted by Γ and u_{t+1}, respectively), as follows:

$$\Gamma_{3\times3} = \begin{bmatrix} \beta_1 & \beta_2 & \beta_3 \\ \gamma_1 & \gamma_2 & \gamma_3 \\ \delta_1 & \delta_2 & \delta_3 \end{bmatrix} \quad \text{and} \quad u_{t+1\ (3\times T)} = \begin{bmatrix} \varepsilon_{1,t+1} \\ \varepsilon_{2,t+1} \\ \varepsilon_{3,t+1} \end{bmatrix} \tag{9a}$$

Finally, we estimate η_{t+1}^{CF} and η_{t+1}^{DR} as follows:

$$\eta_{t+1}^{CF} = (\mathrm{e1}' + \mathrm{e1}' \times \lambda) \times u_{t+1} \quad \text{and} \quad \eta_{t+1}^{DR} = \mathrm{e1}' \times \lambda \times u_{t+1} \tag{9b}$$

where $\mathrm{e1}' = [1 \quad 0 \quad 0]'$; $\mathrm{I} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$; $\rho = \frac{1}{1+\exp(\overline{d-p})}$; and $\lambda_{3\times3} = \rho \times \Gamma \times (\mathrm{I} - \rho \times \Gamma)^{-1}$

where $\eta_{t+1}^{ER} = \eta_{t+1}^{CF} - \eta_{t+1}^{DR}$

The results shown in Table 6, Panel A indicate that the relation between the *STRONG_GOV* minus *WEAK_GOV* return difference and the contemporaneous world index innovation is positive and statistically significant. This indicates the returns of *STRONG_GOV* countries adjust more rapidly to innovations in the world index than their *WEAK_GOV* country counterparts. The sum of the two lag coefficients is negative and statistically significant, which suggests past innovations have more impact on *WEAK_GOV* country returns than their *STRONG_GOV* country counterparts. There is no relation between stock returns and future

innovations. In Panels B and C, we report results for cash flow and discount rate innovations. These results are consistent with the Panel A results. This indicates innovations via the cash flow channel, such as shock to global GDP, and discount rate innovations, such as an increase in the global risk-free rate, impact stock returns in *STRONG_GOV* countries more quickly than their *WEAK_GOV* counterparts.

[Please Insert Table 6 About Here]

4.3. Gradual Information Diffusion

In this section, we consider whether news gradually diffuses from *STRONG_GOV* to *WEAK_GOV* countries consistent with the hypotheses of Hong and Stein (1999) and Hong, Torous, and Valkanov (2007). Menzly and Ozbas (2010) show that informational segmentation can result in slow transfer of information about economically related firms within the same market, so it seems plausible to expect this across markets, especially since Abel, Eberly, and Panageas (2013) show there is an optimal level of inattention when investors are faced with information.[7]

We use the specification of Rapach, Strauss, and Zhou (2013). The return for the *WEAK_GOV* countries consists of its expected returns and the contemporaneous and lagged innovations from *STRONG_GOV* countries. This is generated using each country's T-bill and dividend yield.

[7] There are a number of other examples in the literature of information being slowly reflected in price. For example, relevant information from customers for suppliers (e.g. Cohen and Frazzini, 2008), complex industry information for conglomerates (e.g. Cohen and Lou, 2011), and information for the foreign operations of multinationals (e.g. Huang, 2015).

$$R_{WEAK_{GOV},t+1} = \mu_{WEAK\_GOV,t+1} + \theta\lambda u_{STRONG\_GOV,t+1}$$
$$+(1-\theta)\lambda u_{STRONG\_GOV,t} + \varepsilon_{WEAK\_GOV,t+1}, \quad (10)$$

where:

θ is a diffusion parameter measuring the proportion of the impact of *STRONG_GOV* return shock contemporaneously incorporated into *WEAK_GOV* return.

λ is total impact of *STRONG_GOV* return shock on *WEAK_GOV* return.

$$\mu_{WEAK\_GOV,t+1} = \beta_{WEAK\_GOV,0} + \beta_{WEAK\_GOV,r}R_{WEAK\_GOV,t} + \beta_{WEAK\_GOV,b}Bill_{WEAK\_GOV,t}$$
$$+\beta_{WEAK\_GOV,d}DY_{WEAK\_GOV,t} \quad (11)$$

$u_{STRONG\_GOV,t+1}$ and $u_{STRONG\_GOV,t}$ are contemporaneous and lagged *STRONG_GOV* return shocks, which are the difference between *STRONG_GOV* return and its expected return. The STRONG_GOV expected return is modeled as follows.

$$\mu_{STRONG\_GOV,t+1} = \beta_{STRONG\_GOV,0} + \beta_{STRONG\_GOV,r}R_{STRONG\_GOV,t} +$$
$$\beta_{STRONG\_GOV,b}Bill_{STRONG\_GOV,t} + \beta_{STRONG\_GOV,d}DY_{STRONG\_GOV,t} \quad (12)$$

The *STRONG_GOV* coefficient in equation 12 indicates that the larger the *STRONG_GOV* country return impact on *WEAK_GOV* countries, represented by λ, the stronger the predictability relation. Moreover, a smaller θ, which indicates greater information friction, indicates stronger predictive power for *STRONG_GOV* country returns.

The null hypotheses of no information diffusion therefore are:

$$H_0: \lambda = 0,\ \theta = 1 \quad (13)$$

We reject the first null hypothesis if *STRONG_GOV* country return shocks influence *WEAK_GOV* country returns ($\lambda \neq 0$). Rejecting the second null hypothesis ($\theta = 1$) indicates that not all information from *STRONG_GOV* country returns is reflected in *WEAK_GOV* stock returns contemporaneously.

We estimate the model in equation 10 as follows:

Let Ω be a vector of 10 parameters:

$$\Omega = \left(\theta, \lambda, \beta_{WEAK\_GOV,0}, \beta_{WEAK\_GOV,r}, \beta_{WEAK\_GOV,b}, \beta_{WEAK\_GOV,d}, \beta_{STRONG\_GOV,0}, \beta_{STRONG\_GOV,r}, \beta_{STRONG\_GOV,b}, \beta_{STRONG\_GOV,d}\right) \quad (14)$$

We use a two-step GMM process to estimate Ω using 13 moment conditions, as follows.

$$E\left[u_{STRONG\_GOV,t+1}\right] = 0, E\left[R_{STRONG\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0,$$

$$E\left[Bill_{STRONG\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0, E\left[DY_{STRONG\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0,$$

$$E\left[R_{WEAK\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0, \; E\left[Bill_{WEAK\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0,$$

$$E\left[DY_{WEAK\_GOV,t} u_{STRONG\_GOV,t+1}\right] = 0,$$

$$E\left[\varepsilon_{WEAK\_GOV,t+1}\right] = 0, \; E\left[R_{WEAK\_GOV,t} \varepsilon_{WEAK\_GOV,t+1}\right] = 0, E\left[Bill_{WEAK\_GOV,t} \varepsilon_{WEAK\_GOV,t+1}\right] = 0,$$

$$E\left[DY_{WEAK\_GOV,t} \varepsilon_{WEAK\_GOV,t+1}\right] = 0,$$

$$E\left[u_{STRONG\_GOV,t+1} \varepsilon_{WEAK\_GOV,t+1}\right] = 0, E\left[u_{STRONG\_GOV,t} \varepsilon_{WEAK\_GOV,t+1}\right] = 0 \quad (15)$$

The results presented in Table 7 show the θ estimate, 0.77. This indicates that 77% of information in *STRONG_GOV* country equity returns is reflected in *WEAK_GOV* equity prices contemporaneously, and the remainder gradually diffuses into *WEAK_GOV* prices. This finding of a strong contemporaneous link between *STRONG_GOV* and *WEAK_GOV* monthly returns is consistent with Eun and Shim (1989), Bekaert, Ehrmann, Fratzcher, and Mehl (2014), and many others who document contemporaneous links or contagion between international equity markets using daily data. The λ estimates quantify the economic impact of a unit of *STRONG_GOV* shock on *WEAK_GOV* returns. The results in Table 7 indicate an λ estimate of 0.57, while the test of the joint hypothesis that $\theta = 1$ and $\lambda = 0$ is strongly rejected. It is clear that information from *STRONG_GOV* country returns gradually diffuses into *WEAK_GOV* country returns and that the economic impact of this is important.

[Please Insert Table 7 About Here]

4.4. Slow Moving Capital

Duffie (2010) suggests capital can be slow moving in certain situations, including when there are institutional impediments such as market opaqueness. We therefore consider whether three proxies for market opaqueness and information asymmetry influence the predictability relation. First, we consider the level of information based trading in each country, as expressed in the *PIN* measure Lai, Ng, and Zhang (2014) report for international markets. We conjecture that investors in countries with higher average *PIN* are likely to be more cautious about arbitraging away apparent mispricing on account of concerns that they may be trading with a more informed individual who can exploit their informational advantage. Second, we consider

the financial disclosure index of Bushman, Piotroski, and Smith (2004). Bhattacharya, Daouk, and Welker (2002) find that a lack of clarity around value-relevant drivers puts investors off trading so if there is opacity around financial information investors are likely to be slower to respond to governance-induced return predictability. Our third proxy is analyst coverage based on Chang, Khanna, and Palepu (2000). Piotroski and Roulstone (2004) show analyst activity improves the efficiency of prices.

The results in Table 8 indicate market opaqueness does have an impact on the strength of the predictive relation from *STRONG_GOV* countries to *WEAK_GOV* countries. In Table 8, Panel A, we present results for a regression specification that includes *PIN Diff*, which is the difference of the *PIN* measure from Lai, Ng, and Zhang (2014) between the *STRONG_GOV* country used to make the prediction and the *WEAK_GOV* country whose returns are being predicted. The $R_{STRONG\_GOV,i,t}$ variable remains strongly statistically and economically significant. However, the interaction variable $R_{STRONG\_GOV,i,t} * PIN\ Diff$ is negative and statistically significant. This suggests the predictive relation is weaker when the level of *PIN* in the *WEAK_GOV* country is relatively low compared to that in the *STRONG_GOV* country. In other words, lower relative PIN (and less opaqueness) in a country results in capital moving faster.

The Panel B results are also consistent with this. A relatively low Bushman, Piotroski, and Smith (2004) disclosure index in a *WEAK_GOV* country (i.e. a larger *STRONG_GOV* country - *WEAK_GOV* country) difference, which indicates relatively higher *WEAK_GOV* country opaqueness, results in a stronger predictive relation between *STRONG_GOV* and *WEAK_GOV* countries.

Similar results are evident in Panel C regarding analysts. A difference in analyst coverage between *STRONG_GOV* and *WEAK_GOV* countries does not explain the predictability relation

but it does affect it. Fewer analysts in *WEAK_GOV* countries, which contributes to opaqueness, lead to a stronger predictability relation.

[Please Insert Table 8 About Here]

4.5. Segmentation, Liquidity, Short-Sale Constraints, Country Size, Development, Trade, and Geographic Distance

The fact that the predictability we document disappears within two months suggests it is not due to *WEAK_GOV* countries being fully segmented. Moreover, our finding that the predictability has not decreased over time even though the degree to which markets are segmented has declined, further points away from segmentation as an explanation. Nonetheless, we calculate the valuation-based measure of segmentation from Bekaert, Harvey, Lundblad, and Siegel (2011) using Thompson Reuters Datastream data so as to determine the impact of segmentation in a more formal manner.

In Table 9, Panel A, we present results for a regression specification that includes *SEG Diff*, which is the log of the difference in segmentation measure between the *STRONG_GOV* country used to make the prediction and the *WEAK_GOV* country whose returns are being predicted. The $R_{STRONG\_GOV,i,t}$ variable remains strongly statistically and economically significant. However, the interaction variable $R_{STRONG\_GOV,i,t} * SEG\ Diff$ is not statistically significant. This is further evidence our results are not due to market segmentation.

It is possible that governance-based predictability is driven by lower liquidity in *WEAK_GOV* markets. Chordia, Roll, and Subrahmanyam (2008, p. 249) find "liquidity

stimulates arbitrage activity, which, in turn, enhances market efficiency." These authors show predictability is diminished over time as bid–ask spreads decline. Lesmond, Schill and Zhou (2004) find momentum returns, which are indicative of inefficient pricing, are larger in less liquid stocks, and Bali, Peng, Shen, and Tang (2013) show liquidity frictions explain the delayed stock market price reaction to liquidity shocks.

In Table 8, Panel B, we present results for a regression specification that includes *Liquidity Diff*, which is the log of the difference in monthly turnover (traded value / market capitalization) between the *STRONG_GOV* country used to make the prediction and the *WEAK_GOV* country whose returns are being predicted. These data are sourced from the World Bank. The $R_{STRONG\_GOV,i,t}$ variable remains strongly statistically and economically significant. However, the interaction variable $R_{STRONG\_GOV,i,t} * Liquidity\ Diff$ is not statistically significant. Taken together, these results indicate the finding of *STRONG_GOV* country returns leading *WEAK_GOV* country returns is not related to liquidity differences between countries.

Jain, Jain, McInish, and McKenzie (2013) provide comprehensive data on short-selling regulation in international stock markets covering 18 of the 20 countries in our *WEAK_GOV* sample.[8] We use the Jain, Jain, McInish, and McKenzie (2013) data to create a dummy variable that equals 1 in periods when short selling is allowed, and zero otherwise. We then include this variable and a $R_{Strong\ IP,i,t} * SS$ interaction variable in our regression specification. The Table 6, Panel B results indicate that our core result that monthly *STRONG_GOV* country returns predict monthly *WEAK_GOV* country returns holds after controlling for short sales. The interaction variable is not statistically significant, which indicates we cannot conclude that the predictability is stronger when short-selling constraints are in place.

[8] Kenya and Romania are the two countries in our sample for which we do not have short-selling data.

It is also possible that the predictability we document arises from differences in the size of different countries' economies. We investigate using the same approach used in Panel A for segmentation. We use the *Country Size Diff* variable, which is the log of the difference between total GDP of the *STRONG_GOV* country used to make the prediction and the *WEAK_GOV* country whose returns are being predicted. These data are sourced from the World Bank. The results indicate that the governance-based predictability withstands inclusion of this control variable, while the positive coefficient of $R_{STRONG\_GOV,i,t} * Country\ Size\ Diff$ indicates the predictability is stronger, with larger *STRONG_GOV* country returns used to predict smaller *WEAK_GOV* country returns.

In Panel E, we consider the impact of stock market development on the return predictability. We follow Marshall, Visaltanachoti, and Nguyen (2015) [9] and generate a development index based on the standardized values of market capitalization to GDP, traded value to GDP, the turnover ratio, the number of listed firms, and the concentration ratio, which is the market capitalization of the top 10% of firms relative to total market capitalization. These data are sourced from the World Bank. We then calculate a *Development Diff* variable, which is the log of the difference between the Development Index of the *STRONG_GOV* country used to make the prediction and the *WEAK_GOV* country whose returns are being predicted. The results indicate that the level of stock market development does not influence governance-based predictability.

Rizova (2010) finds equity markets do not immediately reflect news about trading partners. Rather, the stock market returns of a country's main trading partners forecast the

[9] See also Perotti and van Oiijen (2001) and Demirgiic-Kunt and Levine (1996).

subsequent stock market return of that country.[10] In Panel F, we control for trade linkages by including a trade variable that represents total exports and imports between each *STRONG_GOV* and *WEAK_GOV* country pair. The results indicate trade linkages do not explain the governance-based predictability.

There is evidence that geography of investors relative to the stocks they invest in influences returns (e.g., Ivkovic and Weisbenner, 2005; Garcia and Norli, 2012). Most recently, Bernile, Kumar, and Sulaeman (2015, p. 2009) find that "geographic variation in firm-level information generates economically significant location-based information asymmetry." We therefore investigate whether geographic differences can explain the predictability we document. In Panel F, we include the log of distance between each *STRONG_GOV* and *WEAK_GOV* country as a control variable. The results indicate geographic distance is not the driver of the predictability we document.

[Please Insert Table 9 About Here]

5. Conclusion

We investigate whether monthly equity returns in countries with strong governance (*STRONG_GOV*) lead monthly equity returns in countries with weak governance (*WEAK_GOV*). It is documented that prices are more informative in *STRONG_GOV* countries, which raises the possibility of predictability due to governance differences. However, it is also clear that international equity markets have become more integrated in the past few decades, which suggests against a lead–lag relation.

[10] In related research, Cohen and Frazzini (2008) find the market underreacts to the implications of information from customer firms for supplier firms within the same market.

We document strong evidence of governance-based cross-country predictability. A one standard deviation increase in *STRONG_GOV* country returns leads to an 8.7% increase in *WEAK_GOV* country returns, while the monthly out-of-sample R^2 is 3.4%. While the majority of information from *STRONG_GOV* country returns is reflected contemporaneously in *WEAK_GOV* country returns, approximately one-quarter of the information is reflected with a lag.

We show that stock returns in *STRONG_GOV* countries react faster to new information, which has value implications across all countries. This results in *STRONG_GOV* country leading *WEAK_GOV* country relation in a manner which is consistent with two explanations in the literature. First, we show information gradually diffuses from *STRONG_GOV* countries to *WEAK_GOV* countries. Second, we find it is related to institutional impediments, such as market opaqueness and information asymmetry, which result in slow moving capital.

There is no evidence the predictability is caused by differences in country segmentation, liquidity, stock market development, geographic distance, or risk. Moreover, short-selling constraints, microstructure frictions, and trade linkages do not drive the result. Finally, the predictability is not solely due to U.S. returns, or different market closing times, and it persists in both good and bad times.

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Table 1
Country Governance Rankings

Country	GOV Rank	GOV Group	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	Average
Zimbabwe	1	Weak	-1.40	-0.78	-1.23	-1.86	-1.60	-1.35	-1.37
Venezuela	2	Weak	-0.59	-1.03	-0.97	-1.01	-1.31	-1.01	-0.99
Pakistan	3	Weak	-0.94	-1.92	-0.58	-0.62	-0.83	-0.94	-0.97
Bangladesh	4	Weak	-0.39	-1.15	-0.70	-0.94	-0.88	-0.99	-0.84
Kenya	5	Weak	-0.46	-1.15	-0.52	-0.26	-0.93	-0.97	-0.72
Indonesia	6	Weak	-0.32	-1.29	-0.34	-0.30	-0.66	-0.79	-0.62
Egypt	7	Weak	-0.99	-0.72	-0.39	-0.37	-0.14	-0.47	-0.51
China	8	Weak	-1.50	-0.44	0.00	-0.24	-0.42	-0.43	-0.51
Colombia	9	Weak	-0.33	-1.71	-0.14	0.17	-0.63	-0.32	-0.49
Sri Lanka	10	Weak	-0.38	-1.26	-0.22	-0.04	0.07	-0.24	-0.34
Philippines	11	Weak	0.07	-1.18	-0.03	0.00	-0.38	-0.51	-0.34
Peru	12	Weak	-0.12	-0.91	-0.24	0.41	-0.65	-0.31	-0.30
India	13	Weak	0.38	-1.14	-0.08	-0.35	0.10	-0.43	-0.25
Morocco	14	Weak	-0.59	-0.33	-0.09	-0.14	-0.04	-0.13	-0.22
Argentina	15	Weak	0.28	-0.10	-0.03	-0.39	-0.51	-0.40	-0.19
Turkey	16	Weak	-0.26	-0.98	0.14	0.31	0.01	-0.15	-0.16
Mexico	17	Weak	0.11	-0.56	0.21	0.35	-0.53	-0.34	-0.13
Thailand	18	Weak	-0.10	-0.50	0.27	0.26	0.14	-0.24	-0.03
Brazil	19	Weak	0.35	-0.12	-0.07	0.19	-0.28	-0.05	0.00
Romania	20	Weak	0.39	0.14	-0.32	0.32	-0.07	-0.30	0.03
Bulgaria	21	Med	0.46	0.24	0.01	0.43	-0.20	-0.25	0.12
Croatia	22	Med	0.39	0.45	0.47	0.34	0.04	-0.05	0.27
South Africa	23	Med	0.68	-0.18	0.57	0.46	0.09	0.34	0.33
Malaysia	24	Med	-0.36	0.19	1.03	0.56	0.49	0.32	0.37
Latvia	25	Med	0.76	0.47	0.58	0.95	0.56	0.10	0.57
Israel	26	Med	0.63	-1.26	1.19	1.09	0.96	1.00	0.60
Greece	27	Med	0.92	0.34	0.64	0.73	0.72	0.31	0.61
Lithuania	28	Med	0.88	0.63	0.58	1.02	0.57	0.16	0.64
South Korea	29	Med	0.65	0.35	0.92	0.74	0.88	0.40	0.66
Italy	30	Med	1.02	0.64	0.59	0.86	0.57	0.32	0.67
Slovakia	31	Med	0.87	0.90	0.75	0.88	0.40	0.23	0.67
Poland	32	Med	1.00	0.67	0.60	0.81	0.62	0.44	0.69

Czech Rep.	33	Med	0.94	0.87	0.84	1.06	0.86	0.35	0.82
Hungary	34	Med	0.99	0.86	0.80	1.05	0.80	0.49	0.83
Taiwan	35	Med	0.81	0.73	1.03	1.08	0.89	0.68	0.87
Estonia	36	Med	1.05	0.66	0.91	1.37	0.93	0.83	0.96
Slovenia	37	Med	1.10	1.01	0.95	0.82	1.00	0.96	0.97
Spain	38	Med	1.18	0.03	1.36	1.17	1.19	1.13	1.01
Cyprus	39	Med	1.03	0.43	1.29	1.22	1.00	1.20	1.03
Portugal	40	Med	1.29	1.02	1.07	1.04	1.13	1.13	1.11
Chile	41	Med	0.94	0.51	1.20	1.48	1.25	1.44	1.14
Japan	42	Strong	1.00	1.03	1.33	0.96	1.31	1.27	1.15
France	43	Strong	1.23	0.57	1.55	1.09	1.41	1.37	1.21
Hong Kong	44	Strong	0.35	0.88	1.58	1.91	1.32	1.71	1.29
U.S.	45	Strong	1.22	0.53	1.65	1.53	1.55	1.50	1.33
Belgium	46	Strong	1.39	0.91	1.72	1.24	1.32	1.41	1.33
Singapore	47	Strong	-0.03	1.12	2.14	1.98	1.56	2.22	1.50
U.K.	48	Strong	1.33	0.55	1.73	1.80	1.68	1.91	1.50
Germany	49	Strong	1.37	0.97	1.68	1.49	1.64	1.87	1.50
Ireland	50	Strong	1.39	1.20	1.59	1.69	1.63	1.59	1.51
Australia	51	Strong	1.45	1.03	1.72	1.62	1.75	1.94	1.59
Austria	52	Strong	1.40	1.15	1.80	1.52	1.85	1.86	1.60
Canada	53	Strong	1.51	1.02	1.87	1.60	1.73	2.05	1.63
Luxembourg	54	Strong	1.53	1.40	1.82	1.73	1.79	2.00	1.71
Norway	55	Strong	1.61	1.30	1.92	1.41	1.92	2.16	1.72
Netherlands	56	Strong	1.59	1.17	1.91	1.81	1.76	2.16	1.73
Switzerland	57	Strong	1.54	1.32	1.98	1.66	1.87	2.14	1.75
Sweden	58	Strong	1.60	1.25	1.97	1.56	1.86	2.27	1.75
New Zealand	59	Strong	1.62	1.27	1.78	1.82	1.85	2.34	1.78
Denmark	60	Strong	1.60	1.16	2.09	1.80	1.90	2.43	1.83
Finland	61	Strong	1.58	1.47	2.11	1.75	1.95	2.38	1.87

This table presents the average values over the 1996 to 2015 period for the six governance measures discussed in Kaufmann, Kraay, and Mastruzzi (2010). We assign countries as having "Weak," "Med," or "Strong" governance based on average scores for these six measures.

Table 2
In-Sample Group Predictability

	Without Controls		With Controls	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Panel A: GMM Approach of Ang and Bekaert (2007) with Hodrick (1992) Standard Errors				
$R_{STRONG\_GOV,i,t}$	0.172	**3.600**	0.144	**2.814**
$R_{WEAK\_GOV,i,t}$			0.059	1.327
$Bill_{WEAK\_GOV,i,t}$			-0.135	-0.377
$DY_{WEAK\_GOV,i,t}$			2.348	0.333
Adjusted R^2	0.009		0.014	
Panel B: Multi-Predictor Augmented Regression (mARM) Approach of Amihud, Hurvich, and Wang (2009)				
$R_{STRONG\_GOV,i,t}$	0.172	**4.243**	0.139	**3.446**
$R_{WEAK\_GOV,i,t}$			0.023	0.712
$Bill_{WEAK\_GOV,i,t}$			-0.165	-0.554
$DY_{WEAK\_GOV,i,t}$			2.266	**3.068**
Adjusted R^2	0.011		0.019	
Panel C: OLS Regressions with Pedersen (2009) Standard Errors				
$R_{STRONG\_GOV,i,t}$	0.168	**2.912**	0.138	**2.437**
$R_{WEAK\_GOV,i,t}$			0.066	**2.112**
$Bill_{WEAK\_GOV,i,t}$			-0.369	**-2.392**
$DY_{WEAK\_GOV,i,t}$			2.162	**2.211**
Adjusted R^2	0.019		0.032	

We investigate whether $R_{WEAK\_GOV,i,t+1}$, which is monthly excess return in each of the 20 *WEAK_GOV* countries in month *t*+1 in local currency, can be predicted by $R_{STRONG\_GOV,i,t}$, which is monthly local currency excess return of each of the 20 *STRONG_GOV* countries in month *t*. Control variables include $R_{WEAK\_GOV,i,t}$, which is the monthly local currency excess return of each of the *WEAK_GOV* countries in month *t*, and $Bill_{WEAK\_GOV,i,t}$ ($DY_{WEAK\_GOV,i,t}$), which are the three-month Treasury bill rate (dividend yield) for the 20 *WEAK_GOV* countries in month *t*. Panel A results are based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. Panel B results are based on the multi-predictor augmented regression (mARM) approach of Amihud, Hurvich, and Wang (2009), which accounts for the Stambaugh (1999) bias. Panel C results are based on Pedersen (2009) standard errors, which account for country and time effects in the 20 × 20 panel. The results are generated for the 1996–2014 period. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Table 3
Out-of-Sample Group Predictability

Panel A: Out-of-Sample R^2, Root Mean Squared Forecast Error, and Encompassing Tests

	R^2_{OS}	Bootstrap R^2_{OS} p-value	RMSFE Difference	CW Statistic	Enc. Tests	HLN Statistic
All Countries	0.034	0.000	0.025	**24.918**	1.000	**28.050**

Panel B: Certainty Equivalent Return Gains and Sharpe Ratios

	GOV CER Gain	Buy-and-hold CER Gain	GOV Sharpe Ratio	Buy-and-hold Sharpe Ratio	Historical Mean Sharpe Ratio
All Countries	0.045	-0.012	0.597	0.373	0.259

These results are from 2008, when the Kaufmann, Kraay, and Mastruzzi (2010) World Governance Indicator variables were first made available, to 2014. R^2_{OS} is calculated in accordance with Campbell and Thompson (2008). RMSFE Difference is the difference between the mean-square prediction error for the forecast based on governance and the naïve forecast. The CW Statistic is as per Clark and West (2007). Enc. Tests refer to encompassing test, while the HLN Statistic is the Harvey, Leybourne, and Newbold (1998) statistic. GOV CER Gain is certainty equivalent return of the governance-based predictability less the CER from the historical mean forecast. The Buy-and-hold CER gain is the CER from the buy-and-hold approach less the historical mean forecast CER. The final three columns are Sharpe Ratios for the governance-based predictability, buy-and-hold approach, and historical mean forecast, respectively. Statistics that are statistically significant at the 10% level or more are in bold.

Table 4
Individual Country In-Sample and Out-of-Sample Predictability

Panel A: In-Sample

	Pairwise Average		Pooled			Pairwise Average		Pooled	
	Coeff	t-stat	Coeff	t-stat		Coeff	t-stat	Coeff	t-stat
Australia	0.268	**6.548**	0.239	**2.438**	Argentina	0.129	**6.229**	0.131	1.379
Austria	0.180	**5.368**	0.157	**1.899**	Bangladesh	0.004	0.166	0.008	0.098
Belgium	0.104	**3.385**	0.112	1.555	Brazil	0.140	**7.835**	0.140	1.609
Canada	0.240	**6.216**	0.213	**2.113**	China	0.022	1.334	0.039	0.422
Denmark	0.112	**4.313**	0.112	1.423	Colombia	0.252	**17.247**	0.238	**3.842**
Finland	0.155	**5.306**	0.124	**2.757**	Egypt	0.089	**7.097**	0.091	1.044
France	0.164	**5.351**	0.142	**2.393**	India	0.188	**12.899**	0.194	**2.109**
Germany	0.116	**4.622**	0.094	**1.724**	Indonesia	0.335	**11.619**	0.306	**3.003**
Hong Kong	0.213	**9.134**	0.192	**4.149**	Kenya	0.074	**6.828**	0.074	1.036
Ireland	0.130	**6.650**	0.120	**1.908**	Mexico	0.075	**4.528**	0.082	1.359
Japan	0.166	**7.424**	0.153	**2.472**	Morocco	0.124	**13.278**	0.115	**3.202**
Luxembourg	0.127	**4.494**	0.133	**1.905**	Pakistan	0.221	**17.541**	0.210	**2.025**
Netherlands	0.140	**5.452**	0.121	**1.688**	Peru	0.182	**12.957**	0.177	**2.329**
New Zealand	0.117	**1.887**	0.079	0.729	Philippines	0.086	**4.078**	0.078	0.882
Norway	0.173	**6.318**	0.158	**2.212**	Romania	0.453	**17.031**	0.414	**2.971**
Singapore	0.194	**6.555**	0.168	**3.210**	Sri Lanka	0.181	**9.899**	0.163	**1.851**
Sweden	0.155	**5.441**	0.144	**2.726**	Thailand	0.155	**6.538**	0.142	1.114
Switzerland	0.155	**3.291**	0.137	1.645	Turkey	0.323	**10.564**	0.312	**2.437**
UK	0.215	**5.776**	0.200	**2.193**	Venezuela	0.081	**5.306**	0.086	0.908
US	0.170	**5.601**	0.153	**2.057**	Zimbabwe	0.179	**2.663**	0.163	0.820

Panel B: Out-of-Sample

	R^2_{OS}	Bootstrap R^2_{OS} p-value	GOV CER Gain	GOV Sharpe Ratio		R^2_{OS}	Bootstrap R^2_{OS} p-value	GOV CER Gain	GOV Sharpe Ratio
Australia	0.033	0.000	0.059	0.659	Argentina	0.068	0.000	0.040	0.565
Austria	0.028	0.000	0.047	0.592	Bangladesh	-0.017	1.000	-0.019	0.300
Belgium	0.019	0.022	0.039	0.575	Brazil	0.035	0.000	0.022	0.233
Canada	0.029	0.000	0.046	0.592	China	0.025	0.970	-0.013	0.310
Denmark	0.018	0.017	0.032	0.502	Colombia	0.048	0.000	0.047	0.575
Finland	0.035	0.000	0.055	0.679	Egypt	0.029	0.000	0.032	0.205
France	0.024	0.001	0.040	0.561	India	0.008	0.000	-0.015	0.274
Germany	0.019	0.017	0.036	0.542	Indonesia	0.024	0.000	0.037	0.450
Hong Kong	0.036	0.000	0.062	0.672	Kenya	0.002	0.022	0.010	0.408
Ireland	0.025	0.000	0.038	0.538	Mexico	0.002	0.000	0.007	0.775
Japan	0.030	0.000	0.058	0.677	Morocco	0.024	0.000	0.036	0.642
Luxembourg	0.033	0.023	0.034	0.530	Pakistan	0.016	0.000	0.033	0.527
Netherlands	0.037	0.009	0.041	0.567	Peru	0.019	0.000	0.060	0.728
New Zealand	0.026	0.359	0.029	0.510	Philippines	0.024	0.000	0.024	0.394
Norway	0.035	0.000	0.034	0.512	Romania	0.036	0.000	0.068	0.388
Singapore	0.038	0.000	0.061	0.687	Sri Lanka	0.048	0.000	0.060	0.740
Sweden	0.047	0.000	0.055	0.663	Thailand	-0.016	1.000	-0.016	0.074
Switzerland	0.047	0.011	0.046	0.643	Turkey	0.005	0.012	0.009	0.145
UK	0.049	0.010	0.035	0.517	Venezuela	0.003	0.018	0.003	1.003
US	0.044	0.002	0.039	0.541	Zimbabwe	-0.018	1.000	-0.014	0.100

These results are from 2008, when the Kaufmann, Kraay, and Mastruzzi (2010) World Governance Indicator variables were first made available. The first five columns relate to the ability of each of the 20 STRONG_GOV country monthly excess returns in month t to predict the 20 WEAK_GOV country returns in month t+1. We present in-sample "pairwise average" results which are the average coefficient across the 20 WEAK_GOV countries being predicted by each WEAK_GOV country, and "pooled" results which is coefficient from a

pooled regression across the 20 WEAK_GOV countries. The results are based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. The second five columns present results for each of the 20 WEAK_GOV country returns to be predicted by STRONG_GOV country returns. The "pairwise average" result are the average coefficient across the 20 STRONG_GOV countries, while "pooled" result is from the pooled regression across the 20 STRONG_GOV countries. The Panel B out-of-sample results metrics are as per Table 3.

Table 5
Microstructure Biases and Permanent Impediments to Arbitrage

	Coefficient	t-Statistic
Panel A: Changes in Predictability over Time		
$R_{STRONG\_GOV,i,t}$	0.081	**2.795**
$Trend * R_{STRONG\_GOV,i,t}$	0.001	0.627
$Trend$	0.000	0.646
$R_{WEAK\_GOV,i,t}$	0.059	**1.860**
$Bill_{WEAK\_GOV,i,t}$	-0.086	-1.340
$DY_{WEAK\_GOV,i,t}$	2.118	0.91
Adjusted R^2	0.021	
Panel B: Two-Month Lag in STRONG_GOV Predictability		
$R_{STRONG\_GOV,i,t}$	0.140	**2.728**
$R_{STRONG\_GOV,i,t-1}$	0.034	1.010
$R_{WEAK\_GOV,i,t}$	0.058	1.344
$Bill_{WEAK\_GOV,i,t}$	-0.135	-0.384
$DY_{WEAK\_GOV,i,t}$	2.394	0.389
Adjusted R^2	0.014	

Panel A is the same as Table 2, except that a time-trend variable is included. Panel B is the same as Table 2, except that the *STRONG_GOV* country returns used to predict *WEAK_GOV* returns are lagged by two months instead of one month. The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Table 6
Timeliness of Reaction to World Innovation

	Sum Lag	Contemporaneous	Sum Lead
Panel A: Total World Innovation			
Coefficient	-0.095	0.156	-0.055
p-value	0.055	0.001	0.328
Panel B: Cash Flow Innovation			
Coefficient	-0.087	0.144	-0.051
p-value	0.055	0.001	0.317
Panel C: Discount Rate Innovation			
Coefficient	-1.078	1.784	-0.693
p-value	0.056	0.001	0.198

These results are derived from regressing the *STRONG_GOV* minus WEAK_GOV country returns contemporaneous, lead, and lag innovations from the MSCI World Index, using the method proposed by Brennan, Jegadeesh, and Swaminathan (1993). The Cash Flow and Discount Rate innovations are extracted using the VAR approach of Campbell (1990, 1991). There are two lead and lag months, so their *p*-values relate to the F-statistic. The contemporaneous *p*-value is for a t-statistic.

Table 7
Gradual Information Diffusion

	$R_{STRONG\_GOV,i,t}$
$\theta_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV}$, Coefficient	0.777
H_0: $\theta_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 1$, *t*-Statistic	**25.073**
$\lambda_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV}$' Coefficient	0.574
H_0: $\lambda_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 0$, *t*-Statistic	**60.047**
H_0: $\lambda_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 0$, $\theta_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 1$, Chi-Squared Statistic	3612
p-value	0.000

The model is as per Rapach, Strauss, and Zhou (2013). $\theta_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV}$ is a diffusion parameter that measures the proportion of the impact of a *STRONG_GOV* country return shock contemporaneously incorporated into *WEAK_GOV* returns, $\lambda_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV}$ is the total impact of a *STRONG_GOV* country return on *WEAK_GOV* returns. The null hypotheses of no information diffusion therefore are: H_0: $\lambda_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 0$, $\theta_{Ret\ WEAK\_GOV,Ret\ STRONG\_GOV} = 1$. All analysis is for the 1996–2014 period. The first column of results relates to all *STRONG_GOV* countries, while the second is for *STRONG_GOV* countries excluding the U.S.

Table 8
Slow Moving Capital: Market Opaqueness and Asymmetric Information

Panel A: PIN

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.133	**14.385**
$R_{STRONG\_GOV,i,t} * PIN\ Diff$	-0.406	**-3.938**
$PIN\ Diff$	0.027	**5.482**
$R_{WEAK\_GOV,i,t}$	0.040	**7.103**
$Bill_{WEAK\_GOV,i,t}$	-0.186	**-3.217**
$DY_{WEAK\_GOV,i,t}$	3.908	**18.773**
Adjusted R^2		0.024

Panel B: Financial Disclosure

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.126	**9.763**
$R_{STRONG\_GOV,i,t} * Disclosure\ Diff$	0.001	**1.930**
$Disclosure\ Diff$	0.000	-0.629
$R_{WEAK\_GOV,i,t}$	0.023	**3.940**
$Bill_{WEAK\_GOV,i,t}$	-0.242	**-4.223**
$DY_{WEAK\_GOV,i,t}$	2.336	**15.142**
Adjusted R^2		0.0183

Panel C: Analyst Coverage

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.137	**12.465**
$R_{STRONG\_GOV,i,t} * Analyst$	0.002	**2.668**
$Analyst$	0.000	**-3.710**
$R_{WEAK\_GOV,i,t}$	0.020	**3.642**
$Bill_{WEAK\_GOV,i,t}$	-0.258	**-4.504**
$DY_{WEAK\_GOV,i,t}$	4.926	**21.272**
Adjusted R^2		0.025

Table 8 is equivalent to Table 2 but three control variables are added. In Panel A, *PIN Diff* is the difference in the level of information based trading in each country, as expressed in the *PIN* measure Lai, Ng, and Zhang (2014) for *STRONG_GOV* and *WEAK_GOV* countries. Panel B contains *Disclosure Diff*, which is the difference in the financial disclosure index of Bushman, Piotroski, and Smith (2004) for *STRONG_GOV* and *WEAK_GOV* countries. In Panel C *Analyst Diff* is the difference between analyst coverage. between *STRONG_GOV* and *WEAK_GOV* countries from Chang, Khanna, and Palepu (2000). The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Table 9
Segmentation, Liquidity, Short-Selling Constraints, Country Size, Development, Trade, and Distance

Panel A: Segmentation

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.145	**2.846**
$R_{STRONG\_GOV,i,t} * SEG\ Diff$	-0.026	-0.632
$SEG\ Diff$	0.015	**2.971**
$R_{WEAK\_GOV,i,t}$	0.058	1.573
$Bill_{WEAK\_GOV,i,t}$	-0.127	-0.317
$DY_{WEAK\_GOV,i,t}$	2.425	0.724
Adjusted R^2	0.015	

Panel B: Liquidity

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.133	**2.529**
$R_{STRONG\_GOV,i,t} * Liquidity\ Diff$	0.016	1.457
$Liquidity\ Diff$	-0.001	-0.429
$R_{WEAK\_GOV,i,t}$	0.058	1.381
$Bill_{WEAK\_GOV,i,t}$	-0.150	-0.284
$DY_{WEAK\_GOV,i,t}$	2.464	0.623
Adjusted R^2	0.011	

Panel C: Short-Selling Constraints

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.107	**2.521**
$R_{STRONG\_GOV,i,t} * SS$	0.059	0.878
SS	0.002	**2.258**
$R_{WEAK\_GOV,i,t}$	0.054	1.113
$Bill_{WEAK\_GOV,i,t}$	-0.261	-0.525
$DY_{WEAK\_GOV,i,t}$	4.020	1.635
Adjusted R^2	0.025	

Panel D: Country Size

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.137	**2.924**
$R_{STRONG\_GOV,i,t} * Country\ Size\ Diff$	0.011	**1.679**
$Country\ Size\ Diff$	0.012	**2.329**
$R_{WEAK\_GOV,i,t}$	0.057	**1.668**
$Bill_{WEAK\_GOV,i,t}$	-0.249	-0.801
$DY_{WEAK\_GOV,i,t}$	2.442	0.917
Adjusted R^2	0.013	

Panel E: Development

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.145	**2.455**
$R_{STRONG\_GOV,i,t} * Development\ Diff$	-0.003	-0.078
$Development\ Diff$	-0.005	**-1.791**
$R_{WEAK\_GOV,i,t}$	0.058	1.479
$Bill_{WEAK\_GOV,i,t}$	-0.155	-0.390
$DY_{WEAK\_GOV,i,t}$	2.317	0.802
Adjusted R^2	0.014	

Panel F: Trade

	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.154	**2.624**
$R_{STRONG\_GOV,i,t} * Trade$	-0.174	-0.501
$Trade$	-0.062	-0.594
$R_{WEAK\_GOV,i,t}$	0.058	1.335
$Bill_{WEAK\_GOV,i,t}$	-0.136	-0.376
$DY_{WEAK\_GOV,i,t}$	2.553	0.393
Adjusted R^2	0.011	

Panel G: Geographic Distance		
	Coefficient	*t*-Statistic
$R_{STRONG\_GOV,i,t}$	0.549	**6.345**
$R_{STRONG\_GOV,i,t} * Distance$	-0.046	**-4.728**
$Distance$	0.000	0.358
$R_{WEAK\_GOV,i,t}$	0.060	**9.932**
$Bill_{WEAK\_GOV,i,t}$	-0.161	**-5.156**
$DY_{WEAK\_GOV,i,t}$	2.194	**12.948**
Adjusted R^2	0.020	

Table 6 is equivalent to Table 2, but seven alternative control variables are included. Panel A contains *SEG Diff*, which is the difference in the Bekaert, Harvey, Lundblad, and Siegel (2011) segmentation measure, based on Thompson Reuters Datastream data for *STRONG_GOV* and *WEAK_GOV* countries. In Panel B we calculate *Liquidity Diff*, which is log difference of monthly turnover (value traded / market capitalization). These data are sourced from the World Bank. In Panel C, *SS* is a dummy variable that equals 1 in months when short sales were allowed in a *WEAK_GOV* country, and 0 otherwise. This variable is calculated based on Jain, Jain, McInish, and McKenzie (2013). Panel D contains *Country Size Diff*, which is log difference of country GDP. These data are sourced from the World Bank. In Panel E, we control for relative level of development. We follow Marshall, Visaltanachoti, and Nguyen (2015) and generate a development index for each country based on market capitalization to GDP, traded value to GDP, turnover, number of listed firms, and concentration ratio. All these data are sourced from the World Bank. In Panel F, we control for trade linkages between countries based on IMF Direction of Trade Statistics data. Finally, we control for the distance between *STRONG_GOV* and *WEAK_GOV* capital cities in Panel FG. The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Appendix 1
Summary Statistics

Country	GOV Rank	GOV Group	Mean Return	Std. Dev. Return	Mean Risk-free	Std. Dev. Risk-free	N
Zimbabwe	1	Weak	0.013	0.082	0.040	0.047	49
Venezuela	2	Weak	0.033	0.108	0.014	0.007	228
Pakistan	3	Weak	0.017	0.094	0.008	0.003	228
Bangladesh	4	Weak	0.014	0.110	0.006	0.002	228
Kenya	5	Weak	0.017	0.067	0.009	0.005	228
Indonesia	6	Weak	0.014	0.087	0.011	0.010	228
Egypt	7	Weak	0.015	0.088	0.008	0.002	219
China	8	Weak	0.012	0.087	0.003	0.002	228
Colombia	9	Weak	0.013	0.063	0.009	0.008	228
Sri Lanka	10	Weak	0.015	0.074	0.010	0.003	228
Philippines	11	Weak	0.009	0.068	0.005	0.004	228
Peru	12	Weak	0.010	0.057	0.006	0.005	228
India	13	Weak	0.015	0.080	0.006	0.004	228
Morocco	14	Weak	0.010	0.046	0.003	0.001	228
Argentina	15	Weak	0.018	0.098	0.010	0.008	228
Turkey	16	Weak	0.034	0.138	0.035	0.033	228
Mexico	17	Weak	0.014	0.056	0.008	0.008	228
Thailand	18	Weak	0.008	0.096	0.003	0.003	228
Brazil	19	Weak	0.015	0.071	0.014	0.005	228
Romania	20	Weak	0.025	0.135	0.016	0.020	216
Bulgaria	21	Med	0.007	0.093	0.013	0.053	228
Croatia	22	Med	0.005	0.077	0.004	0.003	203
South Africa	23	Med	0.014	0.056	0.008	0.003	228
Malaysia	24	Med	0.007	0.068	0.003	0.001	228
Latvia	25	Med	0.005	0.088	0.004	0.004	203
Israel	26	Med	0.010	0.055	0.005	0.004	228
Greece	27	Med	0.005	0.091	0.004	0.003	228
Lithuania	28	Med	0.008	0.075	0.004	0.004	228
South Korea	29	Med	0.010	0.090	0.005	0.003	228
Italy	30	Med	0.007	0.062	0.002	0.002	228
Slovakia	31	Med	0.009	0.069	0.005	0.004	215
Poland	32	Med	0.011	0.077	0.007	0.005	228
Czech Republic	33	Med	0.011	0.063	0.003	0.003	228
Hungary	34	Med	0.014	0.085	0.008	0.005	228
Taiwan	35	Med	0.008	0.073	0.002	0.002	228
Estonia	36	Med	0.008	0.090	0.003	0.003	210

Slovenia	37	Med	0.011	0.073	0.005	0.003	228
Spain	38	Med	0.010	0.058	0.002	0.002	228
Cyprus	39	Med	0.004	0.121	0.003	0.001	228
Portugal	40	Med	0.006	0.055	0.003	0.001	228
Chile	41	Med	0.008	0.046	0.005	0.004	228
Japan	42	Strong	0.002	0.051	0.000	0.000	228
France	43	Strong	0.009	0.052	0.002	0.001	228
Hong Kong	44	Strong	0.009	0.072	0.002	0.002	228
U.S.	45	Strong	0.008	0.045	0.002	0.002	228
Belgium	46	Strong	0.009	0.048	0.002	0.001	228
Singapore	47	Strong	0.007	0.061	0.001	0.001	228
U.K.	48	Strong	0.007	0.041	0.003	0.002	228
Germany	49	Strong	0.008	0.055	0.002	0.001	228
Ireland	50	Strong	0.008	0.058	0.002	0.002	228
Australia	51	Strong	0.008	0.037	0.004	0.001	228
Austria	52	Strong	0.006	0.054	0.002	0.001	228
Canada	53	Strong	0.009	0.043	0.002	0.001	228
Luxembourg	54	Strong	0.009	0.053	0.003	0.001	228
Norway	55	Strong	0.010	0.060	0.003	0.002	228
Netherlands	56	Strong	0.007	0.055	0.002	0.001	228
Switzerland	57	Strong	0.007	0.043	0.001	0.001	228
Sweden	58	Strong	0.011	0.061	0.002	0.001	228
New Zealand	59	Strong	0.007	0.036	0.005	0.002	228
Denmark	60	Strong	0.011	0.053	0.002	0.001	228
Finland	61	Strong	0.013	0.081	0.002	0.001	228

This Table includes the mean and standard deviation of monthly excess returns and risk-free rates for 61 countries in our sample.

Appendix 2
Alternative Governance Classifications

Panel A: Alternative Governance Measures

		(1) La Porta et al.	(2) Djankov et al.	(3) Spamann	(4) GGI	(5) Lin et al. Horizontal	(6) Lin et al. Vertical	(7) PMI	(8) CPI
$R_{STRONG\_GOV,i,t}$	Coeff	0.123	0.127	0.119	0.147	0.106	0.130	0.059	0.126
	t-Stat	**3.131**	**3.139**	**3.862**	**3.065**	**4.416**	**2.513**	**2.601**	**2.438**
$R_{WEAK\_GOV,i,t}$	Coeff	0.056	0.067	0.075	0.052	0.067	0.090	0.130	0.067
	t-Stat	1.187	1.539	**1.756**	1.189	1.145	**1.872**	**3.711**	**1.541**
$Bill_{WEAK\_GOV,i,t}$	Coeff	-0.138	-0.135	-0.130	-0.270	-0.451	-0.464	-0.533	-0.422
	t-Stat	-0.345	-0.344	-0.331	-0.687	**-2.056**	**-2.018**	-0.197	**-2.326**
$DY_{WEAK\_GOV,i,t}$	Coeff	4.790	1.959	1.696	2.208	3.292	1.704	0.305	2.269
	t-Stat	0.488	0.286	0.250	0.321	0.333	0.240	0.252	0.347
Adjusted R^2		0.021	0.021	0.020	0.019	0.028	0.026	0.019	0.024

Panel B: World Bank Governance Indicator Components

		(1) Voice and Accountability	(2) Political Stability	(3) Government Effectiveness	(4) Regulatory Quality	(5) Rule of Law	(6) Control of Corruption
$R_{STRONG\_GOV,i,t}$	Coeff	0.101	0.108	0.152	0.099	0.135	0.142
	t-Stat	**1.992**	**2.246**	**2.704**	**2.257**	**2.382**	**2.414**
$R_{WEAK\_GOV,i,t}$	Coeff	0.072	0.062	0.093	0.094	0.097	0.094
	t-Stat	1.388	1.180	**1.663**	**1.670**	**1.853**	**1.825**
$Bill_{WEAK\_GOV,i,t}$	Coeff	-0.244	-0.290	-0.363	-1.202	-0.441	-0.456
	t-Stat	-0.605	-0.744	-0.442	-0.635	**-2.136**	**-2.162**
$DY_{WEAK\_GOV,i,t}$	Coeff	2.516	2.524	2.014	2.222	1.852	1.868
	t-Stat	0.340	0.335	0.272	0.320	0.256	0.255
Adjusted R^2		0.017	0.011	0.021	0.015	0.027	0.027

This Table is as per Table 2, except that alternative country GOV classifications are used. In Panel A, "La Porta et al." refers to the La Porta, Lopez-de-Silanes, and Shleifer (2006) classifications. "Djankov et al." is based on the LLS variables, but the LLS anti-directors rights index is replaced with that from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008). "Spamann" is the LLS variables and the Spamann (2010) anti-directors rights index. PMI refers to the distance to frontier measure for the Protecting Minority Investors measures from the World Bank. GGI is the "Good Governance Index" of Morck, Yeung, and Yu (2000) and Karolyi, Lee, and van Dijk (2012). "Lin et al. Vertical" and "Lin et al. Horizontal" are the Lin, Massa, and Zhang (2014) and Acemoglu and Johnson (2005) vertical and horizontal governance measures, respectively. CPI refers to the "Corruption Perceptions Index" from Transparency International. Panel B shows results for the six WGI sub-groups. The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Appendix 3
Medium Governance, Reverse Causality and China Predictability

	Coefficient	*t*-Statistic
Panel A: STRONG_GOV Country Excess Returns Predicting MEDIUM_GOV Country Excess Returns		
$R_{STRONG\_GOV,i,t}$	0.139	**2.637**
$R_{MEDIUM\_GOV,i,t}$	0.098	**1.797**
$Bill_{MEDIUM\_GOV,i,t}$	-0.479	-1.802
$DY_{MEDIUM\_GOV,i,t}$	0.289	0.257
Adjusted R^2	0.033	
Panel B: MEDIUM_GOV Country Excess Returns Predicting WEAK_GOV Country Excess Returns		
$R_{MEDIUM\_GOV,i,t}$	0.068	**3.011**
$R_{WEAK\_GOV,i,t}$	0.070	**1.679**
$Bill_{WEAK\_GOV,i,t}$	-0.173	-0.483
$DY_{WEAK\_GOV,i,t}$	2.382	0.382
Adjusted R^2	-0.022	
Panel C: WEAK_GOV Country Excess Returns Predicting STRONG_GOV Country Excess Returns		
$R_{WEAK\_GOV,i,t}$	0.016	1.453
$R_{STRONG\_GOV,i,t}$	0.141	**2.569**
$Bill_{STRONG\_GOV,i,t}$	-2.979	-0.698
$DY_{STRONG\_GOV,i,t}$	1.267	0.132
Adjusted R^2	-0.027	
Panel D: China Returns Predicting STRONG_GOV Country Excess Returns		
$R_{China,t}$	0.026	0.704
$R_{STRONG\_GOV,i,t}$	0.142	**2.435**
$Bill_{STRONG\_GOV,i,t}$	-2.910	-0.446
$DY_{STRONG\_GOV,i,t}$	1.333	0.084
Adjusted R^2	0.030	

In Panel A, we test the ability of *STRONG_GOV* country returns to predict *MEDIUM_GOV* country returns, while in Panel B we test the ability of *MEDIUM_GOV* country returns to predict *WEAK_GOV* country returns. In Panel C, reverse causality across all *WEAK_GOV* and *STRONG_GOV* countries is considered, while in Panel D, we test the ability of Chinese excess returns to predict *STRONG_GOV* country returns. The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. *t*-statistics that are statistically significant at the 10% level or more are in bold.

Appendix 4
Controlling for U.S. Predictability and Different Market Closing Times

	Coefficient	t-Statistic
Panel A: STRONG_GOV Country Excluding U.S. Returns Predicting WEAK_GOV Country Returns		
$R_{STRONG\_GOV\ X\ U.S.,i,t}$	0.153	**1.939**
$R_{WEAK\_GOV,i,t}$	0.059	1.284
$Bill_{WEAK\_GOV,i,t}$	-0.152	-0.425
$DY_{WEAK\_GOV,i,t}$	2.262	0.325
Adjusted R^2	0.006	
Panel B: Different Market Closing Times		
$R_{STRONG\_GOV,i,t}$	0.157	**3.323**
$R_{WEAK\_GOV,i,t}$	0.031	0.811
$Bill_{WEAK\_GOV,i,t}$	-0.213	-0.589
$DY_{WEAK\_GOV,i,t}$	2.196	0.314
Adjusted R^2	0.011	
Panel C: Dynamic Reclassification		
$R_{STRONG\_GOV,i,t}$	0.135	**2.632**
$R_{WEAK\_GOV,i,t}$	0.063	**1.882**
$Bill_{WEAK\_GOV,i,t}$	-0.347	**-3.364**
$DY_{WEAK\_GOV,i,t}$	2.085	0.266
Adjusted R^2	0.020	
Panel B: All in US$		
$R_{STRONG\_GOV,i,t}$	0.113	**1.889**
$R_{WEAK\_GOV,i,t}$	0.114	**2.098**
$Bill_{WEAK\_GOV,i,t}$	0.063	**2.645**
$DY_{WEAK\_GOV,i,t}$	2.282	0.372
Adjusted R^2	0.019	

In Panel A, we exclude the U.S. from the *STRONG_GOV* country group. In Panel B, the final day of the month is excluded from each *STRONG_GOV* country return. This ensures that any predictability documented is not due to a *STRONG_GOV* country's exchange closing after the *WEAK_GOV* country's exchange. In Panel C we reclassify *STRONG_GOV* and *WEAK_GOV* each year. In Panel D all results are in US$. The results are generated for the 1996–2014 period

based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. t-statistics that are statistically significant at the 10% level or more are in bold.

Appendix 5
Predictability in Good Times and Bad Times

	Coefficient	*t*-Statistic
Panel A: Good Times		
$R_{STRONG\_GOV,i,t}$	0.132	**3.136**
$R_{WEAK\_GOV,i,t}$	0.015	0.314
$Bill_{WEAK\_GOV,i,t}$	0.304	0.494
$DY_{WEAK\_GOV,i,t}$	1.527	0.253
Adjusted R^2	0.009	
Panel B: Bad Times		
$R_{STRONG\_GOV,i,t}$	0.244	**2.683**
$R_{WEAK\_GOV,i,t}$	0.062	0.829
$Bill_{WEAK\_GOV,i,t}$	-1.308	-0.470
$DY_{WEAK\_GOV,i,t}$	3.749	0.538
Adjusted R^2	0.079	
Panel C: Risk		
$R_{STRONG\_GOV,t}$	0.152	**2.722**
$\sigma_{WEAK\_GOV,t}$	0.050	1.363
$R_{WEAK\_GOV,t}$	-0.709	-0.919
$Bill_{WEAK\_GOV,t}$	2.134	0.371
$DY_{WEAK\_GOV,t}$	0.473	**4.566**
Adjusted R^2	0.129	

This table is the same as Table 2 except that in Panels A and B the time period is divided into "Good Times" and "Bad Times" based on *WEAK_GOV* country returns. Following Cooper, Gutierrez, and Hameed (2004) bad (good) times are periods when previous three-year returns are negative (non-negative). The Panel C results control for the risk of WEAK_GOV country returns, which is measured based on the volatility of WEAK_GOV countries. The results are generated for the 1996–2014 period based on the GMM approach of Ang and Bekaert (2007) with Hodrick (1992) standard errors. t-statistics that are statistically significant at the 10% level or more are in bold.