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**WHAT DRIVES INTERNATIONAL STOCK
RETURN COMOVEMENTS?**

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Abstract

This paper presents new evidence on international financial market integration using stock analyst earnings forecasts from 37 countries. By examining cash flow and discount rate news co-movements, we find that the financial and economic aspects of global market integration have diverged over time as financial integration has developed particularly more rapidly than economic integration over the past decade. However, this divergence is less severe in emerging markets when compared with developed markets, where financial integration has proceeded at a slower pace. We find that financial integration has developed relatively slowly in emerging markets due to the hampering effects of their poor information environments.

Keywords: financial market integration, stock analysts, cash flows, discount rates, R2

JEL Classification: G15, F36

1 Introduction

Within international finance, the current understanding of the determinants of global market integration remains incomplete. While the importance of both explicit and implicit barriers to financial integration have been recognized in recent advances within International Finance (Carrieri, Chaieb and Errunza (2009), Bekaert et al. (2007, 2008)), the importance of the real economic and financial dimensions of integration are not recognized. This is an important concern because international asset pricing relies fundamentally on the degree of financial market integration to define the costs of capital and expected returns. It is easily conceivable that globalization encompasses both facets of financial and economic integration. Hence, the key objectives of this paper are to first introduce a new approach to assess the financial and economic linkages encapsulated by global market integration; and second, to understand the fundamental differences in the barriers to financial and economic aspects of market integration. In doing so, we are better able to provide some policy directions on how to gain the known welfare benefits that are associated with global integration (see Lewis (1999)).

It is widely accepted in both international finance and international macroeconomics that financial and economic integration go hand-in-hand. Thus, it is surprising that since the earlier work of Ammer and Mei (1996), which decomposed the second moment of stock returns into dividend and expected return innovations using Campbell's (1991) framework, few attempts have been made to simultaneously assess both economic and financial integration within the broader context of globalization. This is primarily due to the challenges in finding reliable empirical proxies for expected cash-flows. However, it is important to understand both the economic and financial facets of globalization because both cash-flows and discount rate components will influence the convergence in equity prices worldwide. World market integration can be attributable to not only the investors' use of common discount factors in pricing international securities but also the synchronization of economic conditions, which leads to common cashflows.

Stock price in the discounted cash flow framework is defined as the present value of expected

future cash flows discounted at a rate of return that reflects systematic risk. We demonstrate in this paper that a decomposition of price changes into discount rate and cash-flow news components. In addition, using consensus analyst earnings forecasts enables a useful examination of the underlying economic and financial facets of integration within a global context. Specifically, we use stock analysts' monthly consensus forecasts for future earnings obtained from Thomson Reuters' I/B/E/S database to extract firm-specific discount rate and cashflow news for each firm from a standard valuation framework; similar uses feature in Claus and Thomas (2001), Pastor, Sinha and Swaminathan (2006) and Chen and Zhao (2008) and Hail and Leuz (2006). As shown by Chen and Zhao (2008), a price change in the present value of future dividends framework can be decomposed into two fundamental asset pricing components: the cash flow (CF) news (holding discount rate constant) and the discount rate (DR) news (holding CF constant).

Our novel approach to extract information on the investor's expectations from forward-looking stock analyst earnings forecasts to test financial market integration provides complementary evidence for the international asset pricing literature. In the context of the international capital asset pricing model (ICAPM): if markets are globally integrated, then variations in national stock market returns (and it follows, the underlying cash-flow and discount rate news components) should predominantly be driven by the value-weighted global market portfolio; that is, higher co-movements in these stock price components for local and world market portfolios should be observed in globally integrated equity markets. Consequently, we examine the covariation between these two main underlying components of stock returns in country and global market portfolios. First, we conduct a variance decomposition; and second, we separately regress these two local market components with those from a world portfolio to generate integration measures that we interpret to represent the economic and financial facets of global market integration, respectively. Our integration measures are similar to the R^2 measure that was introduced by Pukthuanthong and Roll (2009) to capture the explained variance from a multi-global factor asset pricing model. Our novel perspective offers new and powerful insights into the development of global market integration.

Our empirical evidence suggests that the conventional return-based frameworks to assess finan-

cial market integration may be masking the underlying effects of financial and economic convergence. Our variance decomposition suggests that while both components of stock price changes are positively correlated with returns, their own correlations are actually strongly negative indicative of their differing contributions to equity market integration. To further assess this point, we run a horse race to estimate the relative importance of various country-level factors to cross-sectional and time series variation in the two aspects of global integration. As we empirically demonstrate in this paper, these processes are actually driven by different sets of determinants. Our comparison of the two fundamental components of asset valuation offers new insights into international financial integration.

Our findings are on three levels. First, as measured by R^2 metrics, we find that the financial and economic dimensions to global integration have diverged over time because financial integration has developed more rapidly than economic integration. However, this divergence is less severe in emerging markets when compared with developed markets, where financial integration has proceeded at a slower pace. Second, from our comparison of the set of determinants for the two aspects of global equity market integration, we find that financial integration has been slower in emerging markets thanks to the hampering effects of their poor information environments. Third, we reveal as part of our return that decomposition persists.

We contribute to the financial integration literature in the following respects. First, we develop a new approach to measuring and disaggregating the two key aspects of global market integration represented in stock returns. Second, we document the patterns in these two aspects of global integration over recent time. Third, we provide new evidence on the differential drivers of financial and economic facets of international equity market integration.

The remainder of this paper will proceed as follows. Section II reviews the literature on measures of market integration and previous uses of stock analyst forecasts. Section III presents the methodology and sample construction techniques. Section IV provides a first look at the development of financial and economic integration over time and countries, Meanwhile, Section V discusses our analysis on the determinants of cash flow and discount rate news co-movements. Finally, Section

VI draws a conclusion.

2 Literature Review

While there is a growing body of literature that uses analyst forecasts to examine asset valuations, to our best knowledge this is the first study to use stock analysts' forecasts to study international market integration. We propose the application of the long-standing present value framework to offer a new perspective on global integration. We begin by reviewing the previous empirical tests for financial and economic integration, and we then review the previous use of stock analyst forecasts.

2.1 Measures of financial and economic integration

There is a well-established body of literature that analyzes financial market integration. The empirical measures that have been used to assess the degree of financial integration have primarily been return-based measures within an international asset pricing context.

Traditionally, international financial integration is characterized by the linkages in conditional means and variances of stock market returns sampled over monthly, weekly or daily intervals; see for instance, Wheatley (1988), Campbell and Hamao (1992) and Chan, Karolyi and Stulz (1992). Extending from this, Bekaert and Harvey (1995) introduced a Markov regime switching model to intuitively capture the transition of international financial markets between states of full segmentation to full integration, as reflected by the risks that are priced in equity securities under these conditions. To account for partial integration/segmentation, Carrieri, Errunza and Hogan (2007) introduced an integration index based on the variance ratios of a market portfolio of eligible stocks to the total country stock market (portfolio) index. Furthermore, in their generalized world CAPM, De Jong and De Roon (2005) consider a segmentation risk premia to be priced into emerging stock market expected returns and they allow world market betas to vary with market segmentation. In a more recent study, Bekaert et al. (2009) employ a factor model with time-varying regional and world components to investigate trends in international stock market co-movements. Interestingly, they find that with the exception of countries within Europe, there have been no upward trends in

international equity co-movements.

In a financially integrated world, the discount rate would be a function of the world discount rate because innovations in this would be priced globally. This has led to tests for market integration. For example, Bekeart et al. (2008) use the absolute difference in earnings yield ratios and Bekeart et al. (2009) use industry Price-Earnings ratios to capture the global pricing of worldwide growth opportunities. Similarly, Ammer and Wongswan (2004) and Ammer and Mei (1996) have used correlations in discount rate components as measures of global financial integration.

The law of one price has been applied not only to financial assets for gaging financial market integration but also in goods markets. However, it has been difficult to test the law of one price in both financial asset and goods markets due to differences in the way in which prices are measured and the reliance on the existence of identical goods or financial assets with the same level of risk in different countries. Other attempts to measure real economic integration involve computing ratios of trade to total economic activity (sum imports and exports to national output) or analyzing the international transmission of business cycles based on either co-movements or lead-lag relationships in national output growth, output volatility or other types of macroeconomic indicators; see for example, Imbs (2004), Kose, Prasad and Teronnes (2003). Alternatively, Ammer and Mei (1996) measure real economic integration with the correlations of dividend innovations between different countries using the common vector autoregression (VAR) approach. They argue that in a fully integrated international economic system with labor and capital mobility, common shocks will have similar impacts on economic growth, and hence on corporate earnings and dividends across countries. We follow this spirit and interpret co-movements in cash-flow news as a measure of economic integration. However, we are freed from the statistical biases induced by the VAR specification as detailed in Chen and Zhao (2008) because we are able to construct direct proxies for country (portfolio) and global (portfolio) cash-flow news from accounting data and stock analysts' earnings forecasts.

Taken together, our approach is consistent with Pukthuanthong and Roll's (2009) latest R^2 measure for global market integration. We essentially provide quantitative measures on the common

global components in cash-flow and discount rate news components within international stock returns to capture global economic and financial integration, respectively.

2.2 Informativeness of stock analyst forecasts

There is an established accounting and finance literature on the informativeness of stock analysts' annual earnings forecasts. There is also clear evidence that the consensus forecasts drawn from analyst tracking services such as I/B/E/S reflect markets' earnings expectations and play a key role in price formations. Liu, Nissin and Thomas (2002) have demonstrated that forward earnings forecasts provide the best explanation for stock prices, which suggests that future expectations drive prices. As such, information on the investor's expectations on future returns (discount rates) implied from stock analysts earnings forecasts and market prices should be useful to assess the degree of financial market integration (i.e., the extent to which international assets with similar risks are being priced in the same way). Similar arguments can be made for cash flow forecasts to capture the degree of economic integration across markets in the sense of Ammer and Mei (1996).

Specifically, implied cost of capital models have been used and studied extensively in the accounting and finance literature; see for instance Hail and Leuz (2006) and Lee, Ng and Swaminathan (2007). The basic idea of these empirical models is to substitute price and earnings forecasts into a valuation equation and to back out the cost of capital as the internal rate of return that equates current stock price with the expected future sequence of residual incomes or abnormal earnings.

In a closely related study, Chen and Zhao (2008) have argued that analysts' revisions in consensus earnings forecasts should reflect not only changes in market's views about future expected returns but also earnings. Hence, we adopt their approach in this paper to decompose returns using stock analysts earnings forecasts. Similarly, a number of other studies have applied return decomposition frameworks to study asset pricing issues; see for instance Campbell and Vuolteenaho (2004), Campbell, Polk and Vuolteenaho (2009). We contribute to this line of investigation by utilizing a return decomposition enabled by short and long term analyst earnings forecasts to jointly assess financial and economic integration for the first time.

3 Methodology and Sample Construction

3.1 Methodology

We decompose price changes into cash flow news and discount rate news using analyst forecasts, following the approach of Chen and Zhao (2008). We start with Claus and Thomas's (2001) residual income valuation model to define stock price as

$$P_t = BV_t + \sum_{\tau=1}^{\infty} \frac{(E\hat{P}S_{t+\tau} - R_t \cdot BV_{t+\tau-1})}{(1 + R_t)^\tau}, \quad (1)$$

where P_t is market price of a firm's stock at time t , BV_t is the book value per share at time t , $E\hat{P}S_{t+\tau}$ is the expected future earnings per share for period $(t+\tau-1, t+\tau)$, and R_t is the discount rate at time t . Given that financial analysts provide forecasts up to five years in I/B/E/S, beyond year five the residual income is assumed to grow at the rate G . Equation (1) can be simplified into

$$P_t = BV_t + \sum_{\tau=1}^5 \frac{(E\hat{P}S_{t+\tau} - R_t \cdot BV_{t+\tau-1})}{(1 + R_t)^\tau} + \frac{(E\hat{P}S_5 - R_t \cdot BV_4)(1 + G)}{(R_t - G)(1 + R_t)^5} \quad (2)$$

$$= BV_t + f(E\hat{P}S^t, R_t), \quad (3)$$

where $E\hat{P}S^t$ is the vector of earnings forecasts at time t . Stock price is equal to the sum of book value per share and growth potential, which is a function of earnings forecasts and discount rate. If there is any change in the stock price after financial disclosure of the current book value, then it is either caused by news of future earnings or news from discount rate.

Stock price changes (returns excluding dividends) in time t can be decomposed into

$$RET X_t = \frac{P_{t+1} - P_t}{P_t} = \frac{BV_{t+1} - BV_t}{P_t} + \frac{f(E\hat{P}S^{t+1}, R_{t+1}) - f(E\hat{P}S^t, R_t)}{P_t} \quad (4)$$

$$= \frac{BV_{t+1} - BV_t}{P_t} + \frac{f(E\hat{P}S^{t+1}, R_{t+1}) - f(E\hat{P}S^t, R_{t+1})}{P_t} \quad (5)$$

$$+ \frac{f(E\hat{P}S^t, R_{t+1}) - f(E\hat{P}S^t, R_t)}{P_t} \quad (6)$$

$$= A_t + CF_t + DR_t, \quad (7)$$

where $A_t = \frac{BV_{t+1} - BV_t}{P_t}$ is the change in book values of assets per share in time t , $CF_t = \frac{f(E\hat{P}S^{t+1}, R_{t+1}) - f(E\hat{P}S^t, R_{t+1})}{P_t}$

is the cash flow news caused by updates in earnings forecasts, holding expected returns constant and

$DR_t = \frac{f(\hat{EPS}^t, R_{t+1}) - f(\hat{EPS}^t, R_t)}{P_t}$ is the discount rate news caused by revisions in investors' expected returns, holding cash flows constant.

Even though price changes are determined by A_t , CF_t , and DR_t , we try to focus on cash flow and discount rate news, given that A_t reflects realized changes in asset values instead of revisions in expectations of future cash flows or discount rates. We proxy returns as price changes by removing A_t . In the following work, we do the decomposition for each stock and each month across countries. After CF_t and DR_t are estimated for each stock, they are aggregated at the country level and are value-weighted by the firms' market values at t .

3.2 Sample Construction

We use consensus stock analyst earnings and growth forecasts from the I/B/E/S (Thomson Financial) database for the entire sample period from 1993–2007. Furthermore, PE ratios were computed using stock price and one to five year earnings forecasts that are updated monthly in I/B/E/S. In addition, annual firm-specific dividend payout ratios, market capitalization and book to market values are matched from Datastream.

For each firm in a given year, we estimate its ex ante internal discount rates as implied by the stock price and earnings forecast information. The value-weighted average discount rate estimates of all sample firms in the country is employed as a proxy for the country-level discount rate.

We obtain financial information from the Worldscope database and analyst earnings forecasts (proxies for future earnings) and stock price information from the I/B/E/S database. All information is denominated in local currency. Our sample includes firms that have current stock price P_t , earnings forecasts of one and two periods ahead (\hat{EPS}_{t+1} and \hat{EPS}_{t+2}), and either \hat{EPS}_{t+3} through \hat{EPS}_{t+5} or a long-term earnings growth forecast. Only positive earnings forecasts are employed. All of the analyst earnings forecasts are mean analyst consensus forecasts in I/B/E/S and this information is updated every third Thursday of each month. We use an iterative algorithm to back out the value of each R from the model, and R is constrained to be positive or missing otherwise. The iterative procedure stops when the imputed price is within a 0.001 difference of its

actual price.

Table 1 reports the annual average number of unique firms (N) that we use to compute the implied cost of capital (R) for each of the 21 developed and 16 emerging countries in our sample. In addition, we summarize the dividend payout ratios, long-term growth forecasts, Price-to-earnings ratios based on one and five year ahead earnings forecasts, and book-to-market ratios (BM) for firms in each country. Consistent with Lau, Ng and Zhang (2009) we document that there is substantial international variation in R between developed (10% for most) and some emerging countries (22% for Korea). Payout rates are higher on average in developed markets than in emerging markets where there are more smaller firms with greater earnings growth potential. PE_1 is much higher than PE_5 , which reflects that market price must be incorporating all future earnings. Meanwhile, (BM) is higher on average for emerging market firms than developed market firms, which is consistent with lower market valuations.

To first understand how equity investors and analysts collectively revise their expectations regarding future stock returns and earnings as their information set is updated, we compile a correlation matrix for analyst revisions in EPS and expected returns. Table 2 shows the average of pairwise correlations between the monthly revisions in EPS forecasts based on forecasts over 1 to 5 year horizons and discount rate news over three different sub-sample time periods: 1993–1997, 1998–2002 and 2003–2007, as well as all firms and developed and emerging market sub-samples. Correlations between earnings forecasts are highest in horizons one year apart. Not surprisingly, the table also reveals that there is more persistence in stock analysts’ earnings forecasts in developed than emerging markets but persistence in earnings forecasts have increased over time. The discount rate is more highly correlated with longer term earnings forecasts across all countries.

4 Economic and Financial Integration

In this section, we aim to establish the two distinct facets of global market integration.

We begin by conducting a variance decomposition for stock returns into the underlying cashflow and discount rate news components to understand the importance of these two components in

driving stock returns.

Table 3 summarizes the variances of stock returns (excluding dividends) and the decomposed cash flow and discount rate components, as well as their co-movements (measured as covariances and standardized correlation coefficients). Equal-weighted averages for developed and emerging market firms are reported over different time periods. Consistent with stylized facts, volatility in emerging markets are higher on average than in developed markets in all sub-sample periods. The discount rate news component of aggregate returns is more volatile than the cash-flow news component and these two components are negatively correlated, which highlights that they represent different aspects of firms' performance, especially in emerging markets. This suggests that the distinction in these two components of returns is important in assessing and understanding the process of global market integration. Contrary to Chen and Zhao's (2008) results, we find that discount rate news is the more important influence on international stock returns and its importance has only increased over time.

To understand how these two key components underlying international stock returns may have contributed to global market integration over time, we run time series regressions with monthly observations for the full sample and for three sub-sample periods and emerging/developed market groups to test for international asset pricing equilibria. We first estimate the single factor international asset pricing model by using the world market portfolio returns (excluding dividends) to explain local market country portfolio returns. Assuming there is only a single world factor that is priced in internationally integrated markets, we interpret the explained variance (R^2) measure from this regression as the degree of global market integration introduced by Pukthuanthong and Roll (2009). As Pukthuanthong and Roll (2009) suggest, the proportion of local returns that can be explained by global factors are 'sensible intuitive quantitative measures of financial market integration' (p.1). The intuition is that if countries are influenced by the same global forces, then there must be a high degree of integration. We then separately substitute the local and world market portfolio returns for local and world portfolio cashflow and discount rate news to derive (R^2) measures to capture the economic and financial aspects of global market integration. If na-

tional financial markets are highly integrated, then we should also find high R^2 for cash flow news and discount rate news regressions because they will reflect common exposures to international macroeconomies and equity markets (changes in risk), respectively. Put simply, in an integrated state, global cashflow and discount rate news should be priced.

[insert the equations here]

Table 4 presents the full and sub-sample estimation results for the local returns (and news components) of each country's firms, which are explained by the value weighted average returns (news components) of the world market portfolio. Consistent with stylized facts and previous research (Bekaert and Harvey, 2000), we reveal that in all of the sub-sample periods the betas for emerging market firms are higher than for developed market firms, while the (R^2) measures of their world market integration are lower. The degree of global market integration for developed markets have been consistently higher than for emerging countries and have significantly increased over the past decade (from an (R^2) of 0.316 in 1993–1997 to 0.509 in 2003–2007). As argued by Pukthuanthong and Roll (2009), the simple (R^2) metric is a much more accurate measure for global market integration than traditional correlations. As such, whilst Bekaert, Hodrick and Zhang (2009) find no trend in international stock return co-movements (except in Europe), we document here increasing global integration in both economic and financial terms.

We also reveal in Table 4 that while both financial and economic integration have deepened over time, they have also diverged because financial integration (measured as R^2 for discount rate news) has developed particularly more rapidly than economic integration (measured as R^2 for cash flow news) since the late-1990s. The test of difference in the two R^2 measures, while significant for both emerging and developed markets in the two most recent sub-sample periods of 2003–2007 and 1998–2002, are highly significant at the 1% level for developed markets (t statistics of 6.24 and 6.05, respectively). In the first sub-sample period from 1993–1997, the degrees of economic and financial integration were not statistically different. However, financial integration has since outpaced economic integration in developed markets, which has led to a marked divergence in these two fundamental facets of global market integration. An 'integration index' computed from the

ratios of CF and DR R^2 s to aggregate return R^2 s over time can shed some light on the contribution of the two underlying return components' international comovements to the overall process of international stock market integration. The time-variations in these integration indexes indicate that international investors common pricing of discount rate news has made an increasingly greater contribution to stock market integration relative to cashflow news. Their contributions towards global market integration has diverged from similar levels (0.739 vs. 0.655) to (0.742 vs. 0.412) for DR and CF news, respectively. While DR news has maintained its influence in driving global market integration, CF news has declined in its integrative role for international stock returns.

In summary, subsample analyses on the R^2 reveal that financial and economic integration have diverged over time as financial integration has developed more rapidly than economic integration. However, this divergence is less severe in emerging markets when compared with developed markets, where financial integration has proceeded at a slower pace.

Having identified that financial integration has recently increased more rapidly than economic integration, we will seek to understand why there has been a global divergence in economic and financial integration in the next section. We address this research question using both cross-sectional country-level regressions and panel data estimations to identify the characteristics of more financially and economically integrated countries.

5 Determinants of Financial and Economic Integration

We seek to conduct several horse races to investigate how the variations in potential barriers to perfect market integration (over time and across countries) affect the development of financial and economic facets of global market integration (as measured by discount rate and cash-flow R^2 metrics). The seven categories of market-level barriers (both implicit and explicit) that we examine broadly capture the quality of the information environment, trading costs, market openness, market development, risks, regulatory quality and other relevant market characteristics that are deemed to be important in the existing literature.

5.1 Barriers to Global Market Integration

We consider seven key categories of variables, which will be discussed as candidate determinants.

Information Environment

The transparency of the information environment has been identified in the literature as a major implicit barrier for international investments and financial integration (Bae, Bailey and Mao, 2006). Hence, we consider several variables that measure the quality of the information environment. First, we account for the smoothness of accounting reports measured as the ratio of the standard deviations of operating income to operating cash flows over the past 5 years. Second, we use analyst forecast dispersion.

The other proxies that we consider include the correlations between changes in accruals and operating cashflows over the past 5 years because higher correlations would suggest less manipulation. Forecast error is measured as the absolute deviation of announced earnings from the mean of estimated earnings scaled by the mean of analyst forecasts. Stock market synchronicity was suggested by Morck, Yeung and Yu (2000).

Trading Cost

Trading cost includes turnover and effective spread.

Financial and Economic Openness

This includes investibility home bias foreign direct investment to GDP market segmentation measure of Bekaert, Harvey, Lundblad and Siegel (2008).

Financial and Economic Development

This includes Market value to GDP, Private credit to GDP, and GDP per capita.

Financial and Economic Risk

This includes stock market volatility as measured by the standard deviation of stock market returns book to market ratio output volatility and economic growth.

Financial and Economic Regulation

This includes investment profile index on the combined risk of expropriation, contract viability, payment delays and the ability to repatriate profits. Law and Order measured by ICRG’s law and order index. Accounting standards as measured by La Porta’s accounting standard index. Good government index of Morck, Yeung and Yu (2000).

Properties of Equity Markets

Average market capitalization of firms in a country as size of firms has been linked to the ease of financial integration (Huang, 2007). This includes the total number of listed firms on all stock exchanges within a country and the average implied cost of capital for firms within a country

5.2 Univariate and Multivariate Analysis and Results

We begin with some simple single-factor regressions for economic and financial integration measures to identify the set of potential market level barriers that are important and the best proxies to use. Table 5 presents the estimation results for economic integration (cash-flow R^2) in Panel A and financial integration (cash-flow R^2) in Panel B, respectively. We find that the estimated beta coefficients for our comprehensive list of empirical proxies are mostly significant and of the correct sign. In comparing the overall significance of the variable groups for economic and financial integration, we note that there is a substantial overlap in the determinants for these two types of integration. In particular, we reveal that proxies for financial and economic openness, financial and economic risks and development, regulatory quality and the implied cost of equity capital are mostly significant for both. However, one stark finding is that financial integration is additionally sensitive to the information environment and accounting standards, while economic integration is not.

Our proxies for the transparency of the information environment are primarily based on those commonly used in the financial accounting literature to capture the smoothness of accounting reports, the extent to which managers manipulate accruals, the dispersion in analyst forecasts, and the analysts’ forecast errors. In addition, we also include equity market synchronicity (*Synch*),

which we find is the only significant proxy for economic integration. *Synch* is constructed as the R^2 measure detailed in Morck, Yeung and Yu (2000). It measures the extent to which market-wide information is reflected in stock price movements as opposed to firm-specific information. As expected, higher *Synch* is associated with lower levels of global market integration (inverse relation).

Interestingly we find that within international financial markets, the transaction costs are not sufficiently high enough to hinder financial nor economic integration.

Extending on our univariate results, we perform cross-sectional multivariate regressions to assess the collective explanatory power and relative importance of the main determinants identified for financial and economic integration. The cross-sectional country level multivariate regression results are shown in Table 6. We estimate nine different model specifications to capture the combined explanatory power of empirical proxies for the various types of market level barriers to global integration. In essence, we conduct partial horse races for explanatory variables within groups and full horse races with the entire suite of empirical determinants.

In comparing model specifications across Panels A and B of Table 6, it is again clear that there are fundamental differences in the drivers of economic and financial integration. In Model 1, financial integration is more sensitive to information proxies because both the smoothness of accounting reports and dispersion in analyst forecasts are economically and statistically significant. In Model 5, we observe that financial integration is solely influenced by stock market volatility whilst economic integration is additionally affected by economic growth. In Model 6, we reveal that country (political) risk and law and order is imperative for financial integration but not economic integration. In Model 7, while the implied cost of capital continues to be a significant factor for both financial and economic integration, there is also incremental explanatory power provided by the size and number of listed firms for financial market integration. For the full horse races conducted in Models 7 and 8, we can see that the information environment is important for financial but not economic integration. This result echoes the prior work of Bae, Bailey and Mao (2006), who find that market liberalization improved the financial information environment of emerging

markets. Finally, it is also important to note that the degree of home bias in institutional investment portfolios presents a major barrier to integrating markets financially and economically. This new result contributes to the extensive home bias literature within international finance (see Chan, Covrig and Ng (2005) for an exposition). This clearly suggests that attempts to reduce the extent of home bias around the world can play a key role in further encouraging globalization. Furthermore, the significance of both the implied cost of capital and home equity bias in discouraging both financial and economic aspects of integration is consistent with the work of Lau, Ng and Zhang (2009) in that home bias leads to a higher cost of capital.

5.3 Panel Regression Results

It is well-established in the existing literature that market integration is a time-varying process (Carrieri, Errunza and Hogan (2007)) and may be influenced by country characteristics.

Thus, to account for both cross-country and time-series variations in global market integration, we estimate panel regressions with monthly cash-flows and discount rate news for our 37 sample countries. Instead of country-level R^2 , we directly employ standardized cash flow news and discount rate news as dependent variables in a panel regression context. We then allow these to be explained by the same news component for the world portfolio and its interactions with a set of empirical proxies for barriers to market integration. Specifically, we investigate the role of interaction effects with financial and economic integration for significant variables already identified from Table 6. Essentially, we assume a linear function for our slope coefficients on the global market CF or DR news in explaining local market return components. Our estimated results are presented in Panels A and B of Table 7.

In comparing the magnitude of the beta coefficients for the world portfolio cash-flow and discount rate news components, we can gauge that global financial market integration is more advanced than global economic integration. While there is a common set of deterrents to both financial and economic integration, investor heterogeneity in international equity markets as captured in the dispersion of stock analyst forecasts limits the extent of financial integration.

Most of our explanatory variables for market integration exhibit significant interaction effects with standardized cashflow and discount rate news on the world portfolio, which suggests that these variables are in turn functions of the extent of financial and economic openness and clearly need to be accounted for.

A striking result is that the analysts' forecast dispersion has a strong interactive effect with the global market DR news but not with CF news. This suggests that regulatory efforts to enhance transparency and access to material information in financial markets should facilitate more efficient common pricing of revisions in the investor's expected returns.

6 Conclusions

In this study we have shown how stock analyst earnings forecasts may be used to assess the development of global financial and economic integration. In doing so, we contribute new empirical evidence on the mechanics of global financial and economic integration.

Specifically, we find that financial and economic integration has diverged over time as global financial market integration has developed more rapidly than economic integration. However, this divergence is less severe in emerging markets when compared with developed markets, where financial integration has proceeded at a slower pace. We find that financial integration has been slower in emerging markets. This is consistent with the overwhelming empirical evidence presented on the hampering effect of a poor information environment for financial market integration.

We document that while global financial integration continues to develop, economic integration has stalled. Overall, we find that the strength of the information environment and corporate governance standards are crucial foundations for financial market integration and we conjecture that it is improvements in these aspects of international financial markets that have worked to promote financial market integration ahead of real economic integration in recent decades. Our empirical results suggest that it is easier to integrate markets financially rather than economically because the informational barriers to international financial integration have only ameliorated with technological advances and improvements in corporate governance standards over time. From a

policy perspective, it seems more effective for global policy makers to concentrate their efforts on financially integrating global financial markets than real economies to reap the greatest welfare gains.

In summary, our return decomposition into future expected returns and cash-flow news components allow us to provide deeper insights into the cross-country determinants of financial and economic integration. Our contributions to the international finance literature are that we use stock analyst information to shed new light on global integration and we also distinguish the driving forces behind real economic and financial market integration.

One caveat to our results is that we rely on stock analysts to update their earnings forecasts in a timely fashion. Furthermore, we have not attempted to specifically test the differences in the integration of value and growth stocks. We leave this work to future research on international financial integration.

References

- Abarbanell, J. 1991. Do analysts' earnings forecasts incorporate information in prior stock price changes. *Journal of Accounting and Economics* 14, 147-165.
- Ang, A., R. J. Hodrick, Y. Xiang, and X. Zhang. 2006. The cross-section of volatility and expected returns. *Journal of Finance* 51, 259-299.
- Adler, M., and B. Dumas, 1983. International portfolio selection and corporate finance: A synthesis. *Journal of Finance* 46, 925-984.
- Ahearne, A., G. William, and F. Warnock. 2004. Information costs and home bias: An analysis of US holdings of foreign equities. *Journal of International Economics* 62, 313-336.
- Baxter, M., and U. J. Jermann. 1997. The international diversification puzzle is worse than you think. *American Economic Review* 87, 170-180.
- Bekaert, G., and C. Harvey. 1995. Time varying world market integration. *Journal of Finance* 50, 403-444.
- Bekaert, G., and C. Harvey. 2000. Foreign speculators and emerging equity markets. *Journal of Finance* 55, 565-613.
- Bhattacharya, U., H. Daouk, and M. Welker. 2003. The world price of earning opacity. *The Accounting Review* 78, 641-678.
- Black, Fisher. 1974. International capital market equilibrium with investment barriers. *Journal of Financial Economics* 1, 337-352.
- Botosan, C. A., 1997. Disclosure level and the cost of equity capital. *The Accounting Review* 72, 323-349.
- Botosan, C. A., M. A. Plumlee, and Y. Xie. 2005. The role of information precision in determining the cost of equity capital. *Review of Accounting Studies* 9, 233-259.

- Bradshaw, M., B. Bushee, and G. Miller. 2004. Accounting choice, home bias, and U.S. investment in non-U.S. firms. *Journal of Accounting Research* 42, 795-841.
- Brown, L. D. 1993. Earnings forecasting research: Its implications for capital market research. *International Journal of Forecasting*, 349-356.
- Chaieba, I., and V. Errunza. 2007. International asset pricing under segmentation and PPP deviations. *Journal of Financial Economics* 86, 543-578.
- Carrieri, F., V. Errunza, and K. Hogan. 2007. Characterizing world market integration through time. *Journal of Financial and Quantitative Analysis* 42, 915-940.
- Chan, K., V. Covrig, and L. Ng. 2005. What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *Journal of Finance* 60, 1495-1534.
- Claus, J., and J. Thomas. 2001. The equity risk premium is much lower than you think it is: Empirical estimates from a new approach. *Journal of Finance* 58, 643-684.
- Cooper, I., and E. Kaplanis. 1994. Home bias in equity portfolios, inflation hedging, and international capital market equilibrium. *Review of Financial Studies* 7, 45-60.
- Cooper, I., and E. Kaplanis. 2000. Partially segmented international capital markets and international capital budgeting. *Journal of International Money and Finance* 19, 309-329.
- Covrig, V., S. T. Lau, and L. Ng. 2006. Do domestic and foreign fund managers have similar preferences for stock characteristics? A cross-country analysis. *Journal of International Business Studies* 37, 407-429.
- Covrig, V., M. Defond, and M. Hung. 2006. Home bias, foreign mutual fund holdings, and the voluntary adoption of international accounting standards. Forthcoming, *Journal of Accounting Research*.
- Dahlquist, M., L. Pinkowitz, R. Stulz, and R. Williamson. 2003. Corporate governance, investor protection, and home bias. *Journal of Financial and Quantitative Analysis* 38, 87-110.

- de Jong, F., and F. de Roon. 2005. Time-varying market integration and expected returns in emerging markets. *Journal of Financial Economics* 78, 583-613.
- Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2008. The law and economics of self-dealing. *Journal of Financial Economics* 88, 430-465.
- Doidge, C., A. Karolyi, and R. Stulz. 2004. Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics* 71, 205-238
- Dumas, B., and B. Solnik. 1995. The world price of exchange rate risk. *Journal of Finance* 50, 445-479.
- Easton, P. 2004. PE ratios and PEG ratios, and estimating the implied expected rate of return on equity capital. *The Accounting Review* 80, 501-538.
- Easton, P., G. Taylor, P. Shroff, and T. Sougiannis. 2002. Using forecasts of earnings to simultaneously estimate growth and the rate of return on equity investment. *Journal of Accounting Research* 40, 657-676.
- Elton, E. J. 1999. Expected return, realized return, and asset pricing tests, *Journal of Finance* 54, 1199-1220.
- Errunza, V., and E. Losq. 1985. International asset pricing under mild segmentation: Theory and test. *Journal of Finance* 40, 105-124.
- Errunza, V., and D. Miller. 2000. Market segmentation and the cost of capital in international equity markets. *Journal of Financial and Quantitative Analysis* 35, 577-600.
- Fama, E., and K. French. 1992. The cross-section of expected stock returns. *Journal of Finance* 47, 427-465.
- Fama, E., and K. French. 1993, Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 3-56.
- Fama, E., and K. French. 2002. The equity premium, *Journal of Finance* 57, 637-659.

- Ferreira, M. A., and P. P. Matos. 2008. The colors of investors' money: Which firms attract institutional investors from around the world? *Journal of Financial Economics*, 499-533.
- Foerster, S., and A. Karolyi. 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the U.S. *Journal of Finance* 54, 981-1014.
- Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2004. Costs of equity and earnings attributes. *The Accounting Review* 79, 967-1010.
- Gebhardt, W. R., C. M. Lee, and B. Swaminathan. 2001. Toward an implied cost of capital. *Journal of Accounting Research* 39, 135-176.
- Graham, J. R., C. R. Harvey, and H. Huang. 2005. Investor competence, trading frequency, and home bias. 2006 American Finance Association Meetings paper.
- Hail, L., and C. Leuz. 2006. International differences in the cost of equity capital: Do legal institutions and securities regulation matter? *Journal of Accounting Research* 44, 485-531.
- Harvey, C. 1991. The world price of covariance risk. *Journal of Finance* 46, 111-157.
- Harvey, C. 1995. Predictable risk and returns in emerging markets. *The Review of Financial Studies* 8, 773-816.
- Hau, H., and H. Rey. 2008. Home bias at the fund level. *American Economic Review* 98, 333-338.
- Henry, P. 2000. Stock market liberalization, economic reform, and emerging market equity prices. *Journal of Finance* 55, 529-564.
- Jeske, K. 2001. Equity home bias: Can information cost explain the puzzle? *Federal Reserve Bank of Atlanta Economic Review* (Third quarter), 31-42.
- Joos, P., and M. Lang. 1994. The effects of accounting diversity: Evidence from the European Union. *Journal of Accounting Research* 32, 141-168.
- Jorion, P., and E. Schwartz. 1986. Integration versus segmentation in the Canadian stock market. *Journal of Finance* 41, 603-616.

- Kang, J.-k., and R. Stulz. 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. *Journal of Financial Economics* 46, 3-28.
- Karolyi, A., and R. Stulz. 2003. Are financial assets priced locally or globally? in George Constantinides, Milton Harris, and Rene M. Stulz, eds.: *The Handbook of the Economics and Finance* (North-Holland, New York).
- Kho, B. C., R. M. Stulz, and F. Warnock. 2006. Financial globalization, governance, evolution of home bias. Working paper, Ohio State University.
- La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R. Vishny. 1999. Corporate ownership around the world. *Journal of Finance* 54, 471-517.
- La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R. Vishny. 2002. Investor protection and corporate valuation. *Journal of Finance* 57, 1147-1170.
- La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 2006. What works in securities laws? *Journal of Finance* 61, 1-32.
- Lee, C., D. Ng, B. Swaminathan. 2007. International asset pricing: Evidence from the cross section of implied cost of capital. Forthcoming, *Journal of Financial and Quantitative Analysis*.
- Leuz, C., D. Nanda, and P. D. Wysocki. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69, 505-527.
- Lewis, K. 1999. Explaining home bias in equities and consumption. *Journal of Economic Literature* 37, 571-608.
- Lundblad, C. 2007. The risk return tradeoff in the long-run: 1836-2003. *Journal of Financial Economics* 85, 123-150.
- Miller, D. 1999. The market reaction to international cross-listing: Evidence from depositary receipts. *Journal of Financial Economics* 51, 103-123

- Nishiotis, G. 2004. Do indirect investment barriers contribute to capital market segmentation? *Journal of Financial and Quantitative Analysis* 39, 613-629.
- Ohlson, J., and B. Juettner-Nauroth. 2005. Expected EPS and EPS growth as determinants of value. *Review of Accounting Studies* 10. 349-365.
- Pastor, Lubos, Meenakshi Sinha, Bhaskaran Swaminathan. 2007. Estimating the intertemporal risk-return tradeoff using the implied cost of capital. Forthcoming in *Journal of Finance*.
- Sarkissian, S., and M. Schill. 2004. Are there permanent valuation gains to overseas listing? Evidence from market sequencing and selection. Working paper, University of Virginia.
- Solnik, B. 1974. An equilibrium model of the international capital market. *Journal of Economic Theory* 8, 500-524.
- Shiller, R. J., F. Kon-Ya, and Y. Tsutsui. 1996. Why did the Nikkei crash? Expanding the scope of expectations data collection. *Review of Economics and Statistics* 78, 156-164.
- Stulz, R. M. 1981a. On the effects of barriers to international investment. *Journal of Finance* 36, 923-934.
- Stulz, R. M. 1981b. A model of international asset pricing. *Journal of Financial Economics* 9, 383-406.
- Stulz, R. M. 1999. Globalization of equity markets and the cost of capital. Working paper, Dice center, Ohio State University.
- Stulz, R. M. 2005. The limits of financial globalization. *Journal of Finance* 60, 1595-1638.
- Young, D., and D. A. Guenther. 2003. Financial reporting environments and international capital mobility. *Journal of Accounting Research* 41, 553-579.

TABLE 1

Summary Statistics on Earnings Forecasts, Cost of Capital, and Firm Characteristics

This table provides summary mean statistics of our sample by country. Type of market indicates whether the country is a developed (DEV) or emerging market (EMG). Number of stocks is the number of sample firms in each country for which we include from I/B/E/S. Dividend payout is the ratio between dividends payment and earnings obtained from Datastream. Growth forecasts are analyst forecasts of long-term earnings growth. R is the implied cost of capital estimated for sample firms using the earnings residual model. Market cap. is the firm market capitalization in US dollars. PE_1 indicates the price to one-year ahead earnings forecasts ratio. PE_5 indicates the price to five-year ahead earnings forecasts ratio. BM is the firm's book-to-market ratio. Sample period is between 1993 and 2007.

Country (1)	Type of Market (2)	Number of Stocks (3)	Dividend Payout (4)	Growth Forecasts (5)	R (6)	Market Cap. (7)	PE_1 (8)	PE_5 (9)	BM (10)
Australia	DEV	195	0.548	0.118	0.105	397	14.28	9.13	0.574
Austria	DEV	29	0.324	0.136	0.098	537	15.27	8.71	0.562
Belgium	DEV	51	0.372	0.110	0.095	625	15.23	9.39	0.636
Canada	DEV	161	0.194	0.149	0.102	417	15.95	8.17	0.563
Denmark	DEV	56	0.223	0.123	0.094	250	15.13	8.89	0.633
Finland	DEV	57	0.412	0.151	0.110	308	14.69	7.62	0.584
France	DEV	213	0.280	0.123	0.091	554	16.87	9.44	0.495
Germany	DEV	171	0.377	0.127	0.087	513	18.25	10.55	0.489
Hong Kong,China	DEV	133	0.414	0.160	0.136	515	11.42	6.31	0.693
Ireland	DEV	24	0.291	0.124	0.115	690	12.10	7.57	0.251
Italy	DEV	77	0.392	0.155	0.109	894	17.54	9.12	0.614
Japan	DEV	397	0.277	0.126	0.057	2382	31.65	18.01	0.540
Netherlands	DEV	92	0.385	0.100	0.105	455	12.32	8.03	0.536
New Zealand	DEV	48	0.539	0.102	0.098	167	14.26	9.56	0.614
Norway	DEV	58	0.219	0.152	0.109	279	14.30	7.18	0.559
Singapore	DEV	91	0.309	0.161	0.096	290	16.89	9.17	0.609
Spain	DEV	65	0.399	0.131	0.102	1284	15.15	9.12	0.524
Sweden	DEV	86	0.351	0.152	0.105	460	15.84	8.09	0.498
Switzerland	DEV	91	0.338	0.117	0.091	500	15.91	9.50	0.582
United Kingdom	DEV	406	0.399	0.116	0.117	651	14.46	8.78	0.454
United States	DEV	2324	0.100	0.141	0.099	607	15.73	8.73	0.470
Brazil	EMG	52	0.307	0.217	0.210	637	10.44	4.50	1.100
Chile	EMG	16	0.473	0.145	0.103	1139	17.35	9.84	0.515
PRC	EMG	68	0.353	0.165	0.116	244	14.78	7.48	0.826
Greece	EMG	45	0.450	0.183	0.109	398	18.59	9.44	0.386
India	EMG	105	0.257	0.205	0.140	551	15.38	6.73	0.399
Indonesia	EMG	45	0.262	0.201	0.165	238	11.05	5.28	0.571
Republic of Korea	EMG	114	0.217	0.203	0.217	484	9.55	4.34	1.022
Malaysia	EMG	115	0.310	0.142	0.099	305	17.04	9.27	0.550
Mexico	EMG	29	0.146	0.150	0.141	1204	12.73	6.66	0.542
Philippines	EMG	32	0.113	0.197	0.126	331	14.68	6.37	0.757
Poland	EMG	29	0.123	0.192	0.122	301	15.31	7.39	0.552
Portugal	EMG	24	0.343	0.161	0.101	683	17.23	8.98	0.498
South Africa	EMG	105	0.363	0.189	0.154	603	12.27	6.27	0.493
Taipei,China	EMG	91	0.253	0.189	0.098	786	18.45	9.26	0.427
Thailand	EMG	67	0.331	0.170	0.128	207	12.92	6.68	0.548
Turkey	EMG	29	0.199	0.138	0.143	1241	11.57	6.75	0.576
Average	DEV	230	0.340	0.132	0.101	608	15.87	9.10	0.547
Average	EMG	60	0.281	0.178	0.136	585	14.33	7.20	0.610
Average	ALL	156	0.315	0.152	0.116	598	15.20	8.28	0.574

TABLE 2

Pairwise Correlation of Revisions in Earnings Forecasts and Expected Returns

This table provides cross-country average of pairwise correlation coefficients of monthly revisions in earnings forecasts and expected returns calculated for each country and each five-year period. $\Delta E\hat{P}S_\tau = \frac{(E\hat{P}S_{\tau,t+1} - E\hat{P}S_{\tau,t})}{P_t}$, where $E\hat{P}S_{\tau,t}$ denotes analyst forecasts of τ -year ahead earnings per share at month t . $\Delta R = R_{t+1} - R_t$, where R_t denotes expected returns at month t . Market indicates whether countries are developed (DEV), emerging (EMG), or all markets (ALL). Sample period is between 1993 and 2007.

Market	Variable	$\Delta E\hat{P}S_1$	$\Delta E\hat{P}S_2$	$\Delta E\hat{P}S_3$	$\Delta E\hat{P}S_4$	$\Delta E\hat{P}S_5$	ΔR
2003-2007							
DEV	$\Delta E\hat{P}S_1$	1.000					
DEV	$\Delta E\hat{P}S_2$	0.820	1.000				
DEV	$\Delta E\hat{P}S_3$	0.694	0.848	1.000			
DEV	$\Delta E\hat{P}S_4$	0.564	0.667	0.722	1.000		
DEV	$\Delta E\hat{P}S_5$	0.506	0.580	0.639	0.800	1.000	
DEV	ΔR	0.313	0.341	0.350	0.434	0.504	1.000
EMG	$\Delta E\hat{P}S_1$	1.000					
EMG	$\Delta E\hat{P}S_2$	0.733	1.000				
EMG	$\Delta E\hat{P}S_3$	0.614	0.762	1.000			
EMG	$\Delta E\hat{P}S_4$	0.515	0.584	0.767	1.000		
EMG	$\Delta E\hat{P}S_5$	0.458	0.487	0.710	0.909	1.000	
EMG	ΔR	0.291	0.307	0.402	0.540	0.565	1.000
ALL	$\Delta E\hat{P}S_1$	1.000					
ALL	$\Delta E\hat{P}S_2$	0.783	1.000				
ALL	$\Delta E\hat{P}S_3$	0.659	0.811	1.000			
ALL	$\Delta E\hat{P}S_4$	0.542	0.631	0.741	1.000		
ALL	$\Delta E\hat{P}S_5$	0.485	0.540	0.670	0.847	1.000	
ALL	ΔR	0.303	0.326	0.373	0.480	0.530	1.000
1998-2002							
DEV	$\Delta E\hat{P}S_1$	1.000					
DEV	$\Delta E\hat{P}S_2$	0.872	1.000				
DEV	$\Delta E\hat{P}S_3$	0.818	0.923	1.000			
DEV	$\Delta E\hat{P}S_4$	0.737	0.804	0.871	1.000		
DEV	$\Delta E\hat{P}S_5$	0.654	0.703	0.791	0.904	1.000	
DEV	ΔR	0.156	0.145	0.184	0.246	0.316	1.000
EMG	$\Delta E\hat{P}S_1$	1.000					
EMG	$\Delta E\hat{P}S_2$	0.726	1.000				
EMG	$\Delta E\hat{P}S_3$	0.600	0.775	1.000			
EMG	$\Delta E\hat{P}S_4$	0.490	0.625	0.768	1.000		
EMG	$\Delta E\hat{P}S_5$	0.439	0.542	0.721	0.880	1.000	
EMG	ΔR	0.153	0.221	0.306	0.328	0.410	1.000
ALL	$\Delta E\hat{P}S_1$	1.000					
ALL	$\Delta E\hat{P}S_2$	0.809	1.000				
ALL	$\Delta E\hat{P}S_3$	0.723	0.859	1.000			
ALL	$\Delta E\hat{P}S_4$	0.630	0.727	0.827	1.000		
ALL	$\Delta E\hat{P}S_5$	0.561	0.633	0.761	0.894	1.000	
ALL	ΔR	0.155	0.178	0.237	0.281	0.356	1.000

TABLE 2 (Continued)
Pairwise Correlation of Revisions in Earnings Forecasts and Expected Returns

Market	Variable	$\Delta E\hat{P}S_1$	$\Delta E\hat{P}S_2$	$\Delta E\hat{P}S_3$	$\Delta E\hat{P}S_4$	$\Delta E\hat{P}S_5$	ΔR
1993-1997							
DEV	$\Delta E\hat{P}S_1$	1.000					
DEV	$\Delta E\hat{P}S_2$	0.827	1.000				
DEV	$\Delta E\hat{P}S_3$	0.586	0.710	1.000			
DEV	$\Delta E\hat{P}S_4$	0.445	0.526	0.818	1.000		
DEV	$\Delta E\hat{P}S_5$	0.331	0.383	0.706	0.930	1.000	
DEV	ΔR	0.234	0.272	0.459	0.593	0.595	1.000
EMG	$\Delta E\hat{P}S_1$	1.000					
EMG	$\Delta E\hat{P}S_2$	0.697	1.000				
EMG	$\Delta E\hat{P}S_3$	0.452	0.647	1.000			
EMG	$\Delta E\hat{P}S_4$	0.259	0.381	0.832	1.000		
EMG	$\Delta E\hat{P}S_5$	0.133	0.188	0.673	0.940	1.000	
EMG	ΔR	0.032	0.057	0.363	0.498	0.519	1.000
ALL	$\Delta E\hat{P}S_1$	1.000					
ALL	$\Delta E\hat{P}S_2$	0.771	1.000				
ALL	$\Delta E\hat{P}S_3$	0.528	0.683	1.000			
ALL	$\Delta E\hat{P}S_4$	0.364	0.463	0.824	1.000		
ALL	$\Delta E\hat{P}S_5$	0.245	0.299	0.692	0.934	1.000	
ALL	ΔR	0.147	0.179	0.418	0.552	0.562	1.000

TABLE 4
Economic and Financial Integration

This table shows regression results of the following models.

$$CF_{i,t} = \alpha_{i,CF} + \beta_{i,CF}CF_{w,t} + \epsilon_{i,CF,t},$$

$$DR_{i,t} = \alpha_{i,DR} + \beta_{i,DR}DR_{w,t} + \epsilon_{i,DR,t},$$

$$RX_{i,t} = \alpha_{i,RX} + \beta_{i,RX}DR_{w,t} + \epsilon_{i,RX,t}.$$

$CF_{i,t}$ is a country i 's cash flow news in month t , and $CF_{w,t}$ is the world's cash flow news in month t . $DR_{i,t}$ is a country i 's discount rate news in month t , $DR_{w,t}$ is the world's discount rate news in month t . $RX_{i,t}$ is a country i 's returns excluding dividends, and $RX_{w,t}$ is the world's returns excluding dividends in month t . $\beta_{i,CF}$, $\beta_{i,DR}$, and $\beta_{i,RX}$ are regression coefficients. $R^2_{i,CF}$, $R^2_{i,DR}$, and $R^2_{i,RX}$ are R squares in the regressions, which capture the degree of integration for each country i . These variables are summarized by taking cross-country average. Market indicates whether countries are developed (DEV), emerging (EMG), or all markets (ALL). Sample period is between 1993 and 2007.

Market	CF			DR			RX			DR and CF	
	CF	β_{CF}	R^2_{CF}	DR	β_{DR}	R^2_{DR}	RX	β_{RX}	R^2_{RX}	$R^2_{DR} - R^2_{CF}$	t
						2003-2007					
DEV	0.003	0.677	0.241	0.011	0.904	0.434	0.013	0.961	0.585	0.193	6.24
EMG	-0.003	0.874	0.138	0.022	0.923	0.205	0.018	1.098	0.408	0.067	2.47
ALL	0.000	0.762	0.196	0.016	0.912	0.335	0.015	1.020	0.509	0.139	6.02
						1998-2002					
DEV	-0.006	1.025	0.211	0.006	0.912	0.367	-0.001	0.949	0.553	0.156	6.05
EMG	-0.010	1.160	0.074	0.016	0.974	0.115	0.002	1.087	0.265	0.041	2.69
ALL	-0.008	1.084	0.152	0.010	0.939	0.258	0.000	1.009	0.429	0.106	5.91
						1993-1997					
DEV	-0.005	0.865	0.198	0.019	0.957	0.237	0.011	0.952	0.316	0.038	1.14
EMG	-0.005	0.699	0.100	0.022	0.501	0.097	0.009	1.161	0.136	-0.002	-0.03
ALL	-0.005	0.793	0.156	0.020	0.760	0.176	0.010	1.042	0.238	0.021	1.00

TABLE 5
Simple Regressions of Economic and Financial Integration Measures on Cross-country Characteristics

This table shows simple regression results of economic and financial integration measures on cross-country characteristics. In Panel A, the dependent variable is the economic integration measure (R_{CF}^2) that captures the proportion of a country's cash flow news explained by the world's cash flow news estimated from 1993 to 2007. In Panel B, the dependent variable is the financial integration measure (R_{DR}^2) that captures the proportion of a country's discount rate news explained by the world's discount rate news. *Smooth* is the smoothness of accounting reports, and is the ratio of the standard deviation of operating income to standard deviation of operating cash flows over the last 5 years. *Corr* is the correlation coefficient between changes in accruals and changes in operating cash flows over the last 5 years. *Disp* is the analyst forecast dispersion. *FError* is the absolute difference between announced earnings and mean of estimated earnings scaled by the mean of analyst forecasts. *Synch* is the equity market synchronicity measure of Morck, Yeung, and Yu (2000). *Turn* is the country's overall turnover ratio. *EffSprd* is the effective spread. *Investibility* is the equity market openness measure, which is based on the ratio of the market capitalization of the constituent firms comprising the S&P/IFC Investable index to those that comprise the S&P/IFC Global index for each country. *HB* is a measure of home bias defined as the share of domestic mutual funds holdings in their country's stock market capitalization divided by their country's world-market capitalization weight. *FDIGDP* is the ratio of the sum of absolute values of FDI inflows and outflows to GDP. *SEG* is Bekaert, Harvey, Lundblad, and Siegel (2008)'s segmentation measure. *MVGDP* is the ratio of market capitalization to GDP. *PCreditGDP* is the ratio of private credit by deposit money banks and other financial institutions to GDP. *GDPPC* is GDP per capita. σ_M is the standard deviation of stock market returns. *BM* is log of the firm's book-to-market ratio. σ_{GDP} is the standard deviation of GDP growth. *gGDP* is GDP growth. *InvProfile* is ICRG's investment profile index which reflects the risk of expropriation, contract viability, payment delays, and the ability to repatriate profits. *Law* is ICRG's law and order index. *AccSta* is the accounting standard index, which examines and rates companies' 1990 annual reports on 90 standard index items for 36 countries, covering general information, income statements, balance sheets, fund flow statements, accounting standards, stock data, and other special items (La Porta et al., 1998). *GGov* is the good government index (Morck, Yeung, and Yu (2000)). *MV* is log of the firm's market capitalization. *NLFirm* is the number of firms listed in stock exchanges within the country. *R* is the implied cost of capital estimated for sample firms using the earnings residual model. The country median values of all firm characteristics are employed in the regression analysis.

TABLE 5 (Continued)
Simple Regressions of Economic and Financial Integration Measures on Cross-country Characteristics

Panel A: R_{CF}^2					Panel B: R_{DR}^2				
Variable	b	t	\bar{R}^2	Nobs	Variable	b	t	\bar{R}^2	Nobs
Information Environment									
<i>Smooth</i>	0.372	1.08	0.062	37	<i>Smooth</i>	0.565	2.06	0.115	37
<i>Corr</i>	1.540	1.14	0.083	37	<i>Corr</i>	2.310	2.08	0.145	37
<i>Disp</i>	-1.037	-1.77	0.127	37	<i>Disp</i>	-1.950	-3.97	0.352	37
<i>FError</i>	-0.473	-1.65	0.080	37	<i>FError</i>	-0.885	-3.34	0.235	37
<i>Synch</i>	-0.709	-2.38	0.162	37	<i>Synch</i>	-1.124	-4.44	0.303	37
Trading Cost									
<i>Turn</i>	0.075	1.23	0.032	37	<i>Turn</i>	0.089	1.11	0.030	37
<i>EffSprd</i>	-1.329	-1.17	0.007	37	<i>EffSprd</i>	-0.516	-0.28	-0.025	37
Financial and Economic Openness									
<i>Investibility</i>	0.209	3.32	0.041	37	<i>Investibility</i>	0.299	3.70	0.070	37
<i>HB</i>	-0.057	-2.85	0.391	37	<i>HB</i>	-0.082	-5.87	0.580	37
<i>FDIGDP</i>	0.424	2.23	0.015	37	<i>FDIGDP</i>	0.697	2.68	0.052	37
<i>SEG</i>	-7.338	-2.52	0.248	37	<i>SEG</i>	-10.891	-4.67	0.393	37
Financial and Economic Development									
<i>MVGDP</i>	0.061	2.64	0.071	37	<i>MVGDP</i>	0.108	2.77	0.185	37
<i>PCreditGDP</i>	0.121	2.03	0.150	37	<i>PCreditGDP</i>	0.184	3.50	0.258	37
<i>GDPPC</i>	0.049	3.03	0.161	37	<i>GDPPC</i>	0.080	3.82	0.318	37
Financial and Economic Risk									
σ_M	-0.707	-2.74	0.091	37	σ_M	-1.197	-3.40	0.209	37
<i>BM</i>	-0.156	-1.98	0.109	37	<i>BM</i>	-0.270	-2.96	0.258	37
σ_{GDP}	-2.039	-1.81	0.011	37	σ_{GDP}	-4.080	-2.68	0.080	37
<i>gGDP</i>	-2.332	-2.85	0.073	37	<i>gGDP</i>	-3.517	-2.95	0.131	37
Financial and Economic Regulatory									
<i>InvProfile</i>	0.343	3.54	0.083	37	<i>InvProfile</i>	0.606	4.65	0.213	37
<i>Law</i>	0.216	2.25	0.072	37	<i>Law</i>	0.423	4.27	0.237	37
<i>AccSta</i>	0.274	1.49	0.003	33	<i>AccSta</i>	0.746	3.74	0.156	33
<i>GGov</i>	0.395	3.72	0.123	32	<i>GGov</i>	0.873	4.47	0.309	32
Properties of Equity Market									
<i>MV</i>	0.032	1.41	0.035	37	<i>MV</i>	0.046	1.81	0.065	37
<i>NLFirm</i>	0.045	1.24	0.103	37	<i>NLFirm</i>	0.054	1.82	0.103	37
<i>R</i>	-1.167	-2.27	0.083	37	<i>R</i>	-2.042	-2.60	0.206	37

TABLE 6
Multiple Regressions of Economic and Financial Integration Measures on Cross-country Characteristics

This table shows the multivariate regression results of economic and financial integration measures on cross-country characteristics. In Panel A, the dependent variable is the economic integration measure (R_{CF}^2) that captures the proportion of a country's cash flow news explained by the world's cash flow news estimated from 1993 to 2007. In Panel B, the dependent variable is the financial integration measure (R_{DR}^2) that captures the proportion of a country's discount rate news explained by the world's discount rate news. *Smooth* is the smoothness of accounting reports, and is the ratio of the standard deviation of operating income to standard deviation of operating cash flows over the last 5 years. *Disp* is the analyst forecast dispersion. *Turn* is the country's overall turnover ratio. *EffSprd* is the effective spread. *Investibility* is the equity market openness measure, which is based on the ratio of the market capitalization of the constituent firms comprising the S&P/IFC Investable index to those that comprise the S&P/IFC Global index for each country. *HB* is a measure of home bias defined as the share of domestic mutual funds holdings in their country's stock market capitalization divided by their country's world-market capitalization weight. *FDIGDP* is the ratio of the sum of absolute values of FDI inflows and outflows to GDP. *MVGDP* is the ratio of market capitalization to GDP. *PCreditGDP* is the ratio of private credit by deposit money banks and other financial institutions to GDP. *GDPperCapita* is GDP per capita. σ_M is the standard deviation of stock market returns. σ_{GDP} is the standard deviation of GDP growth. g_{GDP} is GDP growth. *InvProfile* is ICRG's investment profile index which reflects the risk of expropriation, contract viability, payment delays, and the ability to repatriate profits. *Law* is ICRG's law and order index. *MV* is log of the firm's market capitalization. *NLFirm* is the number of firms listed in stock exchanges in the country. *R* is the implied cost of capital estimated for sample firms using the earnings residual model. The country median values of all firm characteristics are employed in the regression analysis.

TABLE 6 (Continued)
Multivariate Regressions of Economic and Financial Integration Measures on Cross-country Characteristics

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Panel A: R_{CF}^2									
Information Environment									
<i>Smooth</i>	0.285 (0.99)								
<i>Disp</i>	-0.916 (-2.07)							-0.281 (-0.46)	-0.335 (-0.51)
Trading Cost									
<i>Turn</i>		0.061 (1.05)							
<i>EffSprd</i>		-0.678 (-0.73)						-1.237 (-1.15)	-1.145 (-1.20)
Financial and Economic Openness									
<i>Investibility</i>			0.053 (0.69)						
<i>HB</i>			-0.057 (-2.28)					-0.054 (-2.48)	-0.050 (-2.23)
<i>FDIGDP</i>			-0.120 (-0.34)						
Financial and Economic Development									
<i>MVGDP</i>				0.021 (1.04)					0.007 (0.28)
<i>PCreditGDP</i>				0.060 (0.91)					
<i>GDPPC</i>				0.032 (2.59)				-0.014 (-0.44)	
Financial and Economic Risk									
σ_M					-0.542 (-2.04)			-0.492 (-0.64)	-0.343 (-0.44)
σ_{GDP}					0.166 (0.14)				
<i>GDPGrowth</i>					-1.568 (-2.43)			-1.828 (-1.23)	-1.186 (-1.36)
Financial and Economic Regulatory Environment									
<i>InvProfile</i>						0.229 (1.81)		-0.142 (-0.49)	
<i>Law</i>						0.118 (0.93)			-0.112 (-0.91)
Properties of Equity Market									
<i>MV</i>							0.040 (1.52)		
<i>NLFirm</i>							0.053 (1.49)		
<i>R</i>							-0.797 (-1.98)	0.664 (0.57)	0.544 (0.46)
Intercept	0.088 (0.78)	0.098 (2.07)	0.322 (2.04)	-0.250 (-2.29)	0.297 (4.17)	-0.169 (-2.21)	-0.277 (-0.94)	0.773 (1.75)	0.554 (2.35)
\bar{R}^2	15.4%	1.1%	36.0%	17.2%	7.5%	7.5%	24.0%	30.8%	30.2%
Nobs	37	37	37	37	37	37	37	37	37

TABLE 6 (Continued)
Multiple Regressions of Economic and Financial Integration Measures on Cross-country Characteristics

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Panel B: R^2_{DR}									
Information Environment									
<i>Smooth</i>	0.397 (2.03)								
<i>Disp</i>	-1.782 (-4.67)							-1.201 (-2.39)	-1.072 (-2.05)
Trading Cost									
<i>Turn</i>		0.099 (1.15)							
<i>EffSprd</i>		0.538 (0.30)						0.730 (0.59)	0.620 (0.59)
Financial and Economic Openness									
<i>Investibility</i>			0.068 (0.56)						
<i>HB</i>			-0.081 (-4.71)					-0.057 (-3.65)	-0.055 (-3.12)
<i>FDIGDP</i>			-0.075 (-0.28)						
Financial and Economic Development									
<i>MVGDP</i>				0.052 (1.71)					0.022 (0.83)
<i>PCreditGDP</i>				0.068 (1.25)					
<i>GDPPC</i>				0.056 (2.84)				0.019 (0.55)	
Financial and Economic Risk									
σ_M					-0.889 (-2.15)			0.381 (0.56)	0.541 (0.89)
σ_{GDP}					-0.769 (-0.55)				
<i>GDPGrowth</i>					-1.986 (-1.87)			-1.231 (-0.75)	-1.573 (-1.57)
Financial and Economic Regulatory Environment									
<i>InvProfile</i>						0.338 (1.95)		-0.120 (-0.54)	
<i>Law</i>						0.280 (2.21)			0.063 (0.54)
Properties of Equity Market									
<i>MV</i>							0.050 (2.03)		
<i>NLFirm</i>							0.063 (2.42)		
<i>R</i>							-1.580 (-2.38)	-0.455 (-0.45)	-0.635 (-0.68)
Intercept	0.235 (2.19)	0.132 (1.57)	0.505 (3.25)	-0.403 (-2.22)	0.500 (5.58)	-0.296 (-2.64)	-0.199 (-0.81)	0.544 (1.35)	0.525 (2.69)
\bar{R}^2	40.3%	0.5%	56.0%	38.7%	21.3%	26.0%	37.4%	61.8%	62.5%
Nobs	37	37	37	37	37	37	37	37	37

TABLE 7
Panel Regressions of Economic and Financial Integration

This table shows the regression results of the following models.

$$\begin{aligned} \text{Panel A : } SCF_{i,t} &= \alpha_{CF} + \beta_{CF_w} SCF_{w,t} + \gamma_{CC,CF_w} CC_{i,t} * SCF_{w,t} + \text{Othercontrols} + \epsilon_{CF,i,t}, \\ \text{Panel B : } SDR_{i,t} &= \alpha_{DR} + \beta_{DR_w} SDR_{w,t} + \gamma_{CC,DR_w} CC_{i,t} * SDR_{w,t} + \text{Othercontrols} + \epsilon_{DR,i,t}. \end{aligned}$$

$SCF_{i,t}$ is a country i 's standardized cash flow news in month t , and $SCF_{w,t}$ is the world's standardized cash flow news in month t . $SDR_{i,t}$ is a country i 's standardized discount rate news in month t , $SDR_{w,t}$ is the world's standardized discount rate news in month t . $CC_{i,t}$ is a country i 's country characteristic in month t . It includes $Disp$, HB , $GDPPC$, $gGDP$, and R . $Disp$ is the analyst forecast dispersion. HB is a measure of home bias defined as the share of domestic mutual funds holdings in their country's stock market capitalization divided by their country's world-market capitalization weight. $GDPPC$ is GDP per capita. $gGDP$ is GDP growth. R is the implied cost of capital estimated for sample firms using the earnings residual model. Sample period is between 1993 and 2007.

Panel A: SCF

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
β_{CF_w}	0.295 (9.92)	0.282 (9.13)	0.506 (12.00)	0.490 (11.34)	-0.369 (-3.56)	-0.360 (-3.30)	0.259 (10.84)	0.250 (10.01)	0.439 (8.40)	0.410 (7.56)
γ_{Disp,CF_w}	-0.319 (-1.80)	-0.294 (-1.57)								
γ_{HB,CF_w}			-0.060 (-6.56)	-0.059 (-6.27)						
γ_{GDPPC,CF_w}					0.065 (5.75)	0.063 (5.33)				
γ_{gGDP,CF_w}							-0.678 (-1.34)	-0.693 (-1.31)	-1.835 (-4.03)	-1.661 (-3.50)
γ_{R,CF_w}										
\bar{R}^2	6.9%	7.2%	8.6%	9.0%	6.2%	6.3%	5.6%	5.8%	6.0%	6.2%
Nobs	5270	5270	4851	4851	5973	5973	5973	5973	5973	5973
Year Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

TABLE 7 (Continued)
Panel Regressions of Economic and Financial Integration

Variable	Panel B: <i>SDR</i>									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
β_{DR_w}	0.534 (26.33)	0.555 (22.11)	0.658 (27.97)	0.769 (25.56)	-0.065 (-0.97)	-0.425 (-4.46)	0.444 (25.37)	0.444 (23.53)	0.599 (17.07)	0.655 (15.42)
γ_{Disp, DR_w}	-0.661 (-5.33)	-0.833 (-4.97)								
γ_{HB, DR_w}			-0.051 (-10.15)	-0.078 (-11.29)						
γ_{GDPPC, DR_w}					0.054 (7.72)	0.093 (9.15)				
γ_{GGDP, DR_w}							-0.115 (-0.34)	-0.279 (-0.71)	-1.424 (-4.71)	-1.985 (-5.28)
γ_{R, DR_w}										
\bar{R}^2	28.2%	28.7%	30.5%	31.6%	26.2%	27.6%	25.2%	26.0%	25.9%	26.9%
Nobs	5270	5270	4851	4851	5973	5973	5973	5973	5973	5973
Year Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes