Assessing global market integration through security analyst forecasts

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This Version: January 2011

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ABSTRACT

This paper presents new evidence on international financial market integration using stock analyst earnings forecasts from 37 countries around the world. By examining cash flow (CF) and discount rate (DR) news co-movements, we find that the influence of these two driving forces of global market integration have diverged over time as DR news have become more important than CF news over the past decade. However, this divergence is less severe in emerging markets compared with developed markets where expected return news has played a less prominent role. We interpret this as being 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, R^2, emerging markets

JEL Classification Number: G15, F36

1 Introduction

Globalization has undeniably brought about unprecedented degrees of financial market integration. Yet, within international finance, the current understanding of the driving forces behind global market integration remains incomplete. Whilst the importance of both explicit and implicit barriers to financial integration have been recognized in recent advances within the literature (Carrieri, Chaieb and Errunza (2010), Bekaert et al. (2007, 2010) and Bekaert and Wang (2009)), the real economic and financial forces of global market integration have not been adequately assessed. This is an important concern as international asset pricing relies fundamentally on 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 firstly introduce a new approach to assessing channels of financial and economic linkages encapsulated by global market integration and secondly, to understand the fundamental differences in the determinants of financial and economic aspects of market integration. Our unique approach to studying global market integration is supported by recent advances in stock return decompositions using revisions in stock analysts' consensus earnings forecasts to provide forward-looking cashflow and discount rate news (Chen and Zhao, 2008) and in the measurement of financial market integration (Pukthuanthong and Roll, 2009).

It is widely accepted in both fields of international finance and international macroeconomics that financial and economic integration go hand-in-hand together. Thus, it is surprising that since the earlier work of Ammer and Mei (1996) that decomposed stock return variations 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 as both cash-flows and discount rate components underlying stock returns will influence the convergence in equity prices worldwide. World market integration can be attributable to not only investors' use of common discount factors in pricing international securities but also the

synchronization of economic conditions and growth opportunities leading to common cashflows.

It is well understood that stock price in the discounted cash flow framework is the present value of expected future cash flows discounted at a rate of return that reflects the level of systematic risk. We demonstrate in this paper that a decomposition of price changes into discount rate and cash-flow news components through 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 (2008) and Chen and Zhao (2008) and Hail and Leuz (2006)). Following the work of Chen and Zhao (2008), a price change in the present value of future dividends framework can be decomposed into two fundamental components: the cash flow (CF) news (holding discount rate constant) and discount rate (DR) news (holding CF constant). We make use of this decomposition to examine whether global market integration is driven more by DR or CF news. Whilst there is a growing literature using equity analyst forecasts to examine asset valuations, to our best knowledge this is the first study to use stock analysts' forecasts to study international financial market integration.

Our novel approach on extracting information on investor expectations from forward-looking stock analyst earnings forecasts to test financial market integration provides new 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 be driven predominantly by the 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. Thus, we examine the R^2s between these two main underlying components of stock returns in country and global market portfolios. It has been demonstrated by Bekaert et al. (2007) that the globalization process has resulted in a worldwide valuation convergence in in-

ternational equities markets with earnings differentials between global and local country portfolios significantly narrowing within industries. Hence, in this spirit first, we conduct a variance decomposition on firm-level stock returns and second, we separately regress these local market CF and DR news components with those from a world portfolio, to generate integration measures which we interpret to represent the economic and financial facets of global market integration respectively. Our integration measures are similar to the R^2 measure 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 conventional return based frameworks for assessing financial market integration (like those used in Baele (2005) and Bekaert and Harvey (1995) for instance) 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, we run several horse races to estimate the relative importance of various country-level factors to cross-sectional and time series variation in the two aspects of global market 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 as financial integration has developed more rapidly than economic integration. However, this divergence is less severe in emerging markets compared with developed markets where financial integration has proceeded at a slower pace. Second, from our comparison of the sets of determinants for the two aspects of global equity market integration, we find that financial integration has been slower in emerging markets due to the hampering effects of their poor information environments. Third, we reveal as part of our return decomposition that international stock return comovements are driven primarily by the discount rate news component.

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 to better understand the true development of financial market integration. Third, we provide new evidence on the differential drivers of financial and economic facets of international equity market integration allowing us to provide further policy directions in advancing financial market integration. Lastly, we reveal that international stock market comovements are driven mainly by discount rate news. Our exploration into equity return components sheds further light on why previous studies have failed to find strong evidence of convergence in aggregate returns despite the ubiquitous effects of globalization (see discussion in Pukthuangthong and Roll (2009)).

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

2 Literature Review

As we propose to use stock analysts' forecasts in an application of the long-standing present value framework to offer a new perspective on global market integration, we first review the previous empirical tests for financial and economic integration and in turn, the current uses of stock analyst forecasts in the literature.

2.1 Measures of financial and economic integration

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

Traditionally, international financial integration has been 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 extreme states of full segmentation to full integration as reflected by the risks that are priced into equity securities under these conditions. Following from the earlier work of Harvey (1991), the intuition is that under a fully integrated state, a country's covariance risk with the rest of the world should be the relevant risk that is priced whilst in a fully segmented state, the country's own variance risk is all that would matter. 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. Baele (2005) accounted for global, country and industry factors in equity market integration whilst Moshirian, Kim and Wu (2005) estimated time-varying conditional correlations to reveal increased European stock market integration in the Eurozone. In a more recent study, Bekaert, Hodrick and Zhang (2009) employ a factor model with time-varying regional and world components to investigate trends in international stock market co-movements. Interestingly, despite the unequivocal forces of globalization and deregulation, they find that with the exception of countries within Europe, there have been no upward trends in international equity co-movements around the world. Using two non-parametric measures, Eiling and Gerard (2007) also do not find time trends in emerging market integration but they reveal a greater role for global factors over time.

In a financially integrated world, the discount rate would be a function of the world discount rate as innovations in this would be priced globally. These lead to tests for market integration. Bekeart et al. (2010) use the absolute difference in earnings yield ratios within industries and

Bekeart et al. (2007) 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 premise underlying tests of financial market integration has been the law of one price - financial assets carrying the same levels of risk in the world should be priced the same regardless of trading location.

The law of one price has been applied to not only financial assets for gauging 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 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 of 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 (2006), Kose, Prasad and Teronnes (2003)). In studying national outputs, Dumas, Harvey and Ruiz (2003) have shown that stock market comovements do not fully reflect economic fundamentals. Alternatively, Ammer and Mei (1996) measure real economic integration with stock return data by estimating 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 corporate earnings and dividends across countries. We follow their lead and interpret co-movements in cash-flow news from a return decomposition as a measure of the real economic dimension of global market integration. However, we are freed from the statistical biases induced by the VAR specification as detailed in Chen and Zhao (2008) as we are able to construct direct proxies for country (portfolio) and global (portfolio) cash-flow news from accounting data and stock analysts' earnings forecasts. The major advantages of using this approach is that it circumvents the need to use low frequency accounting information (for example,

dividends which may be subject to smoothing) and predictive variables for unobservable CF and DR news (as Chen and Zhao (2009) shows the selection of predictive variables then becomes crucial to getting meaningful results and is sensitive to sample length).

Taken together, our approach is consistent with Pukthuanthong and Roll's (2009) latest R^2 measure for global market integration. It provides 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. Instead of R^2s, Da and Warachka (2009) previously used analyst earnings betas to measure systematic cashflow risk and they find that cashflow risk captured by analysts forecast revisions explains cross-sectional return variation in the U.S.

2.2 Informativeness of stock analyst forecasts

There is an established accounting and finance literature on the informativeness of stock analysts' annual earnings forecasts (see for example, Arbarbanell (1991)). Stock analysts are important information intermediaries in financial markets and as such, there is clear evidence that 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, Nissim and Thomas (2002) have demonstrated that forward earnings forecasts provide the best explanation for stock prices suggesting that future expectations drive prices. As such, information on investors' expectations on future returns (discount rates) implied from stock analysts earnings forecasts and market prices should be useful for assessing the degree of financial market integration - 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).

Due to their informativeness, there is a growing literature using equity analyst forecasts to examine asset valuations Specifically, implied cost of capital models have been used and studied extensively in the accounting and finance literatures (see for instance Hail and Leuz (2006), Lee,

Ng and Swaminathan (2009) and Lau, Ng and Zhang (2010)). 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. In this vein, 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 (2010)). 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 earnings forecasts, following the approach of Chen and Zhao (2008). To illustrate, we start with Claus and Thomas's (2001) residual income valuation model to define stock price as

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

where P_t is the 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. As financial analysts provide forecasts up to five years in I/B/E/S, beyond year five, residual income is assumed to grow at the constant rate G (equal to the expected inflation rate as proxied by the annualized median of a country's one year ahead realized monthly inflation rates).

Equation (1) can be simplified into

$$P_t = BV_t + \sum_{\tau=1}^{5} \frac{(\hat{EPS}_{t+\tau} - R_t \cdot BV_{t+\tau-1})}{(1+R_t)^\tau} + \frac{(\hat{EPS}_5 - R_t \cdot BV_4)(1+G)}{(R_t - G)(1+R_t)^5)} \quad (2)$$

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

where $\hat{EPS}^t$ is the vector of earnings forecasts at time t. Stock price is equal to the sum of book value per share (BV_t) and growth potential, which is a function of earnings forecasts ($\hat{EPS}^t$) and discount rate (R_t). After the financial disclosure of current book value, if there are any changes in stock price, it is either from news relating to future earnings or news concerning the discount rate.

Specifically, stock price changes (returns excluding dividends) in time t can be decomposed into

$$RETX_t = \frac{P_{t+1} - P_t}{P_t} = \frac{BV_{t+1} - BV_t}{P_t} + \frac{f(\hat{EPS}^{t+1}, R_{t+1}) - f(\hat{EPS}^t, R_t)}{P_t} \quad (4)$$

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

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

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

where $A_t = \frac{BV_{t+1} - BV_t}{P_t}$ is the change in book values of assets per share in time t, $CF_t = \frac{f(\hat{EPS}^{t+1}, R_{t+1}) - f(\hat{EPS}^t, R_{t+1})}{P_t}$ 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 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 from it. 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 up to the country (portfolio) level, value-weighted by firms' market capitalization values at t.

3.2 Sample construction

We use consensus stock analyst earnings and growth forecasts from the Thomson Reuters' I/B/E/S (Institutional Brokers Estimate System) database for the sample period from 1993-2007 and for a broad global sample of 37 countries. 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, stock market capitalization and book to market values are matched from Thomson's Datastream.

For each firm in a given month, we estimate its ex ante internal discount rate as implied by the stock price and earnings forecast information. The value-weighted average discount rate estimates of all sample firms within a given country is then employed as a proxy for the country-level discount rate to alleviate the noise associated with firm-specific forecasts.

We obtain firm-level 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 the local currency. Our sample includes firms that have current stock price P_t, earnings forecasts of one and two periods ahead ($E\hat{P}S_{t+1}$ and $E\hat{P}S_{t+2}$), and either $E\hat{P}S_{t+3}$ through $E\hat{P}S_{t+5}$ or a long-term earnings growth forecast. Only positive earnings forecasts are employed. All 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 firm-month discount rate 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.

We recognize that this return decomposition framework relies on the quality and timeliness of analysts forecasts in picking up investors' revisions in expected future cash flows as the discount rate component in essence captures residual news. Whilst it has been highlighted in the recent literature that there are inherent problems with the I/B/E/S data with Ljungqvist, Malloy and Marston (2009) revealing changes that were made on historical records in the past, the findings

specifically relate to stock analysts' stock recommendations and not their earnings forecasts.

Table 1 reports the annual average number of unique firms (N) that we use to compute the expected return (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's (2010) study on implied costs of capital 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 with more mature firms than in emerging markets as in the latter, there are more smaller firms with greater earnings growth potential. PE_1 is much higher than PE_5 reflecting the fact that market price must be incorporating all future earnings. BM is higher on average for emerging market firms than developed market firms consistent with lower market valuations due to greater information asymmetries faced by investors.

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 R. 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 3 different sub-sample time periods: 1993-1997, 1998-2002 and 2003-2007 as well as for 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 suggesting that DR and CF news are both drivers of stock market comovements in the long-run.

4 Economic and financial dimensions of global market integration

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

We first conduct a variance decomposition for stock returns (capital gains) into the underlying cashflow and discount rate news components to see how variability in these two parts may differ and importantly, to understand the importance of these two components in driving stock returns and ultimately, market integration.

Table 3 summarizes the variances of stock returns (excluding dividends) and the decomposed cash flow and discount rate news components as well as their co-movements (measured as co-variances 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 highlighting that they do 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. Consistent with Vuolteenaho (2002), we find that discount rate news is the more important influence on international stock returns at the aggregate market level and its importance has only increased over time. This evidence suggests that DR news has been the main driver of stock market integration measured based on aggregate returns.

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 as well as 3 sub-sample periods (1993-1997, 1998-2002, 2003-2007) and emerging/developed market groups. 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 for capturing the economic and financial aspects of global market integration. If national financial markets are highly integrated, we should also find high R^2s for cash flow news and discount rate news regressions as 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 in the following manner.

$$\begin{aligned} CF_{i,t} &= \alpha_{i,CF} + \beta_{i,CF} CF_{w,t} + \epsilon_{i,CF,t}, \\ DR_{i,t} &= \alpha_{i,DR} + \beta_{i,DR} DR_{w,t} + \epsilon_{i,DR,t}, \\ RX_{i,t} &= \alpha_{i,RX} + \beta_{i,RX} RX_{w,t} + \epsilon_{i,RX,t}, . \end{aligned}$$

where $CF_{i,t}$ 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. The third part is representative of a traditional (single-factor) world CAPM where $RX_{i,t}$ 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 the estimated regression coefficients. $R^2_{i,CF}$, $R^2_{i,DR}$, and $R^2_{i,RX}$ are R^2s in the regressions, which capture the degree of integration for each country i.

Table 4 presents the full and sub-sample estimation results for first the local returns (and then news components) of each country's firms being explained by the value weighted average returns (then underlying news components) of the world market portfolio. Consistent with stylized facts and previous research (Bekaert and Harvey, 2000), we reveal that in all sub-sample periods estimated betas for emerging market firms are higher than for developed market firms whilst the (R^2) measures for the degree of integration with the rest of the world 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 1993-7 to 0.509 in 2003-7). 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 consistent with Eiling and Gerard (2007).

We also reveal in Table 4 that whilst both financial and economic integration have deepened over time, they have also diverged as financial integration (measured by R^2 for discount rate news) has developed particularly more rapidly than economic integration (measured by R^2 for cash flow news) since the late 1990s. The test of difference in the two R^2 measures whilst 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, since then financial integration has outpaced economic integration in developed markets leading 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^2s to aggregate return R^2s 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. Whilst 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^2s 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 compared with developed markets where

financial integration has proceeded at a slower pace.

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

5 Determinants of financial and economic aspects of market 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). We consider 7 categories of country-specific determinants that broadly capture the quality of the information environment, trading costs, market openness, market development, market risks, regulatory quality and other relevant market characteristics that may potentially segment financial markets.

5.1 Potential determinants of global market integration

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), Carrieri, Chaieb and Errunza (2010)). Information and monitoring costs may make it difficult for investors to assess financial risks and deter investments in capital markets. Hence, we consider several variables that measure the quality of the information environment. As corporate earnings reports are an important channel for the dissemination of information in financial markets, to capture the transparency and the quality of information in global financial markets we first use two measures of earnings management from Leuz, Nanda and Wysocki (2003). First, earnings smoothing (*Smooth*) is used to measure the degree of earnings opacity in a country.

Smooth is defined as the ratio of the standard deviation of operating income to the standard deviation of operating cashflow over the last five years. In addition, we employ the correlation between changes in actual and changes in accrual operating cash flows over the last 5 years ($Corr$) and the analyst forecast dispersion ($Disp$) and forecast errors ($FError$) to measure the level of financial transparency within a country. $Disp$ is determined by the standard deviation of analyst forecasts (from analysts following each firm listed in I/B/E/S for a country in a specific year) scaled by the mean of analyst forecasts in the past year, whereas $FError$ is the absolute value of the difference between announced earnings and the mean of estimated earnings scaled by the mean of analyst forecasts in the past year. For the latter variables measuring the quality of analysts' forecasts, a high number might indicate that there is less information that is divulged in the economy through the analyst channel leading to greater market segmentation. Lastly, we also use the R^2 equity market synchronicity measure of Morck, Yeung and Yu (2000) ($Synch$) to capture the quality of information access in a given country. It measures the extent to which market-wide information is reflected in stock price movements as opposed to firm-specific information. It is computed as value-weighted R^2s obtained from regressing individual firm stock returns against local market return from the previous year.

Trading cost There is much evidence in the finance literature to suggest that transaction costs present significant barriers to trading in international financial markets. Hence, we incorporate two measures of equity trading costs featured in market microstructure. First, we employ turnover, $Turn$, to control for market liquidity as illiquidity is of key concern for emerging market investors as highlighted by Bekaert, Harvey and Lundblad (2007). Turn is defined as the mean monthly trading volume over the prior 12 months divided by the number of shares outstanding, Second, we employ the effective spread ($EffSprd$) measured as twice the absolute deviation of the transaction price from the midpoint quote at the time of trade.

Financial and economic openness It has been recognized in the literature that the international tradeability of stocks and the free flow of capital is an important element to stimulating financial development and integration of international financial markets. We first account for the legal

restrictions for foreign investment in equity markets with the investibility measure that has featured in prior studies like Bae, Chan and Ng (2004), De Jong and De Roon (2005) and Carrieri, Errunza and Hogan (2007) amongst others. Investibility is the proportion of the local stock market that is legally accessible by foreign investors. We measure the international investibility of local stocks as the ratio of total market capitalization of firms in the Standard and Poors/IFC Investable Index to total market capitalization of firms in the Standard and Poors/IFC Global Index from the Standard and Poors/IFC Emerging Markets Database. For developed countries whose information is not in this database, their investibility measures are set equal to one.

As there are ways for investors to circumvent legal investment restrictions, investibility may not accurately reflect the true extent of financial openness for a given country. Hence, we adopt the Home bias (HB) measure of Chan, Covrig and Ng (2005), measured as log of the share of domestic (open- and closed-end) mutual funds holdings in their own country's stock market capitalization divided by their country's world-market portfolio weight. Home bias has been computed from the domestic holdings of mutual funds that is available from Thomson Reuters' Ownership database. A country that is significantly home-biased would crowd out foreign investment opportunities in their country and limit its financial openness to the rest of the world. Moreover, home bias is attributed to information asymmetries (frictions) in the extant literature. This potentially represents a major barrier to financial market integration.

In addition, we include a more traditional measure of foreign direct investment ($FDIGDP$) measured as the ratio of the sum of absolute values of FDI inflows and outflows to GDP. As an alternative proxy, we also compute Bekaert et al.'s (2010) segmentation measure based on earnings yield differentials between local and global industry portfolios.

Financial and economic development It is conceivable that domestic financial and economic development are both important elements for global market integration as development brings a host of benefits that is attractive for investors. Development of the equity market is represented as the ratio of total stock market capitalization to GDP ($MVGDP$) whilst banking sector development is proxied with the ratio of Private credit provided by deposit money banks and other financial

institutions to GDP and GDP per capita ($GDPPC$) is used to capture the overall level of economic development for a given country. As banks are dominant financing sources in many developing and bank-based countries, poor banking sector development can significantly hamper growth prospects (King and Levine (1993)). These variables have been shown in Bekaert et al. (2007, 2010) to be important for financial market integration.

Financial and economic risk In our horse races, we also control for a multitude of conventional risk proxies and country-specific variables that are drawn from the extant literature. For financial risk, we consider aggregate stock market volatility, measured as the standard deviation of monthly stock market returns over the past year. In addition, we include the log book to market value ratio as a well-known risk proxy. For economic risk, we consider measures of output volatility and economic growth available from the World Development Indicators database.

Financial and economic regulatory environment Corporate governance regulation presents implicit barriers for financial market integration (Carrieri, Chaeib and Errunza (2010). Hence, to capture the importance of investor protection and the quality of legal institutions for financial market integration we follow Bekaert et al. (2007) and use two measures obtained from the International Country Risk Guide's (ICRG) political risk ratings. First, the Law and Order index measures the strength and impartiality of the legal system and the extent of popular observance and enforcement of the law. Second, we use a broader measure of the investment profile of a country to reflect the risk of expropriation, contract viability, payment delays, and the ability to repatriate profits. Bekaert et al. (2007, 2010) argue that this measure is most closely correlated with political risks relevant for foreign direct investments.

On top of these, we also assess La Porta et al.'s (1998) accounting standard index ($AccSta$), which rates companies' broadly on 90 standard accounting items based on information provided in their annual reports and Morck, Yeung and Yu's (2000) good government index ($GGov$) that measures how well a country protects property rights. In countries with governments that are opaque and erratic, investors are reluctant to invest and require higher risk premia to compensate them for taking on potentially higher political risks. As such, this is likely to segment equity

markets.

In sum, we conjecture that countries with better corporate governance regulation ought to be more attractive for foreign equity investment leading to greater market integration than those with a weaker regulatory system.

Equity market properties In addition to the financial market development proxies discussed above, we also consider other relevant properties of a country's stock market that are important for trading purposes. Hence, we look at the average size (MV) and number of listed firms (NLFirm) within a particular country as well as the implied cost of capital (R)from the decomposition exercise. Naturally, access to cheaper capital would encourage financial market integration.

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 determinants 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 (DR R^2) in Panel B, respectively. We find that the estimated beta coefficients for our comprehensive list of empirical proxies are mostly significant and intuitively of the correct sign. In comparing the overall significance of the variable groups for economic and financial integration, we note that whilst there is a substantial overlap in the determinants for these two types of integration, there are also some stark differences. 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 whilst 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, extent to which managers manipulate accruals, dispersion in analyst forecasts and analysts' forecast errors. In addition, we also include equity market synchronicity ($Synch$) which we find

is the only significant information proxy for economic integration. As expected, a higher *Synch* (reflecting less informational efficiency) is associated with lower levels of global market integration (inverse relation).

Interestingly we find that within international financial markets, transaction costs are not sufficiently high enough to pose as indirect investment barriers that hinder financial nor economic integration at the aggregate market level.

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 9 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 a suite of representative 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 proxies for information quality and financial transparency as 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, corroborating the established importance of the legal environment in finance (La Porta et al. (1998)). In model 7, whilst 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 stock market development (proxied 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 clearly again that the information environment is important for financial but not economic integration. This result echoes the prior work of Bae, Bailey and Mao (2006) as they find

that market liberalization improved the financial information environment of emerging markets. Lastly, 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). It 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 (2010) in that home bias leads to a higher cost of capital. We find this significantly works to hamper global market integration.

5.3 Panel Regression Results

It is well established in the existing literature, that market integration is a time-varying process (Bekaert and Harvey (1995), 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^2s, we directly employ standardized cash flow news and discount rate news as dependent variables in a panel regression context and allow these to be explained by the same news component for the world portfolio and its interactions with a set of empirical determinants of financial market integration. We standardize CF and DR news by dividing by their respective standard deviation over time. We investigate the role of interaction effects with financial and economic integration for significant variables already identified from Table 6. Essentially, like Bekaert et al. (2010) 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 estimated 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. Whilst there is a common set of deterrents to both financial and economic sides of market integration, investor heterogeneity (or differences of opinion in the sense of Diether, Malloy and Scherbina (2002)) 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 cash flow and discount rate news on the world portfolio suggesting that these variables are in turn functions of the extent of financial and economic openness and clearly need to be accounted for. When we include both country-specific fixed-effects to control for cross-country heterogeneity and omitted variables and time fixed-effects to control for trends over time, our results are even stronger.

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

In sum, there remains significant limits to financial globalization (Stulz (2005)) as there are implicit informational barriers that exist in international financial markets.

6 Conclusions

In this study we have shown how stock analyst earnings forecasts may be used to assess the development of financial and economic dimensions of global market integration. In doing so, we contribute a new approach and 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 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 whilst 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 in practice, it is easier to integrate markets financially rather than economically as 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 in financially integrating global financial markets than real economies to reap the greatest welfare gains from globalization.

In sum, 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 first in making use of stock analyst information to shed new light on global market integration and second in distinguishing 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 to future research on international financial integration.

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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	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
China	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
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
Portgual	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
Taiwan	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. $\Delta \hat{EPS}_\tau = \frac{(\hat{EPS}_{\tau,t+1} - \hat{EPS}_{\tau,t})}{P_t}$, where $\hat{EPS}_{\tau,t}$ 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	$\Delta \hat{EPS}_1$	$\Delta \hat{EPS}_2$	$\Delta \hat{EPS}_3$	$\Delta \hat{EPS}_4$	$\Delta \hat{EPS}_5$	ΔR
				2003-2007			
DEV	$\Delta \hat{EPS}_1$	1.000					
DEV	$\Delta \hat{EPS}_2$	0.820	1.000				
DEV	$\Delta \hat{EPS}_3$	0.694	0.848	1.000			
DEV	$\Delta \hat{EPS}_4$	0.564	0.667	0.722	1.000		
DEV	$\Delta \hat{EPS}_5$	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	$\Delta \hat{EPS}_1$	1.000					
EMG	$\Delta \hat{EPS}_2$	0.733	1.000				
EMG	$\Delta \hat{EPS}_3$	0.614	0.762	1.000			
EMG	$\Delta \hat{EPS}_4$	0.515	0.584	0.767	1.000		
EMG	$\Delta \hat{EPS}_5$	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	$\Delta \hat{EPS}_1$	1.000					
ALL	$\Delta \hat{EPS}_2$	0.783	1.000				
ALL	$\Delta \hat{EPS}_3$	0.659	0.811	1.000			
ALL	$\Delta \hat{EPS}_4$	0.542	0.631	0.741	1.000		
ALL	$\Delta \hat{EPS}_5$	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	$\Delta \hat{EPS}_1$	1.000					
DEV	$\Delta \hat{EPS}_2$	0.872	1.000				
DEV	$\Delta \hat{EPS}_3$	0.818	0.923	1.000			
DEV	$\Delta \hat{EPS}_4$	0.737	0.804	0.871	1.000		
DEV	$\Delta \hat{EPS}_5$	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	$\Delta \hat{EPS}_1$	1.000					
EMG	$\Delta \hat{EPS}_2$	0.726	1.000				
EMG	$\Delta \hat{EPS}_3$	0.600	0.775	1.000			
EMG	$\Delta \hat{EPS}_4$	0.490	0.625	0.768	1.000		
EMG	$\Delta \hat{EPS}_5$	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	$\Delta \hat{EPS}_1$	1.000					
ALL	$\Delta \hat{EPS}_2$	0.809	1.000				
ALL	$\Delta \hat{EPS}_3$	0.723	0.859	1.000			
ALL	$\Delta \hat{EPS}_4$	0.630	0.727	0.827	1.000		
ALL	$\Delta \hat{EPS}_5$	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 3

Decomposition of International Stock Market Returns

This table reports an analyst decomposition of international stock market returns calculated from Claus and Thomas (2001)'s abnormal earnings model. RX is international stock market returns excluding dividends. CF is cash flow news component of stock market returns calculated from revisions in earnings forecasts. DR is discount rate news component of stock market returns calculated from revisions in expected returns. Market indicates whether countries are developed (DEV), emerging (EMG), or all markets (ALL). Sample period is between 1993 and 2007.

Market	$Var(RX)$	$Var(CF)$	$Var(DR)$	$Cov(CF, DR)$	$Corr(RX, CF)$	$Corr(RX, DR)$	$Corr(CF, DR)$
				2003-2007			
DEV	0.002	0.001	0.003	-0.001	0.054	0.735	-0.618
EMG	0.004	0.009	0.013	-0.009	0.067	0.519	-0.705
ALL	0.003	0.005	0.007	-0.004	0.060	0.642	-0.655
				1998-2002			
DEV	0.003	0.003	0.004	-0.002	0.215	0.669	-0.533
EMG	0.009	0.013	0.019	-0.010	0.081	0.563	-0.628
ALL	0.006	0.007	0.011	-0.005	0.157	0.623	-0.574
				1993-1997			
DEV	0.002	0.003	0.005	-0.003	0.043	0.623	-0.713
EMG	0.007	0.025	0.030	-0.023	0.061	0.419	-0.777
ALL	0.004	0.013	0.016	-0.011	0.051	0.535	-0.741

TABLE 4
Economic and Financial Integration

This table shows regression results of the following models.

$$\begin{aligned} CF_{i,t} &= \alpha_{i,CF} + \beta_{i,CF} CF_{w,t} + \epsilon_{i,CF,t}, \\ DR_{i,t} &= \alpha_{i,DR} + \beta_{i,DR} DR_{w,t} + \epsilon_{i,DR,t}, \\ RX_{i,t} &= \alpha_{i,RX} + \beta_{i,RX} DR_{w,t} + \epsilon_{i,RX,t}. \end{aligned}$$

$CF_{i,t}$ 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. All those 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.

	CF			DR			RX			DR and CF	
Market	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^2_{CF}) 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^2_{DR}) 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 (2010)'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. 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. *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^2_{CF}					**Panel B:** R^2_{DR}				
Variable	b	t	$\bar{R}^2$	Nobs	Variable	b	t	$\bar{R}^2$	Nobs
Information Environment									
$Smooth$	0.372	1.08	0.062	37	$Smooth$	0.565	2.06	0.115	37
$Corr$	1.540	1.14	0.083	37	$Corr$	2.310	2.08	0.145	37
$Disp$	-1.037	-1.77	0.127	37	$Disp$	-1.950	-3.97	0.352	37
$FError$	-0.473	-1.65	0.080	37	$FError$	-0.885	-3.34	0.235	37
$Synch$	-0.709	-2.38	0.162	37	$Synch$	-1.124	-4.44	0.303	37
Trading Cost									
$Turn$	0.075	1.23	0.032	37	$Turn$	0.089	1.11	0.030	37
$EffSprd$	-1.329	-1.17	0.007	37	$EffSprd$	-0.516	-0.28	-0.025	37
Financial and Economic Openness									
$Investibility$	0.209	3.32	0.041	37	$Investibility$	0.299	3.70	0.070	37
HB	-0.057	-2.85	0.391	37	HB	-0.082	-5.87	0.580	37
$FDIGDP$	0.424	2.23	0.015	37	$FDIGDP$	0.697	2.68	0.052	37
SEG	-7.338	-2.52	0.248	37	SEG	-10.891	-4.67	0.393	37
Financial and Economic Development									
$MVGDP$	0.061	2.64	0.071	37	$MVGDP$	0.108	2.77	0.185	37
$PCreditGDP$	0.121	2.03	0.150	37	$PCreditGDP$	0.184	3.50	0.258	37
$GDPPC$	0.049	3.03	0.161	37	$GDPPC$	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
BM	-0.156	-1.98	0.109	37	BM	-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
g_{GDP}	-2.332	-2.85	0.073	37	g_{GDP}	-3.517	-2.95	0.131	37
Financial and Economic Regulatory									
$InvProfile$	0.343	3.54	0.083	37	$InvProfile$	0.606	4.65	0.213	37
Law	0.216	2.25	0.072	37	Law	0.423	4.27	0.237	37
$AccSta$	0.274	1.49	0.003	33	$AccSta$	0.746	3.74	0.156	33
$GGov$	0.395	3.72	0.123	32	$GGov$	0.873	4.47	0.309	32
Equity Market Properties									
MV	0.032	1.41	0.035	37	MV	0.046	1.81	0.065	37
$NLFirm$	0.045	1.24	0.103	37	$NLFirm$	0.054	1.82	0.103	37
R	-1.167	-2.27	0.083	37	R	-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^2_{CF}) 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^2_{DR}) 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. $GDPPC$ 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

Panel A: R^2_{CF}

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

Panel B: R^2_{DR}

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

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

$SCF_{i,t}$ 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, $GDPPC$, g_{GDP}, 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. g_{GDP} 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	0.282	0.506	0.490	-0.369	-0.360	0.259	0.250	0.439	0.410
	(9.92)	(9.13)	(12.00)	(11.34)	(-3.56)	(-3.30)	(10.84)	(10.01)	(8.40)	(7.56)
γ_{Disp,CF_w}	-0.319	-0.294								
	(-1.80)	(-1.57)								
γ_{HB,CF_w}			-0.060	-0.059						
			(-6.56)	(-6.27)						
γ_{GDPPC,CF_w}					0.065	0.063				
					(5.75)	(5.33)				
γ_{g_{GDP},CF_w}							-0.678	-0.693		
							(-1.34)	(-1.31)		
γ_{R,CF_w}									-1.835	-1.661
									(-4.03)	(-3.50)
$\bar{R}^2$	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

Panel B: SDR

Variable	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	0.555	0.658	0.769	-0.065	-0.425	0.444	0.444	0.599	0.655
	(26.33)	(22.11)	(27.97)	(25.56)	(-0.97)	(-4.46)	(25.37)	(23.53)	(17.07)	(15.42)
γ_{Disp,DR_w}	-0.661	-0.833								
	(-5.33)	(-4.97)								
γ_{HB,DR_w}			-0.051	-0.078						
			(-10.15)	(-11.29)						
γ_{GDPPC,DR_w}					0.054	0.093				
					(7.72)	(9.15)				
γ_{g_{GDP},DR_w}							-0.115	-0.279		
							(-0.34)	(-0.71)		
γ_{R,DR_w}									-1.424	-1.985
									(-4.71)	(-5.28)
$\bar{R}^2$	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