Understanding Equity Comovement – An Information Based Approach

Nicky J. Ferguson and P. Raghavendra Rau*

April 2014

Abstract

This paper investigates the relationship between equity comovement and firm level information events. Using a model free measure of comovement and a comprehensive dataset of over 2 million firm level information events covering a global sample of firms, we show that information events about large visible firms are positively related to increased comovement among large and small firms in the same industry and country, small firm information events increase comovement within-industries and decrease comovement within-countries. These relationships persist despite the increase in importance of macroeconomic variables as a determinant of equity comovement during the financial crisis and are robust to information environment such as legal system, or developed status.

Keywords: *Comovement, information models, returns*

* Ferguson and Rau: University of Cambridge, Trumpington Street, Cambridge CB2 1AG, UK, (Ferguson: njf32@cam.ac.uk; Rau: r.rau@jbs.cam.ac.uk). We gratefully acknowledge financial support from the Cambridge Endowment for Research in Finance.

1. Introduction

Roll (1988) classifies movements in asset returns into three categories, attributing them to unpredictable changes in pervasive country-wide factor information, changes in industry-level factor information, and changes in firm-specific factor information. The extent to which stocks move together depends on the relative amounts of country-, industry-, and firm-level information capitalized into stock prices. Research has documented however, that asset returns co-move *excessively* in that the co-movement does not appear to be justified by changes in covariances in their underlying information factors. The literature has also documented patterns in comovement. For example, comovement appears significantly higher in recessions than in booms (Ribeiro and Veronesi, 2002), comovement has been steadily decreasing both in the US (Campbell, Lettau, Malkiel, and Xu, 2001) and in emerging markets (Morck, Yeung, and Yu, 2000) over time, and correlation patterns appear to change as assets are held by different clienteles of investors (Barberis, Shleifer, and Vishny, 2005, and Froot and Dabora, 1999).

To explain the comovement in stock returns, a number of theoretical models of information markets have been developed (see for example, Veldkamp, 2006a or 2006b, or Peng and Xiong, 2006). However, it has proven difficult to examine these models empirically in the absence of data on investors' information sets. The limited empirical literature on comovement has mainly focused on indirect proxies for the quality of information available to investors. Examples include investor property rights (Morck, Yeung and Yu, 2000), lack of transparency (Jin and Myers, 2006), analyst coverage (Chan and Hameed, 2006 or Brockman, Liebenberg, and Schutte, 2010), financial development (Fisman and Love, 2004), index additions (Claessens and Yafeh, 2013), macroeconomic factors (Albuquerque and Vega, 2009 or Brenner, Pasquariello, and Subrahmanyam, 2009), and voluntary disclosure by management (Haggard, Martin, and Pereira, 2008).

In this paper, we directly measure information production at the firm-level using a unique news database with over 2.2 million daily news events on a sample of 8,751 firms in 52 countries and 40 industries across the world over the period from 1995 to 2013. We relate these measures of *firm*-level information to changes in within-industry and within-country equity comovement. The use of daily data allows us to analyze in detail how firm-specific information factors affect correlation at the industry and country level in event time. It also allows us to examine how the market incorporates information shocks into future returns. Our main tests use a raw model-free measure of correlation. This allows us to compute country and industry correlations globally without the use of assumptions on the benchmark model. Constructing our measure of comovement this way, we show that within-country comovement is higher than within-industry comovement, and that emerging markets do not have higher comovement on average than developed markets, as previously documented in the literature.

The essence of the standard information-based theoretical models of comovement can be illustrated through the following example taken from Veldkamp (2006b). Suppose the return to a stock A is driven by the returns to two uncorrelated stocks, B and C. If investors purchase information about the current-period return to A, but not information about B and C, then when A's payoff rises, investors will attribute some of the increase to B and some to C. Because they infer that the valuations of both assets rose, both prices will rise. If A's payoffs fall, the prices of B and C will both fall. Hence, prices of B and C will covary, even though investors know their pay-offs are uncorrelated. Veldkamp (2006b) argues, therefore, that the common source of information adds a new common shock to the prices of B and C, which causes apparent excess covariance in their prices. As Veldkamp notes, a signal must have two features to produce comovement: it must contain information about the value of many assets, and it must be observed by many investors.

In a standard noisy rational expectations model such as Grossman and Stiglitz (1980), if a signal has a fixed cost for purchasing information, investors will seek out signals that other investors are not purchasing. Hence signals are strategic substitutes. In the Veldkamp (2006b) model, information is a non-rival good with a high fixed cost of creation but a low marginal cost of replication. Hence, producing a large number of copies is cheaper on a per-unit basis, leading to complementarities in information purchasing. Investors will tend to buy common information because the information that all investors buy is less valuable but cheap. Similarly, market forces will force suppliers to sell signals that predict the values of a large number of assets to investors, since these signals will generate the highest value for the largest number of investors.

Which information signals are these? In this paper, we use the Key Developments database available from Capital IQ to generate a sample of over 2.2 million key news developments for firms across the world. The key developments include earnings announcements, product-related announcements, board change announcements, and corporate events such as merger announcements, lawsuits, private placements, buybacks, among others. We argue that news announcements concerning the largest firms in a particular industry or country would be likelier to produce information signals that would forecast future payoffs to a wide range of firms within the same industry and country, in particular those for smaller firms in an industry or country. This is because larger firms are likely to be significant customers for a range of smaller firms (and hence are exposed to common input shocks through the smaller firms). In addition, larger firms are more likely to be followed by industry and country analysts. Hence, information shocks to large firms should subsequently raise correlations between otherwise uncorrelated small firms.

That is precisely what we find. Regardless of whether we control for industry or country, we find consistent evidence of an information transfer mechanism, whereby investors make

correlated inferences using large firm information events that increase equity comovement in both large and small firms. We also find that the number of small firm information events tend to *increase* comovement within *industries* for both large and small firms and *decrease* comovement within *countries* for both large and small firms. This finding is relatively intuitive. Small firm information events are likely to contain relevant information, such as information on common input shocks, for other firms in the same industry. Therefore comovement increases as investors make correlated inferences on those firms. However, at the country level, smaller firms are less representative of economic conditions in general. Hence comovement decreases as investors react idiosyncratically to new information. When we split our sample by time period to study the period around the financial crisis, or by rule of law (civil and common law), or by state of development (developed or emerging countries), we find qualitatively similar results. This suggests that the mechanism through which investors use firm level information events to make correlated inferences seems to transcend the information environment. We also show that this effect holds when earnings announcements are excluded from the information event variables, extending prior research to include all value relevant firm level information events. Lastly we find that negative information events have a greater effect on aggregate equity comovement than positive information events and the resultant effect happens faster.

Our paper makes several contributions to the literature on comovement. Our sample of firms is global, representing the entire investible universe. In contrast, prior studies have typically examined the US or emerging markets. Brockman, Liebenberg, and Schutte (2010) (BLS), for example, analyze 32,000 securities from the US in their sample, many of which are not regularly traded. Focusing on the investible universe ensures that even the smallest firms in our sample are regularly traded and have a measureable information flow. Papers that use the market model R^2 often cite the difficulty in computing actual pairwise correlations across

a large universe of firms or use the US market portfolio in market model regressions to estimate emerging market correlations, citing foreign capital flows as a reason for its appropriateness (see Morck, Yeung, and Yu, 2000). However, this procedure does not appear appropriate to examine how investors use information to trade given limited attention, search costs, and trading frictions. In addition, our measure of firm-level information shocks is the most comprehensive in the extant literature. The Capital IQ Key Developments dataset is relatively new and has not been typically used to measure firm-level information shocks. Across these two dimensions, our study, with its direct measure of firm-level information shocks, and model-free daily correlation measure, appears to provide us with the most appropriate setting to test the information based comovement hypotheses.

This study also highlights the use of firm level information events, rather than information environment in empirical asset pricing research. This allows us to analyze the precise channels through which stock returns respond to new information and the efficiency of the market in processing new information.

2. Literature review

Among the earliest papers to show how information influences asset prices, Grossman and Stiglitz (1980) use a noisy rational expectations framework where the price of information is exogenous to the economy. In their model, the price system becomes more informative if the quality of information increases, the information cost decreases, or if the absolute level of investor risk aversion falls. They also show that an increase in noise increases the returns to information, thereby leading more traders to become informed. Veldkamp (2006a) extends the Grossman-Stiglitz model by making information production endogenous. In Veldkamp (2006a), information has high fixed costs of production but low

marginal costs of replication.[1] Free entry into the information market results in a price for information that declines as demand rises. Investors buy the same information that other investors are buying because in bulk, that information is inexpensive. This leads to information based herding with investors converging on assets for which the most (and cheapest) information is available. Herding increases demand for these assets. High demand markets in turn generate additional news, creating a price premium for that market.

Veldkamp (2006b) shows that when information costs do not decline with quantity, investors only choose to learn about a small number of assets, therefore limiting the impact of information shocks on investor priors. Endogenous information production in information markets supplies investors with signals that are cheap and in high demand since they can forecast many payoffs. Hence, information shocks on high-demand assets will influence priors across a wide range of investors and result in asset comovement. Comovement will subsequently decline as signals about additional assets are observed. The model also predicts that comovement will be higher during recessions than in booms. This is because during recessions, the demand for firm specific information falls, increasing the average cost per unit of information. In turn, this leads investors to use a limited number of information signals to forecast the returns of a small number of firms. These returns are then used to estimate the returns of other firms, increasing comovement among the latter. These hypotheses are consistent with results in Ribeiro and Veronesi (2002) and earlier work from Roll (1988), showing that comovement depends on the relative amounts of firm-level and economy-relevant news impounded into asset prices. Buraschi, Trojani, and Vedolin (2014) model the relation between stock return comovement and belief disagreement and find correlation increases when investors disagree about dividends or the aggregate information signals, when there is greater uncertainty in the economy, or when investor inattention is high.

[1] Romer (1990) notes that the declining cost of replication is generally observed in markets for information. For example, the price of a publication rises as the potential audience of the publication declines.

In contrast to Veldkamp (2006a or 2006b), Peng and Xiong (2006) use learning capacity constraints to explain excess comovement. Using entropy[2] to measure the degree to which an information signal reduces investor uncertainty, their model shows that limited investor attention and investor overconfidence interact to create a form of category learning, where investors give market and sector-level information priority over firm-level fundamental information. They show that holding information quality[3] constant, overconfidence and limited attention amplifies comovement. In contrast, greater information efficiency reduces comovement, as investors will allocate more attention to fundamentals in those firms and sectors. Empirically, however, both sets of models make very similar predictions (summarized in Table II).

Empirically, a range of papers have analyzed firm information environments to explain asset comovement. Morck, Yeung, and Yu (2000) report that stock markets are more synchronized in economies with relatively low per-capita GDP and less developed financial systems and argue that their results are attributable to differences in protection for investor property rights. Jin and Myers (2006) argue that lack of protection is a necessary but not sufficient condition. In their model, lack of transparency or opaqueness is also necessary for comovement to occur. Durnev, Morck, Yeung, and Zarowin (2003) document that greater firm-specific price variation in industries leads to more informative prices. Chan and Hameed (2006) find that emerging market stocks with higher analyst coverage exhibit higher stock price synchronicity. Barberis, Shleifer, and Vishny (2005) find that that a stock's beta with the S&P 500 increases after inclusion in the index. Hameed, Morck, Shen, and Yeung (2010) show that firms with few analysts comove significantly with highly covered and prominent

[2] The entropy of a random variable is a measure of its uncertainty relative to a base distribution. The concept is borrowed from information theory (see Cover and Thomas, 2006).
[3] Examples of proxies of information quality are greater analyst coverage, financial system transparency, or simpler business fundamentals in a particular sector.

stocks in the same industry, with the information flow running from the highly covered firms to less covered firms but not vice versa.

BLS perform the most direct examination of the theoretical predictions on information production in business cycles. They define comovement as the amount of stock return volatility common to stocks in a given market. They then use the Campbell, Lettau, Malkiel, and Xu (2001) beta-free volatility decomposition methodology to create a measure of comovement and show that comovement runs countercyclical to economic activity. This relationship strengthens when information production is more volatile. They also show that the relation between comovement and business cycles is weaker in high-income countries, and argue that comovement is related to the scale and sophistication of the information market.

One issue with the results in BLS however, is that their measure of information production is indirect. To proxy for variability in information production, they use asymmetry in firm specific volatility, accounting quality, and variability in analyst coverage. While such smooth measures may be useful to proxy for the information environment on the time scale of business cycles, it is of little use at the firm level. Moreover, one of the underlying assumptions driving most theoretical models is that information observed by the financial market is unobserved by the econometrician. Indirect measures of information production do not address this issue.

3. Data

We select our sample of firms from the Thomson Reuters Global Index (Datastream Mnemonic: LXGLFLD$). This sample covers stocks from 52 countries, and 40 industries, (using ICBSN codes after excluding non-equity securities) for a total sample size of 11,236 sirms. This gives us an investible universe of firms likely to have information events that would attract investor attention. It also reduces the possibility of incorrect entries and jumps

in the return data due to infrequently traded stocks. Daily stock prices, annual dollar market values, and turnover are downloaded from Thomson Reuters Datastream. After matching this constituent list with the Key Developments dataset from Capital IQ, the final sample consists of 8,751 firms over the period 1995 to 2013.

For our sample of firms, we collect 2,264,689 Key Developments from Capital IQ. The Key Developments dataset contains 97 different types of firm level value relevant information events, compiled and identified by type by S&P analysts daily from over 20,000 news sources. Examples of these include earnings announcements, M&A rumors, bankruptcy, and credit downgrades. Figure 1 illustrates the number of information events over time. Dataset coverage of information events increases significantly after 2003 and shows a large cross-sectional and time-series variability in the timing of information events.

[Insert Figure 1 around here]

The top 25 Key Developments in the sample are reported in Table I. Earnings announcements/shocks, which have traditionally been used to examine information based hypotheses in the literature (see for example, Chan and Hameed, 2006, Hameed, Morck, Shen, and Yeung 2010, or Hou, 2007) form 11.5% of the total number of Key Developments. A further 14% are earnings-related, including corporate guidance, expected earnings release dates, and earnings calls.

Among other events included in the sample are executive or board changes (5.4%), product related announcements (5.3%), M&A transactions (9.6%) (including rumors), buybacks (4.8%), and fixed income offerings (3.0%). With the exception of earnings and corporate voluntary disclosures, none of the other events have typically been used in the prior literature to examine asset co-movement.

[Insert Table I around here]

4. Variable Construction and Methodology

4.1 Comovement

The comovement variables were constructed by calculating the average of the lower triangle of the correlation matrix of all stock returns in the sample over a 20 trading day period.

$$Corr_t = \frac{1}{n} \cdot \sum_{1}^{n} L\left[\left(\sum^{(diag)}\right)^{-\frac{1}{2}} \sum \left(\sum^{(diag)}\right)^{-\frac{1}{2}}\right]$$

where $Corr_t$ is the average of n pairwise stock return correlations on day t calculated using daily returns from day *t-20* to *t*. L is the lower triangle of the correlation matrix, and $\sum^{(diag)}$ is the matrix of diagonal elements of the covariance matrix $\sum$. This calculation is then rolled forward to give a daily measure of correlation over the sample period. This methodology is repeated for all sample stratifications.

Our measure of stock return comovement is model free. This contrasts with the common R^2 method popularized by Roll (1988), and does not make any assumptions related to weighting or 'excess' volatility as in the volatility decomposition methodology of Campbell, Lettau, Malkiel, and Xu (2001) and utilized by BLS. In these models, it is necessary to make assumptions related to the market and industry benchmarks. Given different stock weighting systems used in benchmarks around the world, and the different representation of firms in countries and industries, the use of simple correlations avoids the use of any assumptions.

[Insert Figure 2 around here]

In addition, our method allows us to observe the variation in stock return comovement over time required to assess the impact of information shocks at higher frequencies. This variation is not apparent in the regression approach due to the amount of data needed to run the regressions. Figure 2 shows the full sample daily stock return correlation over the sample period. The figure shows that stock return comovement is a dynamic process with a

significant number of notable spikes, reaching a high in 2008 during the recent financial crisis before decreasing.

4.2 Information Events

The information event variable (*InfoEvent*) is defined as the number of value relevant information events on a given day *t*. This variable is calculated by summing the Capital IQ Key Developments for the trading days in the sample period. Key Developments are matched to variables from Datastream by the announced date recorded by S&P. Note this variable is not a proxy for news flow, information demand, or investor attention in the stock market. It just measures the number of information events.

To examine the hypotheses of Veldkamp (2006b) summarized in Table II, we need to first identify the information channel through which we would expect comovement to occur. Veldkamp proposes[4] that observing an information signal about a high value asset has the greatest ability to cause asset comovement. This is because investors gain the highest utility from observing a signal that can forecast many payoffs, where signals observed about high value assets contain both asset specific and economy-wide information. Therefore we would expect the largest firms in a particular industry or country to produce information signals that would forecast future payoffs of the smallest firms in an industry or country. Correlations should then rise amongst the small firms if investors make correlated inferences regarding the information signal.

[Insert Table II around here]

Therefore, we sort our sample into large and small firms, on a country and industry level. Specifically, we classify large firms as those in the top 30% of firms by annual dollar market value and small firms as those in the bottom 30% of firms by annual dollar market value in each industry or country separately. Figure 3 and Figure 4 show information events over time

[4] See Proposition 6.

for large and small firms globally using the full sample of firms, and large and small firm rolling correlation respectively. Large and small firm information events are similarly distributed over time. However, consistent with our hypotheses, there are significantly more information events for large firms than for small firms. A similar pattern holds for large and small firm correlations. While large firm correlation is slightly larger in magnitude, large and small firm equity correlations are similarly distributed. This is in line with Veldkamp (2006b). Since large firms will contain more market-wide information than small firms, they will have a larger common component to their returns. Hence we should expect them to have higher comovement than smaller firms.

[Insert Figure 3 around here]

[Insert Figure 4 around here]

4.3 Methodology

To examine the impact of information shocks on stock return comovement and the transmission mechanism, we regress our daily measure of large or small firm comovement on lagged number of information events (*InfoEvent*).

$$Large\ or\ Small\ Firm\ Corr_t = \beta_1 Large\ InfoEvent_{t-1} + \beta_2 Large\ InfoEvent_{t-2} + \beta_3 Small\ InfoEvent_{t-1} + \beta_4 Small\ InfoEvent_{t-2} + Controls + FE$$

In the regressions, we control for lagged average returns (*Ret*), trading volume (Volume), the number of firms in each industry/country, and lagged comovement (*Corr*). We also control for the macroeconomic environment using the VIX index (*VIX*), the TED spread (*TED*) calculated as the difference between 3 month USD LIBOR and the 3 month T-bill interest rate, the spread of BAA corporate bonds over AAA corporate bonds from Moody's

(*BAA-AAA*), the Gold price (*Gold*), and the Oil price (*Oil*). We use time and country / industry fixed effects (*FE*) throughout, with clustered standard errors[5].

Our empirical approach to examining information-based comovement differs along several dimensions to that of earlier attempts in the literature. First, our comovement variable, being model-free, does not allow us to construct a firm-level comovement measure that the R^2 approach allows. This leads us to use an aggregate approach using average comovement by both industry *and* country, which is similar to that adopted by Morck, Yeung, and Yu (2000), Jin and Myers (2006), and BLS.) However these papers use firm-level comovement averaged by country. Second, our model free comovement measure allows us to use *daily data*, this in turn allows us to examine the effect of information events, which are recorded at daily frequencies, neither of which have been used previously in the literature. Previous papers have only examined the information environment proxied for by analyst coverage, GDP, stock market size, accounting standards, frequency of market crashes, industry concentration, volume, and business cycle variables, measures of which are recorded at much lower frequencies (see Table III for a summary).

In our analysis, we attempt to control for the industry and country macroeconomic variables documented to influence comovement in the prior literature, by using similar variables constructed at higher frequencies, or variables that we expect to be correlated with those used previously. However, this is not always possible since most of these variables (analyst coverage for example) do not change at a daily level. Therefore, we use country, industry and time fixed effects in all our regressions. In addition, in several analyses, we split the sample along these dimensions to examine the importance of these factors.

[Insert Table III around here]

[5] In all regression tables, coefficients for all variables except those on Ret and Corr have been multiplied by 1000 for readability.

Third, our approach also considers the information transmission mechanism. Chan and Hameed (2006), in addition to their main results run separate lead-lag return VAR regressions for high and low analyst coverage firms, by controlling for past returns, and splitting our information event variable into large and small firm information events, we make the hypotheses of Veldkamp (2006b) related to information markets, information completeness, and asset value, central to our investigation.

5. Results

In this section, we present summary statistics of our main variables, describe our testing methodology and report the results of our empirical tests.

5.1 Summary Statistics

Table IV and Table V break down the sample by country and industry respectively and are ordered by average correlation from highest to lowest. Table IV shows that, consistent with Morck, Yeung, and Yu (2000), emerging market countries dominate the top of the table in terms of average correlations. However, on average, there is no clear distinction between developed and emerging markets. The largest and most developed capital markets tend to sit in the middle of the sample. These values are also significantly different in order from the average country stock return comovement values in BLS. Over their sample period of 1980 to 2007, they report that the US and Canada is at the bottom of the range by mean stock return comovement, while countries such as the UK and other developed European nations are towards the top end of the range. Table V shows that industry average correlations are smaller and less variable than country specific average correlations.

[Insert Table IV and Table V around here]

5.2 Comovement and Information Events

Table VI presents our main regression results examining the relationship between comovement and information events. The dependent variables in the regressions are large and

small firm comovement computed within industry and within country respectively. As noted above, large firms represent the top 30% of firms by annual dollar market value, and small firms represent the bottom 30% of firms by annual dollar market value. We find that large and small information events have different effects on equity comovement, depending on whether comovement is measured at the industry or country level. The number of large firm information events is significantly positively related to equity comovement with the greatest impact appearing two days after the information event at the industry level and one day after the information event at the country level. This is reasonably intuitive. Investors take longer to realize correlated inferences on an industry level as the group of firms in an industry is global. In contrast, at the country level, the home bias literature shows that investors typically do not diversify very much internationally. Hence, within a country, investor search costs are likely to be lower and investors are likely to be more familiar with firm peer groups. Therefore, it is not surprising that information events are incorporated into correlation inferences faster at the country level than at the industry level. The number of large firm information events are also significantly positively related to small firm comovement at both the industry and country level (models (2) and (4)). This is consistent with Veldkamp's (2006b) hypothesis that large firm information events have the greatest ability to increase small firm comovement. Again, the number of large firm information events increases comovement among small firms faster at the country level than at the industry level. In the latter case, a large firm information event first reduces small firm comovement the next day and only increases it a day later.

In contrast, the number of small firm information events tends to increase comovement within industries for both large and small firms and decrease comovement within countries for both large and small firms. This finding is also relatively intuitive. Small firm information events are likely to contain relevant information for other firms in the same industry.

Therefore comovement increases as investors make correlated inferences on those firms. However, at the country level, smaller firms are less representative of economic conditions in general. Hence comovement decreases as investors react idiosyncratically to new information.

Overall, these results are consistent with Veldkamp (2006b) whereby at the country level, the marginal contribution of small firm information events is reduced in a more complete information setting as they do not contain much market level information. However, at an industry level, their marginal contribution will be higher as they may still contain industry relevant information.

The results are also consistent with the lead-lag effect found in stock returns, particularly those from big firms to small firms, and high analyst coverage to low analyst coverage firms (see Lo and Mackinlay, 1990, Brennan, Jegadeesh and Swaminathan, 1993 or Hou, 2007).

[Insert Table VI around here]

The results in Table VI also shows that one day lagged comovement is significantly positively related to comovement on day *t*. This is partly because our measure of comovement, average pairwise correlation, is constructed over a twenty-day window and rolled forward. We find that average lagged returns are significantly negatively related to stock return comovement. This is consistent with Jin and Myers (2006) who find that stocks likely to experience higher comovement are more likely to have large negative returns, along with the findings of Ribeiro and Veronesi (2002), Veldkamp (2006), and BLS, who document negative relationships between returns or business cycles and asset comovement. Consistent with these papers, we find that VIX, TED, and the corporate bond spread (our proxies for macroeconomic uncertainty), are all significantly positively related to stock return comovement. Gold and oil are negatively related to equity comovement over the sample period.

Most of the prior research uses earnings announcements or forecasts to examine

information spillover from visible to less-visible firms (see for example, Durnev, Morck, Yeung, and Zarowin, 2003; Chan and Hameed, 2006; Hou, 2007 or Hameed, Morck, Shen, and Yeung, 2010). In Table VII, we repeat our analysis as in Table VI, after excluding earnings announcements. We do this to ensure that our results are not driven solely by reactions to earnings announcements, which comprise just over 11% of our information events.

[Insert Table VII around here]

The regressions in Table VII show that our results are qualitatively and quantitatively extremely similar to our previous results in Table VI. Hence our results are robust to other types of firm-specific information events.

Our results are consistent with Hou (2007) who shows that returns of large firms lead returns of small firms in the same industry due to a sluggish response to information, and that small firms respond to earnings shocks of large firms. We show that Hou's results can be extended to all information events. Our results are also consistent with Chan and Hameed (2006) who find securities that are covered by more analysts incorporate more market-wide information. We find that this result is stronger at the industry level than the country level, given that larger firms will have greater analyst coverage than smaller firms. They find that returns on high-coverage firms lead returns on low-coverage firms and changes in earnings forecasts of high coverage firms predict returns of the low coverage firms but the reverse is not true. Our results extend these findings to all value relevant information events, not just to earnings related events. Hameed, Morck, Shen, and Yeung (2010) argue that information spillover is a source of stock return synchronicity. They use analyst coverage as their measure of information, and show that earnings related information spillovers occurs from visible to non-visible firms and is unidirectional. However their paper only covers US stocks. We results extend their findings to a global sample of stocks using all value relevant information

events. Finally, BLS also find support for the predictions in Veldkamp (2006b), particularly those pertaining to business cycles. However, they have no direct measure of information shocks and proxy for the volatility of information production using asymmetry in firm specific volatility, accounting quality, and variability in analyst coverage. Our results are also consistent with BLS. Although we have fewer firms in our sample, we have broader international coverage. We use data with a higher frequency and more direct (firm level) measures of information shocks rather than looking at the information environment.

5.3 Comovement and Information Environment

BLS show that a country's economic development and transparency affects the link between comovement and the business cycle. Specifically, firms in civil law based legal systems or emerging economies show a stronger positive relationship between comovement and stock market returns than firms in common law legal systems or developed economies. Hence we next examine whether the how the legal system or the country classification as a developed or emerging economy affects the strength of comovement.

[Insert Table VIII around here]

Table VIII splits the sample into civil law and common law countries[6]. Our regressions for common law countries are qualitatively similar to those in Table VI and Table VII. Specifically, we document a significant positive relationship between the number of large firm information events and within-country equity comovement and a significant negative relationship between the number of small firm information events and within-country equity comovement. In contrast, for civil law countries, the number of information events appears unrelated to comovement. Moreover, the number of small firm information events has the opposite sign to our previous results.

[6] See La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000, 2002) for a discussion of the differences between common and civil law countries in terms of investor protection and valuations.

One plausible hypothesis is that since common law countries generally have more developed financial markets and greater shareholder protection, they are more responsive to firm level information events. Therefore, we next classify countries as developing or developed in Table IX using the IMF World Economic Outlook 2013. Our results are not consistent with this hypothesis. Developed countries display a general lack of significance in the impact of firm-specific information variables on comovement. In contrast, in developing countries, the number of large firm information events increases comovement among large firms only while the number of small firm information events decreases comovement among both large and small firms. We do note that the increase in correlation occurs with a one day lag after the information events occur in developed countries, while in developing markets, they occur after a two-day lag, suggesting the information transmission mechanism occurs slightly faster in developed markets.

[Insert Table IX around here]

5.4 Comovement and Information Events over Time

As shown earlier in Figure 2, our measure of comovement reaches its highest point during the recent financial crisis at the end of 2008, around the time of the Lehman Brothers bankruptcy. Comovement remains high after 2008 and has only recently begun to recede to pre-crisis levels. Over the period of the financial crisis, there was a significant debate in the popular press and among practitioners on the high levels of stock return correlation and its impact on the investment process (see Williams, Fenn, and McDonald, 2012). Specifically, practitioners argued that stocks no longer appeared to react to fundamentals, instead moving in lockstep. This reduced diversification benefits and complicated the investment decision process. In this section, we investigate whether the high comovement environment over the financial crisis had any impact on the relationship between the number of firm level information events and equity comovement. We do this by splitting the sample into two

similar sized periods, from 2001 to 2007 and from 2008 to 2013. We exclude pre-2001 from this part of the analysis as the number of information events recorded in the Capital IQ Key Developments dataset is low prior to 2001.

It would be expected that information events about those firms that contain the most market level information would be the most significant during the crisis period and this is what we find at the industry level in Table X. In the reduced sample, only the number of large firm information events have any significant effect on equity comovement. There is a reduction in comovement the day after an increase in the number of information events as shown by the coefficient on Large $InfoEvent_{i,t-1}$. However, a significant increase in comovement occurs two days after an increase in the number of information events (shown by the coefficients on Large $InfoEvent_{i,t-2}$). The results are qualitatively similar to those for within industry comovement in Table VI with reduced significance on the number of small firm information events. The magnitude of the coefficients on the number of large firm information events is reduced during the crisis period compared to the pre-crisis period. The significance and magnitude of the impact of VIX on equity comovement increases during the crisis period. This is not unreasonable, given the greater amount of uncertainty during that period.

[Insert Table X around here]

In Table XI, we conduct the same regressions as Table X using country level regressions. While the results are qualitatively similar to those in Table VI, the significance of the information event variables is reduced in the smaller samples. Pre-crisis, the number of information events appears unrelated to country-level comovement. During the crisis period, the number of small firm information events is significantly negatively related to comovement, particularly for small firms. Given that large firm returns were largely driven by market level and macroeconomic forces during the crisis, it is perhaps then not surprising that

investors would respond idiosyncratically to small firm information events, thus reducing comovement. Again, on the country level, the VIX index becomes more important during the crisis period.

[Insert Table XI around here]

Overall we find that the effect of firm level information events is greatest at the industry level. At the industry level, the number of large firm information events appears significantly positively related to comovement both within large and small firms. This effect appears to be most strongly felt two days after an increase in the number of information events. The number of small firm information events are positively related to comovement at the industry level, and negatively related to comovement at the country level. These relationships are stronger for common law countries, similar for both developed and emerging countries, and weaker during the financial crisis.

5.5 Comovement and Positive/Negative Information Events

Several studies have documented the differential effects of positive and negative news on stock returns (see for example, Tetlock, 2007 or Loughran and McDonald, 2011). We next examine the effect of positive and negative key developments on asset comovement. We select from the Key Developments dataset events that are either unambiguously positive, such as a dividend increase, business expansions, or a credit rating upgrade, and unambiguously negative, such as a lawsuit or legal issues, SEC inquiries, or a dividend decrease. Figure 5 shows the number of unambiguous positive and negative information events over time. Positive events seem evenly spread over time, while the negative events display some clustering around the time of the recent financial crisis.

[Insert Figure 5 around here]

[Insert Table XII around here]

In Table XII, we regress the full sample stock return comovement on the full sample number of positive and negative information events. The results show that the number of positive and negative information events both increase stock return comovement. The effect of positive information events seems to be spread out over several days, while the effect of negative information events on comovement is stronger in magnitude and significance, and the increase in comovement occurs on the day of the information event. This is intuitive. As shown in Figure 5, negative information events cluster in poor economic times, and comovement is higher in recessions (Ribeiro and Veronesi, 2002, or BLS), since investors have a higher demand for information events that provide more market wide information due to greater uncertainty in the economy.

6. Conclusions

Motivated by the information-based hypotheses in models such as Veldkamp (2006b), we examine the relationship between the number of firm level information events and equity comovement. We distinguish our paper from the prior literature along several dimensions. First. we use a daily model-free measure of equity comovement allowing us to compute industry and country level equity comovement without assumptions related to the benchmark. Second, our measure of information events includes all value relevant firm level information events for a global investible universe of firms giving us an extremely comprehensive sample of over 2.2 million information events, extending prior research that only used earnings related events or that was country specific.

We show that investors make correlated inferences from large firm information events that increase equity comovement among both large and small firms. We also find that small firm information events increase comovement within-industries for both large and small firms and decrease comovement within-countries for both large and small firms, showing small firms possess industry level information but not country level information. When we split our

sample by time period to isolate the financial crisis, or into civil and common law, developed or emerging countries, we find qualitatively the same relationships. This indicates that the mechanism through which investors use firm level information events to make correlated inferences seems to transcend the information environment. We also show that this effect holds when earnings announcements are excluded from the information event variables, extending prior research to include all value relevant firm level information events. Lastly we find that negative information events have a greater effect on aggregate equity comovement than positive information events and the resultant effect happens quicker.

References

Albuquerque, Rui, and Clara Vega, 2009, Economic news and international stock market co-movement, *Review of Finance* 13, 401-465.

Barberis, Nicholas, Andrei Shleifer, and Jeffrey Wurgler, 2005, Comovement, *Journal of Financial Economics* 75, 283-317.

Brennan, Michael J., Narasimhan Jegadeesh, and Bhaskaran Swaminathan, 1993, Investment analysis and the adjustment of stock prices to common information, *Review of Financial Studies* 6, 799–824.

Brenner, Menachem, Paolo Pasquariello, and Marti Subrahmanyam, 2009, On the volatility and comovement of U.S. financial markets around macroeconomic news announcements, *Journal of Financial and Quantitative Analysis* 44, 1265-1289.

Brockman, Paul, Ivonne Liebenberg, and Maria Schutte, 2010, Comovement, information production, and the business cycle, *Journal of Financial Economics* 97, 107-129.

Buraschi, Andrea, Fabio Trojani, and Andrea Vedolin, 2014, When uncertainty blows in the orchard: Comovement and equilibrium volatility risk premia, *Journal of Finance* 69, 101-137.

Campbell, John Y., Martin Lettau, Burton G. Malkiel, and Yexiao Xu, 2001, Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk, *Journal of Finance* 56, 1-43.

Chan, Kalok, and Allaudeen Hameed, 2006, Stock price synchronicity and analyst coverage in emerging markets, *Journal of Financial Economics* 80, 115-147.

Claessens, Stijn, and Yishay Yafeh, 2013, Comovement of newly added stocks with national market indices: Evidence from around the world, *Review of Finance* 17, 203-227.

Cover, Thomas, and Joy Thomas, 2006, *Elements of Information Theory*. 2nd ed. John Wiley.

Durnev, Artyom, Randall Morck, Bernard Yeung, and Paul Zarowin, 2003, Does greater firm-specific return variation mean more or less informed stock pricing?, *Journal of Accounting Research* 41, 797-836.

Fisman, Raymond, and Inessa Love, 2004, Financial development and intersectoral allocation: A new approach, *Journal of Finance* 59, 2785-2807.

Froot, Kenneth A., and Emil Dabora, 1999, How are stock prices affected by the location of trade?, *Journal of Financial Economics* 53, 189-216.

Grossman, Sanford, and Joseph E. Stiglitz, 1980, On the impossibility of informationally efficient markets, *American Economic Review* 70, 393-408.

Haggard, K. Stephen, Xiumin Martin, and Raynolde Pereira, 2008, Does voluntary disclosure improve stock price informativeness?, *Financial Management* 37, 747-768.

Hameed, Allaudeen, Randall Morck, Jianfeng Shen, and Bernard Yeung, 2010, Information, Analysts, and Stock Return Comovement, unpublished working paper, National University of Singapore.

Hou, Kewei, 2007, Industry information diffusion and the lead-lag effect in stock returns, *Review of Financial Studies* 20, 1113-1138.

Jin, Li, and Stewart C. Myers, 2006, R^2 around the world: New theory and new tests, *Journal of Financial Economics* 79, 257-292.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 2000, Investor protection and corporate governance, *Journal of Financial Economics* 58, 3-27.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 2002, Investor protection and corporate valuation, *Journal of Finance* 57, 1147-1170.

Lo, Andrew W., and Archie Craig MacKinlay, 1990, When are contrarian profits due to stock market overreaction?, *Review of Financial Studies* 3, 175-205.

Loughran, T. and McDonald, B., 2011, When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance* 66, 35-65.

Morck, Randall, Bernard Yeung, and Wayne Yu, 2000, The information content of stock markets: Why do emerging markets have synchronous stock price movements?, *Journal of Financial Economics* 58, 215.

Moskowitz, Tobias J., 2003, An analysis of covariance risk and pricing anomalies, *Review of Financial Studies* 16, 417-457.

Peng, Lin, and Wei Xiong, 2006, Investor attention, overconfidence and category learning, *Journal of Financial Economics* 80, 563-602.

Ribeiro, Ruy, and Pietro Veronesi, 2002, The excess comovement of international stock markets in bad times: A rational expectations equilibrium model, unpublished working paper, University of Chicago.

Roll, Richard, 1988, R^2, *Journal of Finance* 43, 541-566.

Romer, Paul M., 1990, Endogenous technological change, *Journal of Political Economy* 98, S71–S102.

Tetlock, P. C., 2007, Giving content to investor sentiment: The role of media in the stock market. *Journal of Finance* 62, 1139-68.

Veldkamp, Laura L., 2006a, Media frenzies in markets for financial information, *American Economic Review* 93, 577–601.

Veldkamp, Laura L., 2006b, Information markets and the comovement of asset prices, *The Review of Economic Studies* 73, 823–845.

Williams, S., D. Fenn, and M. McDonald, 2012, Risk on-risk off: Fixing a broken investment process, white paper, *HSBC Global Research.*

Table I
Top 25 Key Developments

This table shows the top 25 Key Developments by number of Key Developments. These firm level information events were downloaded from Capital IQ Key Developments.

Number of Key Developments	Key Development Type
260,707	Announcements of Earnings
148,268	Client Announcements
135,561	Expected Earnings Release Date
124,678	Conference Presentation Calls
122,912	Executive/Board Changes - Other
119,864	Product-Related Announcements
92,324	Corporate Guidance - New/Confirmed
89,332	Earnings Calls
87,090	M&A Transaction Closings
83,601	Investor Conference
72,352	Dividend Affirmations
71,779	Business Expansions
69,018	M&A Transaction Announcements
67,284	Fixed Income Offerings
60,303	M&A Rumours and Discussions
56,180	Buyback Update
52,262	Buybacks
47,198	Annual General Meetings
46,532	Board Meetings
35,296	Strategic Alliances
29,449	Lawsuits & Legal Issues
29,189	Seeking Acquisitions/Investments
26,805	Dividend Increases
26,428	Private Placements
22,739	Index Constituent Adds

Table II
Main Predictions of Veldkamp (2006b) with Differentially Informed Agents

This table summarizes the information-based hypotheses of comovement from Veldkamp (2006b). It details the section from which they are described in the paper for reference, and a brief summary of the predictions.

Prediction	**Summary**
Proposition 3 & 4	If asset prices are a linear function of observed information signals and the asset supply shock, increasing the number of informed agents about one asset relative to others will increase comovement as agents make correlated inferences about other assets as they have incomplete information about the other assets.
Proposition 5	When information becomes more complete, so that more signals about more assets are observed, fewer asset values are determined by inference, and comovement falls.
Proposition 6	With endogenous cost information markets investors will buy high-demand information that can forecast many pay-offs, because it is cheap and increases expected utility the most. These information signals have the highest potential to cause asset prices to comove. The high value signals contain both asset specific and market-wide information.
Business Cycles	Comovement is higher in recessions that in booms. As asset values are lower in recessions, information provision falls (information provision is positively related to asset value), and with incomplete information, comovement will increase.
Time	As technology has made information collection easier, falling information costs increase the diversity of information supply. This brings prices closer to complete information and comovement should fall over time.

Table III

This table summarizes the dependent, explanatory, and control variables of the empirical approaches to examining information-based hypotheses of comovement in our paper* and those most closely related to it in the literature. This table only documents the variables involved in the main results of each paper.

Paper	Main Comovement Measure	Main Explanatory Variable(s)	Control Variables	Data Frequency
Ferguson and Rau*	Average pairwise stock return correlation	Number of firm level information events	Returns, # firms, comovement, VIX, TED, gold, oil, bond spread, time, industry, and country fixed effects	Daily
Morck, Yeung, and Yu (2000)	Average country level R^2	Accounting standards, industry concentration, property rights	GDP and stock market size, # listed firms	Cross-sectional levels. Comovement using bi-weekly data.
Jin and Myers (2006)	Average country level R^2	Frequency of market crashes (skewness and kurtosis), good government index, opaqueness and accounting standards	All Morck, Yeung, and Yu (2000) variables	Annual
Chan and Hameed (2006)	Firm level R^2	Number of analysts	Size, turnover, time, industry, and country fixed effects.	Annual
Hameed, Morck, Shen, and Yeung (2010)	Firm level R^2	Number of analysts	Size, turnover, earnings comovement, volatility, time, industry, and country fixed effects.	Annual
Brockman, Liebenberg, and Schutte (2010)	Average country level comovement. Firm specific vol in total return vol.	Business Cycles and GDP growth, breadth of analyst coverage, accounting quality, governance variables, firm specific volatility	Exchange rate, # firms, industry concentration, time, industry, and country fixed effects, dividend yield comovement	Quarterly

Table IV
Summary Statistics by Country

This table gives the summary statistics for the sample broken down by country. Countries are ranked in the table by average correlation, highest to lowest. Average correlation is the within-country daily correlation averaged over the sample period from 1995-2013. SD correlation is the standard deviation of the within country daily correlation measure of the sample period.

Country	Number of Firms	Number of Key Developments	Average Correlation	SD Correlation
China	1,084	95,614	0.387	0.143
Hungary	6	3,219	0.360	0.183
Dubai	8	1,711	0.351	0.183
Vietnam	8	581	0.326	0.163
Russian Federation	23	15,288	0.322	0.161
Taiwan	412	28,386	0.300	0.139
Turkey	101	5147	0.289	0.149
Greece	61	8,937	0.282	0.153
Spain	28	11,294	0.276	0.137
Abu Dhabi	7	1,948	0.271	0.180
Czech Republic	4	1,450	0.267	0.171
Qatar	11	1,647	0.267	0.170
Portugal	11	4,041	0.254	0.173
Israel	81	13,970	0.253	0.105
Netherlands	34	16,297	0.241	0.152
Italy	76	26,772	0.232	0.126
Mexico	26	5,174	0.229	0.103
United States	1,529	929,502	0.224	0.150
Argentina	22	2,220	0.222	0.115
Sweden	90	37,262	0.211	0.127
Egypt	33	1,968	0.209	0.160
France	101	53,359	0.202	0.137
Japan	1,271	166,405	0.200	0.108
United Kingdom	208	110,715	0.185	0.133
South Korea	610	33,955	0.184	0.109
Pakistan	54	5,567	0.181	0.106
Malaysia	284	55,976	0.173	0.125
Poland	62	9,266	0.172	0.134
India	454	122,223	0.167	0.095
Finland	46	23,201	0.165	0.127
Hong Kong	263	51,476	0.161	0.092
Singapore	135	26,549	0.157	0.100
Denmark	30	11,862	0.155	0.122
Thailand	175	25,479	0.150	0.093
Brazil	45	12,330	0.149	0.085
Norway	57	19,023	0.149	0.096
Indonesia	77	7,263	0.149	0.098
Belgium	40	9,249	0.147	0.102
Austria	29	8,590	0.143	0.108
Switzerland	61	22,848	0.143	0.092
Philippines	54	9,859	0.141	0.091
Chile	35	3,130	0.141	0.098
Germany	131	58,701	0.141	0.090
Oman	13	1,322	0.139	0.131
Kuwait	19	1,784	0.133	0.119
Morocco	9	358	0.113	0.116
South Africa	96	14,305	0.107	0.076
Ireland	18	6,300	0.090	0.080
Australia	223	55,508	0.084	0.076
New Zealand	37	6,453	0.078	0.077
Canada	276	118,841	0.078	0.071
Bahrain	4	595	0.026	0.135
52	8,571	2,264,689	Mean = 0.196	Mean = 0.122

Table V
Summary Statistics by Industry

This table gives the summary statistics for the sample broken down by industry. Industries are ranked in the table by average correlation, highest to lowest. Average correlation is the within-industry daily correlation averaged over the sample period from 1995-2013. SD correlation is the standard deviation of the within country daily correlation measure of the sample period.

Industry	Number of Firms	Number of Key Developments	Average Correlation	SD Correlation
Life Insurance	58	23,349	0.143	0.085
Oil Equipment & Services	113	37,370	0.139	0.078
Aerospace & Defense	55	39,737	0.130	0.093
REITs	163	59,296	0.124	0.076
Nonlife Insurance	125	38,612	0.104	0.067
Technology Hardware	410	158,279	0.104	0.056
Oil & Gas Producers	214	82,927	0.089	0.069
Electronic & Electrical	378	58,687	0.088	0.058
Banks	444	185,499	0.088	0.056
Telecommunications (FL)	56	37,448	0.088	0.050
Industrial Metals & Mining	270	49,920	0.083	0.066
Industrial Engineering	440	83,027	0.082	0.060
Automobiles & Parts	263	58,406	0.081	0.059
Leisure Goods	82	23,820	0.081	0.052
Electricity	175	49,997	0.080	0.043
Real Estate Investment	365	47,479	0.079	0.049
Alternative Energy	12	3,344	0.079	0.117
Chemicals	423	66,689	0.077	0.053
Media	173	57,574	0.076	0.047
Financial Services (Sector)	315	91,866	0.075	0.051
Telecommunications-Mob	67	31,576	0.075	0.048
Software & Services	271	125,649	0.074	0.046
Forestry & Paper	76	11,975	0.073	0.052
Industrial Transportation	236	47,300	0.072	0.053
Mining	209	56,278	0.069	0.060
Support Services	232	68,771	0.068	0.053
Health Care	189	65,054	0.068	0.052
General Industrials	150	43,754	0.066	0.048
Gas, Water & Utilities	123	32,736	0.064	0.044
Construction & Materials	477	78,281	0.063	0.050
Pharma & Biotechnology	345	98,742	0.062	0.039
Household Goods	169	33,261	0.061	0.043
Travel & Leisure	304	84,875	0.061	0.046
Tobacco	22	6,297	0.061	0.050
Equity Investment	4	598	0.060	0.098
General Retailers	352	86,221	0.060	0.038
Beverages	98	21,482	0.060	0.041
Personal Goods	247	36,723	0.058	0.042
Food & Drug Retailers	105	27,306	0.051	0.042
Food Producers	361	54,484	0.045	0.038
40	8,571	2,264,689	Mean = 0.079	Mean = 0.057

Table VI
Industry and Country Level Regressions of Comovement on Large and Small Firm Information Events

This table reports the relation between comovement and information events from 1995 to 2013. The dependent variable is the average pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together each day. In the regression we control for lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within industry				Within country			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	2.5658	***	1.2060	***	3.8339	***	2.2645	***
	(13.69)		(9.92)		(18.69)		(13.49)	
Information Events								
Large $InfoEvent_{i,t-1}$	0.0005		-0.0093	**	0.0199	**	0.0163	**
	(0.08)		(-2.06)		(1.99)		(2.40)	
Large $InfoEvent_{i,t-2}$	0.0400	***	0.0459	***	0.0140	*	0.0100	
	(6.67)		(10.62)		(1.66)		(1.43)	
Small $InfoEvent_{i,t-1}$	0.0766	***	0.0309	*	-0.0452	*	-0.0339	***
	(3.70)		(1.78)		(-1.84)		(-2.60)	
Small $InfoEvent_{i,t-2}$	0.0154		0.0099		0.0099		0.0096	
	(0.80)		(0.78)		(0.60)		(0.71)	
Controls								
$Ret_{i,t-1}$	-0.0092	***	-0.0096	***	-0.0141	***	-0.0185	***
	(-5.79)		(-7.31)		(-4.80)		(-8.64)	
$Ret_{i,t-2}$	-0.0122	***	-0.0094	***	-0.0101	***	-0.0187	***
	(-7.29)		(-7.50)		(-3.11)		(-8.81)	
$Volume_{i,t}$	0.0000		0.0000		0.0000	***	0.0000	***
	(-0.92)		(0.85)		(4.08)		(2.78)	
Number of $firms_i$	-0.0037	***	-0.0002		-0.0014	***	0.0002	
	(-8.72)		(-0.50)		(-5.17)		(1.14)	
$Corr_{i,t-1}$	0.9708	***	1.0053	***	1.0027	***	1.0101	***
	(176.11)		(200.86)		(283.83)		(212.90)	
$Corr_{i,t-2}$	0.0120	**	-0.0315	***	-0.0184	***	-0.0294	***
	(2.20)		(-6.28)		(-5.19)		(-6.20)	
Macroeconomic indicators								
VIX_t	26.6940	***	12.0600	***	25.0520	***	19.5190	***
	(19.79)		(15.49)		(14.23)		(12.65)	
TED_t	0.0002	***	0.0001	***	0.0002	***	0.0002	**
	(4.38)		(3.32)		(3.19)		(2.44)	
$BAA\text{-}AAA_t$	27.5770	***	21.9010	***	21.5400	***	21.8100	***
	(9.34)		(9.76)		(4.72)		(5.43)	
$Gold_t$	-45.1800	***	-18.7190	***	-30.8410	***	-34.4790	***
	(-8.08)		(-5.08)		(-4.02)		(-4.99)	
Oil_t	-7.4646	***	-14.6030	***	-24.2840	***	-25.9030	***
	(-3.09)		(-7.89)		(-6.31)		(-7.74)	
Industry FE	YES		YES		NO		NO	
Country FE	NO		NO		YES		YES	
Time FE	YES		YES		YES		YES	
Obs.	188,214		188,214		217,170		217,170	
Adj R^2	0.9694		0.9536		0.9707		0.9652	

Table VII
Industry and Country Level Regressions of Comovement on Large and Small Firm Information Events Excluding Earnings Announcements

This table reports the relation between comovement and information events from 1995 to 2013. The dependent variable is the average pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together, excluding earnings announcements (Key Development ID = 28) each day. In the regression we control for lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by time and industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within industry				Within country			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	2.5805	***	1.2042	***	3.8496	***	2.2726	***
	(13.77)		(9.90)		(18.75)		(13.53)	
Information Events								
Large $InfoEvent_{i,t-1}$	0.0076		-0.0126	**	0.0246	**	0.0148	**
	(1.17)		(-2.56)		(2.29)		(2.05)	
Large $InfoEvent_{i,t-2}$	0.0397	***	0.0478	***	0.0137		0.0094	
	(6.21)		(10.38)		(1.56)		(1.31)	
Small $InfoEvent_{i,t-1}$	0.0861	***	0.0405	**	-0.0525	*	-0.0273	*
	(3.53)		(1.99)		(-1.83)		(-1.88)	
Small $InfoEvent_{i,t-2}$	0.0160		0.0149		0.0114		0.0131	
	(0.72)		(1.03)		(0.64)		(0.93)	
Controls								
$Ret_{i,t-1}$	-0.0092	***	-0.0096	***	-0.0141	***	-0.0185	***
	(-5.80)		(-7.30)		(-4.80)		(-8.64)	
$Ret_{i,t-2}$	-0.0122	***	-0.0094	***	-0.0101	***	-0.0187	***
	(-7.29)		(-7.50)		(-3.11)		(-8.81)	
$Volume_{i,t}$	0.0000		0.0000		0.0000	***	0.0000	***
	(-0.93)		(0.85)		(4.08)		(2.78)	
Number of $firms_i$	-0.0037	***	0.0000		-0.0014	***	0.0002	
	(-8.83)		(-0.08)		(-5.49)		(0.94)	
$Corr_{i,t-1}$	0.9707	***	1.0054	***	1.0027	***	1.0101	***
	(176.09)		(200.84)		(283.82)		(212.90)	
$Corr_{i,t-2}$	0.0120	**	-0.0316	***	-0.0184	***	-0.0294	***
	(2.19)		(-6.28)		(-5.19)		(-6.20)	
Macroeconomic Indicators								
VIX_t	26.7300	***	12.0860	***	25.0640	***	19.5280	***
	(19.81)		(15.51)		(14.24)		(12.65)	
TED_t	0.0002	***	0.0001	***	0.0002	***	0.0002	**
	(4.39)		(3.29)		(3.18)		(2.44)	
$BAA\text{-}AAA_t$	27.5180	***	21.8130	***	21.5100	***	21.7950	***
	(9.32)		(9.72)		(4.71)		(5.43)	
$Gold_t$	-45.0550	***	-18.5800	***	-30.8210	***	-34.4480	***
	(-8.06)		(-5.05)		(-4.02)		(-4.98)	
Oil_t	-7.4802	***	-14.5960	***	-24.3010	***	-25.9010	***
	(-3.09)		(-7.89)		(-6.31)		(-7.74)	
Industry FE	YES		YES		NO		NO	
Country FE	NO		NO		YES		YES	
Time FE	YES		YES		YES		YES	
Obs.	188,214		188,214		217,170		217,170	
Adj R^2	0.9694		0.9536		0.9707		0.9652	

Table VIII
Regressions of Comovement on Large and Small Firm Information Events for Civil and Common Law Countries

This table reports the relation between comovement and information events from 1995 to 2013. The dependent variable is the average within country pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together each day. In the regression we control for lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within civil law countries				Within common law countries			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	4.0920	***	2.4751	***	2.9169	***	1.7480	***
	(13.65)		(9.59)		(8.39)		(6.85)	
Information Events								
Large $InfoEvent_{i,t-1}$	-0.0139		-0.0290		0.0289	**	0.0249	***
	(-0.63)		(-1.45)		(2.42)		(3.34)	
Large $InfoEvent_{i,t-2}$	0.0453	*	0.0026		0.0035		0.0084	
	(1.92)		(0.13)		(0.37)		(1.09)	
Small $InfoEvent_{i,t-1}$	0.0234		0.0314		-0.0544	*	-0.0384	***
	(0.49)		(0.86)		(-1.91)		(-2.74)	
Small $InfoEvent_{i,t-2}$	-0.0222		0.0171		0.0322	*	0.0182	
	(-0.44)		(0.45)		(1.77)		(1.22)	
Controls								
$Ret_{i,t-1}$	-0.0145	***	-0.0287	***	-0.0124	***	-0.0090	***
	(-2.87)		(-6.81)		(-4.41)		(-3.61)	
$Ret_{i,t-2}$	-0.0093	*	-0.0268	***	-0.0079	***	-0.0099	***
	(-1.78)		(-6.36)		(-2.77)		(-4.31)	
$Volume_{i,t}$	0.0000	***	0.0000		0.0001	***	0.0000	***
	(3.06)		(1.38)		(4.28)		(2.97)	
Number of $firms_i$	0.0003		0.0039	***	-0.0007	**	-0.0003	
	(0.31)		(4.27)		(-2.33)		(-1.51)	
$Corr_{i,t-1}$	0.9956	***	0.9992	***	0.9948	***	1.0247	***
	(219.23)		(162.23)		(133.21)		(100.44)	
$Corr_{i,t-2}$	-0.0108	**	-0.0197	***	-0.0133	*	-0.0438	***
	(-2.37)		(-3.23)		(-1.76)		(-4.24)	
Macroeconomic Indicators								
VIX_t	32.4250	***	26.8350	***	21.4780	***	15.1040	***
	(11.82)		(11.01)		(7.18)		(6.12)	
TED_t	0.0003	***	0.0002	**	0.0004	***	0.0001	
	(2.70)		(2.21)		(3.07)		(0.77)	
$BAA\text{-}AAA_t$	10.1780		15.5200	***	25.1880	***	24.4440	***
	(1.53)		(2.61)		(3.33)		(3.98)	
$Gold_t$	-49.1080	***	-50.8750	***	-30.4650	**	-30.3030	***
	(-4.30)		(-4.96)		(-2.28)		(-2.66)	
Oil_t	-21.5270	***	-23.4320	***	-25.9690	***	-20.7410	***
	(-3.94)		(-4.66)		(-4.23)		(-4.13)	
Industry FE	NO		NO		NO		NO	
Country FE	YES		YES		YES		YES	
Time FE	YES		YES		YES		YES	
Obs.	110,998		110,998		53,086		53,086	
Adj R^2	0.9705		0.9619		0.9689		0.9717	

Table IX
Regressions of Comovement on Large and Small Firm Information Events for Developed and Emerging Countries

This table reports the relation between comovement and information events from 1995 to 2013. The dependent variable is the average within country pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset. These were then summed together each day. Control variables include the lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within developed countries				Within developing countries			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	3.3232	***	1.7498	***	4.3895	***	2.5671	***
	(13.09)		(8.92)		(12.55)		(8.52)	
Information Events								
Large $InfoEvent_{i,t-1}$	0.0191	*	0.0126	*	0.0138		0.0216	
	(1.72)		(1.79)		(0.64)		(0.91)	
Large $InfoEvent_{i,t-2}$	0.0057		0.0080		0.0637	***	0.0066	
	(0.63)		(1.09)		(3.02)		(0.30)	
Small $InfoEvent_{i,t-1}$	-0.0424		-0.0248	*	-0.0674		-0.1353	**
	(-1.59)		(-1.86)		(-1.16)		(-2.27)	
Small $InfoEvent_{i,t-2}$	0.0225		0.0123		-0.1037	**	-0.0150	
	(1.30)		(0.88)		(-2.00)		(-0.30)	
Controls								
$Ret_{i,t-1}$	-0.0218	***	-0.0177	***	-0.0076	**	-0.0199	***
	(-8.47)		(-7.60)		(-2.40)		(-4.45)	
$Ret_{i,t-2}$	-0.0152	***	-0.0148	***	-0.0060		-0.0267	***
	(-5.98)		(-6.54)		(-1.37)		(-5.86)	
$Volume_{i,t}$	0.0001	***	0.0001	***	0.0000	***	0.0000	
	(5.69)		(6.69)		(3.47)		(0.92)	
Number of $firms_i$	-0.0012	***	0.0000		-0.0019		0.0050	***
	(-4.51)		(-0.23)		(-1.42)		(4.00)	
$Corr_{i,t-1}$	0.9902	***	1.0141	***	1.0161	***	1.0047	***
	(228.61)		(181.88)		(177.63)		(131.59)	
$Corr_{i,t-2}$	-0.0041		-0.0309	***	-0.0348	***	-0.0288	***
	(-0.94)		(-5.48)		(-6.04)		(-3.80)	
Macroeconomic Indicators								
VIX_t	27.1770	***	20.1550	***	22.0220	***	18.5550	***
	(11.92)		(10.32)		(7.98)		(7.41)	
TED_t	0.0002	**	0.0001		0.0003	**	0.0003	**
	(2.11)		(1.50)		(2.57)		(2.16)	
$BAA\text{-}AAA_t$	14.2230	***	18.9280	***	32.5240	***	25.9830	***
	(2.62)		(4.03)		(4.10)		(3.64)	
$Gold_t$	-29.8370	***	-40.5500	***	-32.2240	**	-25.3290	**
	(-3.13)		(-4.79)		(-2.54)		(-2.17)	
Oil_t	-25.0490	***	-22.2440	***	-22.9520	***	-31.0630	***
	(-5.53)		(-5.75)		(-3.38)		(-5.16)	
Industry FE	NO		NO		NO		NO	
Country FE	YES		YES		YES		YES	
Time FE	YES		YES		YES		YES	
Obs.	125,476		125,476		91,694		91,694	
Adj R^2	0.9736		0.9707		0.9662		0.9573	

Table X
Industry Level Regressions of Comovement on Large and Small Firm Information Events for 2001 to 2007 and 2008 to 2013

This table reports the relation between comovement and information events. The dependent variable is the average within industry pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together each day. In the regression we control for lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within industry 2001 to 2007				Within industry 2008 to 2013			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	2.9359	***	0.5546	**	3.8428	***	1.7911	***
	(7.76)		(2.37)		(12.38)		(9.86)	
Information Events								
Large $InfoEvent_{i,t-1}$	0.0121		-0.0238	***	-0.0216	***	-0.0153	***
	(1.12)		(-2.62)		(-2.90)		(-2.83)	
Large $InfoEvent_{i,t-2}$	0.0296	***	0.0615	***	0.0240	***	0.0342	***
	(2.78)		(6.35)		(3.27)		(6.90)	
Small $InfoEvent_{i,t-1}$	0.0456		-0.0188		0.0383		0.0157	
	(1.24)		(-0.67)		(1.54)		(0.68)	
Small $InfoEvent_{i,t-2}$	-0.0186		0.0024		-0.0312		-0.0178	
	(-0.59)		(0.10)		(-1.28)		(-1.18)	
Controls								
$Ret_{i,t-1}$	-0.0059	**	-0.0106	***	-0.0120	***	-0.0134	***
	(-1.96)		(-4.22)		(-4.00)		(-5.86)	
$Ret_{i,t-2}$	-0.0094	***	-0.0092	***	-0.0157	***	-0.0121	***
	(-2.96)		(-3.86)		(-5.08)		(-5.56)	
$Volume_{i,t}$	0.0000		0.0000	***	0.0000		0.0000	***
	(0.73)		(3.77)		(-1.37)		(4.86)	
Number of $firms_i$	-0.0037	***	0.0009		-0.0027	***	-0.0006	
	(-4.92)		(1.61)		(-3.50)		(-1.06)	
$Corr_{i,t-1}$	0.9985	***	0.9871	***	0.9399	***	1.0290	***
	(123.89)		(111.74)		(174.87)		(138.36)	
$Corr_{i,t-2}$	-0.0205	**	-0.0160	*	0.0434	***	-0.0521	***
	(-2.53)		(-1.83)		(8.10)		(-7.01)	
Macroeconomic Indicators								
VIX_t	25.2810	***	10.6860	***	30.2040	***	14.9700	***
	(8.79)		(7.46)		(15.27)		(12.86)	
TED_t	0.0003	***	0.0003	***	0.0002	**	0.0000	
	(3.27)		(4.58)		(2.36)		(-0.18)	
$BAA\text{-}AAA_t$	53.0500	***	15.7820	***	14.4850	**	31.0460	***
	(8.29)		(3.64)		(2.80)		(8.70)	
$Gold_t$	-88.7550	***	-37.1480	***	-18.8450	**	-7.2255	
	(-10.06)		(-5.74)		(-2.26)		(-1.41)	
Oil_t	13.9690	***	-5.9374	**	-21.0600	***	-28.5720	***
	(3.45)		(-2.03)		(-4.57)		(-7.94)	
Industry FE	YES		YES		YES		YES	
Country FE	NO		NO		NO		NO	
Time FE	YES		YES		YES		YES	
Obs.	61,035		61,035		55,965		55,965	
Adj R^2	0.9588		0.9473		0.9671		0.9602	

Table XI
Country Level Regressions of Comovement on Large and Small Firm Information Events for 2001 to 2007 and 2008 to 2013

This table reports the relation between comovement and information events. The dependent variable is the average within country pairwise stock return correlation on day *t*. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together each day. In the regression we control for lags of average stock returns (Ret), trading volume (Volume), the number of firms in each industry/country, lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by industry/country, with t-statistics shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability.

	Within country 2001 to 2007				Within country 2008 to 2013			
	Large firms		Small firms		Large firms		Small firms	
	(1)		(2)		(3)		(4)	
(Intercept)	3.8467	***	2.2672	***	4.5694	***	2.3143	***
	(10.75)		(6.68)		(13.87)		(9.90)	
Information Events								
Large $InfoEvent_{i,t-1}$	0.0000		-0.0102		0.0178		0.0089	
	(0.00)		(-0.77)		(1.43)		(1.07)	
Large $InfoEvent_{i,t-2}$	0.0287	*	0.0177		0.0054		-0.0054	
	(1.72)		(1.30)		(0.52)		(-0.63)	
Small $InfoEvent_{i,t-1}$	-0.0070		0.0146		-0.0525	*	-0.0402	***
	(-0.22)		(0.53)		(-1.78)		(-2.71)	
Small $InfoEvent_{i,t-2}$	-0.0254		-0.0199		0.0187		0.0213	
	(-0.79)		(-0.76)		(0.99)		(1.37)	
Controls								
$Ret_{i,t-1}$	-0.0185	***	-0.0192	***	-0.0222	***	-0.0181	***
	(-5.29)		(-5.52)		(-5.72)		(-5.27)	
$Ret_{i,t-2}$	-0.0212	***	-0.0193	***	-0.0100	***	-0.0176	***
	(-5.63)		(-5.47)		(-2.61)		(-5.13)	
$Volume_{i,t}$	0.0000		0.0000		0.0000	***	0.0000	*
	(1.55)		(0.36)		(4.46)		(1.90)	
Number of $firms_i$	-0.0011		0.0012	**	-0.0008		0.0021	***
	(-1.61)		(1.97)		(-1.18)		(3.53)	
$Corr_{i,t-1}$	0.9997	***	1.0077	***	0.9930	***	1.0178	***
	(164.83)		(132.66)		(194.41)		(149.04)	
$Corr_{i,t-2}$	-0.0176	***	-0.0331	***	-0.0093	*	-0.0351	***
	(-2.88)		(-4.40)		(-1.82)		(-5.05)	
Macroeconomic Indicators								
VIX_t	29.3840	***	22.5800	***	22.4310	***	20.5980	***
	(7.60)		(6.87)		(10.01)		(9.87)	
TED_t	0.0003	**	0.0004	***	0.0004	**	0.0004	***
	(2.43)		(2.79)		(3.20)		(3.42)	
$BAA\text{-}AAA_t$	47.0040	***	38.6070	***	13.4400	**	19.0930	***
	(4.78)		(4.29)		(1.97)		(2.98)	
$Gold_t$	-111.8900	***	-101.6800	***	12.2820		-6.5998	
	(-8.37)		(-7.83)		(1.20)		(-0.71)	
Oil_t	-4.4649		-16.0990	***	-45.4330	***	-41.3900	***
	(-0.73)		(-2.75)		(-6.70)		(-7.08)	
Industry FE	NO		NO		NO		NO	
Country FE	YES		YES		YES		YES	
Time FE	YES		YES		YES		YES	
Obs.	70,425		70,425		55,965		55,965	
Adj R^2	0.9657		0.9530		0.9696		0.9695	

Table XII
Regressions of Comovement on Positive and Negative Information Events

This table reports the relation between comovement and information events from 1995 to 2013. The dependent variable is the average pairwise stock return correlation on day *t*, for the full sample. To construct the information event variable ($InfoEvent_t$), firm level information events were downloaded from Capital IQ Key Developments dataset, these were then summed together each day. The Key Developments were then split into definitely positive information events (Pos) and definitely negative information events (Neg) In the regressions we control for lags of average stock returns (Ret), lags of average stock return correlation (Corr), market volatility using the VIX, perceived credit risk in the global economy using the TED spread and the spread of BAA rated corporate bonds over AAA rated corporate bonds, and other macroeconomic risks that may be associated with the Gold and Oil prices. The results control for time fixed effects. Standard errors are clustered by time, with t-statistics shown in parentheses. *, **, *** denotes statistical significance at the 10%, 5%, and 1% levels, respectively. All coefficients except those on Ret and Corr have been multiplied by 1000 for readability

	Aggregated Full Sample	
	(1)	
(Intercept)	-1.4287	***
	(-2.93)	
Information Events		
Pos $InfoEvent_t$	0.0021	
	(0.71)	
Pos $InfoEvent_{t-1}$	0.0064	*
	(1.89)	
Pos $InfoEvent_{t-2}$	0.0075	**
	(2.19)	
Neg $InfoEvent_t$	0.0107	**
	(2.57)	
Neg $InfoEvent_{t-1}$	-0.0006	
	(-0.09)	
Neg $InfoEvent_{t-2}$	0.0051	
	(1.63)	
Controls		
Ret_{t-1}	-0.0391	*
	(-1.80)	
Ret_{t-2}	-0.0589	***
	(-2.72)	
$Corr_{t-1}$	0.9991	***
	(34.39)	
$Corr_{t-2}$	-0.0380	
	(-1.26)	
Macroeconomic Indicators		
VIX_t	0.1916	***
	(5.60)	
TED_t	-0.1191	
	(-0.27)	
$BAA\text{-}AAA_t$	-2.2178	***
	(-4.24)	
$Gold_t$	0.0008	
	(1.14)	
Oil_t	0.0099	
	(1.00)	
Time FE	YES	
Obs.	4,826	
Adj R^2	0.9705	

Figure 1

This figure shows the total number of information events for the full sample over the sample period from 1995-2013 in the upper panel, in the lower panel a 30-day rolling average of the total number of information events is shown for clarity. The information events were downloaded from the Capital IQ Key Developments dataset.

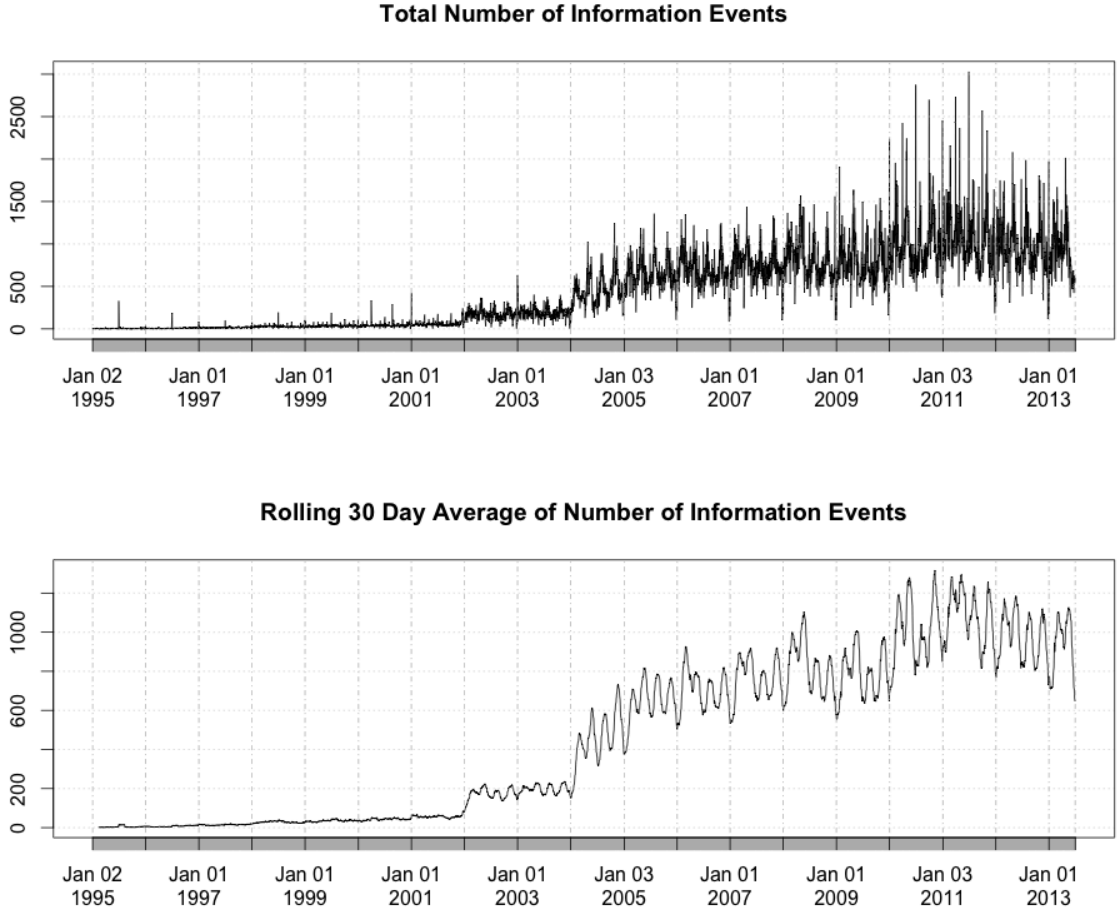


Figure 2

This figure shows the full sample daily average pairwise correlation or comovement for the sample period 1995-2013. The measure of comovement is constructed by taking the average of the lower triangle of the full sample stock return correlation matrix using 20 trading days of data and rolled forward through the sample period.

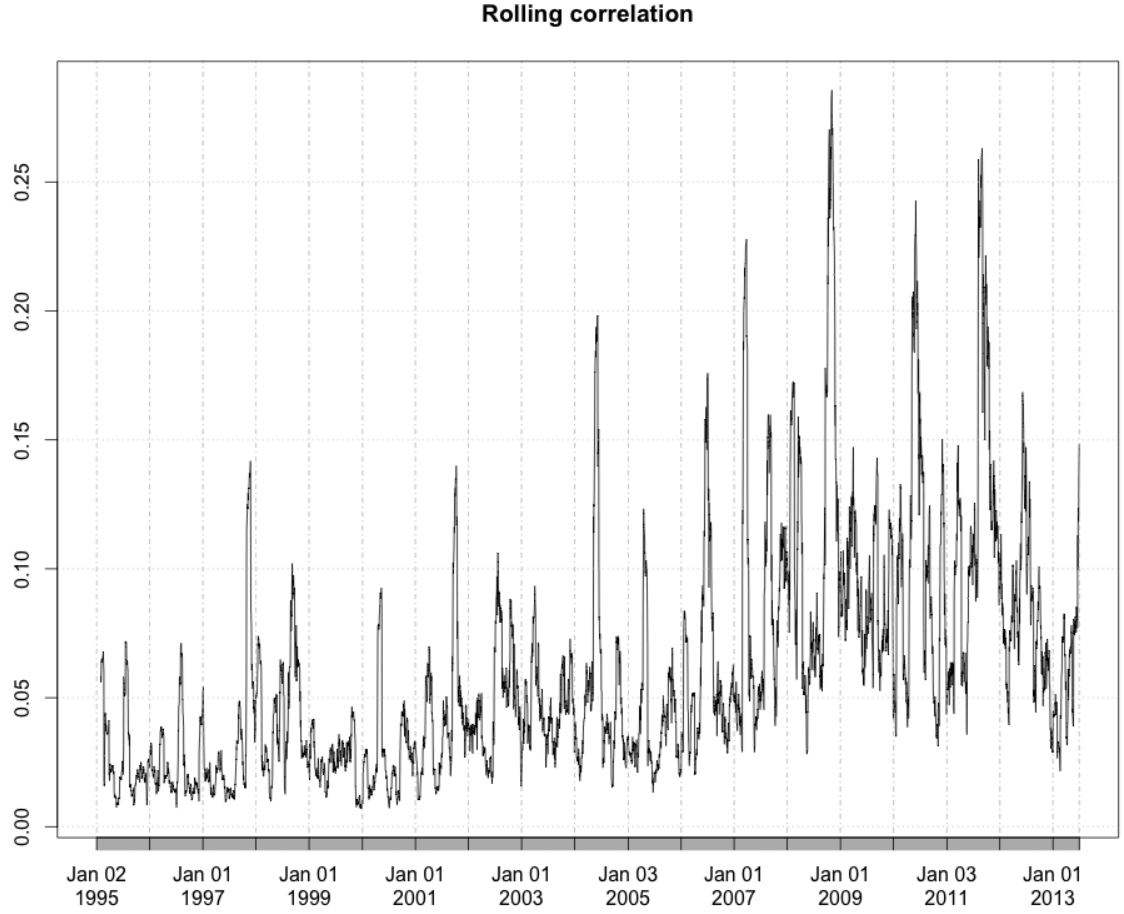


Figure 3

This figure shows the total number of information events for large and small firms globally over the sample period from 1995-2013. The information events were downloaded from the Capital IQ Key Developments dataset. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization.

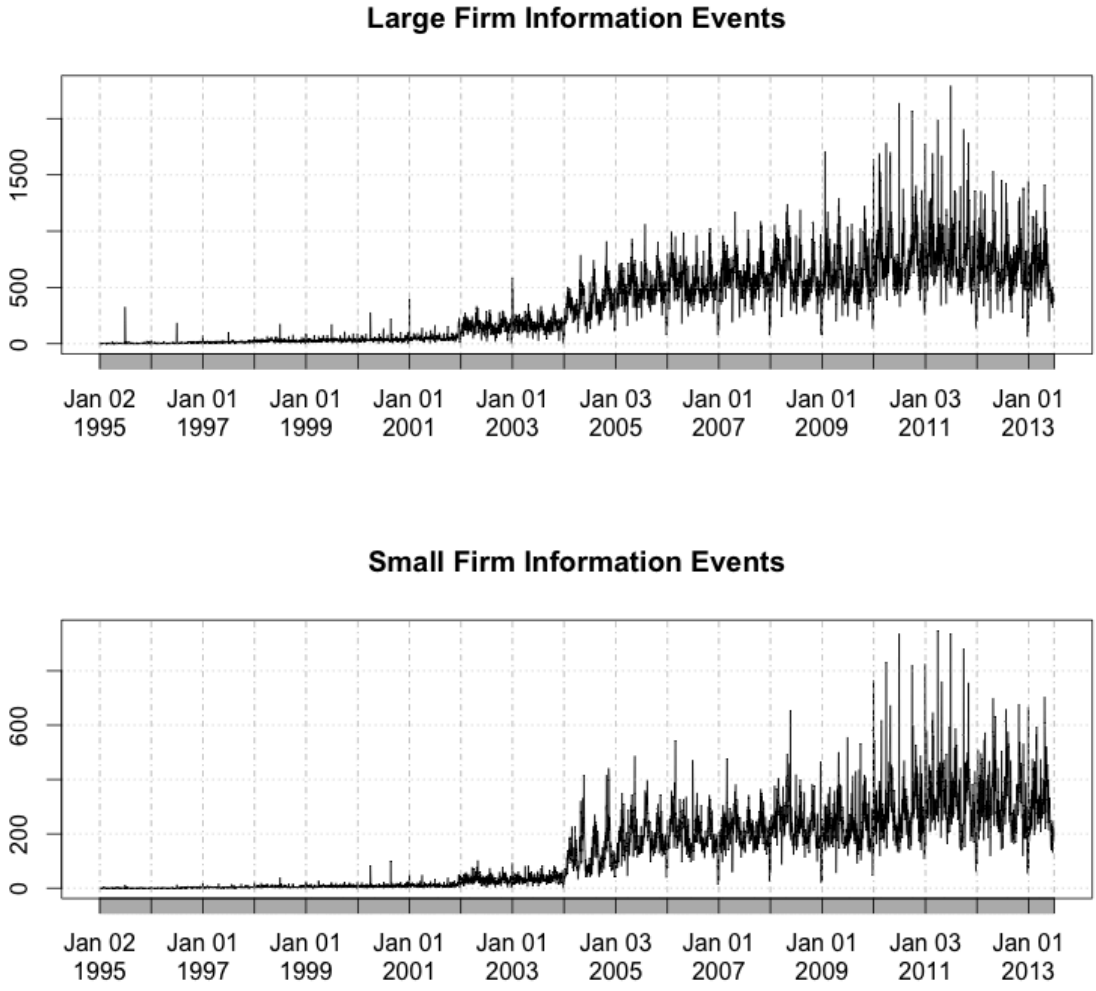
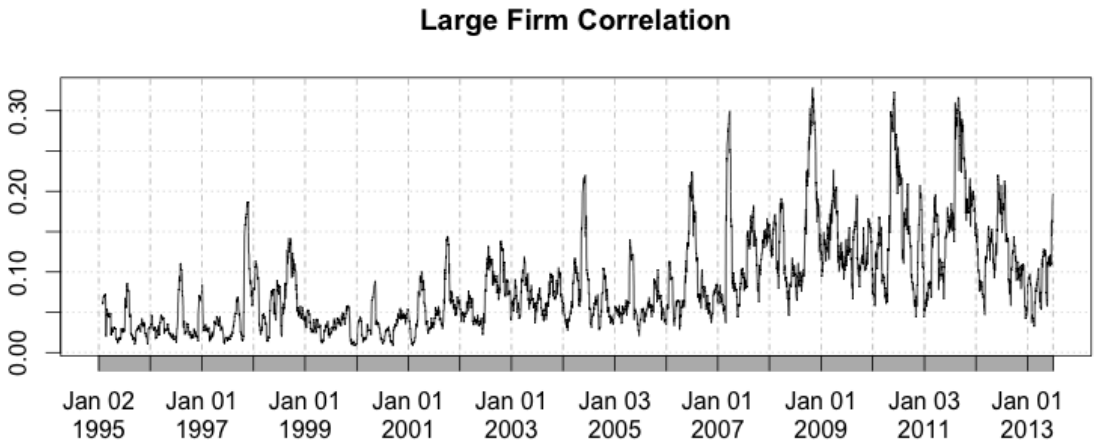


Figure 4

This figure shows the daily average pairwise correlation or comovement for large and small firms for the sample period 1995-2013. The measure of comovement is constructed by taking the average of the lower triangle of the full sample stock return correlation matrix using 20 trading days of data and rolled forward through the sample period. Large and small firms are the top and bottom 30% of firms each year by dollar market capitalization.



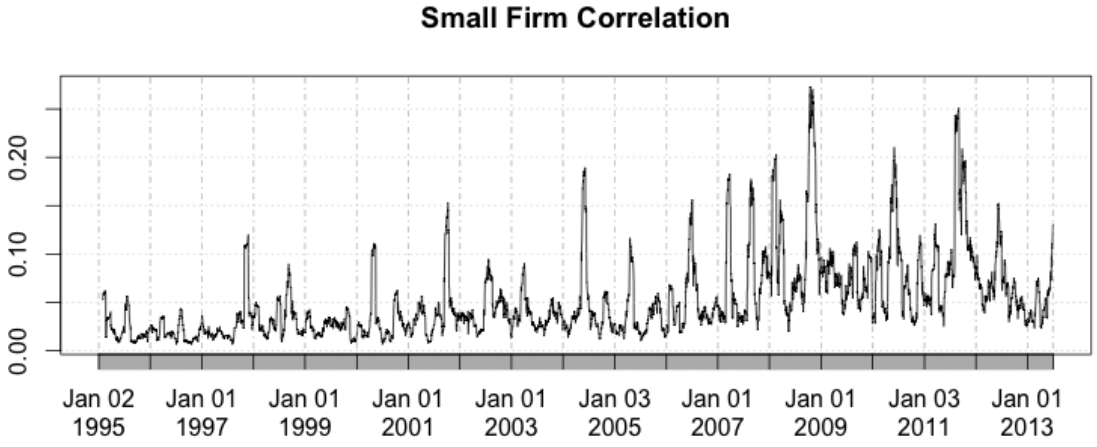


Figure 5

This figure shows the total number of unambiguously positive and unambiguously negative information events for the full sample of firms over the sample period from 1995-2013. The information events were downloaded from the Capital IQ Key Developments dataset.