Market Reaction to Information Shocks—Does the Bloomberg and Briefing.com Survey Matter?

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Bloomberg and Briefing.com provide competing forecasts for prescheduled macroeconomic announcements. This study examines the accuracy of these forecasts and market reactions to announcement surprises. Our results show that the Bloomberg survey is slightly more accurate than the Briefing.com survey. More importantly, although announcement surprises based on both surveys have a significant effect on the trading activities and returns of S&P 500 futures contracts, the Bloomberg survey subsumes the explanatory power of the Briefing.com survey. The findings suggest that on average Bloomberg forecasts are more consistent with the market consensus view. In addition, we provide evidence of asymmetric

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market reactions to positive versus negative announcement surprises. In particular, the market reacts strongly to inflation news in the Consumer Price Index (CPI) and Producer Price Index (PPI) announcements and negative shocks in housing price, personal spending, and retail sales. © 2012 Wiley Periodicals, Inc. Jrl Fut Mark

1. INTRODUCTION

Asset prices are subject to information shocks in the financial market and investors constantly update their valuation of assets as a result of new information arrival. An important source of market information is macroeconomic announcements, such as the release of information about Consumer Confidence, Durable Goods Orders, Consumer Price Index (CPI), Producer Price Index (PPI), and Nonfarm Payrolls, to name a few. These announcements are mostly prescheduled and represent public information available to all investors. Because these announcements contain important information about the fundamentals of U.S. economy, they often have significant impact on market trading activities and market returns.

A testimony to the importance of such announcements is that several institutions consistently conduct surveys of market participants and provide forecasts or market expectations of upcoming announcements. Most noticeable surveys are by Bloomberg and Briefing.com. These surveys provide up-to-date forecasts for almost all macroeconomic announcements, which are widely used by both market participants and academic researchers as consensus market expectations.

The questions we aim to address in our study are as follows. First of all, how accurate are the Bloomberg and Briefing.com forecasts? In particular, with competing surveys from Bloomberg and Briefing.com, which survey is more accurate? The answers to these questions have important implications. For example, if the forecasts are significantly biased, then investors should be cautious in using these surveys and survey providers should work to improve the forecasts. In addition, if one survey is more accurate than the other, then we should put more weight on the more accurate survey.

The second set of questions we examine in this study includes: does the market pay attention to these survey forecasts? In other words, do announcement surprises based on these surveys have a significant effect on market trading activities and market returns? Again, between Bloomberg and Briefing.com, does the market react more significantly to surprises based on one survey than based on the other? We note that a number of studies have used market surveys to examine the effect of unexpected information shocks on bond market, currency market, and equity market, with earlier studies using surveys provided by

the International Money Market Services,[1] and more recent studies using surveys provided by Bloomberg and Briefing.com. For example, Vähämaa, Watzka, and Äijö (2005) use the Bloomberg survey to examine the impact of news announcements on bond market expectations. Dungey, McKenzie, and Smith (2009) link announcement surprises based on the Bloomberg forecasts to jumps and cojumps in the U.S. Treasury prices. Jiang, Lo, and Verdelhan (2011) use both the Bloomberg and Briefing.com forecasts to examine the relative importance of announcement surprises versus market liquidity in explaining jumps in U.S. Treasury market. Fatum and Scholnick (2006, 2008) examine how exchange rates respond to changes of monetary policy expectations and surprises of U.S. monetary policy changes. Wongswan (2006) uses market expectations from Bloomberg as well as other sources to examine information transmission among international equity markets. In this study, we examine the reaction of the U.S. equity futures market to announcement surprises based on both the Bloomberg and Briefing.com forecasts. The findings of our analysis offer direct evidence for whether surprises based on both surveys contain significant information content of future market returns. The horse race between two survey forecasts in terms of information content further helps to pinpoint which survey has more significant impact on the market.

The third question we examine in our study is whether the market exhibits asymmetric reaction to negative versus positive announcement surprises. By separating positive versus negative surprises, it helps to sharpen the inference on market reaction to information shocks. In addition, evidence of asymmetric market reaction to negative versus positive announcement surprises also has important implications on how investors should manage and hedge risk associated with unexpected information shocks.

To answer the first set of questions, we construct several measures of forecast errors. Our study covers a comprehensive list of prescheduled U.S. macroeconomic news announcements, with a total of 59 news items over the sample period from January 1, 1998 to August 31, 2010. For each announcement, we obtain the actual announcement value and the Bloomberg and Briefing.com forecasts whenever available. In addition to the complete set of news items, we also focus on a set of news announcements that are identified as important in the existing literature. Our results show that neither the Bloomberg nor the Briefing.com surveys exhibit systematic biases. Nevertheless, the Bloomberg survey has slightly smaller forecast errors than the Briefing.com

[1]The International Money Market Services (MMS), a San Francisco based corporation, ceased to provide its survey services in 2003 after being acquired by Informa. Studies using the MMS data include Almeida, Goodhart, and Payne (1998), Bollerslev, Cai, and Song (2000), Balduzzi, Elton, and Green (2001), Andersen, Bollerslev, Diebold, and Vega (2003, 2007), Brandt, Kavajecz, and Underwood (2007), Pasquariello and Vega (2007), Brenner, Pasquariello, and Subrahmanyam (2009), Menkveld, Sarkar, and Van der Wel (2012), etc.

survey, especially for the set of important news announcements, such as CPI, Durable Goods Orders, GDP Advance, Personal Spending, and Retail Sales.

To examine the effect of announcement surprises on market activities, we use trading activities and return data of the E-mini futures contracts on the S&P 500 index. E-mini S&P 500 futures contracts are traded almost around the clock on the Chicago Mercantile Exchange (CME) via the Globex electronic trading platform. This is important for our research because most of macroeconomic news announcements occur before the open of the stock market. In addition, an E-mini contract is one-fifth the size of the standard S&P 500 index futures contract and therefore is more affordable for investors. As documented in Hasbrouck (2003), as the result of greater liquidity, most of the price discovery occurs in E-mini market. Our results show that announcement surprises based on both the Bloomberg and Briefing.com surveys have a significant effect on return volatility, trading volume, and market returns as measured during the 5-, 15-, and 30-min postannouncement intervals. There is a significantly higher return volatility and trading volume associated with larger announcement surprises. However, the Bloomberg survey subsumes the explanatory power of the Briefing.com survey for trading activities and market returns. These results hold for all news announcements, including the set of announcements that are identified as important in the existing literature.

Finally, we document evidence that the market exhibits asymmetric reaction to negative versus positive announcement surprises. Our results show that although the market reacts more significantly to negative shocks in the housing price (Case-Shiller 20-city Index), Personal Spending, and Retail Sales announcements, it reacts more significantly to positive shocks in the CPI and PPI announcements. This is evidence that the market reacts strongly to inflation news in the CPI and PPI announcements and negative shocks in the housing price (Case-Shiller 20-city Index), Personal Spending, and Retail Sales announcements.

The rest of the study is structured as follows. In the next section, we describe the data used in our analysis. In the third section, we present main empirical results. In the final section, we conclude.

2. DATA

As mentioned earlier, our study covers a comprehensive list of prescheduled U.S. macroeconomic news announcements, with a total of 59 news items.[2]

[2]The only news items not included in our analysis are Government Budget and National Association of Purchasing Managers (NAPM) index because there is no observation on Government Budget and there is only one observation on NAPM index during our sample period.

The list is obtained from the economic calendar archive at Briefing.com,[3] and includes all quarterly, monthly, biweekly, and weekly announcements. It is noted in the literature that not all news announcements have equal effect on the market. In our analysis, we follow existing studies, such as Ederington and Lee (1993), Almeida et al. (1998), Balduzzi et al. (2001), Andersen et al. Vega (2003, 2007), Green (2004), Boyd, Hu, and Jagannathan (2005), Pasquariello and Vega (2007), and Jiang et al. (2011), and focus on a set of news items that are identified as important in the existing literature. These news items include the following 14 announcements: Building Permits, Capacity Utilization, Case-Shiller 20-city Index, Consumer Confidence, CPI, Durable Goods Orders, Existing Home Sales, GDP Advance, Leading Indicators, Nonfarm Payrolls, Personal Spending, PPI, Retail Sales, and Unemployment Rate.

For each announcement, we obtain the actual announcement value, the Bloomberg forecast from Bloomberg terminal, and the Briefing.com forecast from the economic calendar archive at Briefing.com. Both Bloomberg and Briefing.com forecasts are the median of their respective surveys. According to information provided by Bloomberg, starting roughly one month prior to the scheduled announcement date, Bloomberg sends out surveys to a list of subjects including economists and practitioners to elicit their forecasts of the upcoming announcements. The number of subjects varies across news announcements. For important news announcements, such as CPI and Retail Sales, the numbers of subjects surveyed are as high as 80. After submitting their forecasts, survey subjects can update their estimates as frequently as they like. During the week prior to the scheduled announcement, Bloomberg compiles all the up-to-date forecasts and publishes the median forecasts of upcoming announcements. Briefing.com survey follows a similar procedure except that the number of subjects surveyed is generally smaller, in the range of 20s. In addition, Briefing.com only updates the median forecast twice a week on Tuesdays and Fridays.

In Table I, we report, for each news item, the prescheduled release time (ET), the total number of announcements with Bloomberg forecasts, the total number of announcements with Briefing.com forecasts, as well as the agency that releases the information. As seen from Table I, most announcement times are clustered at 8:30 a.m. ET and 10:00 a.m. ET. For most news items, there are equal numbers of announcements with Bloomberg forecasts and Briefing.com forecasts, making the comparison between these two surveys meaningful.

With actual announcement value and survey forecast, the forecast error for each announcement is defined as

$$e_{kt} = A_{kt} - E_{kt}, \tag{1}$$

[3] http://briefing.com/investor/calendars/economic/.

TABLE I
List of U.S. Macroeconomic News Announcements

Announcement	*Time*	N^{BL}	N^{BR}	*Important*	*Source*
Quarterly Announcements (10)					
Chain deflator advance	8:30:00	39	39		Bureau of Economic Analysis
Chain deflator final	8:30:00	31	32		Bureau of Economic Analysis
Chain deflator preliminary	8:30:00	33	33		Bureau of Economic Analysis
Current account	10:00:00	38	32		Bureau of Economic Analysis
Employment cost index	8:30:00	51	51		Bureau of Labor Statistics
GDP advance	8:30:00	46	47	Yes	Bureau of Economic Analysis
GDP final	8:30:00	47	47		Bureau of Economic Analysis
GDP preliminary	8:30:00	43	42		Bureau of Economic Analysis
Productivity preliminary	8:30:00	39	39		Bureau of Labor Statistics
Productivity revised	10:00:00	50	49		Bureau of Labor Statistics
Announcements Every Six Weeks (1)					
Federal Open Market Committee rate decision	14:15:00	7	7		Federal Reserve Board
Monthly Announcements (43)					
Auto sales	0:00/7:30/17:00	122	124		Commerce Department
Automated data-processing employment	8:15:00	29	19		Macroeconomic Advisers
Average workweek	8:30:00	152	152		Bureau of Labor Statistics
Building permits	8:30:00	132	152	Yes	Bureau of Census
Business inventories	8:30/10:00	147	149		Bureau of Census
Capacity utilization	9:15:00	152	152	Yes	Federal Reserve Board
Case-Shiller 20-city Index	9:00:00	20	13	Yes	Standard & Poor's
Chain store sales	8:30:00	11	14		International Council of Shopping Centers
Chicago Purchasing Managers Index	9:45/10:00	149	149		Chicago Purchasing Managers
Construction spending	10:00:00	150	145		Bureau of Census
Consumer confidence	10:00:00	151	150	Yes	Conference Board
Consumer credit	14:00/15:00	147	146		Federal Reserve Board
Consumer price index	8:30:00	146	146	Yes	Bureau of Labor Statistics
Core consumer price index	8:30:00	128	128		Bureau of Labor Statistics
Core producer price index	8:30:00	127	126		Bureau of Labor Statistics
Durable goods orders	8:30:00	151	151	Yes	Bureau of Census
Durable goods orders ex transportation	8:30:00	17	16		Bureau of Census
Empire manufacturing index	8:30/15:00	88	84		Federal Reserve Bank of New York
Existing home sales	10:00:00	151	151	Yes	National Association of Realtors
Factory orders	10:00:00	151	150		Bureau of Census
Federal housing finance agency house price	10:00:00	7	7		Federal Housing Finance Age
Help-wanted index	10:00:00	57	76		Conference Board

TABLE I
Continued

Announcement	*Time*	N^{BL}	N^{BR}	*Important*	*Source*
Hourly earnings	8:30:00	152	152		Bureau of Labor Statistics
Housing starts	8:30:00	152	152		Bureau of Census
Industrial production	9:15:00	147	143		Federal Reserve Board
Institute for Supply Management index	10:00:00	152	152		Institute for Supply Management
Institute for Supply Management services	10:00:00	122	123		Institute for Supply Management
Leading indicators	10:00:00	144	144	Yes	Conference Board
Net long-term treasury international capital flows	9:00:00	16	6		U.S. Treasury Department
New home sales	10:00:00	153	153		Bureau of Census
Nonfarm payrolls	8:30:00	150	152	Yes	Bureau of Labor Statistics
Pending home sales	10:00:00	36	18		National Association of Realtors
Personal consumption expenditures price	8:30:00	33	33		Bureau of Economic Analysis
Personal Income	8:30:00	150	151		Bureau of Economic Analysis
Personal spending	8:30:00	152	152	Yes	Bureau of Economic Analysis
Philadelphia Federal Index	10:00/12:00	151	152		Philadelphia Federal Reserve
Producer price index	8:30:00	148	148	Yes	Bureau of Labor Statistics
Trade balance	8:30:00	152	152		Bureau of Economic Analysis
Treasury budget	12:00/14:00	147	133		U.S. Treasury Department
Truck sales	0:00/7:30/17:00	122	124		Commerce Department
Unemployment rate	8:30:00	152	152	Yes	Bureau of Labor Statistics
Unit labor costs	8:30:00	10	10		Bureau of Labor Statistics
Wholesale inventories	10:00:00	141	152		Bureau of Census
Biweekly Announcements (1)					
University of Michigan sentiment	9:45/9:50/9:55/10:00	296	296		University of Michigan
Weekly Announcements (4)					
Continuing claims	8:30:00	51	51		Bureau of Labor Statistics
Initial jobless claims	8:30:00	658	657		Bureau of Labor Statistics
Retail sales	8:30:00	151	150	Yes	Bureau of Census
Retail sales ex auto	8:30:00	151	150		Bureau of Census

Note. U.S. macroeconomic news announcements included in our analysis are listed in this table. Time denotes the prescheduled release time (ET). N^{BL} and N^{BR} denote the total number of announcements with forecasts from Bloomberg and Briefing.com, respectively. *Important* is an indicator of whether a news item is identified as important in the existing literature. Source is the agency that makes the announcement. The sample period is from January 1, 1998 to August 31, 2010.

where A_{kt} is the actual announcement value for new item k on date t, and E_{kt} is the most recent consensus forecast provided by either Bloomberg or Briefing.com. Because both the Bloomberg and Briefing.com forecasts are interpreted as market consensus or expectations of upcoming announcements,

the forecast error defined above is also a measure of announcement surprise or unexpected information shock. In order for announcement surprise to be comparable among different news items, we follow existing studies, such as Balduzzi et al. (2001) and Andersen et al. (2007), and standardize the announcement surprises for each news item. Specifically, the standardized announcement surprise for news k on day t is defined as

$$S_{kt} = \frac{A_{kt} - E_{kt}}{\hat{\sigma}_k}, \tag{2}$$

where $\hat{\sigma}_k$ is the sample standard deviation of announcement surprises (i.e., $A_{kt} - E_{kt}$) of news item k based on either the Bloomberg or Briefing.com survey.

To examine market reaction to unexpected announcement surprises, we use trading activities and return data of the E-mini S&P 500 futures contracts. We note that it is important to use data from the futures market instead of the spot market in our analysis because, as shown in Table I, most of macroeconomic news announcements occur before the open of the stock market. E-mini S&P 500 futures contracts are traded throughout the week almost around the clock on the CME via the Globex electronic trading platform.[4] In addition, we also choose to use data on E-mini contracts as opposed to full-size futures contracts for liquidity reasons. E-mini is one-fifth the size of the standard S&P 500 futures contract and was launched in September 1997 to attract more investors into index futures trading. The futures data are obtained from TickData.com and contain the trading date, trading time to the nearest second, contract maturity month, transaction price, and the number of contracts traded. The data are available from January 1, 1998 to August 31, 2010. Data on trading volume are available only after July 1, 2003. There is a cycle of four contract months for futures contracts (March, June, September, and December). In our analysis, we use the contract with the nearest maturity, that is, the front contract, but rollover to the next available contract when trading volume of the next available contract exceeds that of the front contract. Typically, trading volume of the next available contract substantially exceeds that of the front contract during the second week of the front contract's expiring month, although the actual shifting date varies with each specific contract.[5] Over the period with available trading volume after July 1, 2003, the average rollover occurs on the ninth trading day of the front contract's expiring month. We use it as the rollover date for the period prior to July 1, 2003.

[4]Each week, the trading starts at 5:00 p.m. on Sunday and ends at 3:15 p.m. on Monday. Through Monday to Thursday, the trading starts at 5:00 p.m. and ends at 3:15 p.m. the next day. The trading then resumes at 3:30 p.m. to 4:30 p.m. followed by a 30-min daily maintenance shutdown. For the week, the trading ends at 4:40 p.m. on Friday. All time is Central Time.

[5]See also footnote #13 in Kurov and Zabotina (2005).

TABLE II
Summary Statistics of Announcement Surprises and Trading Activities of S&P 500 Index Futures

Variable	*N*	*Mean*	*Median*	*Standard Deviation*	*5%*	*95%*
Panel A: Standardized Surprise						
BL survey	6,691	0.02	0.00	1.00	−1.57	1.58
BL survey	6,669	0.02	0.00	1.00	−1.63	1.59
Panel B: E-mini S&P 500 Futures Contracts						
$Return_{t,t+5min}$	6,558	0.03	0.00	4.27	−6.46	6.58
$Return_{t,t+15min}$	6,558	−0.04	0.00	3.03	−4.79	4.56
$Return_{t,t+30min}$	6,558	−0.05	0.00	2.49	−4.17	3.69
$Volatility_{t,t+5min}$	6,558	3.12	2.30	2.86	0.47	8.90
$Volatility_{t,t+15min}$	6,558	2.40	1.93	1.84	0.55	6.00
$Volatility_{t,t+30min}$	6,558	2.09	1.72	1.46	0.56	4.82
Abnormal Tick Count$_{t,t+5min}$	6,465	1.12	0.37	2.38	−0.63	5.49
Abnormal Tick Count$_{t,t+15min}$	6,470	0.81	0.26	1.78	−0.55	4.07
Abnormal Tick Count$_{t,t+30min}$	6,470	0.74	0.23	1.64	−0.54	3.89
Abnormal Volume$_{t,t+5min}$	3,910	1.42	0.40	3.88	−0.69	6.17
Abnormal Volume$_{t,t+15min}$	3,914	1.02	0.29	2.93	−0.63	5.04
Abnormal Volume$_{t,t+30min}$	3,914	0.91	0.25	2.24	−0.63	4.60

Note. Panel A reports summary statistics of standardized announcement surprises based on Bloomberg (*BL*) survey and Briefing.com (*BR*) survey, respectively. Standardized announcement surprise is the forecast error, calculated as the difference between announcement value and median forecast, divided by the standard deviation of forecast error for each news item. Panel B reports the returns, return volatility, and trading activities of E-mini S&P 500 futures contracts during the 5-, 15-, and 30-min postannouncement intervals. Return is the log-return during the postannouncement interval. All returns are converted to daily returns and are expressed in percentage terms. Volatility is the square root of the sum of squared 1-min log-returns during the postannouncement interval. It is also converted to daily volatility and expressed in percentage terms. The abnormal trading volume is defined as the relative difference between actual trading volume during the postannouncement interval and normal trading volume, where normal trading volume is the average trading volume during the same time interval over the past seven days. The abnormal tick count is defined similarly. The sample period is from January 1, 1998 to August 31, 2010. Data on volume are available only after July 1, 2003 from TickData.com.

Panel A of Table II reports summary statistics of standardized announcement surprises based on the Bloomberg (*BL*) forecasts and the Briefing.com (*BR*) forecasts. The median of standardized announcement surprises for both forecasts is zero. Panel B of Table II reports summary statistics of the return, return volatility, and trading activities of E-mini S&P 500 futures contracts during the 5-, 15-, and 30-min postannouncement intervals. Return is the log-return during the postannouncement interval. In order for regression results to be comparable, all returns are converted to daily returns and are expressed in percentage terms. For example, the 30-min return is multiplied by a factor of 48. Note that the conversion has no effect on statistical inferences of the estimation results. Volatility is the square root of the sum of squared 1-min log-returns during the postannouncement interval. It is also converted to daily volatility and expressed in percentage term. We note that return volatility of the E-mini S&P 500 futures exhibits a U-shaped intraday seasonality during the trading hours. Nevertheless, because most announcement times are heavily clustered in the

morning hours around 8:30 a.m. ET and 10:00 a.m. ET, there is no need to adjust for the intraday seasonal pattern in our analysis. We follow Kuserk and Locke (1993), Wiley and Daigler (1998), and Daigler and Wiley (1999) and measure trading activities using tick count and trading volume. Specifically, tick count is the number of trades during the postannouncement interval, and trading volume is the number of shares traded during the postannouncement interval. As pointed out by Wiley and Daigler (1998), trading volume is an informative variable in the futures market as markets participants view trading volume as an important determinant of the strength of a market move. Similar to Bamber (1987), Ajinkya and Jain (1989), and Ali, Klasa, and Li (2008), we measure abnormal trading volume as the relative difference between actual trading volume during postannouncement interval and normal trading volume, where normal trading volume is the average trading volume during the same time interval over the past seven days. The abnormal tick count is defined similarly. The above measure of trading volume not only captures the abnormal component of trading activities but also takes into account of potential intraday patterns in trading volume (see, e.g., Admati and Pfleiderer, 1988). As shown in Panel B of Table III, both the mean and median of abnormal tick count and trading volume are positive for all intervals, suggesting that there are on average more trading activities during the postannouncement period. This is consistent with Dungey, Fakhrutdinova, and Goodhart (2009) who document that trading volume peaks during the macroeconomic news releases. In addition, the 5th and 95th percentiles show that there is a significant dispersion in trading activities among announcement days. There are fewer observations on the abnormal trading volume because volume data are available over a shorter sample period.

3. EMPIRICAL ANALYSIS

3.1. Bloomberg and Briefing.com Forecast Errors

Our first set of research questions is as follows: how accurate are the Bloomberg and Briefing.com forecasts of macroeconomic announcements? And, is one of the surveys more accurate than the other? We note that different news announcements have different measurements and different numerical magnitudes, the forecast errors are thus not directly comparable. Our comparisons between the Bloomberg forecasts and the Briefing.com forecasts are based on relative forecast errors and standardized forecast errors. Relative forecast error is the forecast error, as defined in Equation (1), scaled by the actual announcement value and standardized forecast error is defined in Equation (2). We first compute the average relative forecast error and the average standardized

TABLE III
Bloomberg (*BL*) and Briefing.com (*BR*) Forecast Errors

	Panel A: Forecast Error				*Panel B: Standardized Error*			
	Mean Relative Error		*Mean Absolute Relative Error*		*Mean Error*		*Mean Absolute Error*	
	BL	*BR*	*BL*	*BR*	*BL*	*BR*	*BL*	*BR*
Average errors for all announcements	0.1035	0.0746	0.1440	0.1567	0.0226	0.0154	0.7488	0.7514
(*p*-value)	(0.04)	(0.05)	(0.00)	(0.00)	(0.42)	(0.58)	(0.00)	(0.00)
Differences between *BL* and *BR* for all announcements								
BL–*BR*	0.0288		−0.0128		0.0072		−0.0026	
(*p*-value)	(0.16)		(0.31)		(0.30)		(0.34)	
Differences between *BL* and *BR* for important announcements								
BL–*BR*	0.0605		−0.0443		0.0095		−0.0166	
(*p*-value)	(0.16)		(0.04)		(0.39)		(0.11)	

Note. Panel A reports the mean of relative forecast errors and the mean of absolute relative forecast errors for Bloomberg (*BL*) and Briefing.com (*BR*) surveys. Forecast error is the difference between announcement value and survey forecast as defined in Equation (1). Panel B reports the mean of standardized error and the mean of absolute standardized error for Bloomberg (*BL*) and Briefing.com (*BR*) surveys. Standardized error is the difference between announcement value and survey forecast scaled by its standard deviation as defined in Equation (2). The differences between Bloomberg (*BL*) and Briefing.com (*BR*) forecast errors for all announcements and for the set of important announcements are also reported in this table. All *p*-values are based on *t*-statistics with standard errors adjusted for heteroskedasticity across different news items.

forecast error for each news item, the comparison is then based on the mean of the average errors across all news items. This is because there are equal numbers of announcements with Bloomberg forecasts and Briefing.com forecasts for most news items, there are several announcements with unequal numbers of Bloomberg forecasts and Briefing.com forecasts.

In Table III, we report the mean relative forecast error, mean absolute relative forecast error, mean standardized forecast error, and mean absolute standardized forecast error for both the Bloomberg and the Briefing.com surveys. The results show that the mean relative error and mean absolute relative error are positive and highly significant for both surveys. The mean standardized error is insignificantly different from zero for both surveys, suggesting that neither Bloomberg nor Briefing.com surveys exhibit systematic biases. On the other hand, the mean absolute standardized error is significant for both surveys. All *p*-values are based on *t*-statistics with standard errors adjusted for heteroskedasticity across different news items.

In Table III, we also report the differences of various measures of forecast errors between the Bloomberg (*BL*) and the Briefing.com (*BR*) surveys based on all announcements and the set of important announcements. As mentioned earlier, the set of important news announcements includes 14 news items that are identified in existing studies as having more significant effect on the market. The results show that there is no significant difference in average relative forecast error between the Bloomberg and the Briefing.com surveys. The average absolute relative error of the Bloomberg survey is, however, significantly lower than that of the Briefing.com survey at the 5% level for the set of important announcements. Similarly, there is no significant difference in average standardized forecast error between the Bloomberg and the Briefing.com surveys. For the set of important announcements, the average absolute standardized error of the Bloomberg survey is lower than that of the Briefing.com survey, with a p-value of 0.11. Overall, the results show that the Bloomberg forecasts are slightly more accurate than the Briefing.com forecasts, especially for the set of important news items.[6]

To further illustrate the differences of forecast errors between the Bloomberg and the Briefing.com surveys, Figure 1 plots the mean absolute errors and mean absolute relative errors for the set of important news in Panels A and B, respectively. Combining the absolute errors in Panel A and absolute relative errors in Panel B, we note that for the CPI (#5), Durable Goods Orders (#6), GDP Advance (#8), Personal Spending (#11), and Retail Sales (#13) announcements, the Briefing.com survey has noticeably higher forecast errors than the Bloomberg survey. Only for the Case-Schiller 20-city index (#3), the Briefing.com survey appears to have lower relative forecast errors than the Bloomberg survey. Nevertheless, in this case the mean absolute error of the announcements, as shown in Panel A, is much higher for the Briefing.com survey than for the Bloomberg survey.

3.2. The Effect of Announcement Surprises on Market Volatility and Trading Activities

The second set of research questions of our study is as follows: how does market react to announcement surprises? In particular, considering the fact that the Bloomberg survey is more accurate than the Briefing.com survey, do

[6]As robustness checks, we construct shrinkage forecasts combining the Bloomberg forecasts and the Briefing.com forecasts. Specifically, we construct two shrinkage forecasts: $BB1 = 0.50\,BL + 0.50\,BR$ and $BB2 = 0.75\,BL + 0.25\,BR$, where BL stands for the Bloomberg forecasts and BR stands for the Briefing.com forecasts. Our analysis confirms that the Bloomberg forecasts are more accurate than these shrinkage forecasts, especially for the set of important news announcement.

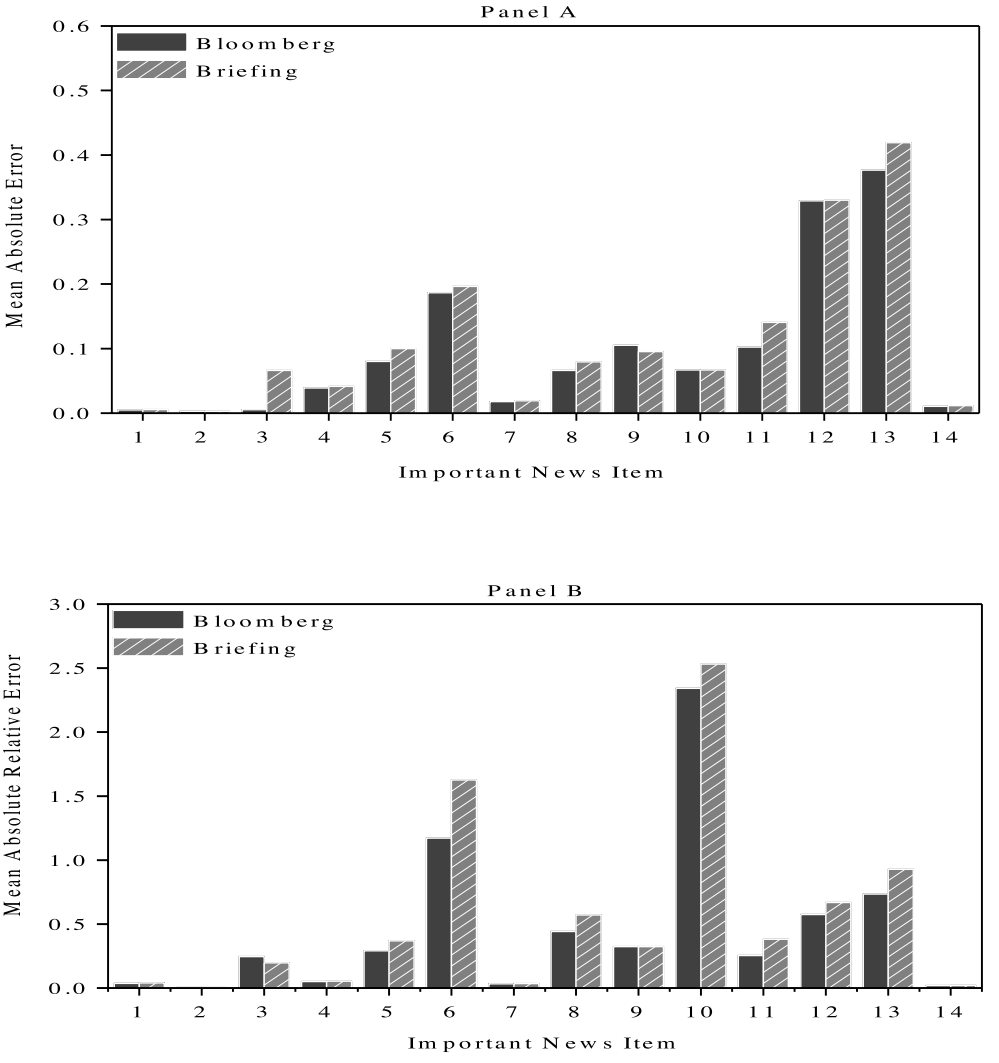

FIGURE 1

Mean absolute error and mean absolute relative error for important news items. This figure plots mean absolute error and mean absolute relative error for each of the 14 important news items based on Bloomberg and Briefing.com forecasts, respectively. Mean absolute error is the average of absolute forecast error where forecast error is defined in Equation (1). Mean absolute relative error is the average of absolute relative forecast error, which is the forecast error divided by the announcement value. The set of important news items includes (1) Building Permits, (2) Capacity Utilization, (3) Case-Shiller 20-city Index, (4) Consumer Confidence, (5) Consumer Price Index, (6) Durable Goods Orders, (7) Existing Home Sales, (8) GDP Advance, (9) Leading Indicators, (10) Nonfarm Payrolls, (11) Personal Spending, (12) Producer Price Index, (13) Retail Sales, and (14) Unemployment Rate.

the Briefing.com forecasts contain significant information content beyond the Bloomberg forecasts? To answer these questions, we regress market volatility, abnormal tick count and abnormal trading volume during the postannouncement interval on absolute announcement surprises. As shown in existing studies, such as Balduzzi et al. (2001), Andersen et al. (2003, 2007), Bjursell, Wang, and Webb (2010), and Hussain (2011), the use of high-frequency data is critical to identify the effect of macroeconomic news announcements. Specifically, the following regressions are performed for (i) return volatility, (ii) abnormal tick count, and (iii) abnormal trading volume with announcement surprises calculated separately from the Bloomberg and the Briefing.com surveys:

$$Variable_{t+30\,\min} = \alpha^{BL} + \sum_{k=1}^{K-1} \gamma_k^{BL} D_k + \beta^{BL} \left|S_{kt}^{BL}\right| + \varepsilon_t^{BL}, \tag{3}$$

$$Variable_{t+30\,\min} = \alpha^{BR} + \sum_{k=1}^{K-1} \gamma_k^{BR} D_k + \beta^{BR} \left|S_{kt}^{BR}\right| + \varepsilon_t^{BR}, \tag{4}$$

where BL stands for the Bloomberg survey, BR stands for the Briefing.com survey, D_k is 1 for news k and zero otherwise, K is the total number of news items considered, $|S|$ is the absolute standardized announcement surprise. In the case with multiple announcements, $|S|$ is the average absolute standardized announcement surprise among all concurrent announcements. As a robustness check, we also set $|S|$ as the highest absolute standardized announcement surprise among all concurrent announcements and we confirm that the results are consistent. In addition, because not all news announcements are of equal importance, we also perform the above regressions only for the set of important announcements. Note that in the above regressions, the absolute standardized announcement surprise is used because both positive and negative surprises represent information uncertainty. In our subsequent analysis, we also test whether the market reacts differently to positive versus negative announcement surprises. The dummy variable D_k for individual news item allows different intercepts for different news items.

In addition, to examine whether the market reacts more significantly to surprises based on one survey than the other, we perform the following encompassing regressions:

$$Variable_{t+30\,\min} = \alpha + \sum_{k=1}^{K-1} \gamma_k D_k + \beta^{BL} \left|S_{kt}^{BL}\right| + \beta^{BR} \left|S_{kt}^{BR}\right| + \varepsilon_t. \tag{5}$$

TABLE IV
Univariate and Encompassing Regressions of Return Volatility, Tick Count, and Trading Volume on Absolute Standardized Announcement Surprises

Dependent Variable	*Intercept*	β^{BL}	β^{BR}	*N*	*Adj.* R^2 *(%)*	*D–W*
Panel A: All Announcements						
$Volatility_{t,t+30min}$	2.00***(0.10)	0.22***(0.04)		6,578	24.79	0.52
	2.04***(0.10)		0.19***(0.04)	6,556	24.70	0.50
	2.62***(0.07)	0.16***(0.05)	0.08* (0.05)	6,470	23.29	0.54
$Abnormal\ Tick\ Count_{t,t+30min}$	−0.12***(0.03)	0.10***(0.02)		6,578	42.68	0.80
	−0.09***(0.03)		0.07***(0.02)	6,556	42.42	0.80
	1.01***(0.09)	0.11***(0.04)	−0.01 (0.04)	6,470	33.19	0.95
$Abnormal\ Volume_{t,t+30min}$	−0.22***(0.05)	0.14***(0.04)		3,998	35.41	0.81
	−0.19***(0.05)		0.11***(0.04)	3,929	35.21	0.81
	1.25***(0.15)	0.14* (0.08)	0.00 (0.07)	3,914	27.31	0.93
Panel B: Only Important Announcements						
$Volatility_{t,t+30min}$	2.91***(0.18)	0.34***(0.07)		1,840	22.59	0.75
	3.02***(0.18)		0.29***(0.07)	1,854	21.42	0.75
	3.22***(0.17)	0.35***(0.08)	0.02 (0.09)	1,827	21.69	0.76
$Abnormal\ Tick\ Count_{t,t+30min}$	3.67***(0.24)	0.16***(0.04)		1,840	48.98	1.28
	3.75***(0.24)		0.12***(0.04)	1,854	48.55	1.28
	3.77***(0.22)	0.19** (0.07)	−0.03 (0.07)	1,827	48.88	1.28
$Abnormal\ Volume_{t,t+30min}$	4.57***(0.41)	0.18** (0.08)		1,079	46.12	1.29
	4.71***(0.43)		0.15* (0.08)	1,071	45.72	1.30
	4.85***(0.40)	0.19 (0.12)	−0.00 (0.13)	1,070	45.89	1.30

Note. The regression results of market return volatility, abnormal tick count, and abnormal trading volume during the 30-min postannouncement interval on absolute standardized announcement surprises based on Bloomberg (*BL*) and Briefing.com (*BR*) forecasts, as in Equations (3)–(5) are reported in this table. Return volatility, abnormal tick count, and abnormal volume are defined in Table II. The sample period is from January 1, 1998 to August 31, 2010. Data on volume are available only after July 1, 2003 from TickData.com. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Corresponding Newey and West (1987) standard errors of the coefficient estimates are in parentheses. The coefficient estimates of news dummies are not reported to preserve space. *D–W* stands for the Durbin–Watson statistic. All *D–W* are significant at the 1% level.

The regression includes those in (3) and (4) as special cases. The purpose of the above regression is to examine whether the Bloomberg forecasts subsume the explanatory power of the Briefing.com forecasts for market activities, given earlier findings that the Bloomberg forecasts are more accurate than the Briefing.com forecasts.

In Table IV, we report the coefficient estimates, together with adjusted R^2s, and the Durbin–Watson statistic, of the above regressions for all announcements in Panel A, and for the set of important news announcements in Panel B. Because the results based on 5-, 15-, and 30-min postannouncement intervals are very consistent, we only report the results based on the 30-min interval to preserve space. The coefficient estimates are obtained using the ordinary least square (OLS) method. However, as indicated in Table IV, the Durbin–Watson statistics are significant at the 1% level in all regressions, suggesting

significant autocorrelations in the residuals. As such, the OLS standard errors are inappropriate for statistical inferences. In this study, we compute *t*-statistics based on the Newey and West (1987) standard errors, which account for both heteroskedasticity and autocorrelations. The results in Panel A show that in all regressions, the estimates of coefficients of $\beta^{BL}$and β^{BR} are positive and highly significant. That is, there is a significant increase of return volatility, abnormal tick count, and abnormal trading volume as a result of higher absolute announcement surprises or unexpected information shocks based on both the Bloomberg and the Briefing.com surveys. The adjusted R^2s of the return volatility regressions are more than 24%, whereas those of the abnormal tick count and abnormal trading volume regressions are even higher, more than 42% and 35%, respectively. This is consistent with Vähämaa et al. (2005) who document that expected bond market volatilities increase in response to higher than expected inflation and unemployment announcements. In Table IV, we further show that the results based on the set of important news announcements are similar, except that overall the coefficients estimates are higher. This suggests that the market reacts more strongly to unexpected information shocks of important news. The findings suggest that surprises based on both the Bloomberg and the Briefing.com surveys have significant effect on market volatility and trading activities.

Next, we examine the results of the encompassing regressions. First, we note that the adjusted R^2s of encompassing regressions are often lower than the separate regressions. This is evidence that adding announcement surprise based on the other survey does not necessarily improve the explanatory power for market activities. In other words, the Bloomberg and Briefing.com consensus forecasts and the announcement surprises based on these forecasts are highly correlated. Second and more importantly, the results based on all announcements show that in almost all regressions, the explanatory power of the surprises based on the Briefing.com survey is subsumed by the surprises based on the Bloomberg survey. The estimate of β^{BL} remains significant in all regressions, whereas the estimate of β^{BR} is significant at the 10% level only in the return volatility regression. The results based on the set of important news announcements offer the same conclusions. As noted earlier, the results based on trading activities during the 5- and 10-min postannouncement intervals are consistent. Overall, these results show that although the Briefing.com surprise by itself has explanatory power for futures trading activities during the postannouncement period, the Bloomberg surprise mostly subsumes information contained in the Briefing.com surprise. If announcement surprise is indeed viewed as a measure of unexpected information shock, the evidence suggests that the market seems to pay more attention to the Bloomberg forecasts than to the Briefing.com forecasts. Or in other words, the Bloomberg

survey is on average more consistent with the consensus view of market participants.

3.3. The Effect of Announcement Surprises on Market Returns

In the following, we further examine how market returns react to announcement surprises. In this case, we perform regressions of market returns during the 30-min postannouncement interval on announcement surprises. We note that the effect of announcement surprise on market returns is likely different for each individual news item. For example, a positive shock in CPI announcement is expected to have a negative effect on market returns, whereas a positive shock in Retail Sales announcement is expected to have a positive effect on market returns. As such, we focus our analysis on the set of important news and the regressions are performed separately for each of the important news items. In addition, we use announcement surprises, instead of absolute announcement surprises, in the market return regressions. Again, this is because the effect of positive versus negative surprises on market returns is specific for each news item. Specifically, we perform the following regressions:

$$Return_{kt+30\,\mathrm{min}} = \alpha_k + \beta_k^{BL} S_{kt}^{BL} + \sum_{c=0}^{C} \beta_c^{BL} S_{ct}^{BL} + \varepsilon_{kt}, \tag{6}$$

$$Return_{kt+30\,\mathrm{min}} = \alpha_k + \beta_k^{BR} S_{kt}^{BR} + \sum_{c=0}^{C} \beta_c^{BR} S_{ct}^{BR} + \varepsilon_{kt}, \tag{7}$$

where BL stands for Bloomberg, BR stands for Briefing.com, S_{kt} is the standardized announcement surprise of news item k on date t, S_{ct} is the standardized announcement surprise of concurrent news item c, and C is the total number of concurrent news announcements. Concurrent news announcements are those that are released at the beginning of or during the return interval and these news announcements may also affect market returns. For robust estimation of the model, we only include concurrent announcements in the set of important news items in the regressions. As noted from Table I, many news announcements occur at the same time and, during some days, there are more than one important news announcements during the postannouncement interval. For example, nonfarm payrolls and unemployment rate are always announced at the same time and both are classified as important news in our analysis. When we examine the effect of announcement surprises of nonfarm payrolls,

announcement surprises of unemployment rate are included as control variables. Similarly, when we examine the effect of announcement surprises of unemployment rate, announcement surprises of nonfarm payrolls are included as control variables. In addition, we require a concurrent news item to have at least 20 observations to be included as control variable.

In addition to the above regressions, we perform the following encompassing regression to jointly examine the effect of the Bloomberg and the Briefing.com surveys on market returns:

$$Return_{kt+30\,\mathrm{min}} = \alpha_k + \beta_k^{BL} S_{kt}^{BL} + \beta_k^{BR} S_{kt}^{BR} + \sum_{c=0}^{C} \beta_c^{BL} S_{ct}^{BL} + \sum_{c=0}^{C} \beta_c^{BR} S_{ct}^{BR} + \varepsilon_{kt}. \quad (8)$$

This regression includes those in (6) and (7) as special cases. As noted earlier, the purpose of the encompassing regression is to examine whether the market reacts more strongly to one of the survey surprises or, specifically, whether one survey subsumes the information content of the other.

In Table V, we report the coefficient estimates, together with adjusted R^2s, and the Durbin–Watson statistic, of the above regressions for each individual news item. Again, the coefficient estimates are obtained using the OLS method, and all *t*-statistics are calculated based on the Newey and West (1987) standard errors, which account for both heteroskedasticity and autocorrelations. For brevity, the coefficient estimates of the concurrent news announcement are not reported. Results in Table V show that of the 14 important announcements, the estimates of the Bloomberg and Briefing.com surprise coefficients $\beta^{BL}$and β^{BR} are statistically significant at 10% level for six announcements: Consumer Confidence, CPI, GDP Advance, Leading Indicators, PPI, and Retail Sales. In these regressions, the coefficient estimates for the Bloomberg and the Briefing.com surprises have the same sign and similar magnitude. The estimates of the Bloomberg surprise coefficient β^{BL} are statistically significant at 10% level for additional two announcements: Durable Goods Orders and Existing Home Sales. Specifically, market return is positively correlated with unexpected shocks in the Consumer Confidence, Durable Goods Orders, Existing Home Sales, GDP Advance, Leading Indicators, and Retail Sales announcements, but negatively correlated with unexpected shocks in the CPI and PPI announcements. This suggests that there is a positive (negative) market reaction to positive (negative) shocks in the Consumer Confidence, Durable Goods Orders, Existing Home Sales, GDP Advance, Leading Indicators, and Retail Sales announcements, whereas there is a negative (positive) market reaction to positive (negative) shocks in the CPI and PPI announcements. For

TABLE V

Univariate and Encompassing Regressions of Market Returns on Announcement Surprises

Announcement	*Intercept*	β^{BL}	β^{BR}	*N*	*Adj.* R^2 *(%)*	*D–W*
Building permits	0.08 (0.25)	0.13 (0.27)		132	−0.07	1.92
	−0.07 (0.23)		0.16 (0.14)	150	0.52	1.90
	0.07 (0.24)	−0.72 (0.56)	0.79* (0.44)	132	1.36	1.97
Capacity utilization	0.03 (0.09)	0.11 (0.13)		152	−0.03	1.85
	0.03 (0.10)		0.11 (0.11)	152	−0.07	1.85
	0.03 (0.10)	0.08 (0.27)	0.03 (0.23)	152	−0.69	2.20
Case-Shiller 20-city Index	−0.05 (0.41)	0.33 (0.37)		20	−2.61	1.93
	−0.07 (0.28)		0.46 (0.27)	13	−3.55	2.06
	0.15 (0.28)	0.87 (0.55)	−0.45 (0.41)	13	7.10	1.95
Consumer confidence	−0.52 (0.32)	2.50***(0.48)		151	25.25	2.22
	−0.41 (0.32)		2.34***(0.50)	150	21.90	2.20
	−0.56* (0.33)	2.60***(0.83)	−0.05 (0.69)	150	25.57	2.26
Consumer price index	0.35 (0.34)	−1.37***(0.52)		146	7.21	1.98
	0.48 (0.35)		−1.21** (0.46)	146	5.41	2.02
	0.41 (0.33)	−1.17* (0.63)	−0.49 (0.63)	146	6.66	1.98
Durable goods orders	−0.20 (0.20)	1.09* (0.57)		151	10.03	2.15
	−0.15 (0.21)		0.93 (0.61)	151	7.07	2.18
	−0.21 (0.20)	1.75***(0.52)	−0.69 (0.73)	150	10.27	2.35
Existing home sales	−0.33 (0.24)	0.57* (0.34)		151	2.35	2.26
	−0.27 (0.24)		0.28 (0.32)	151	0.09	2.26
	−0.37 (0.23)	1.54***(0.59)	−1.09** (0.49)	151	3.98	2.25
GDP advance	0.55 (0.49)	3.52***(0.43)		46	36.90	2.29
	0.88 (0.59)		3.04***(0.58)	47	27.38	2.17
	0.58 (0.50)	3.22***(0.80)	0.36 (0.85)	46	35.56	2.35
Leading indicators	−0.20 (0.26)	0.73** (0.33)		144	4.26	1.92
	−0.21 (0.27)		0.68** (0.33)	144	3.59	1.78
	−0.23 (0.26)	0.89* (0.47)	0.32 (0.43)	143	3.98	1.99
Nonfarm payrolls	−0.97 (0.88)	0.81 (0.55)		150	1.92	2.01
	−0.78 (0.76)		0.57 (0.40)	150	0.31	2.00
	−0.56 (0.49)	1.33* (0.79)	−0.82* (0.50)	150	2.22	2.01
Personal spending	0.20 (0.17)	0.10 (0.13)		152	−0.43	1.95
	0.22 (0.17)		0.18 (0.13)	152	0.12	1.95
	0.23 (0.17)	−0.07 (0.15)	0.23 (0.17)	152	−0.49	1.99
Producer price index	−0.38 (0.28)	−0.67* (0.34)		148	2.18	1.71
	−0.26 (0.28)		−0.67** (0.34)	148	2.38	1.85
	−0.29 (0.27)	−0.70 (1.01)	−0.00 (0.95)	146	1.99	2.19
Retail sales	0.04 (0.32)	1.38***(0.47)		151	9.96	1.90
	0.19 (0.32)		1.21***(0.44)	150	7.54	1.88
	−0.09 (0.38)	2.49** (1.21)	−1.16 (1.11)	150	9.99	2.13
Unemployment rate	0.35 (0.76)	−1.26 (0.97)		152	1.44	1.97
	0.31 (0.76)		−1.10 (0.93)	152	0.96	1.98
	0.36 (0.74)	−1.37 (1.76)	0.13 (1.60)	152	0.78	1.93

Note. The regression results of market returns during the 30-min postannouncement interval on standardized announcement surprises based on Bloomberg (*BL*) and Briefing.com (*BR*) forecasts, as in Equations (6)–(8) are reported in this table. Return is defined as in Table II. The regression is run separately for each individual news item identified as important in the existing literature. The sample period is from January 1, 1998 to August 31, 2010. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Corresponding Newey and West (1987) standard errors of the coefficient estimates are in parentheses. The coefficient estimates of concurrent news are not reported to preserve space. *D–W* stands for the Durbin–Watson statistic.

these announcements, the regressions also have relatively high-adjusted R^2s. For instance, the adjusted R^2s of the GDP Advance regression are, respectively, 36.90% and 27.38% for the Bloomberg and the Briefing.com surprises. The adjusted R^2s of the Consumer Confidence regressions are, respectively, 25.25% and 21.90% for the Bloomberg and the Briefing.com surprises. The adjusted R^2s of regressions for the CPI, Durable Goods Orders, and Retail Sales are also higher than 5%. For other regressions, the adjusted R^2s are generally low and sometimes even negative. We note that the negative adjusted R^2s are likely due to the lack of explanatory power of these announcement surprises and the inclusion of concurrent news announcements as well.

The results of the encompassing regression in Table V suggest that again, the Bloomberg forecasts mostly subsume the explanatory power of the Briefing.com forecasts for market returns. For all six news items with a significant estimate of coefficient β^{BR} in univariate regressions as specified in Equation (6), the coefficient β^{BR} becomes insignificant in the encompassing regressions. On the other hand, for those eight news items with a significant estimate of coefficientβ^{BL} in univariate regressions as specified in Equation (7), the coefficient β^{BL} remains statistically significant in the encompassing regressions. The only exception is the encompassing regressions for the PPI announcements where both coefficients $\beta^{BL}$and $\beta^{BR}$are statistically insignificant. This is evidence that the Bloomberg forecasts on average are more consistent with the consensus market view. The results are consistent with earlier findings that, for the CPI, Durable Goods Orders, GDP Advance, and Retail Sales announcements, the Bloomberg survey is more accurate than the Briefing.com survey. In addition, we note that although the estimate of neither β^{BL} nor β^{BR} is significant in their separate regressions for the Building Permits and Nonfarm Payrolls announcements, one or both of the coefficients become significant but with opposite signs in the encompassing regressions. This is likely due to the effect of multicolinearity among the Bloomberg and the Briefing.com forecasts. We confirm that the Spearman correlations between standardized announcement surprises based on the Bloomberg and those based on the Briefing.com forecasts for Building Permits and Nonfarm Payrolls are as high as 0.920 and 0.782, respectively, in our sample period.

Overall, the results show that although surprises based on both surveys have significant explanatory power of market activities and market returns, the explanatory power of the Briefing.com forecasts is subsumed by the Bloomberg forecasts. The findings suggest that market seems to pay more attention to unexpected information shocks based on the Bloomberg forecasts and the Bloomberg forecasts are on average more consistent with the market consensus view.

3.4. Asymmetric Market Reaction to Announcement Surprises

The results in previous section show that the market reacts significantly to announcement surprises based on both the Bloomberg and the Briefing.com surveys. In this section, we further examine market reactions to positive versus negative information shocks. The extended analysis serves at least three purposes. First, by separating positive and negative announcement surprises, it helps to sharpen the inference on market reaction to information shocks. Second, one stylized fact documented in the existing literature is that market tends to react to negative vs. positive information differently. For instance, based on evidence from foreign currency market, Ehrmann and Fratzscher (2005) document that there is a stronger market reaction to negative news. Using implied volatility in the bond market, Vähämaa et al. (2005) document asymmetric market reactions to unexpected shocks in macroeconomic news announcements. Third, asymmetric market reaction to negative versus positive announcement surprises also has important implications on how investors should manage and hedge risk associated with unexpected information shocks.

In this section, we empirically test whether the market exhibits asymmetric reaction to positive versus negative announcement surprises. Specifically, we perform the following regressions separately for each news item:

$$\begin{aligned} Return_{kt+30\,\min} = \alpha_k &+ (\beta^{BL+} D_{kt}^{BL+} + \beta^{BL-} D_{kt}^{BL-}) S_{kt}^{BL} \\ &+ \sum_{c=1}^{C} (\beta_c^{BL+} D_c^{BL+} + \beta_c^{BL-} D_c^{BL-}) S_{ct}^{BL} + \varepsilon_{kt}, \end{aligned} \tag{9}$$

$$\begin{aligned} Return_{kt+30\,\min} = \alpha_k &+ (\beta^{BR+} D_{kt}^{BR+} + \beta^{BR-} D_{kt}^{BR-}) S_{kt}^{BR} \\ &+ \sum_{c=1}^{C} (\beta_c^{BR+} D_c^{BR+} + \beta_c^{BR-} D_c^{BR-}) S_{ct}^{BR} + \varepsilon_{kt}, \end{aligned} \tag{10}$$

where BL stands for Bloomberg, BR stands for Briefing.com, $D_k^{BL+} = 1 (D_k^{BL-} = -1)$ when $S_k^{BL} > 0$ ($S_k^{BL} < 0$) and zero otherwise, $D_k^{BR+} = 1 (D_k^{BR-} = -1)$ when $S_k^{BR} > 0 (S_k^{BR} < 0)$ and zero otherwise, D_c^{BL+} and D_c^{BR+} are defined similarly, S_k is the standardized surprise of news item k, S_c is the standardized surprise of concurrent news item c, and C is the total number of concurrent news announcements. The regressions extend those in (6) and (7) with dummy variables to allow for asymmetric market reaction to announcement surprises. The coefficients $\beta^{BL+}$and β^{BR+}capture market reaction to positive announcement

surprises, whereas β^{BL-} and β^{BR-} capture market reaction to negative announcement surprises. Specifically, positive (negative) values of $\beta^{BL+}$and β^{BR+} indicate that the market reacts positively (negatively) to positive announcement surprises. Similarly, positive (negative) values of $\beta^{BL-}$and β^{BR-} indicate that the market reacts positively (negatively) to negative announcement surprises. Again, for robust estimation of the model, we only control for concurrent announcements of important news items and require at least 20 observations for a concurrent news item to be included in the regressions.

In Table VI, we report the coefficient estimates, together with adjusted R^2s, and the Durbin–Watson statistic, of the above regressions for each individual news item. Similar to previous regressions, the coefficient estimates are obtained using the OLS method, and all *t*-statistics are calculated based on the Newey and West (1987) standard errors, which account for both heteroskedasticity and autocorrelations. For brevity, the coefficient estimates of the concurrent news announcements are not reported. Because the Bloomberg survey provides more efficient forecasts of news announcements, we focus our discussions on the results based on the Bloomberg survey. The results based on the Briefing.com survey are generally consistent. The results in Table VI show that first, although surprises of the Capacity Utilization, Case-Shiller 20-city Index, Nonfarm Payrolls, and Personal Spending announcements overall have no significant effect on market returns as reported in Table V, the market does respond to negative surprises of these announcements. For these announcements, there is a significantly negative market reaction to negative surprises. However, positive shocks in the Capacity Utilization, Case-Shiller 20-city Index, Nonfarm Payrolls, and Personal Spending announcements do not have a significant effect on market returns. Second, for the Consumer Confidence and CPI announcements, the significant effect of announcement surprises on market returns as reported in Table V is mainly driven by positive shocks. Although the market reacts positively to positive shocks in the Consumer Confidence announcement, it reacts negatively to positive shocks in the CPI announcement. Third, we note that for the GDP Advance, Leading Indicators, PPI, and Retail Sales announcements, the market reacts significantly to both positive and negative shocks. For the GDP Advance, Leading Indicators, and Retail Sales announcements, positive (negative) shocks lead to positive (negative) market reaction. On the other hand, positive (negative) shocks in the PPI announcement lead to negative (positive) market reaction. Note that a positive shock in the CPI and PPI announcements is evidence of higher than expected inflation. This suggests that the market reacts negatively when the inflation is higher than expected, whereas the market reacts positively but less significantly when the inflation is lower than expected. This is consistent with Vähämaa et al. (2005) who document that bond mar-

TABLE VI

Asymmetric Market Reaction to Announcement Surprises: Evidence-based on Market Returns

Announcement	*Intercept*	β^{BL+}	β^{BL-}	*Intercept*	β^{BR+}	β^{BR-}	*N*	*Adj.*R^2 (%)	*D–W*
Building permits	−0.64 (0.49)	0.39 (0.41)	−0.91 (0.66)				132	0.75	1.85
				−0.72* (0.42)	0.43 (0.33)	−0.65 (0.70)	152	0.86	1.88
Capacity Utilization	0.01 (0.37)	−0.14 (0.29)	−0.58* (0.34)				152	1.99	1.90
				0.43 (0.39)	−0.03 (0.24)	−0.54* (0.32)	152	2.01	1.88
Case-Shiller 20-city Index	−0.70 (1.06)	1.05 (0.68)	−1.70** (0.71)				20	3.80	2.07
				−0.63 (1.02)	1.20 (0.77)	−0.92 (0.58)	13	3.91	2.01
Consumer Confidence	0.70 (1.01)	1.49* (0.88)	−0.96 (0.87)				151	26.93	2.20
				1.16 (1.05)	1.82* (0.94)	−0.40 (0.60)	150	22.77	2.21
Consumer price index	1.30 (1.67)	−1.90***(0.66)	0.43 (0.31)				146	12.44	1.98
				0.56 (1.42)	−1.83***(0.66)	0.35 (0.26)	146	9.29	1.95
Durable goods	−0.69 (0.71)	0.86 (0.81)	−0.43 (0.40)				151	10.10	2.16
Orders				−0.77 (0.71)	0.75 (0.80)	−1.01 (0.66)	151	8.22	2.13
Existing home sales	−0.73 (0.82)	0.93 (0.68)	−0.31 (0.55)				151	1.30	2.27
				−0.87 (0.83)	0.40 (0.33)	−0.11 (0.49)	151	−0.79	2.27
GDP advance	0.54 (0.67)	2.01** (0.81)	−1.18* (0.64)				46	34.25	2.12
				0.78 (1.51)	2.10** (0.86)	−1.65* (0.94)	47	19.89	2.24
Leading indicators	−1.36 (0.85)	1.14***(0.42)	−0.86***(0.29)				144	6.19	1.93
				−0.76 (0.98)	1.32***(0.40)	−0.79***(0.28)	144	7.21	1.78
Nonfarm payrolls	−0.44 (1.02)	0.33 (1.27)	−1.25* (0.68)				150	−0.74	2.00
				−1.04 (1.22)	0.17 (0.87)	−1.06* (0.65)	150	−0.91	2.02
Personal spending	−0.81***(0.27)	0.38 (0.26)	−0.71***(0.21)				152	7.97	1.95
				−0.58 (0.42)	0.26 (0.29)	−0.60*** (0.22)	152	1.61	1.95
Producer price index	0.82 (1.06)	−1.68** (0.67)	1.26** (0.63)				148	6.67	1.67
				1.49 (0.97)	−1.64** (0.68)	1.78*** (0.61)	148	8.77	1.80
Retail sales	0.23 (0.53)	0.27* (0.16)	−1.27** (0.58)				151	11.22	1.88
				0.43 (0.40)	0.30 (0.19)	−1.42** (0.69)	150	8.97	1.87
Unemployment rate	−1.55 (1.47)	−0.95 (0.99)	−0.55 (1.48)				152	0.04	1.97
				−1.00 (1.61)	−1.00 (1.02)	0.09 (1.56)	152	−0.58	1.96

Note. The regression results of returns during the 30-min postannouncement interval on standardized announcement surprises based on Bloomberg (*BL*) and Briefing.com (*BR*) forecasts, as in Equations (9) and (10) are reported in this table. Return is defined as in Table II. The regression is run separately for each individual news item identified as important in the existing literature. The sample period is from January 1 1998 to August 31 2010. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Corresponding Newey and West (1987) standard errors of the coefficient estimates are in parentheses. Intercepts and the coefficient estimates of concurrent news are not reported to preserve space. *D–W* stands for the Durbin–Watson statistic.

ket is affected asymmetrically by surprises in unexpected shocks in inflation announcements.

We further examine the asymmetries between market reactions to positive versus negative shocks. Because the absolute values of β^{BL+} and β^{BL-} capture market reactions to one standard deviation of announcement surprises, our tests are based on the differences between the absolute values of $\beta^{BL+}$and β^{BL-}. The results show that for the Case-Shiller 20-city Index, Personal Spending, and Retail Sales announcements, the absolute value of β^{BL+} is significantly lower than that of β^{BL-} at the 10% level, whereas for the CPI and PPI announcements, the absolute value of β^{BL+} is significantly higher than that of β^{BL-} at the 10% level. This is evidence that the market exhibits asymmetric reaction to positive versus negative surprises in news announcements. In particular, the market reacts strongly to inflation news in the CPI and PPI announcements and negative shocks in the announcements of housing price, personal spending and retail sales.

4. CONCLUSION

Bloomberg and Briefing.com provide up-to-date forecasts for prescheduled macroeconomic announcements and these forecasts are used by both market participants and academic researchers as consensus of market expectations. Our results show that the Bloomberg forecasts are overall more accurate than the Briefing.com forecasts, especially for important news announcements. In addition, although the market reacts significantly to announcement surprises based on both surveys, the Bloomberg survey subsumes the explanatory power of the Briefing.com survey. Moreover, we provide evidence of asymmetric market reaction to negative versus positive surprises. In particular, the market reacts strongly to positive shocks in the CPI and PPI announcements and negative shocks in the Case-Shiller 20-city Index, Personal Spending, and Retail Sales announcements.

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