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Quantifying the Announcement Effects in the U.S. Lumber Market

Zarina Ismailova, Shishir Shakya, Xiaoli L. Etienne, and Fabio Mattos[1]

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[1] Zarina Ismailova is a Ph.D. student in the Division of Resource Economics and Management, West Virginia University. Shishir Shakya is a Ph.D. student in the Department of Economics, West Virginia University. Xiaoli L. Etienne and Fabio Mattos are assistant professor in the Division of Resource Economics and Management of West Virginia University and associate professor in the Department of Agricultural Economics of University of Nebraska-Lincoln, respectively.

Quantifying the Announcement Effects in the U.S. Lumber Market

The impact of new information from public reports has been widely investigated in many commodity markets, but little attention has been paid to the lumber market. In this paper, we examine the impact of two housing market reports, namely the New Residential Construction (Housing Starts) and the New Residential Sales reports, on the U.S. lumber futures market. Our results suggest that the housing starts report indeed affect lumber market volatility, while the New Residential sales report exerts a minor impact on lumber price volatility. We further find that the effect of the two reports on volatility differs depending on the level of inventory and nature of the news. When the level of inventory is low, larger-than-expected housing starts has the largest effect on lumber volatility. During periods of abundant inventory, lower-than-expected housing starts increases the volatility most. For the new home sales reports, we find that while lower-than-expected sales do not affect the volatility of lumber prices, larger-than-expected sales do increase the volatility.

Keywords: lumber, volatility, housing starts, new home sales, public reports, inventory

1. Introduction

Since the seminal paper of Fama et al. (1969) that investigates the effects of stocks splits on firm returns, a large number of studies examine how prices in the financial and commodity markets react to new information releases. If the market is efficient, then it is expected that the information contained in these reports or news announcements to be quickly incorporated into market prices. This supposition is commonly known as the Efficient Market Hypothesis (EMH), first put forward by Fama. At the weak, semi-strong, and strong forms, the EMH suggests that market prices should reflect all past publicly available information, reflect all publicly available information and respond instantaneously to new public information, and reflect all publicly available and private information, respectively.

Public reports play a vital role in disseminating latest market information, improving market competitiveness and optimizing resource allocations. However, academic literature and policy arena critically inspect the value of public reports. A number of studies investigate how commodity prices and volatility respond to public news announcements (e.g. Isengildina-Massa et al. 2008; Lehecka 2014; Mattos and Silveira 2016; Olga Isengildina-Massa et al. 2008). Sumner and Mueller (1989) argue that public information services are appropriate only if the information is relevant, accurate and "new" to market participants who are yet to make decisions. Binder (1998) puts a similar view that a public report is valuable only if the information contained in the report can alter prices. Hoffman et al. (2015) argue that evaluating the net benefits of providing public data is crucial as the federal resources are being reduced, agencies are being downsized, and programs are being scrutinized in this new era. Further, examining the relevance of public data is further warranted as private sectors increasingly participate in the generation and dissemination of commodity market information.

Existing literature examining the announcement effects of public reports often focus on agricultural commodities such as corn, soybeans, wheat, and livestock products (Isengildina-Massa, H. Irwin, et al. 2008; Isengildina-Massa, Irwin, et al. 2008; Isengildina, Irwin, and Good

2006; Lehecka 2014; Mattos and Silveira 2016), as well as energy products such as crude oil and natural gas (Halova, Kurov, and Kucher 2013). In general, results suggest that public reports do contain valuable information for commodity market participants and improve their decision making.

Little attention has been paid to the announcement effect of public reports in the lumber market, the end products of which are some of the most widely used goods in the world, ranging from residential houses and furniture to industrial products such as paper and pulp. The only there exceptions in the literature, as far as we are aware of, are Rucker et al. (2005), Karali and Thurman (2009), and Karali (2011). Rucker et al. (2005) investigate the speed of information impoundment of three distinct types of news in lumber prices, namely the monthly housing starts estimates, trade disputes with Canada, and court decisions related to the Endangered Species Act (ESA). They find that of the three types of news, the monthly housing starts estimates are absorbed in lumber prices first, followed by trade disputes and court events on ESA. Karali and Thurman (2009), on the other hand, focus on the reaction of lumber futures prices to monthly housing starts announcements, finding that lumber futures return increases with the unanticipated component of housing starts announcement and that the effect declines with lumber inventories and the length of contract maturity. Karali (2011) focuses on the U.S.-Canada softwood lumber trade dispute on lumber futures price volatility and finds that the daily price volatility was the highest in the post-Softwood Lumber Agreement period (1996-2000) and the trade disputes and temporary tariffs (1992-2005). Karali (2011) argues that the time gap between the arrival of news to the markets and the delivery time of futures contracts appear to the fundamental determinants of the volatility persistence observed in the lumber market.

This paucity of literature on the lumber market is surprising given that lumber accounts for over 90% of house constructions in the United States (Karali 2011) and that the housing market plays an integral role in the overall economy of a country. A recent report by Forest Economic Advisor (FEA, 2017) highlights the critical importance of lumber industry, softwood in particular, to the rural community via direct job creation and income generation, as well as indirect employment in downstream industries. Fluctuations in lumber prices could have ripple effects well extend beyond the lumber and downstream industries.

The purpose of the present paper is to investigate the relevance of two government reports, namely the New Residential Construction (Housing Starts) and the New Residential Sales reports on the U.S. lumber market. These two monthly reports are jointly released by the US Census Bureau and the Department of Housing and Urban Development (HUD) and contain information on housing market statistics from the previous month. Three metrics are reported in the New Residential Construction reports: the number of new building permits issued, housing starts, and the number of houses completed. Of these three, the housing starts which reports the number of privately-owned residential constructions started in a month, is of particular relevance since it projects steady lumber demand for the upcoming months. The New Residential Sales report, on the other hand, provides information on the number of sales of newly constructed residential housing units in a given month, and should contain information regarding the demand of newly-constructed houses. Since housing construction is a primary driver of lumber demand in the U.S., these two reports are closely watched by lumber market participants. To isolate the "new" information contained in these two reports, we collect the consensus forecasts (i.e., what experts are predicting the numbers in the forthcoming reports will be) from Bloomberg and measure the surprises from the two reports as the difference between the actual and the forecasted data.

Unlike Rucker et al. (2005) and Karali and Thurman (2009) who investigate the effect of new information on lumber futures prices, our discussion focuses on the volatility effect of public information releases. Investors closely watch the volatility as it affects the cost of capital as well as direct investment and asset allocation decisions. Here, we use GARCH models with exogenous variables to estimate the impact of news announcements on lumber market volatility. To estimate the asymmetric effect news releases, we allow the volatility to vary depending on the nature of the surprise, i.e., positive and negative news. Additionally, we evaluate how the effect of news on market volatility vary with the level of inventory. Since the lumber market underwent significant volatility over the sample period (2000 to 2017), we divide our sample into two sub-periods, namely the pre-housing bubble episode (2000-2007), and the post-housing bubble period (2008-2017). Seasonal effects, as well as day-of-the-week effects, are incorporated in the analysis. Overall, our results show that the New Residential Sales report significantly affect lumber market volatility, while the New Residential sales report exerts a minor impact on lumber volatility. Additionally, we find that the effect on volatility differs between positive and negative surprises.

The remainder of the paper is structured as follows. In section two, we briefly review the existing papers and highlight our contributions to the literature. Section three discusses the data used in this study, focusing on the price and volatility behavior of lumber around the announcement date of the two market reports. Empirical strategies and estimation results are presented in sections four and five, respectively. Section six concludes the paper.

2. Data

Futures prices used to calculate volatility are based on lumber futures contracts traded in the Chicago Mercantile Exchange (CME) with January, March, May, July, September, and November deliveries. Each contract contains 110,000 nominal board feet, with one board foot being a one inch thick, twelve inches by twelve inches board. The pricing unit of the lumber futures contract is dollars per 1,000 board feet. We retrieve the daily open and closing prices of nearby lumber futures contracts from Bloomberg for the period of January 2000 to November 2017. The roll date used in constructing the nearby series is the first business day of contract delivery month. These price data are based on the trading session that takes place from Monday through Thursday between 9:00 am and 4 pm central time, and Friday between 9:00 am and 1:55 pm central time.

The two public reports of relevance to the lumber market are the monthly New Residential Construction (housing starts hereafter) and the New Residential Sales (new home sales hereafter) reports released by the US Census Bureau and the HUD. Both reports contain information from the month prior to their release. Housing starts are released around the 17th of the month at 7:30 am central time, hence before the futures trading session begins. New home sales data are typically released at the end of the month. The release time for new housing sales is 9:00 am central time, when the futures trading session begins. To gauge the effect of public reports on the lumber market, we follow the literature and compute daily price changes (returns) as in equation (1):

$$r = \ln\left(\frac{P_t^c}{P_{t-1}^c}\right) \times 100 \tag{1}$$

where P_t^c is market closing price on date t and P_{t-1}^c is the market closing price on previous date. The r return series gives the daily price change at close from date $t-1$ to t, and hence reflects market reactions to new information between the end of the trading sessions for two consecutive business days. However, it should be noted that much noise can be introduced to the analysis when r_1 is used since it also reflects market responses to other new information during the trading session. These "measurement errors" in the return sequence should not cause large estimation bias in the regression coefficients, as long as the errors are randomly distributed. However, it does increase the variance of the estimation.

Figure 1 shows the nearby lumber futures contract prices in dollars for per 1000 board feet lumber (mbt) for January 2000-November 2017. As we can see, the prices are overall rather volatile, ranging between approximately \$125/mbt at the end of 2008 to over \$500/mbt in October 2017. Large price declines are observed from 2004 to 2009, during which the housing bubble and the financial crisis occurred. Since 2015, the prices have been in general trending upwards, reflecting a strong recovery in the overall economy in the U.S.

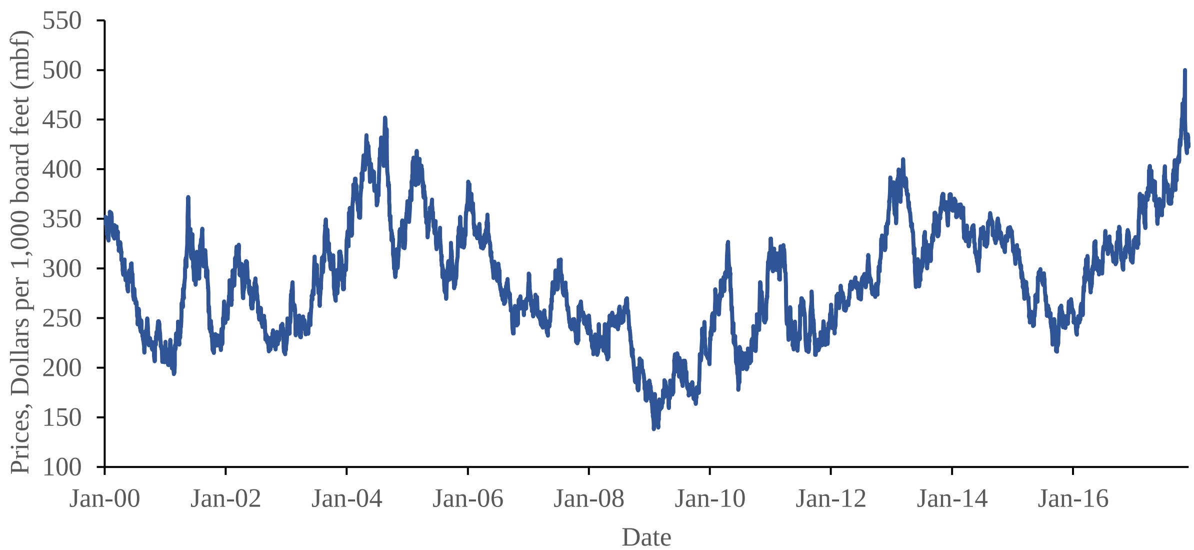

Figure 1. Lumber futures daily closing prices from Jan 2000 to Nov 2017

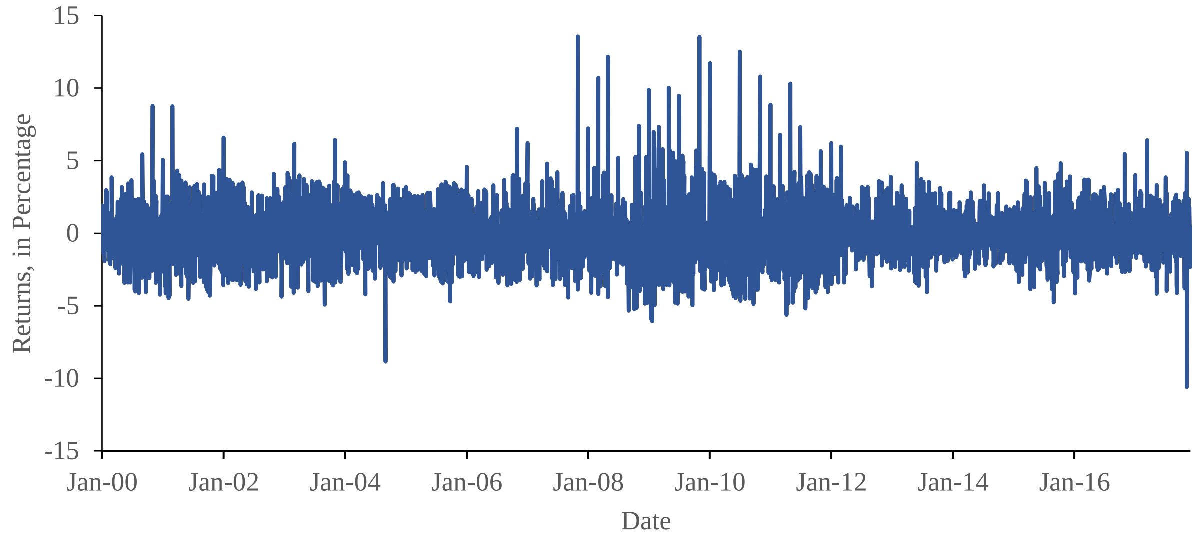

Figure 2. Lumber futures daily log returns of closing prices from Jan 2000 to Nov 2017

Figure 2 shows the daily returns based on lumber futures contract closing prices, as shown in equation (1). As can be seen, there appears to be volatility clustering, i.e., "large changes tend to be followed by large changes, of either sign, and small changes tend to be followed by small changes" (Mandelbrot 1963). Returns were rather volatile between 2008 and 2012, the period that largely corresponds to the financial crisis and the resulting economic recession in the United States (and the "housing bubble" mentioned earlier).

Table 1 presents the summary statistics of the return series. The average daily return is 0.005% during the sample period and are not statistically significant. However, there are some extreme cases when the returns are strongly positive or negative. The highest return is 13.6% which occurred in 2007 and the lowest return is -10.6% towards the end of the sample period. The distribution of returns appears to be positively skewed and has a fatter tail than a normal distribution, or a higher than normal probability of big positive and negative returns realizations. Further, we find that returns, as well as squared returns, are highly correlated, suggesting the appropriateness of using ARCH/GARCH approaches to model the conditional volatility of the return series.

Table 1. Descriptive Statistics of Close-to-Close Percentage Daily Returns for Lumber, 2000-2017

Panel A. Summary Statistics for Returns (2000-2017)				
Mean (%)	0.005	Test of Autocorrelations	Returns	$Returns^2$
Maximum (%)	13.566	Ljung-Box (1)	14.384***	25.277***
Minimum (%)	-10.603	Ljung-Box (3)	14.444***	43.662***
Std. deviation (%)	1.967	Ljung-Box (5)	15.373***	50.785***
Skewness	0.653			
Kurtosis	3.155	ADF test	-16.972***	
Jarque-Bera	2195.46***			

Note: *, ** and *** represents a 10%, 5% and 1% level of significance.

To isolate the "new" information contained in the two reports, we collect "what economists at major banks and brokerages are predicting those numbers will be" prior to the announcement from Bloomberg and use the median forecasts as the proxy for the market consensus view on the two housing market statistics. Chen, Jiang, and Wang (2013) document the details of how Bloomberg compiles the consensus forecasts and show that the forecasts are slightly more accurate and more consistent with the market consensus view than another widely-used forecasts.[2] The Bloomberg forecasts have been widely used in the literature to measure the market consensus view for key macroeconomic statistics. Specifically, we calculate the surprises of the two reports as:

$$E_t^{HS} = HS^{actual} - HS^{forecast} \tag{2}$$
$$E_t^{NHS} = NHS^{actual} - NHS^{forecast} \tag{3}$$

In figures 3 and 4, we plot the actual and forecasted housing starts and new home sales data, as well as their percentage differences throughout the sample period. Similar patterns are seen for the two housing market statistics. Both series increased gradually at the beginning of the sample period and peaked in the first half of 2006, after which their values quickly plummeted, before hitting the lowest values in early 2009. The two housing market statistics have since rebounded from the aftermath of the housing bubble and financial crisis, although their values are still significantly lower than the pre-crisis levels. As is also obvious from figure 3, the market consensus forecasts closely track the actual numbers of housing starts and new home sales. Several large surprises do exist, with the most notable one in March 2009.

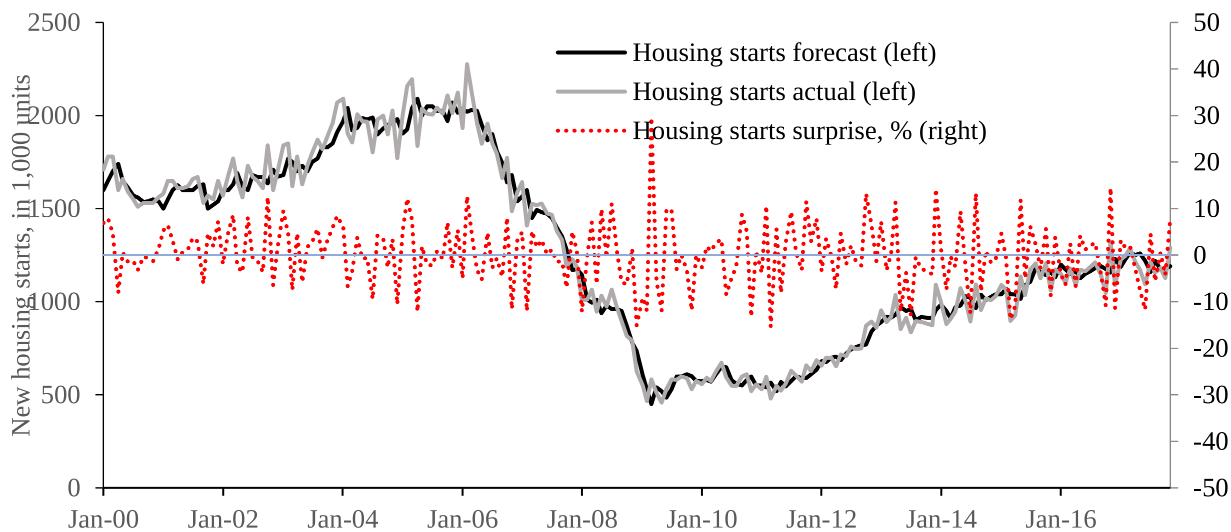

Figure 3. Housing Starts in the U.S.: Forecasted vs. Actual Values, 2000-2017

[2] The Bloomberg survey on key economic statistics is often distributed to a list of economists and practitioners a month prior to the scheduled announcement date, and the survey subjects can update their estimates as often as they like until the week prior to the announcement. Bloomberg then publishes the median estimates for the upcoming announcement in the week prior to the scheduled release date.

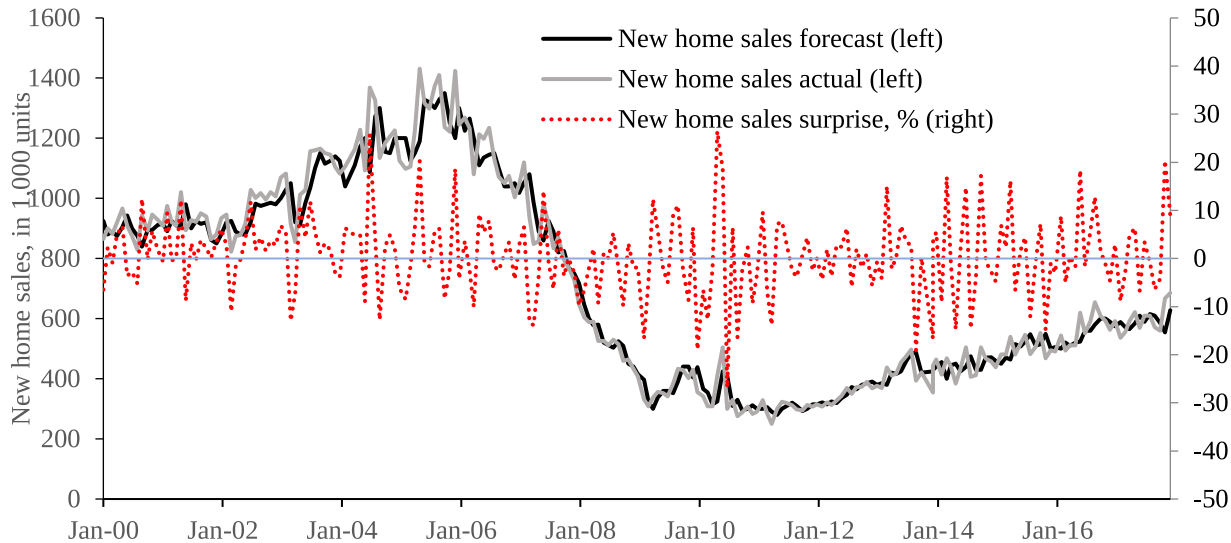

Figure 4. New Home Sales in the U.S.: Forecasted vs. Actual Values, 2000-2017

Figure 5. Seasonally Adjusted Sales-to-Inventories Ratio, 2000-2017

A final variable we consider in the analysis is the level of inventory, which reflects the current availability of lumber for immediate withdraw and indicates the tightness of the supply and demand balance. Karali and Thurman (2009) use the Lumber and Other Construction Materials inventory series from the Monthly Wholesale Trade reports published by the U.S. Census Bureau as a measure of lumber inventory. Unlike Karali and Thurman (2009), we use the seasonally adjusted inventory-to-sales ratio of Lumber and Other Construction Materials from the same set of data. Scaling the inventory with sales provide a normalized measure of inventory. To match the frequency of the return series, we convert the monthly inventory data to daily data using a cubic spline following Karali and Thurman (2009). The inventory-to-sales ratio is plotted in figure 5.

The ratio was consistently above 100% during the sample period. Starting from 2006, the inventory level had been largely trending upward, most likely due to the decreased demand for lumber from the housing market bubble collapse. In recent years, the inventory ratio has slightly declined.

4. Empirical Strategies

Given the high autocorrelation commonly present with financial time series data, which we also detected for the lumber market in the previous section, we specify the return of lumber prices as an autoregressive model of order K, as in equation (4):

$$R_t = c + \sum_{k=1}^{K} \varphi_k R_{t-k} + \epsilon_t \tag{4}$$

where R_t is close-to-close returns, ϵ_t is the error term, φ_k's are the autoregressive coefficients to be estimated, and c is the constant of the regression. The lag order is chosen by minimizing the Akaike information criteria (AIC) while ensuring that the error terms are not autocorrelated.

A common feature of financial time series data is volatility clustering. This salient pattern can be easily seen in figure 2 for lumber futures price returns, where, for instance, substantial changes in prices are observed consecutively around 2008 and relatively small price fluctuations are observed between 2000 and 2002. We hence use the Generalized Autoregressive Conditional Heteroscedasticity model (GARCH) to estimate the conditional volatility equation. Specifically, the error term in equation (4) can further be written as in equations (5):

$$\epsilon_t = h_t z_t,$$

$$h_t^2 = \pi + \sum_{p=1}^{P} \gamma_p h_{t-p}^2 + \sum_{q=1}^{Q} \alpha_q \, \epsilon_{t-q}^2 \tag{5}$$

where z_t follows an identically and independently distributed standard normal process, α_q is the ARCH coefficient indicating the effect of lagged innovation (past news) on conditional volatility, and γ_p indicates the persistence in conditional volatility (GARCH effect). As the sum of γ_p's and α_q's gets closer to one, it takes longer for a shock to dissipate.

Since the primary goal of the present analysis is to determine the value of public reports by investigating how they affect the volatility of lumber prices, we extend the GARCH specification in equation (5) in two ways. First, if the public report indeed contains information that would change market participants' decisions and alter the prevailing market price, then the conditional volatility should be higher on the report release dates than non-announcement days. Additionally, Working's theory of storage posits that for storable commodities, there exists an implied return on holding inventories, i.e., the ability to quickly meet unexpected demand or supply shocks when having the physical commodity in stock. This implied return is often referred to as the convenience yield of stocks, first put forward by Working (1949). Previous research often finds that convenience yield is inversely correlated with the level of inventory, and that the relationship is often non-linear (i.e., the Working's curve). Therefore, the theory of storage suggests that price fluctuations in response to exogenous shocks should vary with the level of inventory, and that during periods of low stocks, large price variations can arise due to an otherwise minor shock. We therefore create interaction terms between the news announcement variables and inventories to determine the differential effects of the two reports in periods of low and plentiful physical stocks, as in equation (6):

$$h_t^2 = \pi + \sum_{p=1}^{P} \gamma_p h_{t-p}^2 + \sum_{q=1}^{Q} \alpha_q \epsilon_{t-q}^2 + \theta S_t + \beta_1 D_{1t} + \beta_2 D_{2t} + \delta_1 D_{1t} * S_t + \delta_2 D_{2t} * S_t \quad (6)$$

where D_{1t} and D_{2t} are dummy variables equaling one if on date t, the housing starts report or the new home sales reports are released, respectively. S_t indicates the level of inventory in the lumber market on date t. A positive and significant β_1 suggests that the housing starts data indeed increases the conditional volatility in lumber market, while under the null hypothesis ($\beta_1 = 0$) the volatility remains the same for both the announcement and non-announcement dates.

Anecdotal evidence suggests that market prices respond to positive and negative news rather differently. To differentiate between the positive and negative news contained in the housing starts report, we define a second set of dummy variables, i.e., i) $D_{1t}^p = 1$ if $HS^{actual} - HS^{forecast} > 0$ and zero otherwise, and ii) $D_{1t}^n = 1$ if $HS^{actual} - HS^{forecast} < 0$. A similar set of dummy variables (D_{2t}^p and D_{2t}^n) are created for the new home sales data. Our second testing equation is specified as:

$$h_t^2 = \pi + \sum_{p=1}^{P} \gamma_p h_{t-p}^2 + \sum_{q=1}^{Q} \alpha_q \epsilon_{t-q}^2 + \theta S_t + \beta_1^p D_{1t}^p + \beta_1^n D_{1t}^n + \beta_2^p D_{2t}^p + \beta_2^n D_{2t}^n + \delta_1^p D_{1t}^p * S_t + \delta_1^n D_{1t}^n * S_t + \delta_2^p D_{2t}^p * S_t + \delta_2^n D_{1t}^n * S_t \quad (7)$$

where the asymmetric market response to positive and negative news is confirmed if $\beta_1^p \neq \beta_1^n$ and $\beta_2^p \neq \beta_2^n$ for the housing starts and new home sales reports, respectively. Additionally, if $\beta_1^n > (<)\ \beta_1^p$ and $\beta_2^n > (<)\ \beta_2^p$, then the negative news from the two housing market reports present a larger (smaller) volatility effect than positive news.

Additionally, to account for the "day-of-the-week" effect reported in previous studies (Isengildina, Irwin, and Good 2006; Karali 2011, 2012; Mattos and Silveira 2016), we use Friday as the base group and incorporate four dummy variables for Monday through Thursday in all regression models. Given the high seasonal nature of housing construction, we also include quarterly dummies to remove the seasonality in the data.

To evaluate the impact of the two housing market reports on prices, we express the estimated coefficients in equations (6) and (7) as a proportion of the average standard deviation of the return series. This not only allows us to compare the effects across different exogenous shocks, but also provides a direct measure in terms of the percentage price change that would incur due to the two reports and their positive and negative surprises. For equation (6), we have:

$$\frac{\partial h_t}{\partial D_i} = \frac{\partial h_t}{\partial h_t^2} \times \frac{\partial h_t^2}{\partial D_i} = \frac{\beta_i + \delta_i S_t}{2h_t} \qquad \text{for } i=1, 2 \qquad (8)$$

For equation (7), the comparative statics for positive and negative surprises can be written as in equations (9) and (10), respectively:

$$\frac{\partial h_t}{\partial D_i^p} = \frac{\partial h_t}{\partial h_t^2} \times \frac{\partial h_t^2}{\partial D_i^p} = \frac{\beta_i^p + \delta_i^p S_t}{2h_t} \qquad \text{for } i=1, 2 \qquad (9)$$

$$\frac{\partial h_t}{\partial D_i^n} = \frac{\partial h_t}{\partial h_t^2} \times \frac{\partial h_t^2}{\partial D_i^n} = \frac{\beta_i^n + \delta_i^n S_t}{2h_t} \qquad (10)$$

5. Estimation Results

Table 2 presents the estimation results based on the mean equation (6) and the conditional volatility equations in (6) and (7). Based on AIC, one lag is selected for the model, and the residual from the mean equation are not autocorrelated. For the conditional volatility equation, a GARCH (1,2) specification fits the data best, as it eliminates all the remaining ARCH effect in the residuals.

Table 2 Model Estimation Results

	Coeff	Std Error	Signif		Coeff	Std Error	Signif
Mean Equation				Mean Equation			
Constant	0.001	0.026	0.977	Constant	-0.005	0.025	0.852
Lag Return	0.067	0.015	0.000	Lag Return	0.065	0.014	0.000
Volatility Equation				Volatility Equation			
C	-0.391	0.186	0.036	C	-0.357	0.172	0.038
ARCH{1}	0.067	0.016	0.000	ARCH{1}	0.066	0.016	0.000
ARCH{2}	-0.052	0.016	0.001	ARCH{2}	-0.053	0.017	0.002
GARCH	0.983	0.003	0.000	GARCH	0.985	0.004	0.000
Housing starts	4.362	2.060	0.034	Housing starts +	5.159	2.239	0.021
New home sales	0.794	2.203	0.719	Housing starts -	3.831	2.274	0.092
Inventory	0.001	0.001	0.199	New home sales +	3.291	1.949	0.091
Inventory*Housing starts	-0.031	0.015	0.037	New home sales -	-0.101	1.919	0.958
Inventory*New home sales	0.000	0.016	0.993	Inventory	0.002	0.001	0.056
Monday	0.333	0.171	0.051	Inventory*Housing starts +	-0.038	0.016	0.019
Tuesday	0.236	0.188	0.210	Inventory*Housing starts -	-0.026	0.016	0.107
Wednesday	0.244	0.181	0.179	Inventory*New home sales +	-0.022	0.014	0.132
Thursday	-0.006	0.192	0.975	Inventory*New home sales -	0.005	0.014	0.724
QTR1	-0.006	0.010	0.550	Monday	0.087	0.187	0.642
QTR2	-0.007	0.007	0.302	Tuesday	0.133	0.202	0.512
QTR3	0.005	0.009	0.620	Wednesday	0.203	0.181	0.264
				Thursday	-0.032	0.201	0.873
				QTR1	-0.005	0.009	0.605
				QTR2	-0.001	0.007	0.866
				QTR3	0.006	0.009	0.517

Q for Residual Serial Correlation	6.106	0.729	Q for Residual Serial Correlation	6.009	0.739
McLeod-Li for Residual ARCH	7.272	0.508	McLeod-Li for Residual ARCH	5.867	0.662

The left panel of table 2 shows the estimation results for equation (6). It appears that the release of housing starts significantly increased the conditional volatility of lumber returns, while the new home sales report does not have any statistically significant impact. Consistent with our prior expectation, the effect of housing starts on the conditional volatility decreases with the inventory level, as suggested by the negative coefficient of the interaction term between inventory and housing starts. However, somewhat surprisingly, the effect of inventory by itself is not statistically significant. We also find that the volatility tends to be the highest on Monday, and there is no statistical difference between the volatility on other weekdays. Quarterly dummies are not statistically significant, either.

The right panel of table 2 shows the estimation results for equation (7) that differentiates between positive and negative surprises. For housing starts, both positive and negative surprises significantly increase the volatility of lumber futures returns, though the effect of former is much larger. The release of new home sales report, while has no effect on lumber market volatility when estimated using equation (6), exerts a positive effect when the report contains positive surprises. For the negative new home sales news, the effect is statistically non-significant. We also find that the impact of news again decreases with the level of inventory, as the coefficient associated with the interaction term between inventory and reports are mostly negative. With the exception of the new home sales negative news, the interaction term is either statistically significant (housing starts positive news) or close to significant (housing starts negative news and new home sales positive).

In order to obtain a clearer picture of the effect of the two housing market reports on lumber market volatility and how they interact with the level of inventory, we plot the change in the standard deviation on the report release date at different inventory levels, following equations (9) and (10). Since the effect of the new home sales negative surprises is not significant, we only plot the responses for positive and negative housing starts news, as well as positive new home sales news. As can be seen in figure 6, positive housing starts news have the largest impact when the level of inventory is low, while the effect of positive new home sales report is the largest when the level of inventory is high. When the inventory is below <115% of the sales, positive news from the housing start report will increase lumber price by over 20%. This effect gradually decreases as the level of inventory gets larger.[3]

[3] Here, the interaction terms for the housing starts negative news and the new home sales positive surprises are close to being statistically significant. These two interaction terms are accounted for in figure 6.

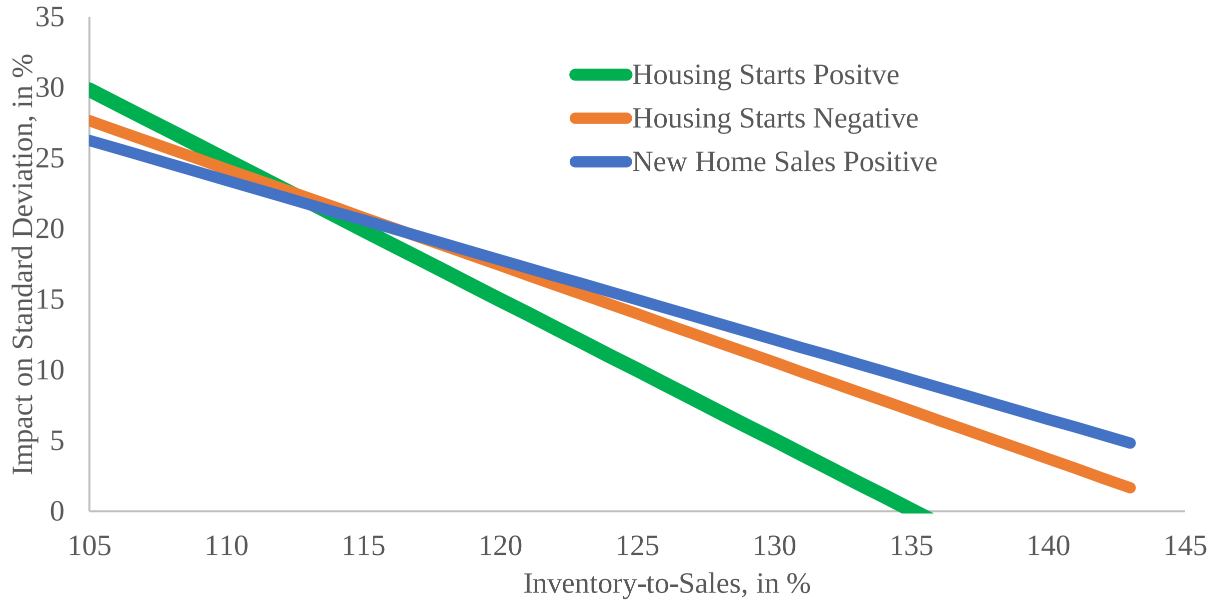

Figure 6. Impact of Positive and Negative Surprises on Lumber Market Standard Deviations, 2000-2017

6. Conclusions

In this paper, we examine the impact of two housing market reports, namely the New Residential Construction (Housing Starts) and the New Residential Sales reports on the U.S. lumber market. Our results suggest that the housing starts report indeed significantly affect lumber market volatility, while the New Residential sales report exerts a minor impact on lumber price volatility. We further find that the effect of the two reports on volatility differs depending on the nature of the news, i.e., whether the news is positive or negative, and that the impact also varies with the level of inventory. When the level of inventory is low, the positive housing starts news has the largest effect on lumber volatility. For the new home sales reports, we find that while the negative news does not affect the volatility of lumber prices, the positive news does significantly increase the volatility. Furthermore, we observe a high degree of volatility persistence in the lumber futures market which suggests that the effect the two reports may last for several periods.

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