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Nowcasting the real estate market
with news articles
and Internet search data

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Executive Summary

Because real estate market data are released with a lag, real estate investors are prone to misread current market trends as a result of being influenced by the market's rapidly changing mood. By utilizing real-time data such as news articles and Internet search data, investors can predict the present of the real estate market by quantifying market sentiment and interest in real estate.

You cannot drive a car with your eyes fixed solely on the rear-view mirror. Nearly all economic statistics, including real estate market data, are historical data. Such data is analogous to a road viewed through a rear-view mirror. For example, real estate price indices and real estate fundamentals data are released with a lag of at least two months. GDP data are released quarterly, about 45 days after the end of the quarter. In other words, regardless of how recently these statistical data were released, they do not represent the "present" viewed through the front windshield.

NOTE

1) "Nowcasting" is a coined term that means predicting the present, in contrast to forecasting, which predicts the future.

A technique called nowcasting¹⁾ has been gaining attention in recent years. Historically, data available in real time has been limited to financial market data such as stock prices and exchange rates. Today, however, a vast amount of data, sometimes referred to as "big data," has become available, including Internet search data and text data such as Twitter tweets, blogs and news articles. These data are being widely used to try to predict various financial and economic indicators' present readings.

Financial and economic nowcasting using big data

Data available in real time most notably include Google and other search engines' search volumes²⁾ and text data such as news articles and tweets. In fact, some investment funds use natural language processing and text mining techniques to quantify market sentiment based on news articles, tweets and other such data to engage in algorithmic trading based on market sentiment³⁾. Additionally, central banks are researching use of real-time Internet search volumes as a means of nowcasting macroeconomic indicators⁴⁾. With respect to the real estate market in particular, researchers at the Bank of England, the UK central bank,

2) Choi, H. and H. Varian (2011), "Predicting the present with Google Trends," Working Paper, Google Inc.

3) Bollen, J., H. Mao and X. Zeng (2010), "Twitter mood predicts the stock market," Journal of Computational Science, 2, 1-8.

4) Shiraki, N., A. Matsumoto and K. Matsumura (2013), "Potential of Search Data in Assessment of Current Economic Conditions," Bank of Japan Research Paper, BOJ Research and Statistics Department.

5) McLaren, N. and R. Shanbhogue (2011), "Using Internet Search Data as Economic Indicators," Bank of England Quarterly Bulletin, Bank of England, 51 (2), 134-140.

are attempting to predict current housing prices, which are reported with a lag, by focusing on the relationship between home prices and the volume of Google searches for the term "estate agents"⁵⁾. They hypothesized that if the volume of Google searches for "estate agents" is increasing, real estate prices also are likely rising currently. This approach can also be regarded as gauging the degree of interest in buying or selling real estate in real time.

Quantifying real estate market sentiment and interest

We have developed a Real Estate Market Sentiment Index and Real Estate Attention Index as gauges of the real estate market's mood. Following is a brief explanation of these indices.

First, we constructed the Real Estate Market Sentiment Index by applying natural language processing and text mining techniques to the full text of roughly 10 years of daily news articles published online by Nikkei Real Estate Market Report, a real estate industry journal published by Nikkei Business Publications. The Real Estate Attention Index is a monthly index of seasonally adjusted Google search query volumes in the real estate category. Both are of course real-time indices.

We omit the details on how the indices are computed, but the accompanying graph plots the Real Estate Market Sentiment Index and Real Estate Attention Index's monthly readings from January 2006 through March 2013. For comparison, it also plots the TSE Home Price Index (for Tokyo) published by the Tokyo Stock Exchange. The graph shows that real estate market sentiment improved from

Exhibit : Real estate market sentiment and interest in real estate



Source: NRI, based on Nikkei Real Estate Market Report, Google Trends, and TSE Home Price Index data

the latter half of 2005, peaked at the end of 2006, and subsequently deteriorated rapidly. The Real Estate Market Sentiment Index appears to lead the TSE Home Price Index by a sizable interval. In statistical terms, the three variables plotted on the graph—real estate market sentiment, attention, and transaction prices—are in a long-run equilibrium relationship and have a circular causality relationship. In particular, we find that an upturn in market sentiment has the effect of inducing a rise in real estate transaction prices with a lag⁶⁾.

6) Taniyama, T., J. Homma and Y. Kawaguchi (2013), "Information Epidemics in the Real Estate Market: news articles and internet search volume as a leading indicator of price," the proceedings of Japanese Association of Real Estate Financial Engineering (JAREFE).

Also noteworthy is that market sentiment has recently rebounded very strongly. The Real Estate Attention Index also has been rising sharply since the beginning of 2013. In other words, the indices show that market sentiment toward real estate is rapidly improving and interest in real estate is rapidly rising. Home price data for the most recent months are not yet known because the TSE Home Price Index is released with a lag of about two months, but it may be possible to approximately nowcast the real estate market trends by tracking market sentiment and interest in real time.

Nowcasting the real estate market with real-time big data

Currently, most real estate market participants judge the current market environment based on intuition, experience and nerve while monitoring data that are outdated by several months. Their judgments are likely heavily influenced by the real estate market mood, including the tone of news articles and the degree of interest in real estate that they observe around them.

Historically, market expectations were generally quantified through questionnaire surveys of companies or individuals. However, conducting such surveys on a regular basis is costly and the resultant data lack real-time immediacy. By utilizing real-time text and search data as discussed above, analysts can quantify market expectations and interest without any time lags.

Real estate market sentiment and interest in real estate are currently both in steep uptrends. Historical data suggest that fundamentals are likely to start improving going forward. However, by utilizing real-time big data to quantify the market mood without any time lag, investors would be able to quantitatively tell that market sentiment is currently still well below its 2007 peak level. To make level-headed investment decisions without falling prey to overconfidence or fear, real estate investors should nowcast the real estate market by quantifying its current mood.

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