

Houston's Office Market Cycle (As Much as Oil) Shapes Its Current Vacancy and Forecast

Executive Summary

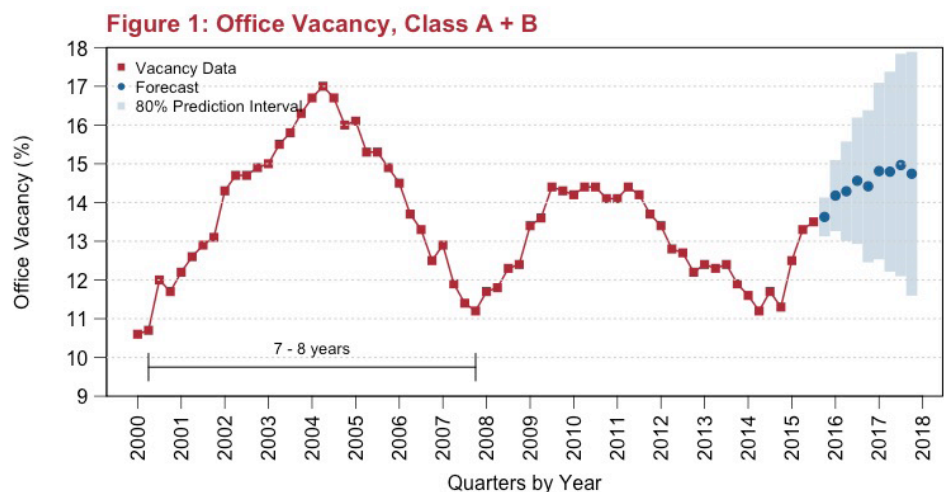
Much attention has been given to the oil downturn as underlying the slowing office market in Houston. Indeed, of the 7.7 million sq. ft. of sublease availability, 3.2 million (42%) are in energy submarkets of west Houston. Yet, office markets undergo cycles, which rise, peak, fall, and bottom, only to then repeat this market cycle. Since early 2014, prior to the oil downturn, office vacancy rates have been rising in accord with what appears to be the onset of the falling phase of the office market cycle. **Whether due to the oil downturn or a typical swing in the cycle of Houston's office market, a slowing office market may well represent opportunities for office tenants, investors, and others through the financial principle of "sell high, buy low."**

Here, we use vacancy rates to measure Houston's office market cycles, including their timing and duration. We then forecast how vacancy and market cycles are likely to change in coming quarters and years. Figure 1 shows Houston's market cycles with vacancy of Class A and B office space from 2000 to Q3 2015. As percent vacancy in Figure 1 is inversely related to the phase of the market cycle, increases in

vacancy rates equate with a falling market and decreases in vacancy rates equate with a rising market. The four stages of CRE market cycle can be seen in the rise, peak, fall, and bottom of office vacancies, a cyclic pattern that is repeated over two market cycles, namely 2000 - 2007 and 2007 - 2014. Houston's CRE market is certainly cyclical, with a duration of 7 - 8 years.

In 2014, Houston's office market again peaked near 11% vacancy, consistent with prior peaks in late 2007 and early 2000. Figure 1 shows our forecast for

vacancy rates (blue circles) and their 80% prediction intervals (80% probability vacancies will be in this range). **With a market cycle of 7-8 years, we forecast that the slowdown of the current market cycle is likely to bottom in mid to late 2017 with vacancy rates around 15% (Figure 1).** While this is high, it is well below 17% of 2004 and in accord with the bottom of 2010-2011. The office market is then projected to rise and peak in 2020 - 2021. Please contact NAI Partners for a detailed analysis of how Houston's market cycles may influence your office lease, investment properties, or otherwise.



Data InSight is a monthly business-to-community (B2C) whitepaper series that uses data analytics to look at current and historical trends in commercial real estate (CRE). Indeed, like many other industries, CRE is undergoing a revolution in the volume, velocity, and variety of data being generated. At NAI Partners, we are embracing this data revolution through data science --- the process of using the scientific method and statistics to extract knowledge from data. Complementing its full CRE platform and more than 500 years of combined broker and professional experience, NAI Partners offers a data analytics consulting service to guide its clients in their business intelligence and decision making in CRE.

Motivation

Commercial real estate (CRE) is not a static market, but rather a dynamic industry that fluctuates through time. Office markets undergo cycles whereby they rise, peak, fall, and bottom out, to then rise again by which the market cycle repeats itself. Although market cycles are often referred to as property “clocks”, this is a misnomer as CRE markets are much more variable than timepieces. For the United States as a whole, the office market cycle tends to be about 10 years, but market cycles vary within and among various metropolitan areas. What is the timing and duration of Houston’s office market cycle?

Whether an investor, office tenant, broker, or otherwise, an understanding of market cycles is critical, as they are associated with predictable changes in important CRE variables, including vacancy (supply), net absorption (demand), rental rates, and among others construction. The “sell high, buy low” perspective of financial markets is applicable to CRE market cycles. For example, investors can maximize their return opportunities by timing the buying and selling of their CRE products with down and up markets, respectively. Likewise, negotiating rents and other landlord concessions for office tenants can often be most successful under higher vacancy rates of falling and bottoming markets. In what phase is Houston’s market cycle currently, and where is it going? Is it a “buy high” or “sell low” position?

Much attention has been given to the oil downturn as underlying the slowing office market in Houston. Indeed, 7.7 million sq. ft. of Class A and B sublease space is currently available, more than double the historic average of 3.3 million sq. ft. Of the 7.7 million sq. ft., 3.2 million (42%) are in energy submarkets of west Houston, including Katy East, Katy West, and Westchase. Yet, since early to mid 2014, vacancy rates have been rising in accord with what appears to be the onset of a falling phase of the office market cycle.

Whether due to the oil downturn or a predictable shift in Houston’s office market cycle, a slowing office market may well represent opportunities for office tenants, investors, and others.

With vacancy as a key indicator variable, we examine cycles of Houston’s office market. Specifically, we evaluate the extent to which Houston’s office market has predictable cycles, and what the timing and duration of the cycles according are for vacancy rates. We then forecast how vacancy and market cycles are likely to change in coming quarters and years.

Office Vacancy

Vacancy is a key measure for the supply of office space on the market, and a key component of CRE that shapes office market cycles. Vacancy is empty space in sq. ft. of rentable building area (RBA) that is not occupied by a tenant, whether or not that space has a lease obligation or is available for lease or sublease. When expressed as a percentage or rate, vacant sq. ft. is divided by total sq. ft. of RBA to produce a percent of market that is vacant.

Figure 2 shows percent vacancy for Class A, B, and C office products from 2000 through Q3 2015. Class A and B office spaces show a cyclical pattern in peaks and troughs in vacancy from 2000 to 2015, with differences in vacancy among peaks and troughs

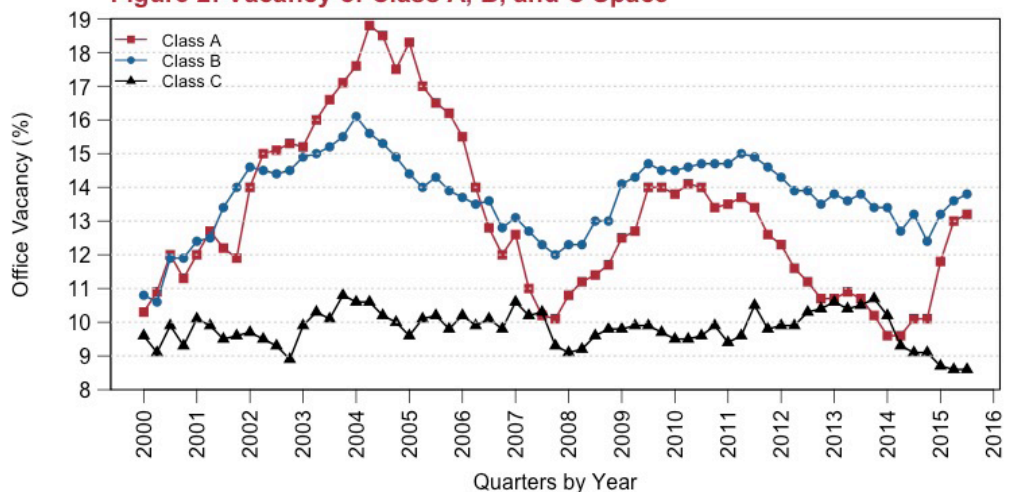
ranging from 4 - 9%. On the other hand, Class C space is largely stable through time, fluctuating just 1-2% around a long-term average of 9.8% vacancy. Thus, Class A and B office products are demarcated from those of Class C, the former two of which display market cycles.

We focused our vacancy analyses of market dynamics on Class A + B space (Figure 1). We combined Class A and B space (and omit Class C), as analyses of Class A and B separately show their cyclical behavior to be largely the same. The primary difference between Class A and B cycles were in their amplitudes, with Class A having bigger peaks and troughs (4-9% difference from peak to trough) than Class B (3-6% difference from peak to trough) (Figure 2).

Periodicity of Office Vacancy

Figure 1 shows Houston’s market cycles with vacancy of Class A + B office space from 2000 to Q3 2015. The four stages of CRE market cycle can be seen in the rise, peak, fall, and bottom of office vacancies, a cyclic pattern that repeats for two market cycles, namely from 2000 - 2007 and from 2007 - 2014. Note, because percent vacancy is inversely related to the phase of the market cycle, increases in vacancy rates equate with a falling or bottoming market, whereas decreases in vacancy rates equate with a rising or peaking market.

Figure 2: Vacancy of Class A, B, and C Space



From 2000 - 2003, office vacancy increased from <11% to >14%, bottoming in 2004 with vacancy rates of 17%. Then, from 2005 - 2007 the office market improving from >16% to <13% vacancy rates, eventually peaking in late 2007 at about 11% vacancy. This completed one market cycle. From 2008 - 2014 this market cycle repeated itself, but with a flattened bottom of about 14.5% vacancy from 2010-2011.

In early to mid 2014, prior to the onset of the oil downturn, Houston's office market again peaked at just above 11% vacancy, consistent with prior peaks in late 2007 and early 2000. **It is important to note that, independent of Houston's economy and the oil pullback which began in late 2014 and early 2015, Houston's office industry was already moving toward a falling phase of its market cycle, as manifesting in increasing vacancy rates.** Certainly, the pullback in Houston's oil industry is not going to help the office market, but it is nonetheless important to recognize that the CRE market cycle was already poised for a slowdown.

Periodicity is the tendency for recurrent and repeated patterns in time, which may be regular or irregular in their frequency. A regular periodic pattern has peaks and troughs that occur at the same fixed frequency through time, whereas an irregular but still cyclic pattern occurs when the peaks and troughs are repeated but not at the exact same fixed frequency. **Houston's CRE market cycle is certainly periodic, but our statistical analyses indicate that its frequency is irregular, on the order of 7 - 8 years.** That is, from start to end, the office market cycle lasts between seven and eight years from peak to peak or trough to trough.

Forecast of Office Vacancy and Market Cycle

With a complete market cycle lasting 7 - 8 years, we project that the slowdown of the current phase of the market cycle is likely to last about 3.5 years, bottoming out in mid to late 2017 (possibly including early 2018). That is,

vacancy rates will continue to increase through 2017. To this end, Figure 1 shows our forecast for vacancy rates (blue circles) and their 80% prediction intervals (i.e., 80% probability vacancies will be in the range) for the next nine quarters of the falling and bottoming office market. **Based on the current data, our analyses and forecast put vacancy rates at the bottom of the market cycle in 2017 near 15%.** While this is high, it is well below 17% of 2004 and in accord with the bottom of 2010-2011. The office market is then projected to rise and peak in 2020 - 2021, a time span too far for reasonable forecasts.

Methodology

Commercial real estate data on office space were obtained from CoStar following the end of Q3 2015. The statistical analyses and data visualization were performed using the R software and programming language, including the 'forecast' package:

R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <http://www.R-project.org/>.

The time series analyses were performed using both exponential smoothing and ARIMA methods. While exponential smoothing cannot adequately capture swings associated with cycles, it is often best for short term forecasts. In our case, the exponential smoothing captured more variation than the ARIMA model, though both were reasonable and on par with the other. We compared accuracy of the two time series and forecasting models using MPE, MAPE, and MASE. We examined the cyclic nature of vacancy in the office market using autocorrelations, which showed a highly significant partial autocorrelation of one lag, and a market cycle of ~28 quarters. Our statistical analyses also showed no seasonal/quarterly influences on vacancy rates, consistent with prior analyses which showed no seasonal/quarterly influences on leasing rates.

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Chief Research and Data Scientist

Dr. J. Nathaniel Holland is a research scientist with 20 years of experience in using the scientific method to extract information from complex multi-dimensional data. He joined NAI Partners in 2014 as Chief Research and Data Scientist. At NAI Partners, Nat leverages his sharp intellectual curiosity with his skills in statistical modeling to guide data-driven business decisions in commercial real estate. Like many data scientists in the private sector, Nat joined NAI Partners following a career in academia. Prior to taking up data analytics at NAI Partners, he held professorial and research positions at Rice University, University of Houston, and the University of Arizona between the years of 2001 and 2014. Nat is the author of more than 50 scientific publications, and he has been an invited expert speaker for more than 60 presentations. Trained as a quantitative ecologist, he holds a Ph.D. from the University of Miami, a M.S. from the University of Georgia, and a B.S. from Ferrum College.

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