Search *for* Tomorrow
The Science of Forecasting

By Harold D. Hunt

"There are no facts about the future," writes noted inventor and futurist Paul Niquette.

Yet the hope of obtaining insight into future changes in office rents or apartment vacancy rates continues to inspire a great deal of interest in real estate forecasts.

In a perfect world, all data would be accurate and available to anyone, and real estate markets would be more predictable than they are today. However, unexpected external factors would still influence the course of events and affect the accuracy of forecasts.

In the less-than-perfect real world, forecasting future changes in commercial real estate markets involves working with a number of significant limitations. Real estate professionals interested in learning more about forecasting may benefit from a brief overview of the process and some of its fundamental challenges.

Forecasting Methods

"Trend extrapolation" and "structural analysis" are two of the most common forecasting methods. Trend extrapolation is straightforward: what will happen in the future is based on what has happened in the past. For example, if rental rates have gone up 3 percent annually for the last five years, trend extrapolation suggests they will continue to do so next year.

Trend extrapolation can be fairly accurate in predicting the future as long as circumstances mirror the past. It tends to fall apart when an "inflection point" is reached — that is, when conditions begin to deviate from the historical trend.

The second method, structural analysis, attempts to predict the future by correctly identifying the underlying economic variables that influence real estate markets. For example, all other things being equal, an increase in population should bring about an increase in retail sales. As a result, retail shopping centers in the market should benefit.

Simply identifying the correct economic variables is not enough. The knowledge that retail centers in a particular market should benefit from a population increase is helpful. But the expected amount of benefit is a much more valuable piece of information. Should retail rental rates be expected to increase by 2 percent, 10 percent or not at all? The question of *how much* change should be expected is an important one.

To answer this, historical numbers for the relevant economic variables are used in the construction of "models" for the structural approach. The models are then used to forecast the amount of change expected to occur in real estate markets.

What are Models?

Constructing a model may conjure up visions of a complex process. However, predictive models can be as simple as a "back-of-the-envelope" set of calculations based on a few economic assumptions. More commonly, they are a sophisticated set of mathematical equations that must be calculated by a computer.

A typical demand model would estimate the total space *desired* by all tenants in a particular market during a specified future period. A supply model would attempt to estimate the space that will be *available* to all tenants during the same period. Supply and demand estimates, combined with other relevant information, are then used in other models to predict future vacancy and rental rates.

Forecasting in a Perfect World

Assume that all data and information necessary to estimate square feet of demand and supply in a given city's office market during the next 12 months is available and entirely accurate. Assume that the data necessary to estimate the overall vacancy rate and rental rate at the end of this 12-month period is accessible as well.

Estimating future market demand. Current demand is defined as total square feet available to tenants in a given market multiplied by current occupancy rate. The square feet of "net absorption" that will occur during the next 12 months must be added to current demand to estimate the new future demand total.

"Gross absorption" is defined as total space for which leases were signed during a given period. However, some tenants may move from one location to another within the same market area, resulting in no growth in overall occupied space.

Net absorption, the net change in occupied space within a specific market, is a more relevant number for forecasting purposes. Net absorption can be either positive or negative.

Square feet of gross absorption is calculated by multiplying the expected increase in office-related jobs in the market area during the next 12 months by the amount of office space used

LIKE THE WEATHER, markets can change, sometimes rapidly. Though forecasting is an inexact science, it gives developers at least some of the information they need to make sound decisions about future projects and investments.

per employee. Expected losses in office-related jobs multiplied by the space used per employee are then deducted from gross absorption to estimate net absorption.

Finally, assume that any change in rental rates has no effect on the amount of office space tenants will demand. Expected net absorption during the next 12 months is then combined with current demand to produce an estimate of new total demand for office space (in square feet) one year forward.

Estimating future market supply. Current supply is space in a given market that is immediately available to tenants. Newly constructed office space that will be completed within the next 12 months, reduced by any demolition or removals, should

produce an estimate of net new office space. When combined with current supply, the result is an estimate of future supply (in square feet).

New completions occurring during a given period, say one year, are often only a part of all new construction taking place within a market. Construction activity is affected by the current rental rate's relationship to some "trigger rent," a rent level that individual developers estimate will just cover the replacement cost of existing income-producing properties. As market rents exceed developers' trigger rents, new development becomes feasible and construction activity increases.

Calculating future market vacancy. The new vacancy rate forecast for the end of the specified 12-month period is estimated via a few simple mathematical calculations. The new total demand estimate in square feet is subtracted from the new estimate of total supply.

The resulting estimate of future vacant space is then divided by the new total supply estimate to arrive at the fraction of total space forecast to be vacant 12 months out. Multiplying the fraction by 100 yields the estimated percentage of vacant space.

Estimating future market rental rate. The rental rate forecast is largely based on two factors: "natural" vacancy rate and rental rate "sensitivity."

Natural vacancy rate can be defined as the vacancy rate at which landlords are content to neither raise nor lower their real (inflation-adjusted) rental rates. No excess demand or supply exists at the natural vacancy rate, which is fairly stable over long periods within a given market. Actual market vacancy rates tend to cycle above and below the natural rate over a number of years as office-related employment fluctuates and new space is brought online.

Property owners expect to carry some quantity of unoccupied space, which can be an advantage or a disadvantage. If demand suddenly increases, the vacant space can be leased for higher rents, increasing return on investment, before new supply can be completed. Alternatively, a decrease in demand may result in landlords holding space that produces no rent for an extended period.

An optimal vacancy rate exists that matches a market's long-term supply/demand needs with landlords' desire for short-term leasing flexibility. This optimal rate is the market's natural vacancy.

Changes in rental rates are at least partially dependent on where the new actual vacancy rate is in relation to the natural

TO BUILD OR NOT TO BUILD? In the absence of complete data on commercial markets, focusing on past trends or on economic variables that influence markets allows forecasters to suggest how much and how fast those markets will change in the future.

vacancy rate. When actual vacancy drops below the natural rate, the real rental rate generally increases. Conversely, a decline in real rent usually results when vacancy increases beyond the natural rate.

Natural vacancy rate varies by market area. Landlords located in markets with strong expected demand for space, heavy development restrictions and a shortage of developable land would want to hold more vacant space to retain the flexibility necessary to capture higher future rents. All other things being equal, this market should exhibit a high natural vacancy rate.

Alternatively, landlords in markets with weak demand expectations, a tenant base that has no attractive space alternatives in other markets and few restrictions on new development would be expected to maintain less vacant space. Such a market's natural vacancy should be relatively low.

Estimating rent sensitivity requires calculating the percentage change in the real rental rate, given the percentage change in actual vacancy that is forecast to occur during the specified 12-month period. Rent sensitivity reflects the speed at which real rents react to a change in actual vacancy. The speed can vary based on a number of factors, including the actual vacancy rate's new position relative to the natural rate.

Assume the market's natural vacancy rate and level of rent sensitivity are known with certainty. With this data, the new market rental rate can be estimated.

Real World Forecasting Challenges

In reality, the information necessary to accurately forecast future demand, supply, vacancy and rent in a given market is not readily available. A number of hurdles can arise during the forecasting process. Some of the more significant ones follow.

Estimating future market supply and demand. Demand drivers for commercial space are difficult to know for certain. For example, which industries occupy office space? Professional and business services and financial activities are two North American Industry Classification System (NAICS) sectors thought to use office space. But are the information, government or leisure and hospitality sectors occupying space as well? If so, what percentage of their total employment occupies office space?
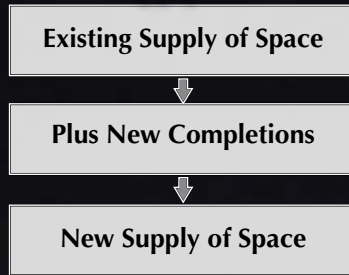
The same argument can be made for other commercial property types. What percentage of the population rents apartments in multifamily developments containing five or more units?
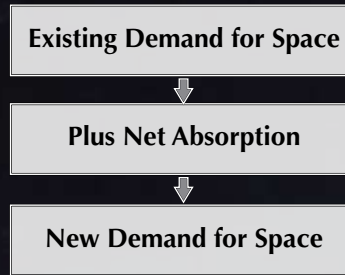
Forecasting Process

Supply Side

Existing Supply of Space

↓

Plus New Completions

↓

New Supply of Space

Demand Side

Existing Demand for Space

↓

Plus Net Absorption

↓

New Demand for Space

New Actual Vacancy Rate

↓

Apply Natural Vacancy and Rent Sensitivity Effects

↓

New Rental Rate

Estimating future market rental rates. Published rents are generally "asking" rents, the rental rates being *offered* to tenants by landlords. But the "effective" rental rate, the rate after any concessions such as free rent or extra money for tenant improvements, is the critical figure.

Effective rents cannot be obtained for forecasting purposes since they are proprietary information. As a result, forecasters (and landlords) may make decisions without good market information about actual rents. The disparity is greater in weak markets where asking and effective rents can vary dramatically.

Which employment subsectors require industrial space? How much space per employee do they need? Do any of these values or ratios change rapidly, or are they relatively stable? Estimates are not always correct.

Assuming the correct employment subsectors can be identified, how accurate and timely is the employment data? How often is the data revised? A revision of the employment data during the period being forecast but after the estimate was originally made may result in inaccurate projections.

Finally, the assumption was made in the perfect-world example that changes in rental rates had no effect on the amount of space demanded. In the real world, rental rate fluctuations will impact the amount of space that users demand. But will the impact be large or small? Would high office rents drive potential tenants to industrial flex space as an alternative? These issues must be addressed to forecast successfully.

Estimating the square footage of new completions during a specified period can be tricky if the forecasting period is relatively long. Although building permits can give some indication of future construction, permits do not always translate into new space. Construction time can vary based on weather or changing economic conditions that may occur between the time the permit is issued and final completion of the property.

The mere act of forecasting construction completions can affect the final volume of completed space. If developers hear that much more space than previously expected is slated to come online, some may delay construction. As a result, the accuracy of the new supply forecast is affected.

An incorrect demand or supply forecast will result in an incorrect market vacancy calculation. If actual vacancy is in error, its proximity to the market's natural vacancy rate will be in error as well. The result will then be carried through the forecasting process, impacting the accuracy of the rental rate estimate.

Landlords make the critical decision to increase or decrease their rental rates. This decision is largely based on changes in the market's actual vacancy rate. Is the market improving or are tenants beginning to vacate more space?

Whether a change in the new actual vacancy rate is perceived to be temporary or permanent will be an important factor in the landlord's decision. Is the current market vacancy a trend or just a bump in the road? If more landlords believe the change is permanent, rents will rise or fall more rapidly and the market's rent sensitivity will be greater. Historical data can be extremely beneficial here.

A final factor to consider is the position of actual vacancy in relation to natural vacancy rate. Rents are generally more sensitive to actual vacancy changes in tight markets and can increase rapidly when actual vacancy is far less than natural vacancy. However, rents are also "sticky" downward and tend to remain high in the face of a weakening market. Opposing forces can send mixed messages when estimating the new market rent under changing market conditions.

Forecasts are valuable.

As Niquette says, "Knowing something about the future is a whole lot better than not knowing anything about the future."

But forecasting is not an exact science and should be viewed with a healthy dose of skepticism. ♣

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THE TAKEAWAY

Accurate forecasting facilitates better business decisions. But accuracy requires information that is not readily available. Although forecasting is a complicated and inexact science, it is nevertheless valuable.