

Office Vacancy Rates: How Should We Interpret Them?

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The construction and leasing of commercial office space receive considerable coverage in most metropolitan newspapers. Often it is the office vacancy rate, or the percentage of office space available for lease, that grabs the headlines. But this measure is not an easy statistic to interpret. The vacancy rate associated with a healthy office market varies from place to place and from period to period. In a city like Boston, a 10 percent vacancy rate might be viewed as a

sign of oversupply. But in a city like Denver, a 10 percent vacancy rate could be seen as a constraint on expansion.¹ And the same 10 percent vacancy rate that would have indicated a slack

¹In mid-1988, when the average vacancy rate for 34 downtown markets, according to The Office Network, was about 18 percent, office vacancy rates in the central business districts of Boston, Hartford, New York, and Washington, D.C. were all below 11 percent. In Dallas, Denver, Kansas City, and Miami, they were greater than 24 percent. Moreover, except for short periods, vacancy rates in the first four cities have been below the national average for the past 10 years; rates in the latter four cities have generally been above the national average. It is unlikely that all those cities with long periods of above-average vacancy rates are always overbuilt.

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office market in the late 1970s would be less likely to signal oversupply in the early 1980s.²

The true measure of slack in an office market is the gap between the actual vacancy rate and what has been called the natural rate. The natural vacancy rate is the one that would prevail if developers' expectations about regional economic conditions were realized. A city's natural vacancy rate cannot be observed directly, but economists have developed some estimates. The gap between the actual and natural vacancy rates helps rationalize the way the commercial office market performs.

Making sense of commercial office markets is no mean feat. To the casual observer, prolonged periods of high vacancy rates—or sometimes rising vacancy rates accompanied by new construction—might be evidence that the office market works slowly or maybe not at all.³ But the realization that it is the gap that matters suggests that office markets do adjust to shifts in supply and demand much the way that other markets do.

DEVELOPERS PLAN FOR SOME SPACE

In the office market, vacancies serve the same role that inventories serve in other markets. They are like any store's merchandise that is kept on hand for immediate purchase. For some goods there are consumers who buy made-to-order items, such as tailor-made suits, and there is no need for the craftsman, in this case the tailor, to keep an inventory of finished

goods on hand. Most people, however, buy suits from clothing stores, where they are available in a short time after only minor alterations. Knowing that most people shop around until they find the suit they want, clothing store managers keep an inventory on hand in order not to lose customers who do not want to wait.

Developers sometimes act like tailors and build to suit, but more often they act like clothing store managers and keep some inventory on hand. For some clients, developers build to suit, or the clients pre-lease space in a building on which construction has not yet begun. These clients, especially if they are large users of space, frequently get concessions on the rental rate, but they must wait for some time before they can occupy the building.

Other tenants, however, need to occupy space quickly and must select from the available inventory. For these tenants, the existence of an adequate inventory of office space saves not only the cost of delay in moving, but also some of the search costs associated with locating the right space. Only a developer who has space readily available will be successful in leasing to these tenants. Vacancies allow developers to have different configurations of space available for potential tenants and to take advantage of any unexpected high demand.

How Much Vacant Space Should Developers Hold? In deciding how much space to hold, each developer will weigh the benefits and costs of holding the inventory. In any market, the appropriate level of inventories depends upon the expected level of sales. The clothing store manager who normally sells 50 suits a week will hold more inventory than the one who normally sells only 25. In the same manner, the prime consideration in how much vacant space developers are willing to hold is the amount of space they expect to be absorbed in the near future. (Absorption, or the demand for new office space, is simply the amount of newly occupied space in a given period minus the space vacated in that period.)

²The average vacancy rate for the nation has ranged from 11 percent to 18 percent since 1983. For the previous five years, 1978 to 1982, it was much lower—in the 4 percent to 7 percent range. The years 1972 to 1977 represented an earlier period of double-digit vacancy rates, according to the Building Owners and Managers Association.

³For example, the average downtown vacancy rate rose from about 6 percent in mid-1982 to approximately 16 percent by late 1985; yet office construction continued to expand in each of the intervening years.

But what ultimately accounts for the pace of office absorption? Leased as an input into the production of other goods and services, office space is a requirement for accountants, lawyers, and bankers, among others. Thus, office absorption is closely tied to growth in office-related employment, and developers have to assess how fast that employment will increase in the near future, then determine how many years' or months' supply of office space they have on hand. In effect, they have to forecast the growth of certain industries in which a large percentage of workers occupy commercial office space. These industries are fairly easily identified. An examination of the San Francisco office market from 1961 to 1983 found that the best predictor of the increase in occupied office space was the growth of employ-

ment in finance, insurance, and real estate.⁴ And a study of national office markets was able to establish that the growth of jobs in these financial services, as well as in other business and personal services, was the most significant factor in explaining the amount of office space absorbed nationwide in the 1967-86 period.⁵

Based on this historical experience, developers can expect the demand for office space to increase with overall job growth in the service

⁴Kenneth T. Rosen, "Toward a Model of the Office Building Sector," *AREUEA Journal* 12 (1984) pp. 261-69.

⁵William C. Wheaton, "The Cyclic Behavior of the National Office Market," *AREUEA Journal* 15 (1987) pp. 281-99.

Office Market Surveys

Published on a regular basis, the following surveys contain vacancy rates for individual office markets.

Building Owners and Managers Association, *North American Office Market Review*: Produced by the Association since 1986, this semiannual publication contains data on total office space, occupied space, and vacant space for both downtown and suburban markets in various cities in the U.S. and Canada. It also includes a range of quoted rental rates for downtown and suburban markets. This publication replaces an earlier, less complete office market survey by the Building Owners and Managers Association.

Coldwell Banker, *Office Vacancy Index*: This quarterly publication contains office vacancy rates for both downtown and suburban markets in various U.S. cities. The earliest data are for June 1978.

Cushman and Wakefield, *Across the Nation*: Issued quarterly, this publication contains vacancy rates for both downtown and suburban office markets in various U.S. cities. The survey contains a range of rents for older buildings and for new construction. The number of square feet of completed office construction is also provided in the survey.

The Office Network, *International Office Market Report*: This semiannual report contains vacancy rates for downtown and suburban office markets in several U.S., Canadian, and Western European cities. Rates are given separately for existing buildings and for buildings under construction. Quoted rental rates are given for the same categories of buildings. The earliest data are for December 1979.

sector. But not all new jobs in the service sector generate the same demand for office space. First, office workers do not all require the same amount of space. One attempt to estimate the amount of space an office worker uses found that the typical manager occupies 372 square feet of space while the average sales person occupies less than half that (144 square feet).⁶ And categories like “manager” and “sales person” are themselves fairly broad. Furthermore, there is no guarantee that the amount of space occupied by a particular type of office worker is the same in every market. It is unlikely that a manager in midtown Manhattan, where yearly asking rents in new buildings in mid-1988 averaged \$50 a square foot, would occupy as much space as his or her counterpart in Wilmington, Delaware, where the average was only \$22.50. In other words, the demand for additional office space is determined not only by the number of new office workers in an area, but also by the price of office space.

By and large, developers’ planned vacancy rates will rise and fall with expected job growth. And at least one recent study found a positive relationship between nonmanufacturing employment growth and the natural vacancy rates estimated for 17 U.S. cities.⁷ But the composition of new employment and the price of office space will affect the absorption rate and the planned vacancy rate associated with a given rate of job growth. Expected absorption rates rise with increases in expected job growth, but not in lockstep.

While expected demand is the primary factor determining developers’ planned vacancy rates, the costs of holding vacant space also

play a role. The major cost, of course, is the cost of financing a building, which depends on the level of interest rates. But this is not the only cost. Operating expenses—including taxes, energy costs, and janitorial services—represent another inventory cost, since some of these expenses are incurred whether the space is leased or not. Property taxes, for example, are an operating expense that can affect the natural vacancy rate. These taxes must be paid whether the building is occupied or not. Accordingly, higher local property taxes seem to lower the natural vacancy rate.⁸

Income tax considerations, too, can affect planned vacancy rates. Even if a building is only partially occupied and not yet producing a positive cash flow, investors can sometimes write off the building’s depreciation against the tax liability on income from other projects. This became an important factor in real estate investment in the early 1980s, when the income tax law was changed to allow much of the cost of commercial real estate to be written off soon after it was first put into service or purchased. This accelerated depreciation reduced the cost of holding space in new or newly acquired buildings and may have raised the natural vacancy rate in the United States.⁹

With so many regional and national variables at work, it would not be surprising to find that developers’ planned vacancies in office space vary from region to region and from one period to the next. Of course, we cannot observe each developer’s plans directly, but economists have tried to estimate the natural va-

⁸See Shilling, Sirmans, and Corgel (1987).

⁹Estimates by Richard Voith and Theodore Crone of natural vacancy rates for 17 cities and suburbs showed a significant increase in late 1982, about one year after the passage of the 1981 tax act. The authors suggest that this increase was due to the change in the tax law. See Voith and Crone, “National Vacancy Rates and the Persistence of Shocks in U.S. Office Markets,” *AREUEA Journal* 16 (1988) pp. 437-58.

⁶David L. Birch, *America’s Office Needs: 1985-1995* (Cambridge: MIT Center for Real Estate Development, 1986).

⁷James D. Shilling, C.F. Sirmans, and John B. Corgel, “Price Adjustment Process for Rental Office Space,” *Journal of Urban Economics* 22 (1987) pp. 90-100.

cancy rate for various cities—that is, the vacancy rate we would observe if developers' expectations were realized. Recent attempts to measure the natural vacancy rate for individual cities have found considerable differences among cities (see *Estimates of Natural Vacancy Rates*, p. 8).

OFFICE MARKETS RESPOND TO GAPS BETWEEN ACTUAL AND NATURAL VACANCY RATES

Assessing the health of an office market is not simply a matter of estimating the market's natural vacancy rate or of measuring its actual vacancy rate. It is a matter of evaluating the gap between the two.

If the actual vacancy rate exceeds the natural rate, the market is overbuilt and developers respond accordingly with lower rents and slower construction. If the actual vacancy rate falls below the natural rate, then the market is short on supply and developers raise rents and speed up construction.

A gap between the actual and natural vacancy rate can develop any time the natural rate changes either because expectations about future growth have changed or because the costs of holding inventory have changed. **However**, larger gaps between the actual and **the natural** rate generally develop when there is some *unexpected* change in demand.

Consider the case of a market in which office-related employment and office use had both grown at 4 percent a year for some time and the vacancy rate had been a steady 6 percent, indicating that the natural vacancy rate was 6 percent. At any point in time, this market would have a one and a half years' supply of space available. Now suppose that in one year office employment and the use of space unexpectedly grew by 6 percent. Because it takes time to build large office buildings, the level of inventories could fall dramatically. The actual vacancy rate could drop to 4 percent, producing a 2-percentage-point gap

between the natural and the actual vacancy rate. Moreover, if developers believe that the faster growth in employment and office use is likely to continue, they may now prefer a 9 percent vacancy rate in order to maintain the year and a half's supply of space. This scenario would produce a 5-percentage-point gap between the actual and the natural vacancy rate. A similar gap in the other direction could occur with an unexpected decline in the growth of office employment and office use. Over time, of course, developers will act to eliminate the gap.

Rents Respond to Changes in the Gap. In response to such gaps between the natural and the actual vacancy rate, rents should change, increasing when the actual rate falls below the natural rate and decreasing when the opposite occurs. It is difficult to measure the extent to which rents in commercial office markets react to these gaps, because the rental rate for office space is not a publicly quoted price but rather is set by individual leases.¹⁰ Despite this difficulty, at least three studies, each using a different measure of rent, have found that a gap between the actual and desired vacancy rate does translate into an adjustment in rental rates. One study of national office markets found a 2.3 percent change in average rents for each percentage-point deviation of the actual vacancy rate from the natural rate.¹¹ In a market like center-city Philadelphia, where the

¹⁰Rents are set by lease agreements that normally last for five to 15 years. These leases may contain concessions and special provisions, such as one year of free rent, an allowance for moving costs, or specific terms for increasing the rental rate over time. There are surveys of average rental rates, but these are generally quoted rates and do not reflect the special features in lease agreements. In the following discussion, changes in rents refer to changes in real rents, or rents adjusted for inflation.

¹¹See William C. Wheaton and Raymond G. Torto, "Vacancy Rates and the Future of Office Rents," *AREUEA Journal* 16 (1988) pp. 430-36.

Estimates of Natural Vacancy Rates

Wheaton and Torto, in "Vacancy Rates and the Future of Office Rents" (*AREUEA Journal*, 1988), estimated that the nation's average natural vacancy rate was about 7 percent in 1968 and rose to almost 13 percent in 1986. They used data from the Building Owners and Managers Association and from Coldwell Banker. A number of factors, including increased growth in office-related employment and changes in the tax law, could have accounted for this increase.

Shilling, Sirmans, and Corgel, in "Price Adjustment Process for Rental Office Space" (*Journal of Urban Economics*, 1987), estimated average natural vacancy rates over the 1960-75 period for 17 cities, using data from a survey of vacancy rates and rents done by the Building Owners and Managers Association.^a The following table shows the resulting estimates:

| City | Average Actual Vacancy Rate | Estimated Natural Rate | Average Estimated Gap |
|---------------|-----------------------------|------------------------|-----------------------|
| Atlanta | 5.8 | 6.3 | -0.5 |
| Baltimore | 5.9 | 13.9 | -8.0 |
| Chicago | 2.9 | 4.1 | -1.2 |
| Cleveland | 3.3 | 2.8 | 0.5 |
| Denver | 8.7 | 12.3 | -3.6 |
| Des Moines | 3.3 | 9.9 | -6.6 |
| Detroit | 8.0 | 11.8 | -3.8 |
| Indianapolis | 6.1 | 6.5 | -0.4 |
| Kansas City | 8.9 | 20.9 | -12.0 |
| Minneapolis | 3.8 | 4.5 | -0.7 |
| New York | 0.5 | 1.0 | -0.5 |
| Philadelphia | 7.3 | 9.5 | -2.2 |
| Pittsburgh | 5.6 | 10.0 | -4.4 |
| Portland | 7.4 | 16.0 | -8.6 |
| San Francisco | 2.3 | 2.9 | -0.6 |
| Seattle | 8.4 | 8.4 | 0.0 |
| Spokane | 9.7 | 10.5 | -0.8 |

Voith and Crone, in "National Vacancy Rates and the Persistence of Shocks in U.S. Office Markets" (*AREUEA Journal*, 1988), constructed estimates of natural vacancy rates for a group of U.S. cities during the 1979-87 period, using data from The Office Network.^b In this study, the natural vacancy rate for each city was assumed to vary over time. In center-city Philadelphia, for example, the estimated natural vacancy rate ranged from a low of 4.5 percent in December 1980 to a high of 11.0 percent in June 1987 (see figure).

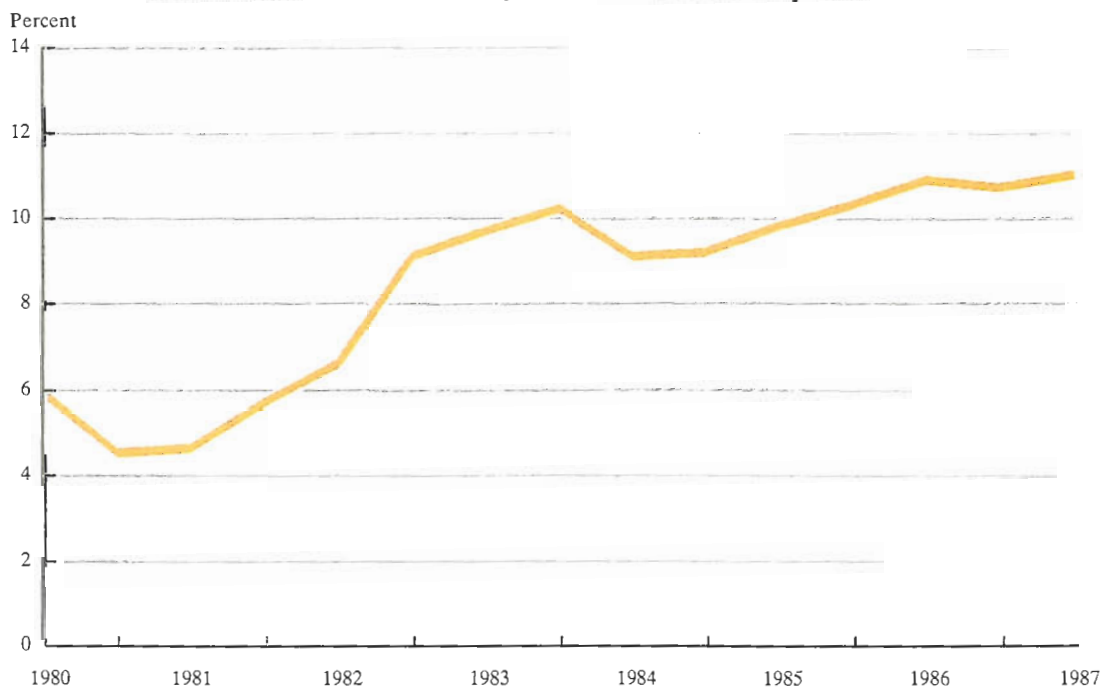
^aThe natural vacancy rates were estimated much the way the natural rate of unemployment is often estimated. Changes in real rents were regressed on actual vacancy rates, and the natural vacancy rate was calculated from the estimated constant term in the regression equation.

^bThe authors regressed the actual vacancy rates on two sets of dummy variables, one set for the cities and one for the time periods, in a cross-section, time-series model. Because of the lingering effects of shocks to the office market, the error terms for each city were assumed to be serially correlated. The sum of the coefficients on the city-specific dummy and the time dummy represents the natural vacancy rate for any period.

The following table shows the estimated natural vacancy rates for 16 downtown office markets in mid-1987:

| City | Actual Vacancy Rate (June 1987) | Estimated Natural Rate (June 1987) | Estimated Gap |
|------------------|---------------------------------------|--|------------------|
| Atlanta | 19.9 | 20.3 | -0.4 |
| Baltimore | 19.0 | 5.2 | 13.8 |
| Boston | 7.3 | 6.5 | 0.8 |
| Chicago | 14.4 | 9.9 | 4.5 |
| Dallas | 25.9 | 13.1 | 12.8 |
| Denver | 26.5 | 17.3 | 9.2 |
| Hartford | 11.6 | 10.9 | 0.7 |
| Houston | 23.9 | 12.5 | 11.4 |
| Kansas City | 18.9 | 10.7 | 8.2 |
| Los Angeles | 8.0 | 8.5 | -0.5 |
| Miami | 29.8 | 14.9 | 14.9 |
| New Orleans | 23.3 | 13.9 | 9.4 |
| New York | 9.3 | 8.5 | 0.8 |
| Philadelphia | 12.0 | 11.0 | 1.0 |
| Pittsburgh | 15.6 | 8.8 | 6.8 |
| Washington, D.C. | 12.1 | 8.4 | 3.7 |

Estimated Natural Vacancy Rate for Center-City Philadelphia



average asking price of new office space is about \$34 a square foot, this would imply an increase to almost \$38 a square foot if the actual vacancy rate fell 5 percentage points below the natural rate.

Estimates for individual markets around the country in the 1960s and 1970s show changes in rents ranging from 0.2 percent to 6.3 percent for each percentage-point gap between the actual and the natural vacancy rate.¹² This broad range of estimates may reflect the difficulty in accurately measuring rent changes. But even with no agreement on the degree to which rents adjust, these estimates provide evidence that developers do react quickly to changing market conditions by adjusting their rents, since the rent changes were estimated for the same year in which the gap occurred. Therefore, as quoted vacancy rates change, it is important to determine whether these rate changes are being accompanied by changes in rents. Such price changes will indicate that a gap has developed between the actual and the natural vacancy rate.

The response of office market rents to a gap between the actual and natural vacancy rate is a normal part of the price-adjustment process. Both tenants and developers should react to these price changes in a way that reduces the gap (see *The Adjustment Process*). But who accounts for most of the adjustment? And when should we expect to see results in terms of the vacancy rate?

The Demand for Office Space Declines Somewhat as Rents Rise. Demand for new office space is driven primarily by growth in certain types of employment, but this is not the only factor. As rents rise, a given amount of job growth will result in less absorption of new space per worker than would occur when rents were lower. Evidence of this effect is docu-

mented in Kenneth Rosen's study of the San Francisco market. After taking account of the growth in office-related employment, Rosen estimated that a 1 percent increase in real rents led to a 0.18 percent decline in occupied office space. This estimate suggests that office space per worker does respond to changes in real rents, but not radically.

Construction Responds to Changes in Vacancy Rates and Rents. Most of the adjustment in office markets seems to depend upon developers, the suppliers of office space. William Wheaton's study of the national market indicated that gaps between the actual and natural vacancy rate and the subsequent changes in rents had a much greater effect on new office construction than on the demand for new space.¹³ Specifically, he estimated that a 1-percentage-point decrease in the vacancy rate, and the resulting rise in rents, would decrease demand for new space by 2.5 percent but increase office construction by 6.5 percent. John Hekman found a similar relationship between new construction and changes in rent. In an examination of rents and construction in 14 cities between 1979 and 1983, Hekman estimated that a 1 percent increase in real rents produced an increase of more than 3 percent in the square footage of new office space under construction.¹⁴

This new space would not typically become available for occupancy for one and a half to two years. Thus, the construction process itself introduces a lag between the time in which the actual vacancy rate begins to diverge from the natural rate and the time in which new space becomes available. It has been estimated that

¹³See Wheaton (1987).

¹⁴See John S. Hekman, "Rental Price Adjustment and Investment in the Office Market," *AREUEA Journal* 13 (1985) pp. 32-47. Hekman's construction variable is the value of buildings for which permits have been issued divided by the cost per square foot of new construction.

¹²See Rosen (1984) and Shilling, Sirmans, and Corgel (1987).

The Adjustment Process

The adjustment process in the commercial office market can be illustrated in a set of diagrams of short-run supply and demand. Since it takes time to build office space, the maximum amount of space available for lease (OZ) in any period will be determined by decisions made in the past (see Figure A). No matter how high rents go, the total amount of space cannot be increased very much in the short run. Some of that space (AZ) will represent planned vacancies. (Since OZ is not total space in the market but only that available for lease, it is not the case that AZ/OZ is the vacancy rate.)

Developers will have based their building decisions on the expected demand for office space (D^e) and on the rent (R) they would have to charge to earn the required rate of return. If actual demand (D^a) turns out to be greater than expected demand, developers will be willing to lease more space and lower their inventories, but only in exchange for higher rents (R'). With this shift in demand and higher level of rents, tenants will lease new space equal to OB.

In time, developers will be able to supply more space, and space available for lease in any period will eventually increase from Z to Z' (see Figure B). As vacancies return to their desired level, real rents should also drop (R''), resulting in somewhat more space being leased (OB'). Rents may not return to their original level, however, because land, one of the major inputs into office construction, tends to become more expensive as a market grows more rapidly. The increase in construction will provide for the increased demand (OB') and a return to the desired level of vacancies (B'Z'), which will be higher than the original level (AZ) because of the more active leasing market.

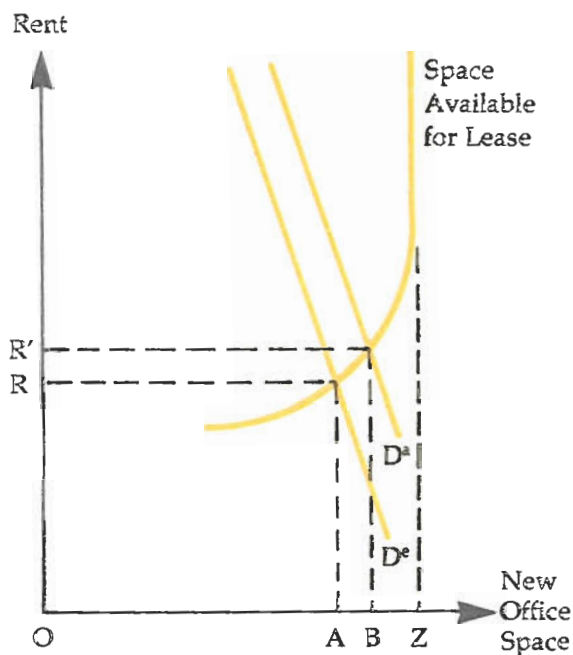


FIGURE A

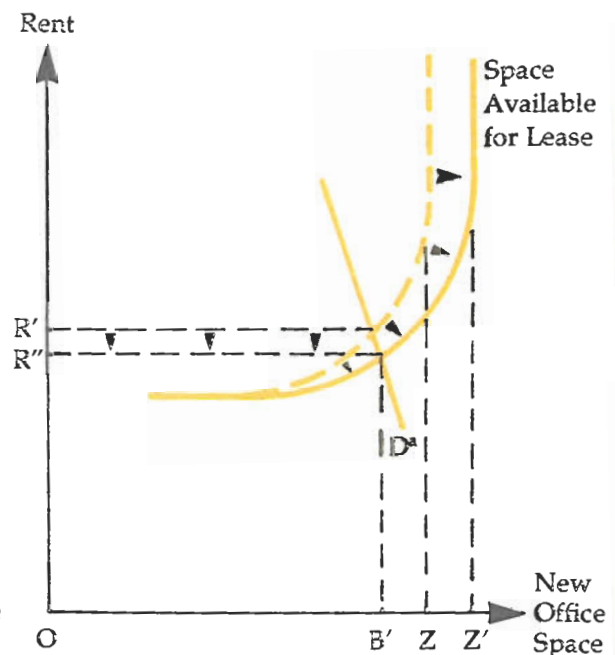


FIGURE B

when some unexpected event causes the actual vacancy rate to deviate from the natural rate, it takes most markets almost a year to return half way to the natural rate.¹⁵ Because of these lags it can appear to someone focusing only on the vacancy rate that developers are not reacting quickly to changing circumstances, such as a drop in demand for new space. But developers may have already begun to react by lowering their rents and by slowing the pace at which new projects are begun, even though projects already under construction will still be completed.

INTERPRETING INFORMATION ON COMMERCIAL OFFICE MARKETS

The notion of a natural vacancy rate brings a new perspective to the interpretation of office market statistics. First, it is clear that the natural rate can vary considerably from city to city. A city can have a vacancy rate consistently higher than the national average without having unplanned vacancies or unplanned inventory. Moreover, the vacancy rate alone is an inadequate measure of whether an office

market is overbuilt. It is also important to look at changes in rents to see whether the supply of available space is greater or less than what developers had planned. Changes in rents are also the first evidence that an adjustment is taking place in the local office market to bring supply and demand into balance. Other signs of adjustment, such as a change in the amount of new space coming on the market or a turnaround in the vacancy rate, can take time because of the lags in the construction process itself.

Much progress has been made in understanding how commercial office markets function, but many aspects of these markets still need to be explored. Better measures of the real cost of office space would help. Estimates of natural vacancy rates need to be tied more closely to expectations of future demand for new space and to the costs of holding inventory. Projections of future office needs could be greatly improved. For example, little attention has been paid to how demand for new space is affected by the need to replace or renovate older office space. But while recent research has not answered all of the questions about office markets, it has taught us to look beyond the simple vacancy rate and to read office market indicators with more care.

¹⁵See Voith and Crone (1988).