

# The Demand for Office Space

Since 1980, there has been an extraordinary increase in office vacancy rates. The Coldwell Banker vacancy index for downtown buildings increased from 3.4 percent in March 1980 to almost 17 percent currently. Vacancy rates in suburban buildings are even higher—about 24 percent, according to Coldwell Banker. Vacancy rates are above equilibrium levels not only in areas experiencing economic distress, but in virtually all major metropolitan areas of the country.

The increase in vacancies is primarily attributable to extraordinary rates of new construction. As Figure 1 shows, the value of office construction put in place in recent years has been more than three times as large as in the mid 1970s. Measured in 1982 dollars, the value of office construction put in place in recent years has averaged about 24 billion dollars. That includes remodeling and rehabilitation. Construction of new buildings and additions to existing buildings probably averaged about \$19 billion in 1982 dollars. Assuming an average construction cost in 1982 dollars of \$65 per square foot, that represents about 300 million square feet a year.

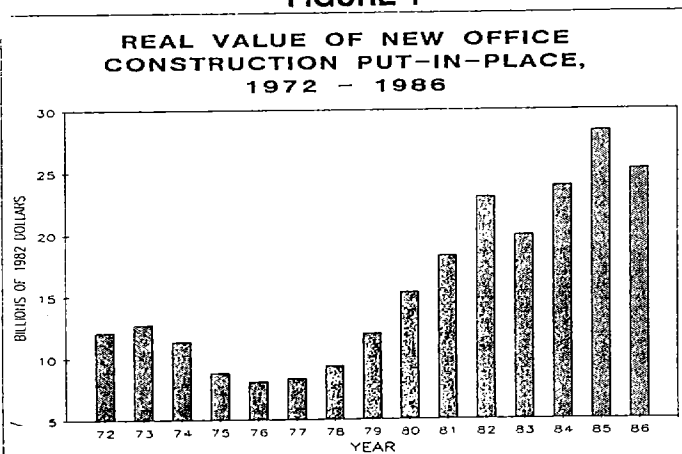
Whether the increase in vacancies is also attributable to unpredictable weakness in demand as well as excessive additions to supply is unclear. This article reviews some of the information available on office demand. An analysis of office space demand is important to understanding the prospects for future absorption of all that vacant space and for future construction activity.

As with all aspects of the construction and real estate industries, demand and supply are really local phenomena, and to speak of national demand is to risk obscuring reality, but the basic forces driving demand are similar across the country. However, while our comments have relevance to all markets, the extent of the vacancy problem and the prognosis for real estate values and construction activity is much more favorable in some places than in others.

The demand for office space depends on the number of office workers and the amount of space per worker. In addition, the demand for new construction will reflect the need for space to replace office buildings that are demolished or otherwise removed from the stock.

Our analysis of office space demand is based on rather conservative estimates of the growth in office employment, space per worker, and replacement demand. Frankly, this is because less conservative estimates lead to the conclusion that demand in recent years was adequate to absorb the new supply, and the current oversupply is too visible to be ignored. However, reported vacancy rates such as those of Coldwell Banker, the Office Network, BOMA, etc., based on newer multi-tenant buildings in major metropolitan areas, probably overstate the extent of the current national oversupply for the office market as a whole. Those vacancy measures have increased by 10 to 15 percentage points. The amount of excess supply added since 1980 was probably significantly less than ten percent of the existing stock.

**FIGURE 1**



Source: Bureau of the Census, Construction Reports, Series C-30, Value of New Construction Put-In-Place

**TABLE 1**

## EMPLOYMENT IN OFFICE-INTENSIVE INDUSTRIES (MILLIONS)

S.I.C.	1974	1976	1978	1980	1982	1983	1984	1985	1986
60-67 Finance, Insurance, and Real Estate	4.15	4.27	4.72	5.16	5.34	5.46	5.69	5.95	6.30
73 Business Services	2.03	2.18	2.63	3.09	3.29	3.57	4.06	4.45	4.81
801 Offices of Physicians	0.54	0.61	0.69	0.75	0.83	0.87	0.91	0.96	1.15
802 Offices of Dentists	0.23	0.27	0.30	0.34	0.38	0.41	0.43	0.44	0.46
81 Legal Services	0.32	0.36	0.43	0.50	0.57	0.60	0.65	0.69	0.73
86 Membership Organizations	1.44	1.49	1.51	1.53	1.53	1.51	1.51	1.52	1.51
89 Miscellaneous Services	0.72	0.73	0.87	1.00	1.05	1.07	1.15	1.22	1.30
TOTAL OFFICE-INTENSIVE(A)	9.43	9.91	11.15	12.37	12.99	13.49	14.40	15.23	16.26
TOTAL NONAGRICULTURAL(B)	78.26	79.37	86.70	90.42	89.57	90.20	94.49	97.61	100.16
A/B	12.05%	12.49%	12.86%	13.68%	14.50%	14.96%	15.24%	15.60%	16.23%

Source: Bureau of Labor Statistics

These calculations lead to the conclusion that the extent of the correction in office construction activity over the years ahead may be less drastic than many people have feared.

### Office Employment

Office-related employment is concentrated in the Finance, Insurance and Real Estate industries and in certain categories of Services, especially Business Services. Table 1 shows employment in selected industries that are most likely to be housed in office buildings.

There are also office-type employees in other industries, such as in the corporate headquarters of manufacturing companies. Generally, employment data do not distinguish offices from production facilities, so that it is difficult to infer office employment from total industry employment in industries where most employment is not in offices. However, in the Economic Census and County Business Patterns reports, employment in "Administrative and Auxiliary Establishments" is counted separately, with totals available by major industry groups. Table 2 shows the total employment in such establishments for relevant major industry groups. As of 1984 (the latest year available), employees in administrative and auxiliary establishments for mining, construction, manufacturing, transportation and public utilities, and trade totaled about 2.6 million, compared to total employment of 14.2 million (according to County Business Patterns) for the industries we have identified as office-intensive. Not all of the establishments classified as administrative and auxiliary are in offices. Some warehouses, laboratories, and other non-production facilities are classified in that category. Manufacturers' sales offices are included in wholesale or retail trade, not as administrative or auxiliary. Some non-auxiliary establishments in non-office-intensive industries are housed in offices. That would be particularly true for communications and trade industries.

**TABLE 2**

Employment in Administrative and Auxiliary Establishments from County Business Patterns (thousands)		
	1975	1984
Mining	74	157
Contract Construction	14	19
Manufacturing	1,134	1,251
Transport & Public Utilities	108	167
Wholesale Trade	241	276
Retail Trade	501	749
	2,045	2,619

Source: Bureau of the Census

The rate of growth for employment in administrative and auxiliary establishments for mining, manufactur-

ing, etc., has generally been below the rate of growth for office-intensive industries. Between 1975 and 1984, the employment in those administrative offices grew by 28 percent, while employment in office-intensive industries grew by 50 percent. Since 1984, the growth differential may have widened, since there have been major reductions in some administrative offices (e.g., GM and AT&T) at the same time that finance and business services have shown strong growth.

Another major category of office space use consists of the legions of office workers in government. However, most government workers work in government buildings. As of 1985 the federal government used 536 million square feet of office space, of which 88 million square feet consisted of leased space in private buildings.<sup>1</sup> That implies that less than 400,000 federal government workers were in private office buildings. State and local government workers also work primarily in government-owned buildings.

Data on employment by industry are imperfect measures of office demand. Some of the employees in the industries we have called office-intensive have little to do with offices. For example, the burgeoning "business services" industry includes temporary help agencies that employ nurses, laborers, and other workers with little connection to offices. On the other hand, as noted, there are establishments in communications, trade, and other industries that are not simply administrative or auxiliary but that have operations located in offices.

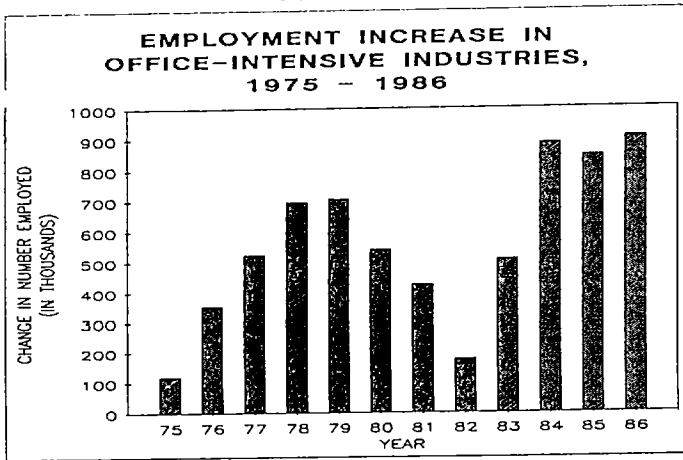
An alternative approach to measuring office employment would be to use data on employment by occupation, rather than by industry. However, occupation data are even less perfect as measures of office employment than industry data. Even for occupations closely associated with office work, such as secretaries, many people in those occupations work in non-office environments such as schools, hospitals, stores, government buildings, warehouses and manufacturing plants. For occupations such as engineers, sales representatives, or the more than 5 million "managers, not elsewhere classified," the division into office and non-office jobs is even more difficult.

### Growth in Employment

The rate of employment growth in office-intensive industries in the 1980s has been comparable to growth in the 1970s. For the six year period from 1980 to 1986 employment grew by 30.3 percent, compared to 31.2 percent over the 1974 to 1980 period. In contrast, total nonagricultural employment grew only 10.8 percent from 1980 to 1986, down from 15.5 percent in the preceding six year period.

In terms of numbers of employees, the growth in office-intensive industries from 1980 to 1986 averaged nearly 625,000 per year. The increases in the past three years have exceeded 800,000, with the increase from 1985 to 1986 exceeding 900,000.

**FIGURE 2**



This figure is based upon the information on Table 2

The growth in office demand implied by data on employment by occupation was less robust than the growth implied by data on employment by industry. Analysis is complicated by the fact that occupation categories were redefined by the Bureau of Labor Statistics in such a way that data beginning in 1983 are not comparable to earlier data. For the period from 1983 to 1986, the number of management jobs increased 17 percent and the number of jobs in administrative support occupations increased by 8 percent (see table 3), compared to the increase in jobs in office-intensive industries of 20 percent. Growth in office employment outside the office-intensive sector was probably limited. We assume that the growth in office employment outside the office-intensive sector was 25,000 more than the growth of non-office jobs in office-intensive industries. Thus, office employment growth is estimated as 650,000 per year since 1980.

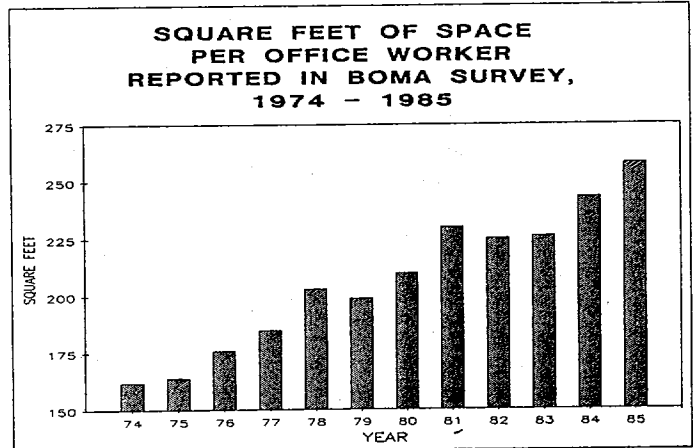
In the future, growth in office employment may come a bit less rapidly, in part because demographics—the influence of the baby bust cohort reaching working age—point to slower growth in overall labor force and employment. Moreover, the office-intensive sector is due for some belated productivity improvements that would reduce employment requirements. Thus, the increase in the number of office jobs may slow somewhat.

**Space Per Worker**

In our estimates of space demand, we assume that currently space per worker is 225 square feet and that this value is increasing by 3 square feet per year. The amount of space per office worker is a key factor in determining total demand for space. As with other aspects of office space demand, there are no solid data and there is a lack of consensus both as to current space per worker and about past and future trends. Estimates of current space per worker range from about 180 square feet<sup>2</sup> to 323 square feet. The latter estimate, from a Department Of Energy study, however, includes vacant space, retail space, and enclosed unfinished space such as garages, and is thus not really an estimate of office space demand per office worker.<sup>3</sup>

The most widely used estimate of space per worker comes from surveys by the Building Owners and Managers Association (BOMA). Their latest survey shows a mean of 258 square feet. The BOMA surveys show a dramatic increase in space per worker of about 10 square feet per year over the past decade (see figure 3). The BOMA sample consists primarily of larger multi-tenant buildings. If their data on space per worker are representative of the universe of office usage, it implies that in addition to absorption due to employment growth, an additional 200 million square feet was absorbed each year. That doesn't seem likely.

**FIGURE 3**



Source: Building Owners and Managers Association

**TABLE 3**

	1972	1974	1976	1978	1980	1982	1983	1984	1985	1986
All Occupations	82,153	86,794	88,752	96,048	99,303	99,526	100,834	105,005	107,150	108,357
Broad Occupation Groups:										
Exec, Admin, Manager	7,278	8,119	8,544	9,343	10,215	10,597	10,772	11,571	12,221	12,639
Professional, Specialty	11,538	12,488	13,550	14,538	15,968	16,951	12,820	13,286	13,630	13,901
Administrative Support	13,126	13,870	14,290	15,549	16,638	16,507	16,395	16,722	17,309	17,732
Specific Occupations:										
General Office Clerks	1,329	1,388	1,444	1,705	1,899	1,871	648	664	694	740
Bookkeepers	1,592	1,706	1,712	1,881	1,942	1,968	1,970	2,010	2,037	2,004
Secretary, Steno, Typists	4,114	4,368	4,524	4,811	5,053	4,855	4,861	4,877	5,002	4,935
Lawyers	305	346	402	487	532	606	612	678	642	618
Economists	69	96	106	120	141	200	98	110	102	111
Accountants	720	815	884	999	1,076	1,193	1,105	1,234	1,263	1,257
Computer Programmers	188	203	235	255	351	434	597	713	774	852

Source: Bureau of Labor Statistics Occupational Classifications were changed in 1983

There are three key factors that will affect future space per worker: technology, the mix of employment in offices, and the cost of office space.

The influence of technology on space is one of the areas of least agreement. Some have argued that more efficient design and new materials and equipment involving, for example, reduced need for paper files, will allow space requirements to be reduced.<sup>4</sup> Others argue that the use of word processing, micro-computers, and desktop publishing will require additional space.<sup>5</sup>

A factor that clearly points toward increased space per worker is the changing mix of office employment among managerial, professional and clerical occupations.

One handbook for space planning suggests the following square footage allocation for different types of workers:<sup>6</sup>

General Office Worker	65-80
Supervisor	100-120
Administrative Assistant or Secretary	150
Executive Assistant	200-250
Administrative Executive	300
Executive (Private Office)	400-500

We have no data on actual space allocated to different types of workers, but this example illustrates the impact of a change in the mix of workers. It can be expected that the number of managerial and professional office jobs will continue to grow more quickly than the number of clerical jobs, leading to further increases in space per worker.

Finally, the amount of space per worker can be expected to be influenced by office rents. Real effective office rents can be expected to fall as long as office vacancy rates remain above equilibrium. The allocations of space to workers will be more generous under low rents than if rents were higher.

### Replacement demand

Neither the size of the existing stock of office space nor the rate at which it is removed are known with any certainty. A study by the Department of Energy (DOE) came up with an estimate of 6.2 million square feet in privately-owned buildings for 1983.<sup>7</sup> However, that study included non-office space in office building such as underground parking and retail space. If our assumptions about office employment and space per worker – 20 million and 225 square feet, respectively – are correct, then after allowance for vacancies that implies about 5 million square feet of existing private space.

The DOE study also found that between late 1979 and mid-1983, demolitions from the sample of commercial buildings in their study amounted to 3.0 percent of the total. Excluding mercantile, storage, and vacant buildings, the demolition rate was 2.1 percent for the 3 1/2 year period. A reasonable estimate of the loss rate for office buildings would be something on the order of 0.7 percent per year. That compares to a net loss rate from the conventional housing stock of about 0.5 percent per year. A loss rate of 0.7 per-

cent per year from a stock of 5 million square feet implies a replacement demand of about 35 million square feet per year.

### Demand-supply balance

Using the assumptions and estimates presented above, we find that the average total annual demand increase over the past 5 to 6 years consisted of:

- 146 million square feet to accommodate 650,000 workers per year,
- 60 million square feet to allow an extra 3 square feet to each of 20 million office workers, and
- 35 million square feet replacement demand,

for a total of 241 million square feet per year. This estimate is only 20 percent below the estimated construction of 300 million square feet per year. If these estimates are correct, only 60 million square feet of excess supply, equivalent to 1.2 percent of the existing stock, were added each year. Thus the amount of excess supply would only be enough to raise vacancy rates for the entire stock by 7.2 percent in 6 years. The types of buildings covered in the Coldwell Banker survey and similar measures clearly were disproportionately impacted by the excess supply.

### The Outlook

Looking toward the future, it is clear that a slowdown in new office construction is in order. How sharp a slowdown?

Assuming that the increase in office employment averages 650,000 per year, the implied annual demand would continue to be about 240 million square feet per year. In order to not only equate new supply with demand growth but also to bring the vacancy rate in multi-tenant buildings down below 10 percent over a five year period, construction would have to be less than 240 million square feet per year. New construction on the order of 200 million square feet per year ought to do it.

—Michael Carliner

### Notes

- 1 U.S. General Services Administration, *Summary Report of Real Property Leased by the United States Throughout the World as of September 30, 1985* (Washington, Sept. 1986).
- 2 Nathan Schloss, "Use of employment data to estimate office space demand" in *Monthly Labor Review*, Vol. 107, No. 12 (December, 1984), p. 42.
- 3 U.S. Department of Energy, Energy Information Administration, *Characteristics of Commercial Buildings, 1983* (Washington, GPO, 1985; DOE/EIA-0246(83)), p.19.
- 4 David Birch, *America's Office Needs 1985-1995* (MIT Center for Real Estate Development, 1986) p.ii.
- 5 "G.V. Tatham, president of BOMA, noted that 'tenant-employers are finding that new technologies require more space.'" *Real Estate Leasing Report*, Vol. 3, No. 1, (October 1986).
- 6 Duane F. Roberts, *Marketing and Leasing of Office Space* (Chicago, Institute of Real Estate Management, 1979), Ch. 10, quoted in Urban Land Institute, *Office Development Handbook* (Washington, Urban Land Institute, 1982), p. 69.
- 7 Department of Energy, *op. cit.*, p. 79.