APPENDIX 6

OFFICE SPACE DEMAND

Office space demand is sensitive to space requirement assumptions, rent levels, tenant type and possibly culture. In many models, such as the one illustrated in Exhibit 6-6 in the printed text, we assume 200 square feet. If you ask corporate real estate managers, they may tell you the target is 150 or even as low as 100 square feet per person in the United States and even less in Asian or expensive European markets, but they are speaking of a target based on full capacity where everyone the firm plans to hire over the next several years is already hired. Until the firm actually has hired all the planned new employees, it may find that the space per worker is closer to 200 square feet or even 250 square feet. Firms with targets as low as 100 square feet per employee typically utilize very standardized and non-dedicated office space. Few employees have exclusive private office space. Telecommuting where work is accomplished from home, in coffee shops, airports or libraries is also permitted in some firms reducing the need for dedicated office space in one location.

The estimate of office using employment growth is no less critical an assumption than the space required per worker and at the same time, the disparity of assumptions we observe in the market is baffling. More refined office demand models will use space per worker by industry sector with a forecast of the growth of each sector by market, but it all boils down to a reasonable guess on the space requirement per worker.

PERSPECTIVES AND TERMS VARY

IFMA, the International Facility Management Association, in conjunction with BOMA, the Building Owners Management Association International, in 2007, agreed upon terms that are different from those traditionally used in commercial real estate by brokers and leasing agents. They came up with the following terms:

- **Interior Gross** This is basically the same as *gross area*.
- **Plannable Gross** Perimeter encroachments, such as window seals, are subtracted.
- **Plannable** Vertical penetrations, such as elevators and service areas, are subtracted. This is akin to what commercial real estate professionals call the RBA, Rentable Building Area.
- **Assignable** This is the useable space after interior encroachments are subtracted.

In a survey conducted near the end of 2009, which was tabulated and published in 2010, IFMA received 424 completed surveys detailing space use for different types of organizations. The sample was nationally stratified by state and included some responses from Canada as well as the United States. It was fairly proportional to population so the largest number of surveys came from California. The typical building was 31 to 50 years old but building age ranged from 1 to 200 years. Using the IFMA definitions of space, plannable gross, or RBA, was 93.8 percent of the interior gross. Therefore, landlords lose 6.2 percent of the building from rentable space on average, as of 2009, because of vertical penetrations and encroachments. When we go from RBA to "plannable" which we might call *useable space*, tenants lose 16.2 percent off the RBA based on the facilities managers calculations and when you go to *assignable* space adjusted for interior encroachments they end up at only 75.6 percent of the RBA. On average, tenants lose 16.2 percent of the RBA before they even divvy up the space. This means that the tenant might view the situation as having 250 square feet per worker (using the useable definition) while a landlord might calculate this at 298 square feet, as they are charging rent on this RBA space even though some is not useable. Right away we start to understand how the corporate facilities managers might have smaller figures per worker than real estate professionals who are relying on RBA definitions.

Space per Worker Trends

If we only look at the square feet per worker on new leases where the tenant moved in within the last 90 days, we see a national average as of fourth quarter 2010 of only 187 square feet.[1] But over time, the amount of space leased and the number of workers in the space changes. Firms may be able to negotiate expansions more easily than contractions, especially in soft markets. On leases closer to expiration the average space per worker is more than double the 187 estimate for new leases.[2] Newer firms and start-ups squeeze more people into the same amount of space while older firms cannot downsize until leases expire. This might help to explain why the average square feet per worker shown in Exhibit 6A-1 is so much higher than the figures suggested by corporate real estate executives. We also must keep in mind that Exhibit 6A-1 is based on RBA (rentable building area) and not the plannable or useable space that is used by the corporate real estate world. This difference in terminology alone explains perhaps a 16 percent upward bias in the figures. Instead of 340 square feet, the corporate real estate person might calculate this as 283 square feet. Still, when we do not discriminate by origination date, when a lease was signed, and simply look at how much space the average tenant occupies, the figures are quite large. In soft economies, we would expect a fair amount of shadow space, space that is leased but not occupied. Because labor costs matter

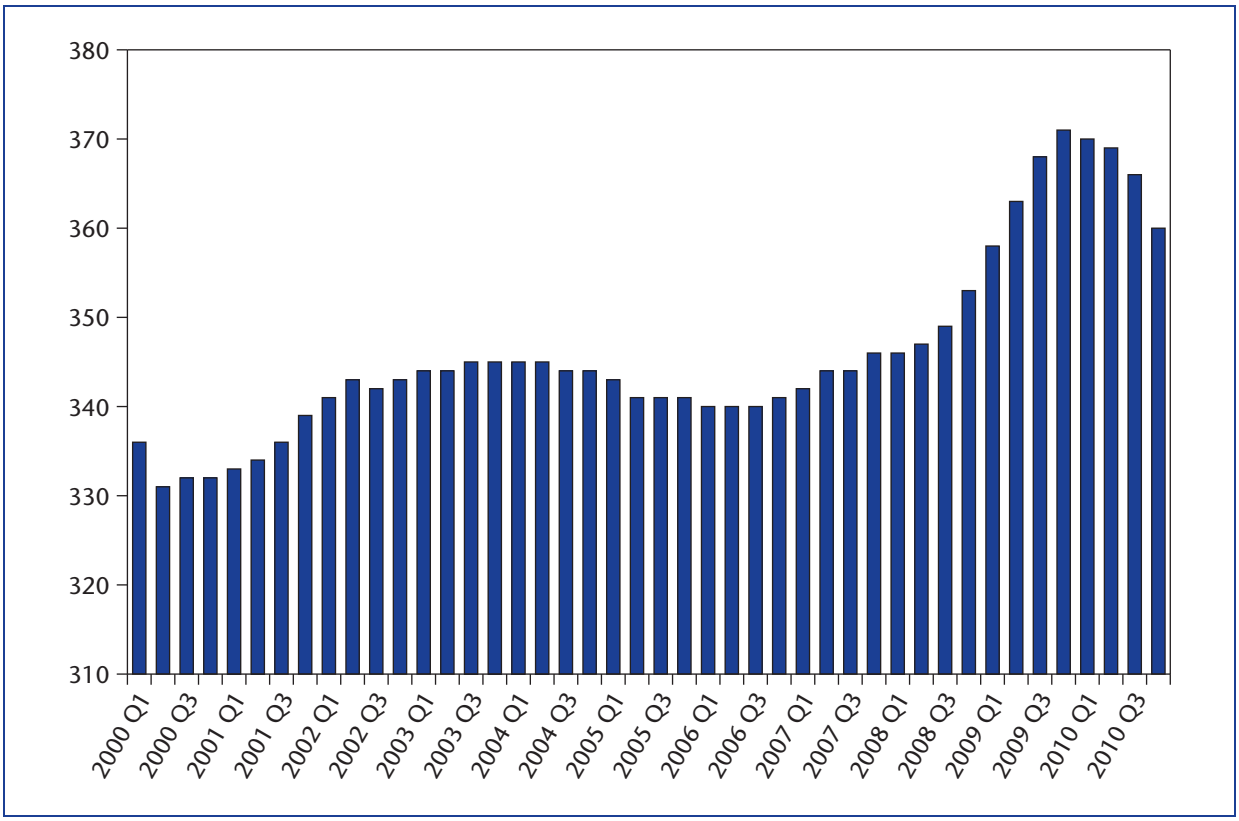


EXHIBIT 6A-1 U.S. Space per Worker Trends in Square Feet

Source: Based on Property Portfolio 54 (largest 54 markets) and CoStar data

[1]Source: CoStar data.

[2]For leases with original terms of 5 years that are within the last year of their lease, we see figures that are double the 187 estimate for new leases.

much more than occupancy costs, by a factor of approximately 10 in the typical U.S. city, tenants are able to honor their leases until the leases expire and pay for more space than they need. The extra space also provides an option to expand and hire more workers without the need to move. Therefore, we should expect to observe significant extra space in weaker economies and we do. When space per worker trends are climbing it usually suggests that tenants have not had the chance to downsize yet and are awaiting either the expiration of the lease or simply riding out the weak economy with extra space. The more uncertain the future need for workers, the more optional space a firm needs to control in order to be able to ramp up quickly.

Exhibit 6A-2 is a sample of averages pulled from mid-2010 from a sample of various cities. Note that while we see more space per worker in the larger cities like New York and Boston, these markets also have more shadow space at the time of the survey compared to smaller markets.[3] Only Honolulu in this survey is close to the 200 square feet per worker as of 2010 and we know that Honolulu is an extremely supply constrained market. We also know that in the very expensive markets of London and Hong Kong the average space per worker is on average much smaller than the figures shown here, so we should not presume that larger, more expensive cities always require more space per worker.[4]

Shadow space certainly provides much of the explanation for the run ups in 2008 through 2010. If we take the lower 340 average square feet figure in the last decade as more realistic of what a firm prefers we would estimate that, on average, firms had about 9 percent excess space

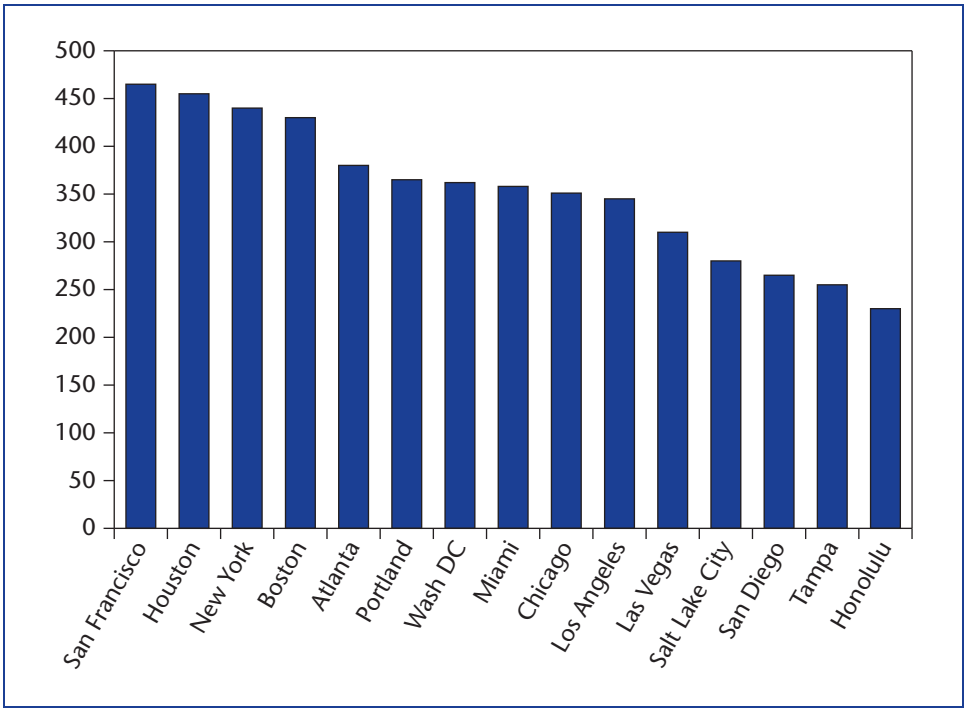


EXHIBIT 6A-2 U.S. Square Feet per Worker by Market in 2010

Source: Based on CoStar data and all existing office leases in the U.S. national database.

[3]One other bias in the square foot per worker data is that in the larger cities where we observe retail space on the ground floors, this space is classified by CoStar as "office" and not retail space, so that there is a slight upward bias in the measurement. Certainly this is insignificant for the nation as a whole, but for large cities like New York, San Francisco and Boston it may mean as much as a 5% upward bias helping to explain why in Exhibit 6A-2 we see larger numbers than might be expected in the larger cities.

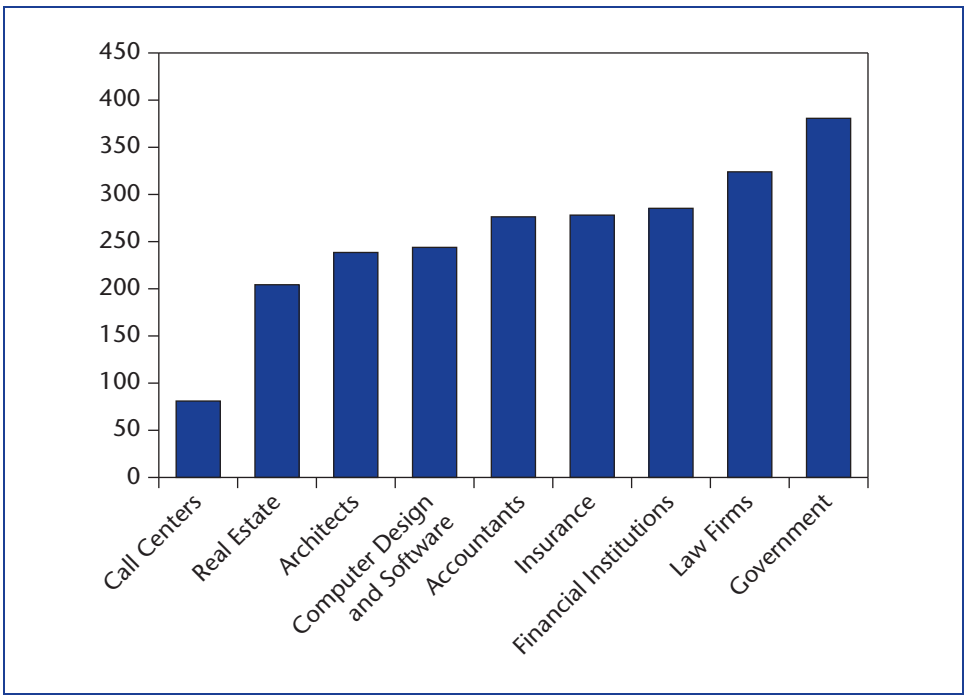
[4]Michael Hickey and Aaron Jodka, Senior economists from PPR (Property Portfolio Research, a division of CoStar) suggest that we observe more high paid jobs in markets like New York and Boston compared to smaller cities and so the space allocated per person is larger while back office people work in cheaper areas.

in 2010, some much more and some much less. If you assume a lower figure, based on the more recent leases, but still generously high at 250 square feet then you would estimate that the average firm has on third of its space as excess shadow space as of 2010. Certainly this will decline over time, but figures as conservative and elusive as 100 square feet per worker remain more aspirational than anything else for the smaller and private firms. Larger stable public firms, more apt to allow space hoteling or sharing and telecommuting from home, airports and coffee shops,[5] will see higher utilization rates and much lower space per worker figures, perhaps under 100 square feet per worker. It will take some time before the balance of the United States firms move towards high utilization rates (defined as desks actually occupied) over the typical work week, but we do observe much smaller space per worker figures in China and Europe, so culture likely plays a role in how closely workers are placed, as well as willingness to share space as opposed to sole occupancy of permanent space.

Space per Worker by Industry or Function

Aside from call centers that cram many workers into small cubicles where they answer telephones, we see fairly large figures for the typical space required by industry, relative to the goals stated by corporate real estate executives. At the same time call centers are now being shifted to home-based workers, at least in the United States, where computer networks manage phone call systems and workers answer phones when they are available saving transport costs and overhead and allowing a more flexible work schedule so this group may be less relevant in the future. Knowing that 2011 is a year with significant shadow space we would still expect to see some variation by industry and it is not surprising that government space is both fairly generous to workers but also includes some public access and service space that might help explain the well above average results. Law firms come in next as high space demanders followed by financial institutions that often include generous open space at branches. The results in Exhibit 6A-3 are not inclusive of all industries but merely serve to

EXHIBIT 6A-3 Median Square Feet per Worker by Industry as of 2011
Source: CoStar data



[5]Spaces known as the "third place" for work.

demonstrate that we will find systematic differences in space demands when we analyze each industry group. If a particular industry group, such as telemarketing that operates through call centers is moving into an area and has stated that they need to hire a thousand new workers it would have dramatically less impact on office market space demand than a thousand architects or computer designers. When possible, space per worker in demand estimate models should be adjusted for what is typical in the relevant industries.

Further Reading and References

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