Office Market Analysis: Improving Best Practice Techniques

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Abstract. **This article focuses on ways to improve market analysis for proposed office projects, taking time and data limitations into account. The discussion moves sequentially through the three primary components of systematic, logical market analysis: the market overview, the market study and the marketability study. Key suggestions cover: (1) discussing megatrends affecting office user preferences and product design; (2) estimating long-term attractiveness of the office location and site; (3) forecasting balance or imbalance between future demand and supply of office space at the metropolitan level; (4) segmenting and differentiating supply and demand at the submarket level for the purpose of assigning market capture rates; and (5) conducting sensitivity analysis of the key variables affecting project net operating income.**

Introduction

There are four major reasons why improvements in market analysis methods and techniques should focus on office markets. First, offices are the premier city-building land use. They house the economic base in metropolitan service centers and are owned by institutional investors. Yet, the large capital requirements and long development and construction periods make investments in office buildings riskier than other types of real estate. As Carn, Rabinaski, Racster and Seldin (1988) point out, the historic fluctuations in the supply of office space, which have been more volatile than other real estate products, make timing extremely important (the ''development window'') for even the best conceived office projects. One of the main tasks of market research in this context is to investigate whether a proposed project meets the unfilled product and location requirements of a select group of consumers at a time when supply alternatives are limited (Graaskamp, 1985).

The second reason for focusing this analysis on the office product is the current need for improved analysis in the face of the heavy losses experienced by lenders, developers and investors in urban office projects since the late 1980s. If domestic and international institutional investors are to regain confidence in United States office markets, their ability to assess the risks of office product ownership needs to be greatly improved.[1] Market analysis for this audience must substitute a consistent, structured, inclusive approach (Hartzell and Malizia, 1989) for some of the more infamous short cut techniques.[2] Nevertheless, if the academic discussions of improved office market

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analysis are to be useful in practice, the limitations of time and data availability which often lead to these shortcuts must be taken into account and addressed directly.

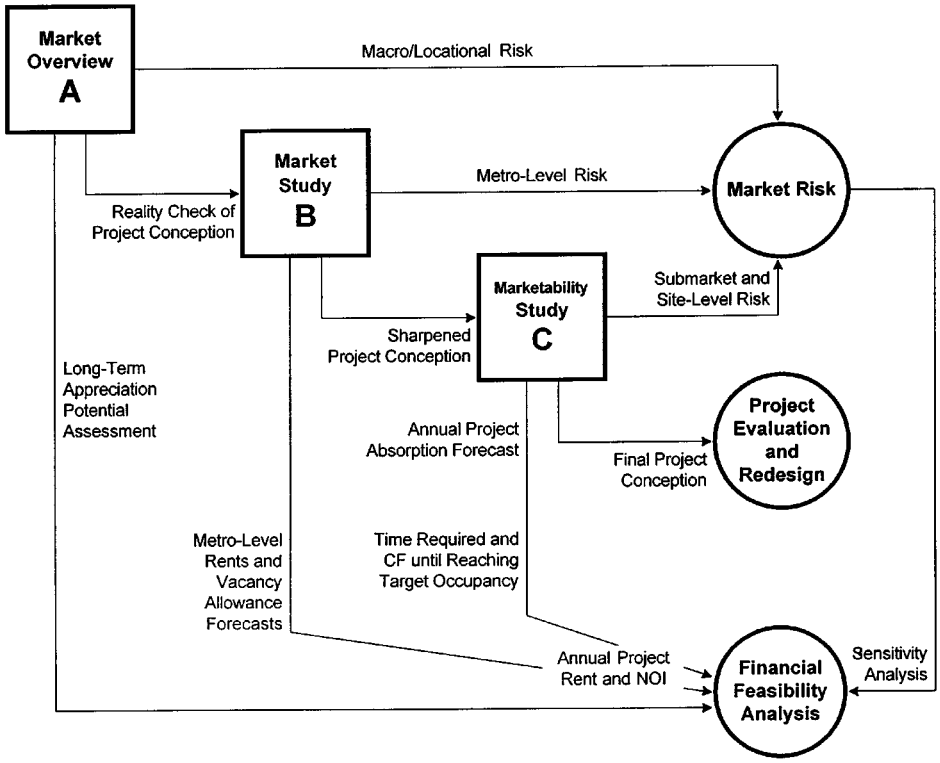
Third, more than any other real estate product, office markets face a future of slow demand growth which continues a trend that began in the 1970s.[3] This secular decline in demand results from demographic factors (smaller cohorts reaching working age and lower growth rates in female workforce participation), consolidations in key office-using industries, shifts to open-plans for office space, and the growth in telecommuting and hoteling (Rosen, 1993). On the other hand, office supply is driven by numerous factors in addition to expected demand, such as credit market liquidity, tax laws, local development restrictions and the like. Thus, the ''burden of proof'' for any one office project regarding its ability to profitably attract and retain tenants is increasing.

Finally, the discussion of improvements in market analysis focused on office markets can have useful applications to other types of real estate product. Office users that serve local markets (insurance agents and other personal service providers, medical and other health practitioners, real estate brokers, professionals serving local businesses, etc.) and retail tenants have shared linkage requirements revolving around access and visibility. The situs issues that influence the location of office-using export services also influence other basic activities (export manufacturing, distribution, etc.). Moreover, office market analysis is increasingly concerned with quality-of-life factors that have traditionally been the domain of residential market research, especially those factors that appeal to top executives of ''footloose firms'' making locational decisions.

The basic structure of a well-conceived market analysis for any type of proposed income-producing property has been well laid out in previous work (Carn, Rabinaski, Racster and Seldin 1988; Clapp, 1993; and Myers and Mitchell, 1993). Malizia and Howarth (1995) distill from these sources three essential components of a systematic, logical, market analysis: (1) the market overview; (2) the market study; and (3) marketability study. These components each have a unique objective and set of tasks. The order of these tasks leads the market analyst from general insights about the market (market overview), to forecasts of rent levels and vacancies at the metropolitan or submetropolitan level (market study) and, finally, to specific forecasts of project absorption (marketability study). See Exhibit 1 for the authors' model of the market analysis process.

The key tasks of market analysis include : (1) discussing megatrends affecting user preferences and product design; (2) estimating the long-term attractiveness of the location and site; (3) forecasting balance or imbalance between future demand and supply; (4) segmenting demand and differentiating supply, which allows the analyst to identify the relevant market segments and subset of competitive projects and to subsequently assign market capture rates; and (5) conducting sensitivity analysis of key variables in the project's cash flow projections. The remainder of this article is devoted to a discussion of ways to improve office market analysis that take time and data limitations into account moving sequentially from the market overview through

Exhibit 1
Market Analysis to Evaluate the Proposed Project, Identify Market Risk and Inform the Financial Feasibility Analysis



A Market Overview

- Mega trends affecting user preferences.
- Survey wide range of similar projects recently completed to identify additional marketing risks.
- Economic/regulatory trends affecting market and site.
- Relative attractiveness of project location to comparable region.
- Marketing strengths and weaknesses of sponsors for product type.

B Market Study

- Market/trade area definition.
- Site analysis — intra- and inter-metropolitan linkages.
- Metro-level forecast of demand based on employment trends.
- Metro level of supply based on construction pipeline and historical cyclical patterns.
- Annual forecast of metro-market supply/demand (im)balance.

C Marketability Study

- Demand segmentation using dispersion and concentration trends of office — using industries and intramarket shifts of tenants.
- Supply differentiation recognizing construction pipeline and filtering in submarket.
- Assign capture rates to project using modified appraisers grid.

the marketability study. The discussion loosely mirrors the ''nine proposals for improvement'' format developed in a recent article by Malizia and Howarth (1995), albeit in a condensed form.[4] The suggestions presented here should enable market analysts to circumvent many traditional pitfalls when performing office market

research for (re)development projects. See Exhibit 2 for a summary of the proposals presented below compared to existing practices, risks mitigated by implementing the proposals and additional data requirements

Improvements to Market Analysis for Office Projects

Proposal one. A market overview should suggest ways to improve project marketability based on information from similar projects in other locations and knowledge of user preferences in general.

The market overview should include a discussion of macro/mega trends in office user-preferences as well as ''lessons learned'' from recent office developments of a similar type. The purpose here is to sharpen the conception of the proposed project and justify its timing. The analyst should cast a wide net at this stage of the analysis—specific issues related to the subject project's locality and site are covered later. For instance, a market analysis investigating the feasibility of a proposed suburban midrise office project might include a review of the survey literature on such tenant ''hot buttons'' as building security, telecommunication infrastructure, floor plate flexibility for modular layouts and ground floor retail support services. The discussion should include some notion of alternative amenity packages for meeting user needs, their incremental costs, and the extent to which they can be recouped in increased rents and/or reduced vacancy. The economics of certain architectural features has been addressed formally by Vandell and Lane (1989) and Doiran, Shilling and Sirmans (1992). They found that, in general, better design and special architectural features were rewarded with higher rents. Whether profitability increases is unclear, however, due to the typically sketchy nature of cost information.

If the project is pioneering in some area of design, construction and/or marketing, it behooves the market analyst to look at the recent outcomes of similar projects in the market overview. For example, an awkwardly shaped office parcel that necessitates remote parking is a marketing liability. The analyst should look to similarly handicapped projects and determine the extent to which they have overcome their parking problems with innovative access services such as van transportation, pedestrian walkways, valet parking and the like. A proposed major office rehabilitation probably justifies an investigation of the painful lessons learned by developers, lenders and investors in the area of ''hidden costs.'' These typically include asbestos removal, elevator upgrades, handicap accessibility and other expenses necessary to meet modern building codes. The purpose of this part of the market overview is to identify unusual project risks, assess their importance based on a survey of similar projects and suggest mitigations not yet proposed by the developer.

Proposal two. Reference regions, used to gain insights about the social and economic outlook for a project's metropolitan location, should be chosen on the basis of economic comparability.

The main purpose of the typical market overview is to gauge the relative attractiveness of the location and site to future employers and residents. This purpose is best

Exhibit 2
Office Market Analysis—Comparison of Proposals versus Current Practice

	Market Overview	Market Study	Marketability Study
Typical Content/ Existing Techniques	Area history, demographics, economic base, major local developments, forecasts of population and employment Comparisons between local area and regional/national economies	Cursory treatment of metro level data, focus on submarket supply and demand (approach often skips metro market) Demand forecasts based on demand parameter calculated from past averages or simple trends	Submarket demand for past market share Submarket short-term s estimates based only o under construction, or projects Long-term supply forec extrapolation of short-t
Proposals for Improvement	Add megatrends in user preferences, experiences of projects with comparable marketing challenges, ability of sponsors to address marketing risks, regulatory and economic trends affecting supply and demand Substitute economic reference regions for ''nested'' comparisons	Provide a thorough analysis of metro level supply and demand before focusing on the submarket in the marketability analysis Substitute modified demand parameter taking into account a careful analysis of the historical relationship between employment indicators and absorption	Adjust market share es demand to reflect spati industry concentration, and intramarket tenant Short term supply adju filtering, capital availab sublease space, and co owner occupied space space Long-term supply forec real estate cycles

Exhibit 2 (continued)
Office Market Analysis—Comparison of Proposals versus Current Practice

	Market Overview	Market Study	Marketability Study
Risks Mitigated through Implementation of Proposals	Poor or dated conceptualization of project Overly optimistic growth assumptions for locality	Determination of market (im)balance based on unreliable/incomplete data sources for submarket, lack of awareness of imbalances in the metro area that will affect submarket Avoids overestimating demand due to conditions of past space hording or incompatibility of data for occupancy vs. office-using employment	Overestimation of dem "naïve" demand param Under/overestimation supply Under/overestimation supply Alerts analysts to poter oversupply when proje substantial releasing u
Additional Data Required by Proposals	Secondary data: trade journals, surveys of national brokerage firms, data from state and local planning commissions Census bureau sources of metropolitan-level data	Secondary data for demand: Bureau of Economic Analysis, Bureau of Labor Statistics, National Planning Association, economic forecasting centers of local universities Secondary data for supply: national and local brokerage firms, real estate research firms, local planning agencies, construction permit data Primary data: surveys or interview with local brokers, tenants and property managers	All require additional p collection surveying kn parties active in the pr submarket. Information analyst forecast supply gleaned from secondar yearly annual supply ir area

achieved by comparing the subject area to similar metropolitan areas. These metropolitan areas are used as the relevant ''reference regions'' for the subject area. They are far superior to the spatial units typically selected for this purpose, such as the state or census region in which the subject area is located. These metropolitan areas share with the subject area a comparable ''economic location'' in the larger economic system. They have roughly similar economic bases and employment sizes. They share other characteristics, such as similar connectivity to markets, labor force quality, business service mix, public service and taxation levels, etc.

For example, a study forecasting employment in the Raleigh-Durham area analyzed the average historical and forecasted rates of growth in five economically similar metropolitan areas to adjust the subject's forecasts: Austin, Columbus (OH), Nashville, Salt Lake City and Richmond. Similarly, forecasts of office-using employment for the subject area could be adjusted with estimates of the expected levels of office-using employment in these same five cities.

Proposal three. The market study should use thoughtful long-term forecasts of demand and supply to support a financial feasibility analysis that reflects business cycles, the regulatory environment and capital availability. A market study's forecast of demand should acknowledge current trends in occupational and industry-based employment, as well as the changing space needs of different types of employment (e.g., clerical, technical, managerial). Exogenous factors that alter the expected relationships between demand and absorption should also be addressed.

Most office market studies usually begin with a focus on specific spatial subareas, market segments and office products. Yet, for the market study part of the office market analysis to contain reasonable forecasts of market conditions, such forecasts require data on historical market conditions which are extremely limited for subareas. In most instances, the metropolitan area as a whole will need to be the unit of analysis in order to assemble the relevant time series data. An additional reason to conduct a thorough analysis at the metropolitan level is a recognition that many tenants looking for space do not have a preference for a specific submarket. These tenants typically consider a number of submarkets within a larger economic area in their search.

Three demand-side indicators should be used: total employment, office-using employment and absorption (annual changes in occupancy). Historical data on total employment by place of work as well as ten-year forecasts for metropolitan areas are readily available from public (*e.g.*, the Bureau of Economic Analysis or BEA) and private (*e.g.*, the National Planning Association, ''NPA'') sources. Office-using employment can be defined by industrial sector at different levels of detail. BLS and BEA provide one-digit SIC sectors while CBP contains three- and four-digit level detail. Ratios of office worker-to-total worker by industrial category, which are available at the state level (see Carn, Rabianski, Racster and Seldin, 1988) should also be used.

The market analyst must understand white collar job trends within the subject metropolitan area by examining both occupational and industry-based employment

data to improve the accuracy of office-employment forecasting. These trends inform the expected relationship between what should be separate forecasts of office using employment and total employment in a metropolitan area. Kelly (1983) points to the simultaneous trends of substantial job losses in manufacturing and trade in many older metropolitan areas with stable or increasing demand for office space. His work revealed the relative independence of office employment in FIRE and services in New York City from the manufacturing and trade sectors in the 1960–80 time period.[5] The degree of independence is largely a function of the metropolitan area's economic diversity. One would expect greater dependence between office-employment and total employment in cities with highly specialized production bases and related intermediate services such as Detroit and San Jose, and lower associations in nodal centers such as New York, Boston and Los Angeles.[6]

Changing occupational trends within the manufacturing and trade sectors may also be the cause of diverging trends in total and office employment. White collar employment in certain manufacturing sectors can be increasing even as total employment is falling because the ratio of white collar workers in that sector is increasing over time. On the other hand, corporate downsizing in larger corporations across many sectors has reduced managerial employment relatively.

After the forecasted relationship between total employment and office-using employment is estimated, the relationship between the office-using employment forecast and absorption is addressed. This relationship gives an estimate of the demand parameter—space per employee. It is extremely important to analyze the historical relationships between the employment indicators and absorption estimates before forecasting absorption on the basis of employment. The trends may not track for several reasons. First, absorption, which is interpreted as the measure of realized demand, may be more variable due to ''space hording'' in soft markets or shrinkage in tight markets.[7] Second, the definition of office space used for occupancy and absorption estimates is usually much narrower than the space occupied by office-using employment. The data provided by commercial brokers and leasing agents seldom covers the entire metropolitan area, usually ignores owner-occupied office space and office space affiliated with retail or industrial operations, and is often limited to multi-tenant buildings above a certain threshold (20,000 s.f.).

It may be possible to revise the estimate of office-using employment to increase the correlation between the two time series. Building-by-building inventory data, often available in larger markets, can provide rough estimates of tenure status (owner-occupied versus renter-occupied). Knowledge of the types of companies attracted to the subject area also helps gauge tenure status. National and regional headquarter locations, for example, should have above average proportions of owner-occupied space.[8]

It makes little sense to forecast space demand by multiplying forecasted office-using employment by the demand parameter (*e.g.*, 250 s.f. per employee) without carefully examining the historical relationship between these two variables. This simplistic approach usually leads to an overestimate of the demand for office space.[9]

In summary, the demand-side forecasts should reflect the subject area's relative attractiveness, forecasted employment and office-using employment, trends in intensity of space use and tenure status. The forecasts should follow a monotonic long-term trend that may incorporate minor cyclical fluctuations around the trend.

Proposal four. A market study's forecast of supply should reflect business and building cycles, credit availability and the regulatory environment.

The source providing historic occupancy statistics will also have annual estimates of inventory levels, usually broken out for CBD and suburban submarkets. These estimates of supply, in conjunction with demand estimates, should provide a logical explanation of historical rent and vacancy levels in the metropolitan area as well as in the CBD and suburban submarkets. The value of office building permits, which is available from the Construction Division of the Census Bureau for most metropolitan areas for the years since 1980, should also be analyzed as a more comprehensive indicator of supply. If inventory amounts and permit value correlate reasonably well, it may be easier to forecast the supply response to predicted demand using the value of building permits as the supply-side indicator.[10]

The preferred indicators of demand and supply are used to forecast market conditions for a period that matches the time frame of the investment analysis (*e.g.*, ten years). The supply-side forecasts should not follow a linear or exponential trend. Empirical studies of the office market suggest a process of demand leading supply, supply increasing rapidly and overshooting demand, and then a steep decline in new supply.[11] Historic information on the building cycle in the subject area (from permit data) should help estimate the volatility of supply. Knowledge of capital availability and development restrictiveness should help estimate the supply response to increasing demand. Larger metropolitan areas and ''hot markets'' attract greater amounts of capital investment which increases the responsiveness of supply. The more restrictive the local jurisdictions in the area, the longer the response time and less likelihood of prolonged oversupply conditions.[12]

Taken together, these forecasts of demand and supply detailed above suggest future rents and vacancy levels that will enable the market analyst to make informed estimates of NOI (gross potential income, vacancy allowance and operating expenses) as the backbone of the financial feasibility analysis.[13] For speculative projects, the most practical approach is to assume that rents and operating expenses will move with expected changes in the CPI and that vacancies will reflect changing, cyclical market conditions.[14] This pure quantity adjustment is reasonable given the empirical evidence on the adjustment process. The market analyst may assume that target occupancy (vacancy) rates can be maintained after initial lease up only by making capital expenditures in years during which significant amounts of space in the project are up for lease renewal. The level of expenditures should reflect general market conditions, moving with the forecasted vacancy rate. For example, if markets are expected to soften over time, pro forma vacancy rates could increase gradually but require extraordinary expenditures in heavy re-leasing years to prevent vacancies from jumping higher in these years.[15] See the Appendix for an abbreviated illustration of

long-term demand and supply forecasting as well as some of the issues that arise in the marketability study discussed later.

Proposal five. The marketability study should engage in a careful exercise of market segmentation and product differentiation when moving from the level analyzed in a market study to the narrower definitions of demand and supply considered in a marketability study. The segmentation of demand at the submarket level should be informed by employment dispersion and concentration trends by industry, expectations of growth or contraction of specific large employers already located in the submarket, and an analysis of new tenant demand. The differentiation of supply should include a look at filtering issues between the differing qualities of existing office space, as well as sources of new supply. A modified appraiser's grid will help distill this information into expected capture rates for the subject project and its comparables.

Dispersion and Concentration

The identification of dispersion and concentration trends at the submarket level is an important initial task in market segmentation. Clapp, Pollakowski and Lynford (1992) studied forty-five Boston area cities and showed that spatial agglomerations by industry, and the degree to which these clusters are being reinforced or weakened, are an important component of demand growth. Submarkets with growing concentrations of such office-using sectors as computer services, research and development laboratories, management consulting, architecture and engineering had a more positive outlook for demand growth. These business services export a large percentage of their output and are experiencing strong growth in most metropolitan areas.

Central city versus suburban market differences can be related to the segmentation process. In general, central cities have had relatively large concentrations of employment in the fast-growing sectors of FIRE, business services and legal services (Clapp, 1993). Many central city submarkets continue to be relatively attractive to firms demanding face-to-face contact with customers and suppliers, superior transportation infrastructure and a cosmopolitan environment. Suburban markets, nevertheless, have been experiencing much greater demand growth for office space in general because of the rapid decentralization of clerical and administrative support employment for most sectors. This decentralization is encouraged by improvements in telecommunications, lower labor and tax costs, and greater space availability. Kelly (1983) shows how one can calculate dispersion/concentration indices for select industries to assist the analyst in determining the velocity of these trends and the impact this velocity will have on the future share of metropolitan office demand that a given submarket can expect to capture.[16]

While the type of tenants in the suburbs and central cities tend to be different, Carn, Rabianski, Racster and Seldin (1988) point out that the market analyst must be aware of the linkages between the two markets. Prospering tenants in the suburbs may want to move up to high profile downtown space, especially when rents there are depressed. Vacancies are thus transmitted from central to suburban locations. Similarly, relatively

low rents in the suburbs may outweigh the attractions of a central location for certain tenants. In general, these linkages are speculative in nature, and further research needs to be conducted to clarify these spatial interactions. Yet the knowledgeable market analyst may be able to incorporate these influences in the marketability study.

Intramarket Shifts

Intramarket firm expansion and new firm startups have been shown to have a far greater affect on employment growth in metropolitan areas than firm relocation into an area (Schmenner, 1982). Careful attention should be paid to the dynamic space needs of existing tenants in and around a given submarket in the market segmentation process.[17] Are major tenants in an expansion mode and is their existing space adequate or approaching functional obsolescence? Large commercial brokerage firms periodically survey existing tenants within major submarkets noting their SIC code, space needs and lease expiration dates (Carn, Rabianski, Racster and Seldin, 1988). The market analyst should analyze the likelihood of the subject project capturing some portion of this internal market growth by conducting an abbreviated survey. Alternatively, some submarkets are experiencing waves of consolidation among major employers resulting in a glut of sometimes highly competitive vacant space for sublet. The analyst should take into account the vulnerability of a submarket to economic hardship within a few key industries. As an example, the South Bay office markets of Los Angeles have experienced a rapid increase in Class A vacancy rates due to defense industry and aerospace cutbacks. Another potential source of demand within the submarket for multi-tenant space could be prospering small firms seeking to upgrade from their current Class B or C premises. This information can only be determined by survey, a time-consuming process which will only be justified if the market analyst is adequately funded.

When differentiating supply, some of the same filtering issues that affect the demand side come into play. One potential source of competitive supply that is often overlooked is owner-occupied space recently sold and leased back or ‘‘ripe’’ for such an arrangement. In recent years, many large owner-occupants of office buildings have sold their building to institutional investors to raise cash and increase their flexibility with regard to premises. These arrangements usually result in an increase of vacant speculative space over a relatively short time period as clerical and other support workers of the former owner move to less costly premises outside the relevant submarket or the entire metropolitan area. Thus, the analyst should not always assume that owner-occupied space will remain nonspeculative over the relevant time period. A brief analysis of recent trends in owner-occupancy in the submarket should alert the analyst to significant risks in this area.

Potential competitive supply can also ‘‘filter up’’ from existing office buildings of lower quality if tight market conditions justify the costs of significant office rehabilitation. Many rehabilitated office properties benefit from superior access, parking ratios and identity. These properties may represent attractive space for architectural and engineering firms, law firms, small financial institutions, ad agencies and the like. The analyst should be aware of the local activities of those few

experienced developers in the office rehab field who have the financial clout, vision and marketing ability to make these projects truly competitive with Class A space.

Conversely, when markets are soft, the market analyst should look closely at the selling prices and condition of existing supply. It is difficult to justify new development in submarkets where functional office space can be purchased at a price that is well below the capital investment required to create new space.

The Modified Appraiser's Grid

The modified appraiser's grid is an appropriate tool to compare the competitive differentials of new office supply (completed, under construction and in the pipeline) and any existing vacant office product that may be competitive including vacant space for sublease, former owner-occupied space and rehabilitated space. Carn, Rabianski, Racster and Seldin (1988) provide an excellent format for such a grid which ranks each project, including the subject, on the basis of financial factors, physical features, locational features and building amenities. In assigning capture rates, one should focus the analysis on initial lease-up—the period of time it will take to achieve target occupancy, presumably about a two year time frame, depending on market conditions.

The grid analysis is most suited to determine market capture in the near term and project absorption for the first two or three years due to the difficulty of generating reliable long-term forecasts of competitive supply. Beyond year five, it is best to rely on the market study to model general (monotonic and cyclical) trends in rents, vacancies and operating expenses. Furthermore, even the best maintained project should experience some functional and economic obsolescence after ten or more years no matter how well maintained. Therefore, the market analyst should carefully consider the most appropriate going-out cap rates to use in the financial feasibility. Going-out cap rates equal to or less than going-in cap rates require rigorous justification.

Proposal six. The market analysis should present ranges of results based on a sensitivity analysis reflecting the degrees of risk and uncertainty faced by the market analyst.

The conclusions of office market analysis are often presented as normative and worst case scenarios. A better approach is to present important results as distributions rather than as point estimates. This approach helps reveal the assumptions of the market analyst that bear on market risk.[18]

Explicit presentation of the results based on varying assumptions will help rebuild confidence in discounted cash flow analysis. By applying sensitivity analysis to the forecasting logic presented here, the market analyst can generate specific cash flow forecasts over the investment period that will increase the sophistication and credibility of discounted cash flow analysis.

Sensitivity analysis of all critical assumptions clarifies their influence on key market analysis results. For example, through sensitivity analysis, the market analyst can use

a reasonable range of values for tenure choice (percentage owner-occupied versus renter-occupied space) rather than one point estimate and show results in terms of the distribution of market or project absorption, again, instead of generating a single result. Second, lenders and investors should be more comfortable with a range of forecasts than with one point estimate. For some variables, such as the forecast of long-term supply, the point estimate can be nothing more than a guesstimate. However, the market analyst may have sufficient knowledge to identify a reasonable range of expected levels of supply and show how the distribution influences forecasted cash flows.

Costs and Benefits of Improving Best-Practice Technique

The authors have estimated the costs of implementing the improvements outlined in this article for a ''typical'' office market study both in terms of person-hours and dollars. Obviously, these costs will vary widely by location, project complexity and project duration. The purpose of this discussion is to illustrate the order-of-magnitude of the cost increase and show that, as a percentage of the total project budget, the more thorough market study continues to represent a very minor expense for the developer and the project's institutional players. First, we assume that a typical market study runs about $15,000 of which two-thirds is billable time and one-third is overhead. The $10,000 of real time consists of approximately seven weeks of one junior staff person at $700/week and five days of direction and oversight by a principal or senior consultant at $1000/day (interspersed over the seven week period). Given the relative sophistication of some of our suggested improvements, the authors estimate that the improved market study would require a doubling of expert time and a 50% increase in backup assistance. Thus, the billable time of the senior person would increase to ten days ($10,000) and the billable time of the staff person to ten-and-a-half weeks ($7,500). Adding the overhead factor brings the total cost of the new market study to about $26,500, a 77% increase over the cost of the typical market study. This amount represents only about 0.2% of the $12,500,000 budget for a suburban mid-rise office project of about 100,000 square feet.

Office market studies must simplify dynamic, complex systems of human behavior in order to forecast outcomes at one point in time. With this information, decision-makers can proceed with greater confidence in the face of inherent uncertainty. These systems present risks for the office developer and institutional players that cannot typically be insured against in the manner of performance, casualty and business interruption risks. Better quality information and techniques of analysis are the primary risk-mitigation tools vis-á-vis market risk. The state-of-the-art of office market analysis and the quality of available data sources leave substantial room for improvement. The cost of these improvements is relatively minor. However, quantifiable benefits to conducting more thorough market studies and institutional willingness-to-pay for these benefits have not been studied in any systematic way to date.[19] This area may be fruitful for future research if researchers can identify a group of institutions who have implemented reforms in this area and follow portfolio performance over a ten-to-fifteen year timeframe. Unfortunately, researchers do not have the benefit of regulatory reform in this area (other than FIRREA which deals with the quality of appraisals not

market studies) to provide a benchmark. We look forward to the development of this area of research as a means of testing the new techniques outlined in this article and elsewhere.

Conclusion

The six proposals discussed above target weaknesses that can be found in the traditional office market analyses of the major real estate players, primarily developers, lenders and investors. The market analysts hired by these players face the major challenge of producing credible market studies in the face of increasing skepticism regarding new office construction and the usual constraints of limited time and data. The proposals included here are focused on practical amendments to the already substantial body of protocols and techniques that exist for office market analysis. These proposals can increase the sophistication of office market analysis without unduly complicating it. They assume, however, that major clients are now willing to pay more to obtain a careful and detailed analysis of their office projects vis-á-vis market supply and demand in order to improve the accuracy of discounted cash flow analysis.

Appendix

Illustration of Select Office Market Analysis Proposals for a 75,000 s.f. Office Building in Knoxville, TN

A hypothetical 75,000 s.f. office building is under consideration by a developer for lease to a data processing firm. The location is in a Knoxville suburban business park and represents an expansion of existing facilities for the prospective tenant. Despite the credit tenant, the developer commissions a market study for the proposed office building recognizing that ''anything can happen'' and wanting to position the product as competitively as possible with respect to the market for speculative space.

The ''Knoxville MSA Forecast of Employment, Office Demand and Office Supply'' that follows is an illustration, in abbreviated form, of the type of metropolitan area market study that is proposed by the authors. The forecast synthesizes data from a number of secondary sources and forecasts office employment, demand and supply over a fifteen year period. The numbers reflect a relatively stable and favorable environment for development at the metro level over the next five years with a trend towards oversupply after that due to slowing employment growth and supply that responds sluggishly to market indicators.

Although this illustration does not include the detailed marketability analysis at the submarket level that should follow the metro level market study, a few comments on the submarkets are warranted. One of the proposals for the marketability analysis entails expanding the analysis of current and future supply to look at the potential of nonspeculative space converting to speculative space over the relevant time period. The downtown Knoxville submarket is a case in point. According to the 1994 Office Market Analysis prepared by the Knoxville/Knox County Metropolitan Planning

Knoxville MSA Forecast of Employment, Office Demand and Office Supply

	Actuals					Forecasts			
Employment (000's)	Total '90	Office '90	Total '95	Office '95	Office Change '90–'95	Total 2000	Office 2000	Total 2010	Office 201
Manufacturing	50.79	5.08	52.16	5.22	0.14	53.85	5.39	54.59	5.46
Mining	0.92	0.10	0.60	0.07	−0.03	0.55	0.06	0.54	0.06
Construction	19.34	2.26	23.85	2.79	0.53	27.47	3.21	34.18	3.99
Trans, Comm, Utilities	13.95	5.11	14.38	5.26	0.15	16.37	5.99	19.60	7.17
Wholesale Trade	17.83	6.06	19.03	6.47	0.41	21.12	7.18	24.46	8.32
Retail Trade	65.64	13.78	73.56	15.45	1.67	85.04	17.86	102.32	21.49
Finance, Insurance,	20.21	13.66	20.62	13.94	0.28	22.75	15.38	26.20	17.71
Real Estate Services	89.58	22.13	115.98	28.65	6.52	134.62	33.25	163.81	40.46
Government	49.99	6.45	56.56	7.30	0.85	61.47	7.93	70.57	9.10
Total	328.25	74.62	376.74	85.14	10.52	423.24	96.25	496.27	113.76
Marginal Demand Parameter (change in occupied s.f./change in office employment)					223		225		225

Knoxville MSA Forecast of Employment, Office Demand and Office Supply (continued)

	Actuals						Forecast
Office Supply (000's of s.f.)	1990	1991	1992	1993	1994	1995	2000
Gross	11049	11520	11955	12335	12932	13402	16837
Rentable	9392	9792	10162	10485	10904	11392	14311
Occupied	8034	8568	9181	9512	9847	10381	12880
Yearly Absorption	453	534	613	331	335	534	500
Vacancy (%)	14.5	12.5	9.7	9.3	9.7	8.9	10.0
Avg. Monthly Rents ($/s.f.)	11.42	11.21	10.85	10.08	10.92	11.35	11.50

Sources: Actual and forecasted total employment: National Planning Association, MSA profile #147.
Actual and forecasted office employment: calculated using the Multiplier shown above. The authors calculated the Multiplier using s
classification industry employment by occupation from the 1980 Census of Population.
Actual office supply figures and monthly rents: Knoxville/Knox County Metropolitan Planning Commission, *1994 Office Market Ana*
Forecasted office supply and rents provided by the authors for illustration only.
Vacancy figures and the actual marginal demand parameter are endogenous.
Notes: The authors did not change the Multiplier in calculating forecasted office employment as a conservative measure, given tha
is expected to increase
The marginal demand parameter used in the forecasts of occupied office space is assumed to remain constant for purposes of thi
is assumed that a full analysis of this market would allow for a more precise estimate of trends in the marginal demand parameter

Commission, the downtown office market experienced an unanticipated jump in vacancy in 1994 to 13.7% from 8.8% in 1993 due to the dissolving of Whittle Communications and the subsequent availability of their 212,500 s.f. headquarters building. This space represented 35% of all vacant space in that submarket. The planning commission publication mentions that the space was later placed under contract with the General Services Administration for purchase and conversion to a federal courthouse, replacing plans for a new 150,000 s.f. courthouse nearby.

The authors also propose that the analyst pay close attention to intramarket tenant shifts in analyzing submarket supply and demand. The planning document lists a number of Knoxville firm expansions and/or relocations underway that could have significant effects on the various submarkets. A national insurance firm currently leasing space in the West County submarket, recently announced expansion plans that included the construction of its own 100,000 s.f. facility. Whether or not the new facility is located in Knoxville, the developer should anticipate that the tenant's currently leased space will soon be available and competitive. A number of other firms in suburban Knoxville area announced expansion plans in 1994, many of them involving the construction of new owner-occupied space. While this should indicate to our developer that locally generated demand for office space is healthy, the effects on existing speculative space in the suburbs are uncertain. For this reason the 1994 suburban vacancy rate of 6.9% may not be indicative of the potential near term competition in office supply.

In the downtown submarket, the Tennessee Valley Authority (TVA) announced plans for a $4 million upgrade of its 690,000 s.f. office towers. Although downtown has been losing tenants to the more competitive suburbs for some time, the developer should keep his eye on downtown corporate investment in existing facilities of the type being made by the TVA and others. Should the city proceed with a long-considered downtown redevelopment plan in conjunction with corporate support, the dynamics between the downtown office market and the suburban submarket could change, at least in the short term.

Notes

[1] For a discussion of the due diligence responsibility of individual and institutional investors, see Roulac (1995).

[2] See Myers and Mitchell (1993) who profile many of the shortcuts taken in a typical market study in such areas as hypothetical occupancy levels, assumed capture rates and shallow demand projections.

[3] See Rosen (1993) who provides historical and projected compound annual growth rates for U.S. office employment for the following time periods:

1970–80	5.27%
1980–85	4.81%
1985–90	2.83%
1990–00	2.04%

[4] The reader can refer to Exhibit 1 of that article for a listing of the information expected to be included in the market overview, market study and marketability study.
[5] For more recent empirical studies of office space demand, see Kimball and Bloomberg (1987) and Howland and Wessel (1994).
[6] Noyelle and Stanback (1984) make the distinction between *nodal* cities such as New York that provide a range of headquarter functions, producer services, distributive services, nonprofit and government activities to international, national, regional or subregional hinterlands and *specialized service centers* that specialize in the provision of a narrower range of intermediate services strongly oriented to production activity or government/education/non-profit activities.
[7] See Clapp (1993) for a discussion of how the demand parameter (and hence absorption) can be affected by the supply-side variables of new construction rates and/or vacancy rates. He shows that employers ''spread out'' in soft markets, utilizing more space per employee and taking down space needed for anticipated future growth. The opposite effect occurs in tight markets. The 1980s showed increasing space intensity per worker partly due to this effect. Rosen (1993) thinks this increase in intensity should stabilize and turn in the other direction due to tighter markets, increasing use of modular layouts, and telecommuting.
[8] See Carn, Rabianski, Racster and Seldin(1988:258–60) for an example of how the subtraction of occupants of non-speculative space can reduce a forecast of office-using employment by approximately 25% using ''standardized adjustments'' for such items as white collar manufacturing employment occupying offices in plant space, public employees in government-owned buildings and the like.
[9] See Miles, Malizia, Weiss, Berens and Travis (1991:333–4) for a comparison of estimates of the demand parameter based on standard ratios which assume a linear function between employment and space usage plotted through the origin versus an actual regression equation which would typically have a nonzero intercept. This nonzero intercept implies that the standard ratio either underestimates or overestimates the demand parameter.
[10] Construction employment may be treated as a weaker but readily available indicator of supply. It is worthwhile to examine how well this employment series tracks the supply indicators.
[11] See Wheaton (1987) who identifies recurrent ten- to twelve-year office construction cycles at the national level since World War II.
[12] Black and Hoben (1985) published information on development restrictiveness for selected MSAs in 1980 and 1985 on the basis of key informant surveys. We found fairly strong negative correlations between 1986 office vacancy rates and their development restrictiveness measures for the selected MSAs.
[13] For another argument in favor of introducing cycles into supply-demand analysis, see Born and Pyhrr (1994).
[14] It may be useful to separate real estate taxes from operating expenses in order to forecast this expense separately. Real estate taxes are influenced positively by development restrictiveness, income and education levels in the subject area and the quality of subject property maintenance. Other operating expenses are influenced more by internal factors under the control of property managers.
[15] The other relevant issue pertains to how forecasts should be subjected to sensitivity analysis. This issue is discussed under ''Proposal Six.''
[16] See Solomon Brothers (1992) for a discussion of the convergence of suburban and downtown vacancy rates at the national level during 1992 (around 19%) as suburban vacancy levels dropped and downtown rates increased. The report expects these trends to continue, reversing the long standing historical ''fact'' of higher vacancy rates in the suburbs.
[17] Note that unlike the market study which ultimately ''nets out'' employment changes over the wider metropolitan area, market segmentation is concerned with gross employment changes which affect the relevant submarket(s) differentially.

[18] Del Casino (1985) provides an example of forecasting office space demand using a simulation approach. Also, see Roulac (1976) for a discussion of critical success factors and sources of risk for decision makers.

[19] The main problem is that, although careful market research reduces the uncertainty of project outcomes, it does not necessarily reduce a project's exposure to market risk. Better research should generate more accurate point estimates of rental, occupancy or absorption rates. But these estimates may be lower than anticipated, revealing the project to be more risky. Similarly, careful research may uncover greater variability of outcomes which would also indicate increased exposure to market risk. Developers and institutions may not be any more able or willing to modify a project in response to valid risks identified by the improved market research than they were previously.

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