

Making decisions in an uncertain world: Intuition vs analysis

Jane E. Mather, Ph.D.

President, Critical Core, Inc.

Prepared for Occupiers Property Databank Annual Conference, February 2004

"Truly successful decision making relies on a balance between deliberate and instinctive thinking." Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking*.

No where is there a better example of this than in the world of corporate real estate and facilities management. In a world of continuous change, corporate real estate executives need good intuitive strategies and reasoned decision making. Experienced real estate professionals have consistently demonstrated well-honed skills for intuitively identifying the right strategies. During negotiations, quick calculations can be invaluable.

Nevertheless, as other corporate disciplines increase the sophistication of their analysis, senior executives have begun to expect the same from real estate professionals. They still want simple summaries, but they want to be sure that there is reasoned analysis behind them. They want real estate professionals to set targets and demonstrate that they are achieving them. In addition, in a world of change, they must explain the risks of their recommendations,

This presentation addresses how portfolio managers and strategic planners can make better decisions in an uncertain business environment. It considers when intuition is sufficient and when a more detailed analysis can be beneficial. After a review of some of the basic issues in decision making in an uncertain environment, it turns to some typical strategies for managing uncertainty to show which of those can benefit from a more technical analysis. Then it addresses the role of metrics in decision making and demonstrating performance.

Role of costs in decision making

In workplace decisions, the goal is to identify the solution that provides the best balance of productivity enhancement, cost control, and risk minimization. While these goals are widely recognized, most of our decision making revolves around costs. In some situations, costs maybe taking too central a role.

Costs versus productivity. It's important to remember the relative role of real estate in the organization. Workplace costs per person, which typically include real estate, facility operations, and furniture costs, and should also include workplace-specific data and telecommunication costs, can range from £4,000 to £8,000 per person. At the same time, the salary and benefits of the person, which reflect the productivity added by the worker using those workplace assets, can range from £20,000 to £80,000 per person. Thus a 5% reduction in costs, which would total £200 to £400 per person, would not be warranted if it led to even a 1% reduction in productivity.

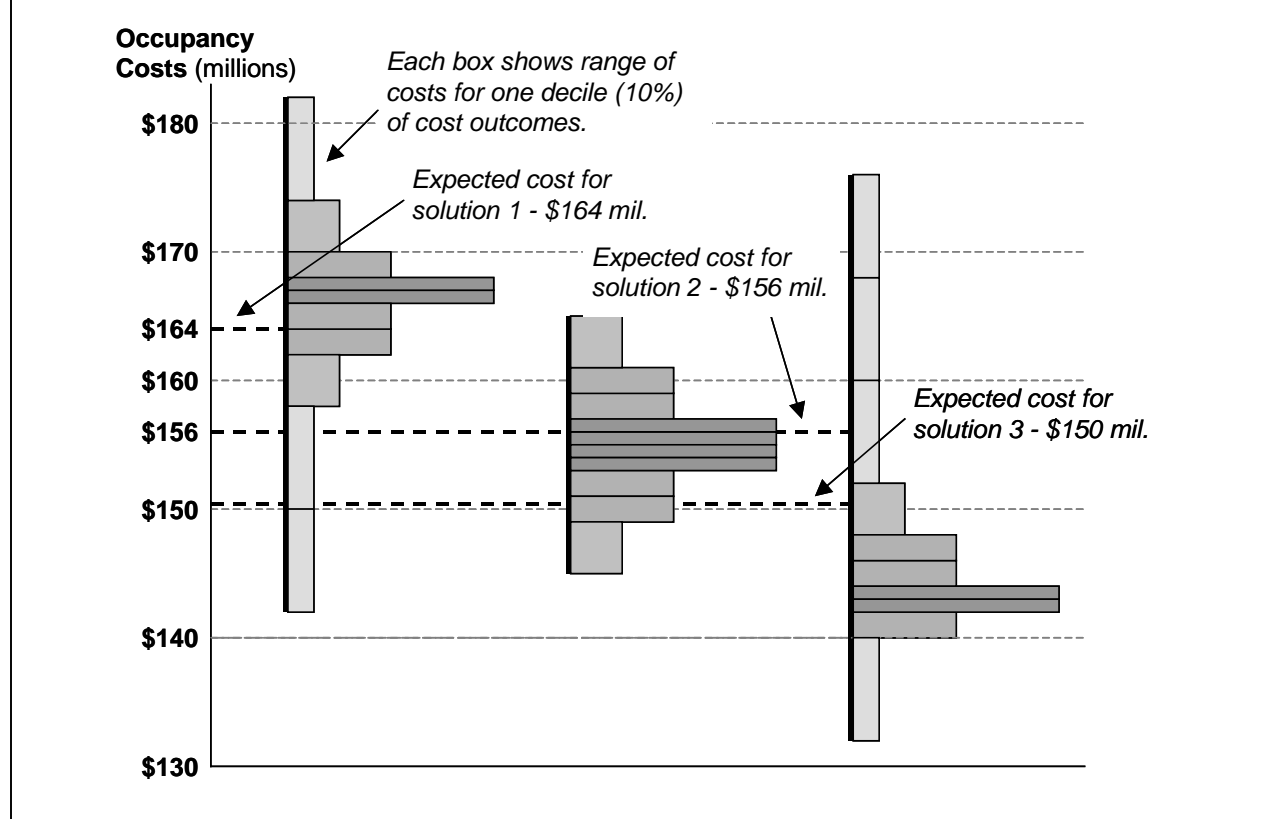
Costs versus risk. Much of the decision making in an uncertain business environment reflects the trade-off between cost and risks. Often it can be considered within the framework of whether the insurance that provides flexibility is worth the cost. There are two primary approaches for evaluating these trade-offs: expected net present value, which assigns probabilities to various outcomes, and simulations, which demonstrate the range of possible outcomes.

We have used expected net present value analysis to evaluate the appropriate term lengths and options for leases in different situations. This analysis will be described in the section on how analytical approaches can be used to evaluate different approaches to managing uncertainty.

Simulation approaches can be beneficial in a number of situations. As financial analysis has become so central to decision making, simulations can help us understand whether the estimated cost differences are really meaningful within the context of uncertain assumptions. They can also identify the risks that accompany a recommendation, for example, a long term lease might reduce costs, but might lead to additional costs if that space is not needed in the future. Figure 2 shows how a simulation analysis can identify the relative costs and risks. Decision makers might determine that solution 3 is the best, but they need to note that the reduced cost comes with the risk of higher costs in some situations.

From a technical perspective, simulation analysis is most beneficial when the range of potential outcomes is not symmetrical, for example, due to limits on price changes, such as upward only rent reviews, or due limits on losses, such as cancellation options.

Figure 1. Simulations enable planners to review the costs and risks of each solution



We've used simulations and related techniques to price cancellation, contraction, and expansion options, that is, to identify the increase in rent that a landlord should charge or a tenant should be willing to pay. As described by Tony Key in his presentation at last year's conference, these approaches typically do not add much more value than intuition. In our projects, our estimates have shown that the tenant ought to be willing to pay £5 to £12 per square meter (\$1 to \$2 per square foot) for various options. The exact pricing is difficult because we do not have sufficient information to accurately estimate the likelihood of various market rent trends in the future. These techniques can be beneficial when decision makers need to demonstrate that an option is worth at least a specific price, but they don't provide sufficient information to provide an exact value. Thus intuition is often sufficient for evaluating real estate options.

Strategies for managing uncertainty

The first step in assessing decision making is to review various strategies than can help manage the uncertainty. In this section, we review some suggested strategies for managing

uncertainty and assess when more sophisticated analysis approaches can add value to implementing these strategies. The strategies considered include:

- Better headcount forecasts,
- Duration matching
- More flexible work environments
- Clustering

Better headcount forecasts. Many organizations have tried to manage uncertainty by trying to develop better headcount forecasts and thus reduce uncertainty. Unfortunately, business unit executives are generally uncomfortable providing a one-year forecast, while real estate professions are looking for three to five year forecasts.

Some real estate professionals have suggested quantitative approaches for headcount forecasting. They range from relating headcount forecasts to revenue projections, if available, to complex econometric time-series methodologies. Certainly business unit revenue forecasts and headcount forecasts are beneficial, but most of the more complex forecasting methodologies provide few insights within the real estate context. As with option pricing, planners generally do not have sufficient data to make use of sophisticated forecasting techniques. Spending more time talking with the businesses, combined with intuition, will reap more benefits.

As part of these discussions, corporate real estate executives should on focus on achieving a better understanding of the range of possible outcomes. For those who want a more systematic approach to specifying these ranges, we suggest a review of the historical values specified in Figure 2. This matrix highlights the different types of business units and the types of historical information about employment and revenues that can be beneficial.

With this understanding of the possible future scenarios, planners can intuitively specify lease terms and options to provide the flexibility needed to match the wide range of business outcomes, as illustrated in Figure 3.

Figure 2. Historical workforce and revenue characteristics for estimating the range of outcomes

Business Unit Categories	Share of Workforce	Range of Rates of Change for Workforce / Revenue		
		Average	Recession	Recovery
Mature business units - stable, low variance				
Mature business units - cyclical, high variance				
		Timing for Workforce / Revenue		
		Average rate of change	Time to maturity	Time to closure
New, growing business unit				
Contracting business unit				

Duration matching. In an uncertain environment, most real estate professionals recognize that the low-cost long-term lease is not always the best solution. Many have suggested shorter-term leases to provide the needed flexibility and some have suggested “duration matching” as one approach to identify the appropriate lease term. Duration matching in real estate is similar to this concept within the financial sector. This approach stresses the importance of matching the duration of the lease to the demand uncertainty, shorter leases for more uncertain business environments. Some go further and recommend that the lease term match the expected life cycle for the business or product. While the former is certainly true, the more specific focus on the product life cycle can lead to too much flexibility because other factors are not being considered.

Evaluating lease term lengths and ownership structure depends on whether the real estate executive is looking at individual properties, such as field sales offices, or a portfolio of properties within a city or considering a portfolio of “fungible” properties whose activities can be relocated among the properties, for example, a campus or a number of call center facilities.

For individual properties, analytical models using probabilities can be used to identify the appropriate term lengths and options. Landlords charge more for shorter-term leases due to the amortization of tenant improvement costs and a premium to compensate the landlord for the risk

of having to release the space at the end of the term. Probability analysis show when an organization should be willing to pay more to eliminate the risk of be caught with excess space.

A formal term length and option analysis can be completed by considering the relative costs of space with different term lengths and options, the tenant-specific improvements, market rent forecasts, and the historical probabilities that the tenant of this type will want to move. With these estimates, one can identify when the probability of moving is sufficiently high to warrant a short-term lease, and when the probability of staying is sufficiently high to suggest the long-term lease. In the situation described in Figure 4, the probability of staying that would warrant a longer lease term (in this case from 3 to 6 years) ranged from 40% to 60%. In other words, even if the tenant had only a 60% chance of staying it would be better to choose the longer lease. (The analysis in the UK is likely to be different in the US because the US has had a

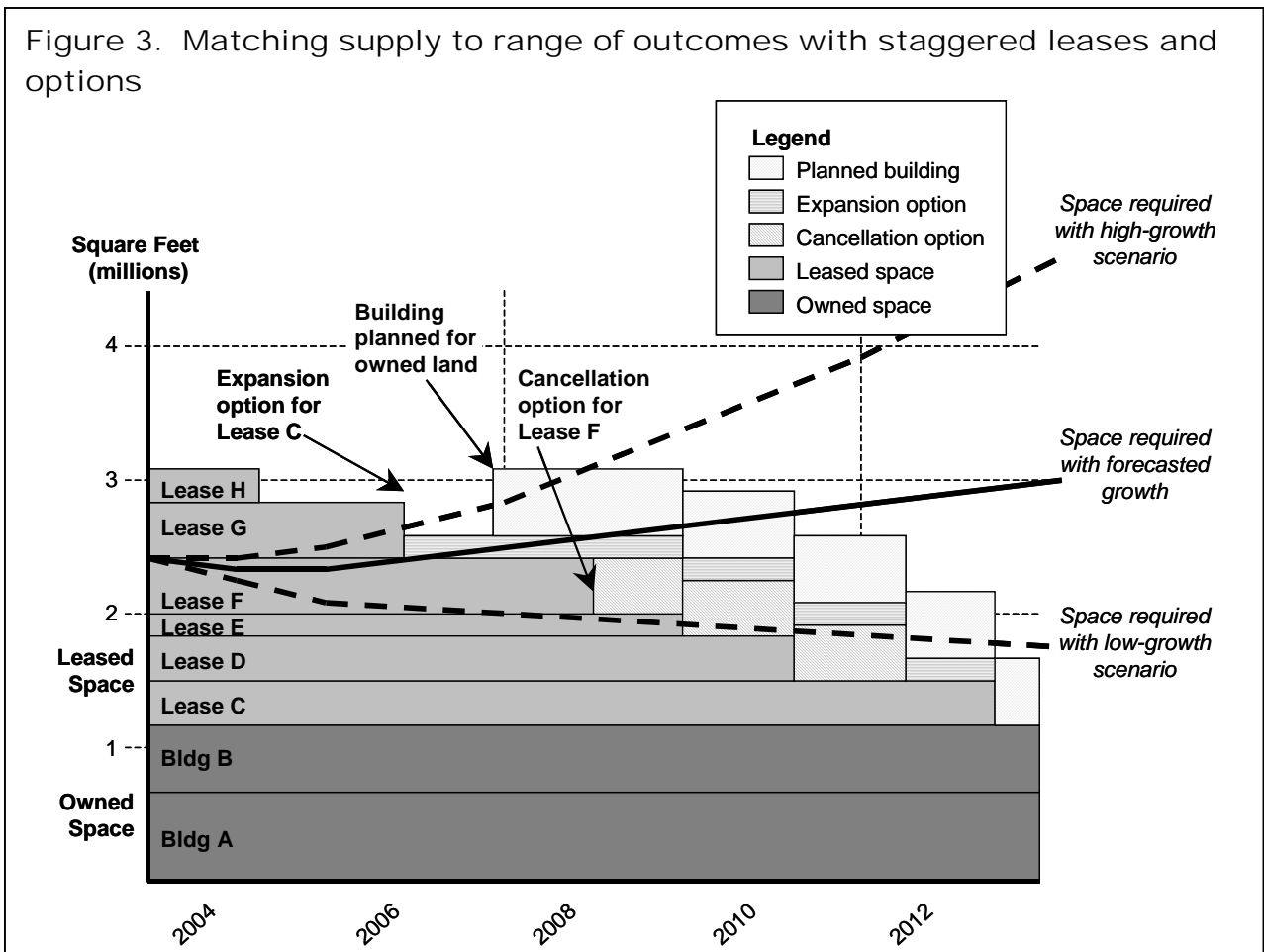


Figure 4. Probabilities of staying that warrant longer lease terms

Lease Comparisons	Tenant Improvement Requirements		
	\$25 / sf	\$40 / sf	\$75 / sf
6-year lease, no cancellation option 3-year lease, no credit for TI amortization	62%	50%	35%
6-year lease, canc. penalty = unamort TI + 1 year gross rent 3-year lease, fixed renewal rate ½ credit for TI amortization	60%	50%	40%

stronger push for short-term leases to provide flexibility than in the UK.) The challenge in this case is gaining the trust from senior executives, that if your organization is left with excess space, they would understand that the decision was based on sound analysis that considered this risk.

As illustrated in this analysis, term length analysis should go beyond the life cycle of the business activity and also reflect amount of tenant specific improvements within a space. One of the primary downsides of a short-term lease is the need to renew the lease if the tenant decides to stay. When there are tenant specific improvements, the tenant is at a disadvantage because the landlord knows it will cost a great deal to recreate these improvements at another location.

There are many examples in which the amount of tenant specific improvements drives the approach to flexibility. For example, a leading high-tech manufacturing company has production plants with products that have very short, and uncertain, product life cycles. They don't follow the pure duration matching example and negotiate a short-term lease. Instead they own these properties since these factories are core to their business and they can be retooled to meet future business needs. They understand that if they leased the property and decided to renew, they would be in a very poor negotiating position.

Some organizations are increasing their lease flexibility through portfolio contracts with real estate owners. These contracts enable the tenants to give back a certain amount of space across their portfolio as part of the contract. As in the case of shorter lease lengths, this flexibility comes at a cost. In this case, the landlord or owner may not need to charge as much for the flexibility because they are able to limit the cost across portfolios and because they may win leases that they would not otherwise have gotten because of the opportunity to be part of this more flexible national contracts.

More flexible work environments. Many organizations have increased the flexibility of their portfolios by providing more flexible work environments, through strategies such as hotelling, or some other form of shared officing, and more standardized space. Both of these situations achieve flexibility by limiting the extent to which the space is customized to the occupant. Some organizations that have implemented hotelling approaches have found that the cost reduction was minimal but that true benefits were the increased flexibility they achieved during tight real estate markets and the increased worker satisfaction of those who appreciated the ability to work remotely.

Clustering. While it is important to understand the demand uncertainty for individual spaces, it is less important when considering a group of fungible properties. Large organizations can consolidate activities into one general location, for example, within a campus or collection of buildings. Then the risk that any one individual business unit needs more or less space can be diversified across other business units. While one group is growing another might be shrinking. Once more, the lease term does not need to match the specific life cycle for a project.

Over the years, we've seen significant improvement in organization taking advantage of the benefits of consolidation. In major locations, most organizations no longer let individual business units go out on their own to secure properties. At the same time, this approach can be taken too far. When there are significant moving costs and reconfiguration costs to support different business needs, the benefits of consolidation may be less than costs. In addition, users need to consider their need to diversify activities across locations.

CoreNet Global's Core 2010 resource classifications present a concept that complements clustering. In this case, the workplace organization classifies its the properties based on their "commitment" to the overall property portfolio, identifying those properties that are core to the

portfolio and other properties which are more “flexible” and easier to dispose of if not needed. In this way, when companies are making long-term plans they can focus their major investments in core properties and avoid decisions to make major investments in “flexible” properties. At the same time, they need to ensure that they have enough short-term flexible space to respond to changing business requirements.

The challenge in these situations is identifying the right balance of owned properties, long-term leases, and short-term leases. Generally, a good balance can be achieved intuitively, for example, by using an approach similar to that shown earlier in Figure 3.

In other disciplines, optimization modeling for inventory management and supply chain management provide key insights into setting the appropriate capacity when there demand is uncertain. These techniques, which combine financial modeling and management science, have enabled organizations to save millions of dollars. We are starting to do some analysis in this area but don't have any clear findings on our ability to find better solutions using this approach.

Once a business has developed a cluster of properties, it can be a very complex analysis process to determine how to best relocate business activities when business requirements change. In these situations, we have found significant added value of through more sophisticated analysis approaches. To evaluate these situations, we have developed proprietary software that extends the optimization modeling techniques mentioned above. Like internet search engines that quickly and systematically search through millions of web sites, mathematical optimization techniques quickly search through the possible relocations to find the set that best meet the user's goals and requirements. This approach goes beyond databases and spreadsheets, enabling users to consider millions of different combinations of real estate relocation, construction and other workplace activities to find the combination that best meet their goals.

The savings from better analysis in this area can be in the millions. In a back-office consolidation for a financial services firm, we identified a solution that met all the business requirements, would have reduced labor and real estate costs by over \$20 million, and would have reduced the number of lay-offs required by one-third through better relocation of activities to locations where workers can be retrained for new positions. In another situation, the

consolidation of two financial firms' properties within one city, we identified a solution that saved \$16 million by relocating activities into spaces that required less reconfiguration and freeing up space that had greater sublease value.

In some cases, we find the same solutions that we identified intuitively. The advantage of optimization modeling in these situation is that it provides a systematic framework to include all relevant factors and enables users to quickly try many different alternatives. This process also enables real estate executives to show senior executives that they have considered all of the possible alternatives.

Metrics

“The single most important reason why corporate real estate executives and facilities managers fail to have an influence in the boardroom is that they lack the information to demonstrate that they are doing a great job.” Christopher Hedley, “Getting to grips with information.”

Increasingly, senior executives are evaluating the performance of workplace organizations through selected metrics. This trend is likely to accelerate amid greater concern over corporate accountability. To the extent that decision makers are evaluated on these metrics, they also drive decision making

While workplace organizations recognize that success depends on more than costs, costs continue to receive the greatest focus. A common metric is the cost per person housed or served. To explain performance, this metrics can be decomposed into three primary components. Changes in each of these components drives changes in occupancy costs.

$$\frac{\text{Cost}}{\text{Persons Housed}} = \frac{\text{Cost}}{\text{Square Foot}} * \frac{\text{Square Foot}}{\text{Seat}} * \frac{\text{Seats}}{\text{Persons Housed}}$$

Consistent measures. To provide valuable measures of performance and to motivate good decisions, metrics need be consistent and accurately reflect cost differences. Often the information for these metrics resides in separate, tactically-focused databases. Combining data from different systems can lead to multiple values for the same data and inconsistencies. Before workplace executives can demonstrate performance, they need address more resources to making sure that their data meets both their strategic needs as well as their tactical needs.

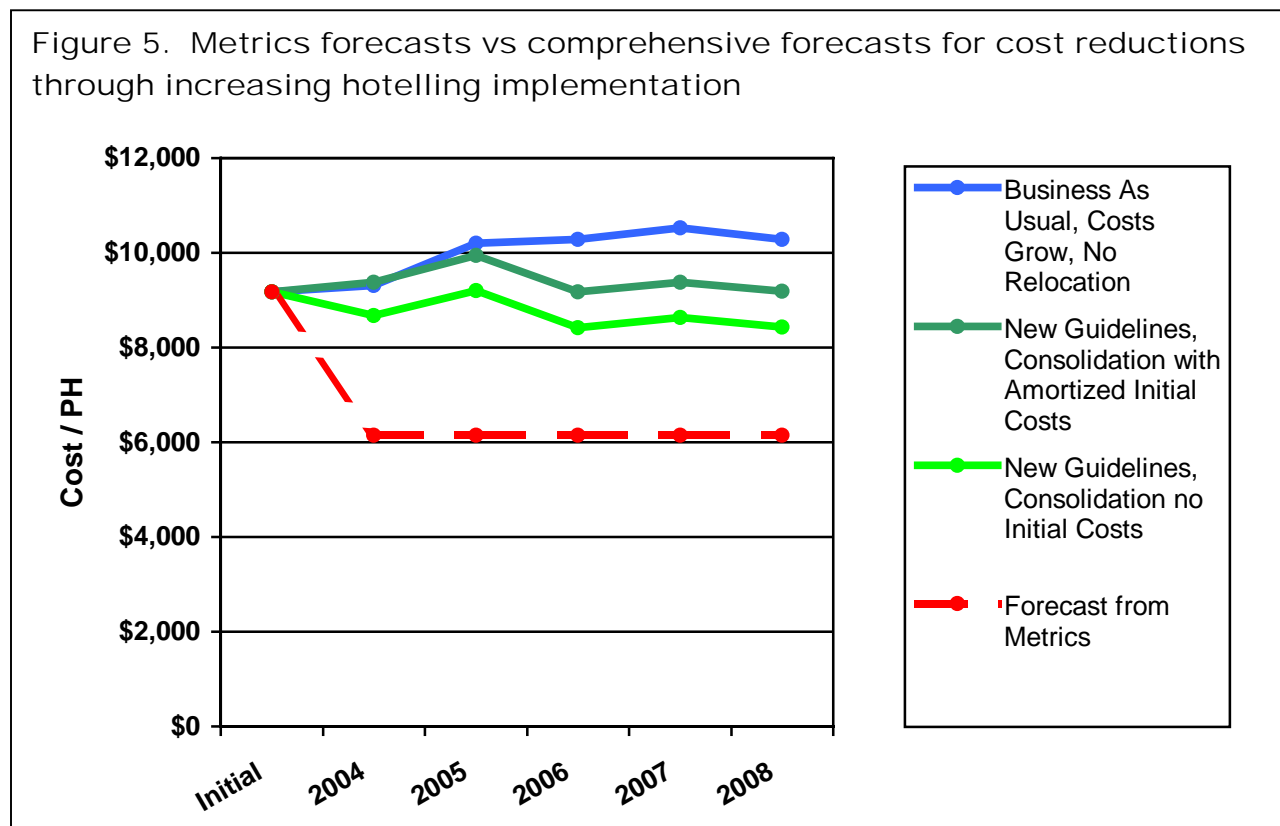
One of the areas that is most often mismeasured is the cost of capital, as measured in the cost of owned properties relative to leased properties. Most organizations now require a discounted net present value analysis for major decisions. Through this approach, the analysis explicitly reflects the fact that if the capital wasn't invested in the workplace assets, it could be invested elsewhere. Yet, when it comes to metrics and chargebacks, the cost of capital that is measured in the discount rate is ignored. The cost of owned property often only includes depreciation, operating expenses, and property taxes. There is no charge for capital invested; it's like having a mortgage with zero interest.

When performance is based on calculations involving these measures, this oversight can drive poor decisions. Within the workplace organization, business considerations may suggest leasing property but the performance metrics will be lower if the properties are owned. For business units occupying the real estate, owned properties may look less expensive as well. For example, a real estate organization for a financial service firm recommended that some business units relocate from Manhattan to less expensive locations in New Jersey. Once this space was vacated, they would then be able to lease the space to outside tenants at the current high market rates. But because the business unit was being charged only depreciation and operating expenses, its costs in Manhattan appeared less than those in New Jersey. But once the real estate organization shifted their charges for owned properties to be market rates, the business unit's cost reflected the true opportunity cost, and the business unit leaders readily agreed that New Jersey was a smart move.

A key challenge in demonstrating good performance is being able to explain why any negative changes are not the result of poor performance. It is not sufficient to say that increasing costs reflect circumstances beyond the workplace organization's control. Executives need to be able to show that these negative results were anticipated, and that the cost to avoid them was too great compared to the benefits. Better comparative data and more comprehensive decision making, including some of the techniques described earlier, will help in these explanations.

As part of this process, workplace organizations are not just responsible for reporting these measures, they also must be able to set targets and then explain the differences when the targets aren't met.

Setting the targets for these metrics can be even more challenging than explaining them. While it might seem possible to use the simple decomposition specified earlier to set targets, this approach can lead to unrealistic forecasts for improvement, setting the workplace organization up for failure. Figure 5 shows the results of implementing a hotelling system to reduce space usage estimated through the simple metrics and through a more comprehensive analysis approach. While the simple analysis projects significant cost savings, the comprehensive model shows almost no change. The simple analysis did not take into account the implementation costs and the limited opportunities for disposing of the excess space.



Conclusion

Workplace organizations generally lag behind their counterparts in other corporate disciplines in adopting more sophisticated analysis approaches. In this paper, we’ve described several ways in which workplace decisions can be improved:

- Focus on a range of outcomes rather than point estimates
- Use probabilities and simulations to compare costs and risks

- Consider both product life cycles and tenant-specific improvements in setting ownership structure and lease terms
- Cluster properties and identify those that are core to the organization
- Ensure that metrics are consistent
- Use comprehensive models, not metrics, for forecasts

These recommendations and the related analytical approaches can lead to better decisions and the ability to demonstrate the value of the workplace organization. Even if workplace executives can identify good recommendations intuitively, senior executives are demanding more accountability and that will require more comprehensive analysis.