For more than a decade, it has been asserted that “24-hour cities” outperform “9-to-5 cities” for investors in commercial real estate. Since 1995, the widely-read survey of Emerging Trends in Real Estate1 has proposed that traditional market distinctions such as the comparison of central business districts (CBDs) to suburbs matter far less than the capacity of places to sustain activity well beyond the bounds of the traditional business day.

Yet this claim, though often discussed, has never been rigorously examined. Though there are a number of investments firms that speak about programs of investing in 24-hour locations, a search of the academic and the industry literature failed to uncover any studies that took a serious and detailed look at the numbers that might support or refute the 24-hour city hypothesis.

This paper and two others to follow attempt to bring together for the first time the component elements that would permit a sound quantitative analysis of those claims, and the investor expectations they presumably reflect. Emerging Trends develops its annual report by a broad survey of hundreds of developers, investors, lenders, consultants, analysts, academics, and others with high-level professional interest in commercial property. The annual publication, therefore, represents the combined perspectives gleaned from the interviewing process, as interpreted by the report’s authors and editors. Its assertions reflect the judgments of an influential panel of experts. Given the wide circulation of the report, and its reputation in the U.S. commercial property industry, its claims can help to shape the outlook for this sector. The ‘principle of anticipation’ holds that the value of an asset is equal to the anticipated future benefits of ownership. Hence, any information such as the Emerging Trends report that helps articulate expectations should be carefully examined.

This paper focuses on office rents for a hypothesized set of 24-hour cities, and a complementary set of 9-to-5 cities. Where data is available, information on the individual cities will be discussed, but the burden of the analysis will be carried by the groups of cities considered reflective of 24-hour status, versus those regarded as generally more tied to limited business hours. The cities included in each of the proposed clusters are:

**24-hour markets**
- Boston
- Chicago
- Las Vegas
- Miami
- New York
- San Francisco
- Washington, D.C.

**9-to-5 markets**
- Atlanta
- Dallas
- Los Angeles
- Minneapolis
- Philadelphia
- Phoenix
- Seattle

In each cluster, I have selected those cities most frequently mentioned by Emerging Trends, but added other cities (Miami and Las Vegas in the 24-hour group, Minneapolis and Seattle in the 9-to-5 group) that may fall somewhere between these extremes.

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1 Emerging Trends was originally a project of the Real Estate Research Corporation, and was co-published by the Equitable Life Assurance Society of the United States. It has experienced changing sponsorship over the years, and is now co-published by the Urban Land Institute and PricewaterhouseCoopers.
in between the two paradigmatic types. The added cities serve to add some balance, too: bringing to the 24-hour group some Sunbelt exposure, and adding some coastal markets to the 9-to-5 grouping.

**Theoretical considerations**

Urban economic theory points to the appropriate measure of agglomeration economies, namely differential land rent between intense clusters of economic activity, such as the central business districts (CBD) and sub-centers of metropolitan areas. In the monocentric city model canonically developed by Alonso, Mills, and Muth (A-M-M), land rents are highest in the CBD and then fall off with distance from the center. From the mid-twentieth century forward, the monocentric city model became less descriptive of actual metropolitan areas, as transportation and communication costs fell and the production of goods dispersed from urban centers.

Sub-centers or ‘edge cities’ sprang up around cities. If the urban center has become devalued vis-à-vis new sub-centers, that should be manifested in differential land rents. Changes in those differential land rents would indicate if the value of agglomeration economies is falling (the death of distance hypothesis), or rising (the expansion of the information economy in urban centers hypothesis).

During the 1980s and 1990s, the polycentric or multinodal character of many U.S. metro areas becomes apparent. The stress such urban trends placed upon the A-M-M model was recognized by many investigators. By 1993, Mills himself had conceded that the generality of the Alonso-Mills-Muth model could no longer be asserted as a tenable proposition. Yet the power of the model can be seen by its continued use as a point of departure long after this concession. For many metro areas, A-M-M still serves as an adequate approximation of urban spatial trends.

Far from rejecting the value of the model, exceptions prompt a search for a more inclusive theoretical framework, as Kuhn (1962) described in his influential work, *The Structure of Scientific Revolutions*. The A-M-M model, in common with most economic equilibrium approaches, is grounded in Newtonian principles of physics and mechanics. Those fundamental sciences have, in the 20th century, advanced to accommodate stochastic elements unknown to Newton and are now pursued as quantum physics and quantum mechanics. The still-powerful explanatory power of A-M-M as a theoretical model is confirmed by the evident tendency of most U.S. cities to sprawl outward and the persistent evidence that commercial, as well as residential, land uses grow away from the center in the majority of U.S. metropolitan areas. This can be seen as an example of economic entropy across the intrametropolitan, as well as the intermetropolitan geography of the United States.

Researchers in complexity theory have been seeking to model elements of emergent self-organization against the background of entropy posited by Newton’s Second Law. This approach has promise both for understanding economic clustering in multi-nodal cities and for 24-hour downtowns as well. The work of Bettencourt, et al., (2007), which discerns differences in the ‘metabolism’ of cities, namely their capacity to turn resources into economic and social energy, may be an early example of the usefulness of this approach.

**Historical Rent and Vacancy Data**

The empirical basis for this paper is commercial office rents in major office markets of the United States. The

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2 See works by Greene, 1980; LeRoy and Sonstelie, 1983; Steen, 1988; Gin and Sonstelie, 1992; White, 1994; Baum-Snow and Kahn, 2005; Glaser, Kahn and Rappaport, 2008 as cited in the bibliography.
Theoretical link between land rents and office rents is strong, and data on office rents is more readily available. The sample is derived from 122 major office markets in 52 MSAs over 21 years (1987-2007) in a database maintained by Torto Wheaton Research. This analysis uses data drawn from the sample, analyzing variation in real rents and occupancy.

This paper does not develop and estimate here a multi-equation model seeking to regress the relevant variables of real estate markets. That is an objective of a larger project now underway. Nor does it examine the risk-adjusted returns and their impact on capital flows, themes that will be explored in subsequent papers in this series.

The present focus is to use real office rents (expressed in constant 2007 U.S. dollars) and vacancy rates in many metropolitan markets over time to determine if the asserted superiority of 24-hour markets can be observed in the data series normally used to measure real estate performance. Further, given the view that urban agglomeration economies decay with distance (Acs 2003) and that producer services activities tend to cluster in large metropolitan areas (Drennan 2002), the paper explores the question as to whether central locations command a premium over alternative locations in the same urban area. If so, have such premiums increased, decreased, or disappeared?

This paper builds upon work previously co-authored with Matthew P. Drennan of UCLA, now out for peer review (Drennan-Kelly, 2009). That research pointed to steady or enhanced real rents in some markets (expansion of the information economy) and real declines in other markets. A key element in the research strategy for that paper was the disaggregation of the markets by size and by concentration.

For purposes of analysis, data generously supplied by Torto Wheaton Research was segmented into four classes of commercial office markets. The 49 markets with complete data sets were sorted into four analytical groups, defined below, and listed in Table 1. The aggregate volume of these markets is 3.46 billion square feet of net rentable area, an average of just over 70 million square feet per market. The mean ratio of downtown space to total in the sample is 33.79%.

I. **Primary, Strong Core Markets** are those above the sample mean for both the size of the metro market and the ratio of downtown space to total. Seven markets comprise this subset.

II. **Primary, Weak Core Markets** are those above the mean in market size, but below the mean of downtown space as a percent of total inventory. There are six markets in this subset.

III. **Secondary Markets** are those having between 35 and 70 million square feet of inventory. In the table below, the secondary markets having more than 33.8% of total in their downtowns are indicated by an asterisk (*). Sixteen markets are designated as “secondary”.

<table>
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<tr>
<th>Markets by Analytical Grouping</th>
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<td>Primary, Strong Core</td>
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<td><strong>Boston</strong></td>
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Source: Drennan-Kelly (2009), forthcoming
IV. Tertiary Markets are those with less than 35 million square feet of office space. The remaining twenty markets are included in this category. Tertiary markets whose downtowns comprise more than 33.8% of total inventory are indicated by an asterisk (*).

Table 1 has been slightly modified from its original form in Drennan-Kelly, by noting 24-hour markets in **bold italic** font, and 9-to-5 comparison markets in **bold**.

The hypothesized set of 24-hour markets differs somewhat from the Drennan-Kelly clustering of ‘strong-core, primary markets.’ The cluster considered in the 24-hour city grouping includes Boston, Chicago, Las Vegas, Miami, New York, San Francisco, and Washington, D.C. Five of these are classified “strong core, primary” in the Drennan-Kelly categorization. Miami is a secondary market, and Las Vegas a tertiary market.

The presence of five markets common to each group yields the unsurprising result that summary data for the ‘strong core primary’ markets and the ‘24-hour city’ markets are extremely similar. Both clusters show substantially higher rents than the average level of all U.S. markets. This is true within the CBDs and for the suburbs as well. The rent premium for CBDs in both clusters is quite obvious, especially at market peaks.

Drennan-Kelly found virtually no rent premium discernable for downtowns across the entire sample of MSAs provided by Torto Wheaton (Figure 1). The difference was only one or two dollars per square foot (constant 2007 US$). For the primary strong core markets, the differential ranges between $5 and $17 per square foot. The 24-hour city cluster registers a differential of $6 to $12 per square foot, a narrower range than the primary strong core cluster. The reason for the difference is in higher suburban rents surrounding the 24-hour downtowns, suggesting a positive regional influence from 24-hour activity.

Over the 21-year timeframe reviewed, real rents in 24-hour city downtowns have commanded a 28.8% premium over their adjacent suburbs (Figure 2). That rental premium has expanded sharply since 2000, and stood at 41% as the fourth quarter 2007. The premium was at a low of 14% in 1997, but has been between 20% and 29.9% in twelve of the 21 years, between 30% and 39.9% in six of the years, and above 40% in 2006 and 2007. Real rents surged most strongly in the late 1990s, coincident with the tech boom, but also reflecting the long and quite robust overall job expansion that characterized the national economy toward the end of the last century. From 1987 to 2007, real rents grew most

![Figure 1: Full Sample of Markets](image1)

Source: Data courtesy of Torto Wheaton Research; analysis by Hugh Kelly

![Figure 2: For Set of 24-hour Cities, Downtown Rents Average 28.8% Higher than their Respective Suburbs](image2)

Source: Data courtesy of Torto Wheaton Research; analysis by Hugh Kelly
strongly in the Manhattan office market and showed gains in Las Vegas, San Francisco, and Washington’s downtowns as well. For suburban markets in 24-hour metros, Las Vegas, Miami, and San Francisco posted gains in inflation-adjusted rents between 1987 and 2007. Over that period, 24-hour CBDs tended to have higher occupancy rates than their associated suburbs. Vacancies (Figure 3) were much less volatile in 24-hour downtowns, and over the roughly two decade time span averaged 2.42% lower than for the surrounding suburban office markets. Not only were the suburban markets more volatile than the 24-hour downtowns (with a standard deviation for their vacancy rates of 4.08% vs. 2.80% for the CBDs), but the variation was greatest at the upper end of the vacancy range with a peak 19.7% for the 24-hour metro markets, and a 15.5% peak for the downtowns as a group. The range of the mean annual vacancy rate for 24-hour downtowns was 9.2 percentage points, compared with 12.5 percentage points for the suburbs.

By contrast, performance in the 9-to-5 cluster of markets is remarkably homogeneous when downtown is compared to suburb. Since 1993, in fact, suburbs have maintained a modest premium over CBD rents, although this is not as dramatic as Drennan-Kelly found for ‘weak core primary markets.’ The likely reason is that two of the 9-to-5 markets posited for this study are Philadelphia and Seattle, both of which are in the Drennan-Kelly ‘strong core primary’ group. Furthermore, Minneapolis is a secondary market by size, but has a strong CBD inventory concentration at 45.6% of total MSA office space. All three of these market display real rents that are, on average, very similar for their downtowns and their suburbs. For the seven posited 9-to-5 metro, a slim 0.5% average real rent premium is measured in favor of the suburbs (Figure 4), dwarfed by the 28.8% premium earned by CBDs in the 24-hour metro cluster. The 9-to-5 markets failed to regain their prior peak of real rents in the market cycle which reached its acme in 2000, and real rents in 2007 were 27.8% lower for 9-to-5 CBDs when compared with 1987. For suburbs, the decline in real rents over two decades was about half as much – 13.9%, but still seriously lagging the 24-hour city cluster. Only Seattle showed a gain in real rents between 1987 and 2007, and this market managed to do so both in its downtown and suburbs. Dallas’ downtown had the most alarming drop in real rents over the period, more than 50%.

The suburban 9-to-5 markets had a 116 basis point advantage in average occupancy, consisting mostly in their descent to single-digit vacancy in the

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**Figure 3:**
For Set of 24-hour Cities, Downtown Vacancy Average 242 basis points lower than their Respective Suburbs

![Graph showing downtown vacancy rates compared to suburban rates over time](source)

Source: Data courtesy of Torto Wheaton Research; analysis by Hugh Kelly

**Figure 4:**
In 9-to-5 Metros, Very Little Difference in CBD and Suburban Rents Overtime

![Graph showing CBD and suburban rents over time](source)

Source: Data courtesy of Torto Wheaton Research; analysis by Hugh Kelly
1996 – 1998 period. Throughout the 1990s, in fact, the suburbs boasted higher occupancies than the downtowns in the 9-to-5 cluster of metro areas (Figure 5). The vacancy rate range over the period is smaller for the CBDs of the 9-to-5 group, at 9.87 percentage points, than the range for the associated suburbs, at 13.84 percentage points. Yet both peaked at just above 22% vacancy, the suburbs in the final years of the 1980s and the CBDs in 1993. Since 2000, however, the CBD/suburb occupancy differential has been very narrow for 9-to-5 metro markets.

Figure 6 illustrates the positive real rental differential earned by 24-hour markets when compared with 9-to-5 markets, when downtowns are matched with downtowns and suburbs with suburbs. The 24-hour downtowns have registered real rent premiums ranging between $8.15 per square foot (in 1991, at the trough of the Savings and Loan industry collapse) to $22.40 per square foot (in 2000, just before the bursting of the dot-com bubble). Much of the spike in 2000, in fact, is due to the sharp rental rise in the San Francisco area, with its high-technology and venture capital concentration, and in New York, where the stock market was surging to a cyclical high-water mark. Over the 21 annual observations, the average premium for 24-hour CBDs has been $12.11 when compared with 9-to-5 downtowns. The advantage does appear to carry over to the suburbs, but in a much attenuated fashion. (This is consistent with the agglomeration attenuation findings of Rosenthal and Strange, 2005a and 2005b). The suburban rent premium for 24-hour markets vis-à-vis the 9-to-5 panel is $4.19 in real dollars, about 35% of the premium earned by the downtown 24-hour panel. As with the CBDs, the low point in the premium for suburbs was in the early 1990s, but slightly later and for a bit longer period than the downtown lull. The suburbs of the 24-hour metros did not seem to partake of the 2003 – 2007 cyclical upturn in anything like the robust response of the 24-hour downtowns.

This is undoubtedly related to the comparative vacancies displayed in Figure 7. On this graph, the negative slope of the y-axis indicates the degree to which vacancies are lower in 24-hour markets than in 9-to-5 markets, a condition that describes the entire period with one brief exceptional period: suburban vacancy rates were slightly lower in 1996.
and 1997 in the 9-to-5 markets. The sharply increasing rent differential for 24-hour downtowns (compared with 9-to-5 downtowns) has fluctuated between $10 and $22 per square foot since 1996, (about the time of the early discussion of 24-hour markets in Emerging Trends in Real Estate), a period in which the occupancy rate advantage has favored 24-hour downtowns by 484 and 646 basis points. Over the same period, suburbs in 24-hour metros have never held an advantage of more than 368 basis points (in 2000), and have averaged just 106 basis points of occupancy advantage over 9-to-5 metro suburbs in the 2001 – 2007 time frame.

Taken together, the evidence appears fairly convincing that the hypothesized 24-hour markets, especially their downtowns, have posted superior results in inflation-adjusted rents and in office market occupancy, when compared with the posited 9-to-5 metros. Within 24-hour metros, there is a clear rental pricing differential with higher prices in the central business district. Though cyclical softening affects this differential, it has not entirely disappeared at any of the years reviewed. Moreover, since 1996 24-hour CBDs have been able to sustain higher occupancy rates than either their own suburban areas or the 9-to-5 metros’ downtowns and suburbs.

The next task to is evaluate what, if any effect, these superior supply and demand fundamentals have had on investment pricing and returns, and this will be the subject of the following paper in this series.

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**Figure 7:**

Vacancy Rates in 24-hour CBDs have been significantly lower than in 9-to-5 market; Suburban differential has decreased over time

![Graph showing vacancy rates in 24-hour CBDs vs 9-to-5 markets]

Source: Data courtesy of Torto Wheaton Research; analysis by Hugh Kelly


