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Publication Date

1988-03-01

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WORKING PAPER NO. 88-141

THE MEASUREMENT OF EFFECTIVE RENT

BY

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Working Paper 88-141

March, 1988

ACKNOWLEDGMENTS

This paper could not have been prepared without the long term interest and assistance of staff at Grubb and Ellis offices in San Jose and San Francisco. William Puterbaugh, Vice President, Grubb and Ellis in San Jose, has made lease agreements and other information available to use on an ongoing basis. The care his staff has clearly taken in maintaining lease and building inventory data sets made this analysis possible. Charles Froland, formerly Research Director with Grubb and Ellis and currently Associate Treasurer, Stanford University, participated with us early in discussions of effective rent definitions. Richard Betts, President of Richard M. Betts/Property Analysis, provided suggestions on references and the conceptualization of effective rents. Randall Pozdena, Assistant Vice President, Banking and Regional Studies at the Federal Reserve Bank in San Francisco, was very helpful in selecting appropriate interest rates in the calculations. Several graduate students shared the burden of data preparation, including Willie Makundi, Ignacio Dayrit and Bruce Griesenbeck. Linda Kimball, formerly a research analyst with the Center, participated in earlier stages of our research on R & D space and helped in early conceptualization and data gathering for this paper.

THE MEASUREMENT OF EFFECTIVE RENT

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ABSTRACT

Rent levels and their rate of change are the key indicators of market conditions for commercial and industrial space. The use of contract rent (the initial rent paid by the tenant) fails to account for many of the factors in non-residential rent agreements, including the level and timing of rent adjustments, free rent, and negotiated improvements to the property. In a rapidly changing market, contract rents may provide data significantly different from actual market conditions.

This paper examines alternative measures of "effective rent" as indicators of market conditions for research and development (R&D) space in the Santa Clara Valley. Using data on lease agreements kept by brokerage firms from 1980 through July, 1987, alternative measures of effective rent are analyzed and compared with contract rent data. These measures include adjustments for free rent, rent escalations, present discount value and tenant improvements.

Analysis of these rent calculations indicate that contract rents are not as sensitive to movement in the non-residential real estate market as effective rent measures. In the seriously overbuilt R&D market of the early 1980's, contract rents maintained their relative strength while effective rents were declining. Contract rents also mask significant regional differences. A greater variation in rents is apparent between core and peripheral areas when all factors of the lease arrangement are taken into account.

The research indicates the importance of tracking and calculating effective rent in changing and complex markets. By providing a "net" assessment of the major factors in lease agreements, researchers and real estate professionals can arrive at a better understanding of current and future market conditions.

THE MEASUREMENT OF EFFECTIVE RENT

I. Introduction

The 1980s have seen a major surge in nonresidential construction activity. With this construction have come sharp increases in vacancy levels in rental office space and "R&D" style industrial space. Much of the debate over how a massive oversupply of office and industrial space arose has centered on supply factors, ranging from the 1981 tax law changes regarding accelerated appreciation to the increasing amount of money available for investment in nonresidential buildings (Sears [1986]).

Less attention has been paid to the demand side of the equation. What happened to employment growth and the use of space during this period and why did lenders so badly misread the market in many areas, allowing substantially more space to be built than could be rented? Many markets appear to have expanded where investors misinterpreted active real estate markets (i.e. many deals being struck) with increases in the net level of demand (an increase in occupancy levels and/or in the level of rent received per square foot). Thus, market analyses often ignored aggregate trends in the market while focusing on particular aspects of a limited number of rental agreements.

This paper is the third in a series that closely examines

elements of the demand for industrial space in the San Francisco Bay Area's Silicon Valley. The first two papers examine aggregate trends in employment and net and gross absorption of space and look in detail at the characteristics of tenants in R&D space (Kroll and Kimball [1986], Kroll [1987]). This third paper addresses the issue of rent. Rent levels and their rate of increase have been major factors in evaluating the strength of office and industrial markets. It is important to understand to what degree rent reflects conditions in the market and what other factors must be considered with rent to obtain an accurate picture of trends in the market.

II. Issues in the Measurement of Rent

Rent levels are a key indicator of market conditions for speculative commercial or industrial markets. Theoretically, rent is a driving factor in determining the amount of space added over time and how much of new and existing space is absorbed (Rosen [1984], Shilling, Sirmans and Corgel [1987], Hekman [1985]). Practically, however, measurement of rent is not straightforward. A building owner's asking rent will differ from the initial level agreed to in a lease, and the initial level may be modified over the life of the lease by special lease provisions such as free rent allotments and rate increases over the term of the lease.

These details become quite important in analyzing a market that is changing rapidly. For example, a market with rapidly expanding stock and high vacancy rates may show rising asking rents, and even rising "contract" rents in new leases while a

more detailed look at lease provisions would indicate growing difficulties in attracting tenants. In markets such as California's heavily overbuilt Santa Clara County industrial market and newly established San Francisco area suburban office markets, brokers have begun to recognize the inadequacy of asking rents or initial lease agreements in describing market trends. Instead, "effective" rent is tracked--estimates that try to adjust for factors such as free rent and price increases. Unfortunately, no consistent method has been developed to assess effective rents, and the methods used vary considerably among sources.

This paper argues that the use of contract rent (the initial rent paid by the tenant), rather than effective rent in market analyses is likely to distort the picture of the market provided. After reviewing the use of rent as a factor in the analysis of real estate markets, the paper describes the leasing processes that lead to the need for an effective rent calculation. The major elements affecting effective rent levels are then described and alternative measures of effective rent discussed. These effective rent measures are applied to a set of lease agreements for industrial space in the Santa Clara County area between 1980 and 1987. Finally, the implications of alternative rent measures for understanding the Santa Clara County market are compared.

III. Definitions and Measures of Rent in Real Estate Literature

Rent has been used in a number of different papers examining nonresidential real estate markets. The type of rent measured

and the sources of rent for empirical studies varies among these papers. Rents used may be an areawide average (e.g. for a city as a whole), the average rent paid per building, or the average among specific leases. Citywide averages may come from several sources. Rosen [1984] and Nelson [1980] use average rents as reported by commercial brokers. Brokers generally track either average asking rents for buildings on the market in that year or the average contract rent for leases signed that year.

Schilling, Sirmans and Corgel [1987] use survey data published by the Building Owners and Managers Association (BOMA). The data are unweighted averages of rental cost per square foot for buildings responding to the BOMA survey, thus reflecting actual payments received for space under lease, regardless of the term of the lease or when the lease was written. Hekman [1985] argues that the BOMA data are biased by the small size of the sample. Instead, he uses data from The Office Network, National Office Market Report, which reports average rents for all office buildings by location.

Some authors concentrate on the limitations of all these rental measures. Cannaday and Kang [1984] point out that most of the rental information sources described above report the actual contract rent received (regardless of when the lease was written) rather than the market rent that space could command if the building were on the market today. Their work develops a regression model to estimate a hedonic (market) rent from characteristics of the building, its location, and specific lease terms demanded by the owner. Brennan, Cannaday and Colwell

[1984] demonstrate that the contract rent will vary with the lease structure, affected by such factors as the term of the lease, the number of months of rental abatement, and whether the lease includes CPI escalation.

Barnes [1986] directly addresses the effects of rental concessions on effective rents and the value of a building. Using a simple averaging technique to calculate effective rents, he argues that a concession such as free rent can have a "tremendous effect" on the appraised property value.

Two important aspects of the problem are not addressed in these studies. First, how can lease conditions be aggregated into the contract rent to produce an accurate measure of "effective" rents? Second, when is the use of contract or asking rents rather than effective rents in a market assessment most likely to give a distorted picture of market conditions?

IV. The Leasing Process

In a healthy, gradually expanding market, the leasing process may be quite standard, with little variation occurring among leases in the term of the lease, the type of escalators included over time, and short initial periods of rental abatements. In a rapidly changing market, however, leasing activity may become highly competitive, either from the point of view of the tenant or building owner, and lease terms may vary dramatically as tenants or building owners each try to reach "creative" rental agreements.

What goes into these "creative" lease agreements? In a market with growing demand and very low vacancy rates, the contract rent may hide a higher long-term value of the lease because many leases may include CPI or other escalation clauses. Markets with high vacancy rates and several years supply of space may find a far lower incidence of escalation clauses, while standard items may include rental abatements of up to 24 months and significantly higher tenant improvement allowances. In heavily overbuilt markets, brokers also report such agreements as equity clauses for major tenants, and vacation or automobile bonuses for brokers.

Several problems for analyzing real estate markets arise from this process. Probably the most serious issue that arises is how well do contract rents reflect changing market conditions over time. Consider for example the downtown San Francisco office market, which went from a vacancy level of below 1 percent in 1981 to 15 percent in 1986. The tremendous change in vacancy (and absorption) levels has led to a shift from lease agreements which included cost-of-living increases as a standard item to agreements with substantial rental abatement concessions.

Other problems with the use of contract rather than effective rents include that of comparing rents among markets or among niches within the same market. Rents may appear similar among markets with very different vacancy levels and rates of absorption if other types of lease concessions are in use. For example, within a single market area, owners with buildings in the periphery of a rapidly expanding and overbuilt industrial or

office market may choose to use lease concessions other than drops in rent, to keep the contract rent level closer to what they believe the space can command in the longer term.

Finally, in the most competitive overbuilt markets, some of the significant leasing give-aways may not be reported or may be very difficult to classify. Despite this limitation, a significantly better measure of rent may be made by incorporating the major lease agreements into an effective rent calculation.

V. Deriving A Measure of Effective Rent from Lease Agreements

If the contract rent is defined as the initial dollar per square foot payment to be made by the tenant (after any initial period of rental abatement), then several factors are likely to influence the level of "effective" rent (the value landlords actually receive from the rental agreement). These factors include:

- o Months of rental abatement (free rent)
- o Rent escalation over the course of the lease (either specified dollar amounts or tied to a price index)
- o Total term of the lease (number of months)
- o Tenant improvements (up-front payments by the landlord for improvements to the shell of the building)

Effective Rent (1)--Free Rent

The simplest (and most common) measure of effective rent is to average out the months of effective rent over the total term

of the lease. This is illustrated in equation 1:

$$(1) \quad EF = \frac{1}{M} * Rc * (M - f)$$

Here, Rc is the contract rent at the outset of the lease, M is the total number of months in the lease, and f is the number of months of free rent. (See, for example, Barnes [1986])

Effective Rent (2)--Escalation

An expanded approach would take into account any escalation in rent paid over the term of the lease. Rent at time m is determined by the specific escalation requirements of the lease. These may be either a specified dollar amount of increase in particular months, or an increase at the rate of growth of the CPI (or some other price index), again set for particular months. In some leases, the increase may be tied to the CPI, but capped. For example, one Santa Clara County lease includes a CPI bump in the third year of the lease, capped at 8 percent annually. Before free rent is taken into account, a simple modification of average rent received, to adjust for cost of living increases would be:

$$(2a) \quad EB = \frac{1}{M} * \sum_{m=1}^{m=M} Rm$$

where Rm is the rent in month m, including all escalations, and M is as defined above.

Adjusting equation (2a) to account for free rent, gives an equation that accounts for both free rent and bumps:

$$(2b) \quad EP = \frac{1}{M} * (EB * M - Rc * f)$$

where all variables are as defined above. Equation (2b) assumes that all rental abatement applied to the initial contract rent. There are a few leases for which Equation (2b) will not be appropriate. These are cases where rental abatements are offered at some time other than the outset of the lease. Special adjustments would be needed, for example, in a case where free rent is offered for the 24th through 30th months of the lease, after a cost escalator comes into effect.

Effective Rent (3)--Adjusted to Present Discounted Value

Many commercial and industrial brokers who calculate effective rents rely on some version of equation (1) or (2b). These equations adjust for periods when rent is below or above the contract rent. However, neither equation takes into account the timing of rental adjustments. As many appraisers and research professionals in the brokerage industry recognize, timing can have a significant effect on the value of the lease, if the rental stream is discounted to a present value.

For example, consider three building owners, each of whom has agreed to a lease with a 60 month term. Owner A receives \$0.60/month (per square foot) steadily for the full 5 years, Owner B receives no rent in the first 24 months and \$1/month in the last 36 months of the lease, and Owner C receives no rent in the first 24 months, \$0.80/month in next 12 months, \$1.00/month

for months 37 through 48, and \$1.20/month for the last 12 months of the lease. Using Equation (2b), all three landlords will have effective rents of \$0.60, while contract rents range from \$0.60 (Owner A) to \$1.00 (Owner B). If the rents are discounted at an 8% discount rate, however, Owner A's rental stream will be worth 8.4 percent more than the rental stream received by Owner B and 9.6 percent more than for Owner C (see Table 1).

A more complete view of effective rent, then, would be to calculate the present discount value of the stream of rents agreed to in the lease and to then translate this value into a constant stream of payments over the life of the lease. The equation for calculating the present discounted value of the stream of payments is shown in Equation (3a).

$$(3a) \quad PDV = \left[\sum_{m=1}^M \frac{R}{(1 + i/12)^m} \right]$$

Here R , m , and M are defined as above, and i is the nominal interest rate at the time the lease was written. A nominal, rather than real interest is used for these calculations, to account for the effects of inflation.

An amortization equation is used to translate the discounted value of the rental stream back into an even set of monthly payments, as shown in Equation (3b).

TABLE 1: COMPARISON OF EFFECTIVE RENT AND PRESENT VALUE ESTIMATES (60 month terms, 8% discount rate)

RENT ESTIMATES	OWNER A (\$0.60/mo./sf)	OWNER B (\$1.00/mo./sf, 2 yrs free)	OWNER C (2 yrs free, then yearly bumps \$0.80/\$1.00/\$1.20)
Nominal Rent	\$0.60	\$1.00	\$0.80
Effective Rent (not discounted)	\$0.60	\$0.60	\$0.60
Present Discounted Value of Rental Stream	\$29.79	\$27.47	\$27.19

$$(3B) \quad ED = PDV * \frac{r / 12}{1 - \frac{1}{(1 + r/12)^M}}$$

In this equation, the real interest rate, r , is used to make comparisons among leases of different years consistent.

Effective Rent (4)--Tenant Improvements

While it is recognized that income from a building involves payments other than rent, effective rent discussions generally refer only to the actual stream of rents received. However, the use of discounting in analyzing effective rent makes it possible to add other costs or payments into the equation as well. A frequent factor modifying the value of a lease to a building owner (or to the tenant) is the amount spent on tenant improvements. The tenant improvement allowance is generally a one-time payment at the outset of the lease, and is normally quoted in terms of dollars per square foot. This can be added to the ED calculation to produce Equation (4):

$$(4) \quad ET = (PDV - TI) * \frac{r / 12}{1 - \frac{1}{(1 + r/12)^M}}$$

where variables are defined as above and TI is the dollar amount of tenant improvements provided per square foot at the outset of the lease.

Other Adjustments and Some Practical Limitations

If the purpose of the analysis is to compare lease rates over time, it would also be desirable to translate leases into constant dollars. This is a cumbersome process in Equations (1), (2a) and (2b), requiring that each rental payment be adjusted to reflect changing price levels before the rental stream is averaged. In Equations (3a) and (3b), the most appropriate approach would be to translate the present discounted value of the rental stream into constant dollars before making the amortization adjustment.

As one might expect, other dilemmas also arise in calculating the alternative effective rent measures outlined above using actual leasing records. The most significant come from circumstances in the leases that do not fit the standard process described above and from trying to choose appropriate interest rates. An example of a lease condition that is not easily incorporated into the equations discussed here is a pre-existing tenant improvement that is taken over by the incoming tenant (it represents a value to the tenant but not a new cost to the owner).

The interest rate chosen for the present value calculation needs to reflect both the appropriate term of the lease and the risk attached to the return (the tenant may be unable to fulfill the terms of the lease). For this study, treasury note rates are used matched to the terms of the lease (from 2 to 20 years) added to a risk factor calculated as the difference between the AAA corporate bond rate and the 7-year treasury note rate.

The real interest rate may also change significantly over the period being studied, as it did dramatically in the first half of the 1980s. In addition, if the purpose of the calculation is to reflect the value as perceived by the building owner or tenants at the time of the transaction, then the expected real interest rate, rather than the actual rate as evident from hindsight may be the most appropriate measure. For the amortization calculations done below, the real interest rate is calculated as the difference between the AAA corporate bond rate and the expected rate of inflation over the next 12 months, as reflected in the Livingston index.¹

VI. Effective Rent in Santa Clara Valley

Nowhere has effective rent more clearly become an issue than in the Santa Clara Valley in recent years. In this market, building activity continued strongly despite rapidly rising vacancies for several years. Contract rents also continued to rise during much of the building boom, even as many buildings stood empty. Thus, rent levels seemed out of kilter with other measures of market health. Reports from brokers indicated that the contract rent may mask other important aspects of the lease agreement, with rental abatements and tenant improvement concessions cited as important elements in attracting firms to empty space. Thus, the measurement of effective rent in this market becomes very important as an indicator of the changing strength of market conditions.

A. The R&D Market in Santa Clara Valley

Santa Clara County and neighboring cities underwent a tremendous surge of industrial building activity in the 1980s. From December 1981 through December 1986 industrial stock increased by 84 percent. More than three fourths of the space added during this period was in the type of building classified as R&D (research and development). (Kroll and Kimball [1986]).

As early as December 1982, vacancies in R&D space approached 20 percent. While this is far above average industrial or office vacancy rates, it is not necessarily a problem in rapidly growing markets. However, the Santa Clara County market on average through 1985 absorbed a net amount of about 4 million square feet of industrial space while adding space at more than twice this pace. The result was a vacancy rate of 36 percent by 1984. Building activity began to slow in 1985. The value of industrial permits dropped from a peak of \$524 million in 1984 to only \$122 million in 1986 (Security Pacific Bank [1984] and [1986]), and vacancies dropped modestly to 32 percent by December 1986 (Kroll and Sturgeon [1987]). Additional evidence market change included a yearly drop in the size of leases beginning in 1985 and a shift in the composition of tenants of leased space (Kroll [1987]).

What happened to rents during this period? How accurately did contract rents reflect the changing market? Earlier research indicated that average contract rent continued to rise through mid 1985, while dropping sharply in 1986 (Kroll [1987]). An updated and more complete data set for the rest of 1985 and beyond shows that this drop continued through mid-1987 (see

Figure 1). Vacancy rates, however, indicate that problems in the market may well have preceded the mid-1985 period, when a recession hit the electronics industry. One means of addressing the discrepancies between rising rents and rising vacancy rates is to examine the difference between effective and contract rents.

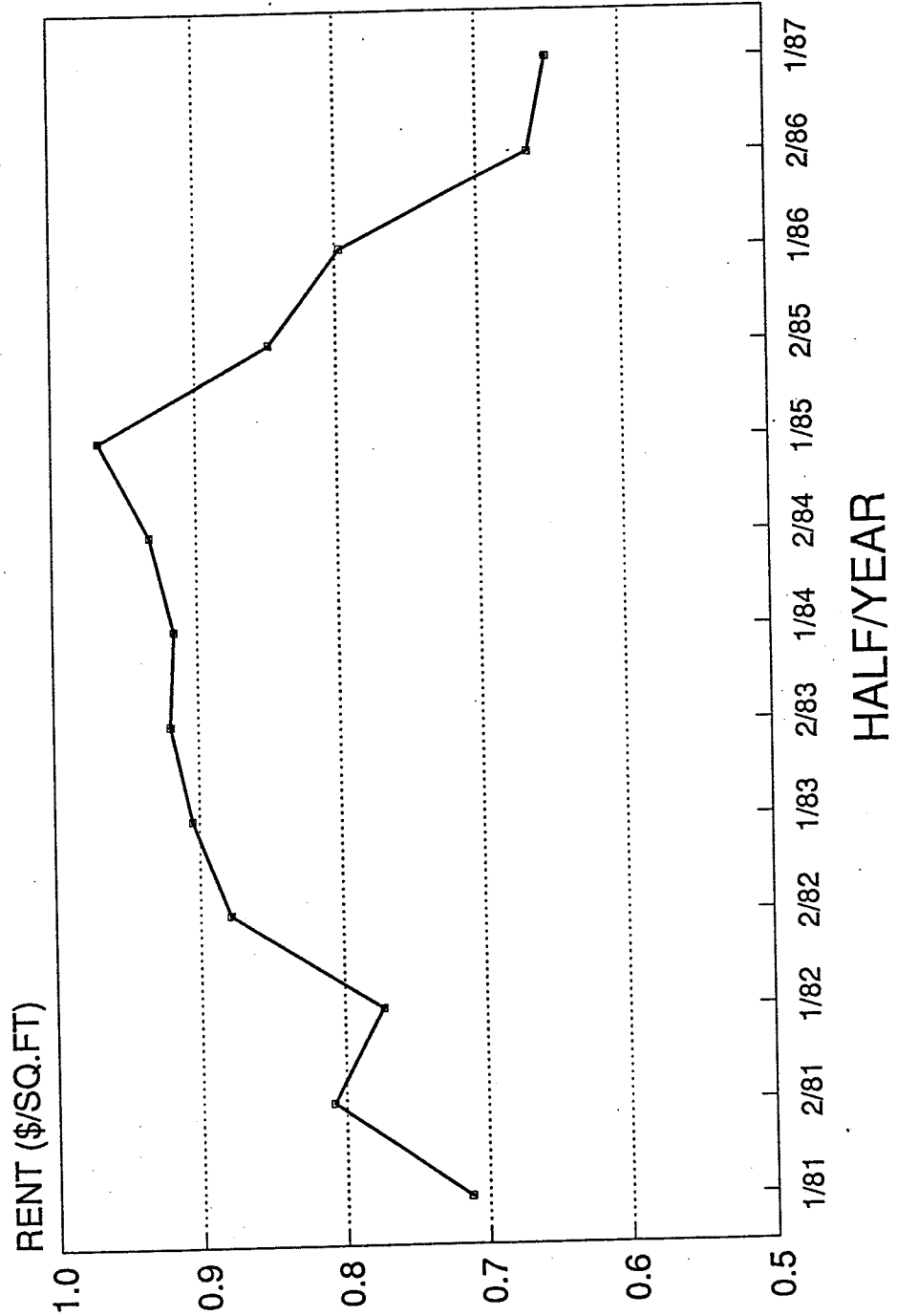
B. The Data Base

Concern with the accurate measure of effective rent has arisen only recently, as building owners in overbuilt markets attempt to boost occupancies while maintaining projected contract rents. Thus, until recently, any tracking of rents in industrial markets focused on contract rents only. However, heavy leasing activity in the Santa Clara Valley and the complexity of leases being struck led some brokerage firms to begin tracking the market in detail, keeping records of not only the contract rent agreed on but on such factors as rental abatements, cost of living bumps, and tenant improvement costs.

The analysis described here is based on rental agreements tracked by the San Jose office of Grubb and Ellis between 1981 and mid-1987. The Grubb and Ellis listing of lease agreements include not only those leases in which the firm's own brokers were involved but all other lease agreements of which they were aware. Thus, this is neither a random sample of leases nor a complete listing of all lease agreements in the area. For some of the years, listings were available from Cushman and Wakefield, another South Bay broker, as well. Comparison of the two lists showed that while much overlap existed in the information,

Figure 1

AVERAGE RENTS
SIX MONTH AVERAGES
JAN 1981 - JUN 1987



neither list was fully comprehensive over the time period covered. Nevertheless, the Grubb and Ellis listing provides a long term history of leasing activity, within the population of leases tracked by the firm.

To make all leases as comparable as possible, only listings from a single brokerage firm (Grubb and Ellis) was used, and only triple-net leases were analyzed.² Leases for which only partial information was available on such factors as free rent, cost-of-living escalators, or tenant improvements, were also excluded from the analysis.

C. Effective Rent Measures for Santa Clara Valley

There are several hypotheses on how an effective rent measure may clarify the changes in the R&D market. Two are examined closely in this analysis. The first is that, since many of the components in calculating effective rent are subject to negotiation, the effective rent may be more sensitive than the nominal rent in pointing to fundamental market changes. Thus, for example, effective rent may have peaked earlier than contract rents in Santa Clara Valley.

The second is that comparing contract rents among locations may mask some locational differences. Thus, effective rent may show a steeper (or shallower) rent gradient between peripheral and central areas in Santa Clara Valley than indicated by contract rent alone. For the purposes of the location analyses, Santa Clara Valley is divided into 5 zones:

Zone 1--the "service core," close to Stanford University, where R&D and high-tech-linked financial and business services concentrate

Zone 2--the older "manufacturing core," where manufacturing headquarters concentrate, drawing R&D, services, and prototype production activity

Zone 3--the "new service center," where many non-high tech and smaller scale high-tech related services lease space

Zone 4--the "new manufacturing center," with a combination of newer manufacturing headquarters and routine manufacturing operations, and

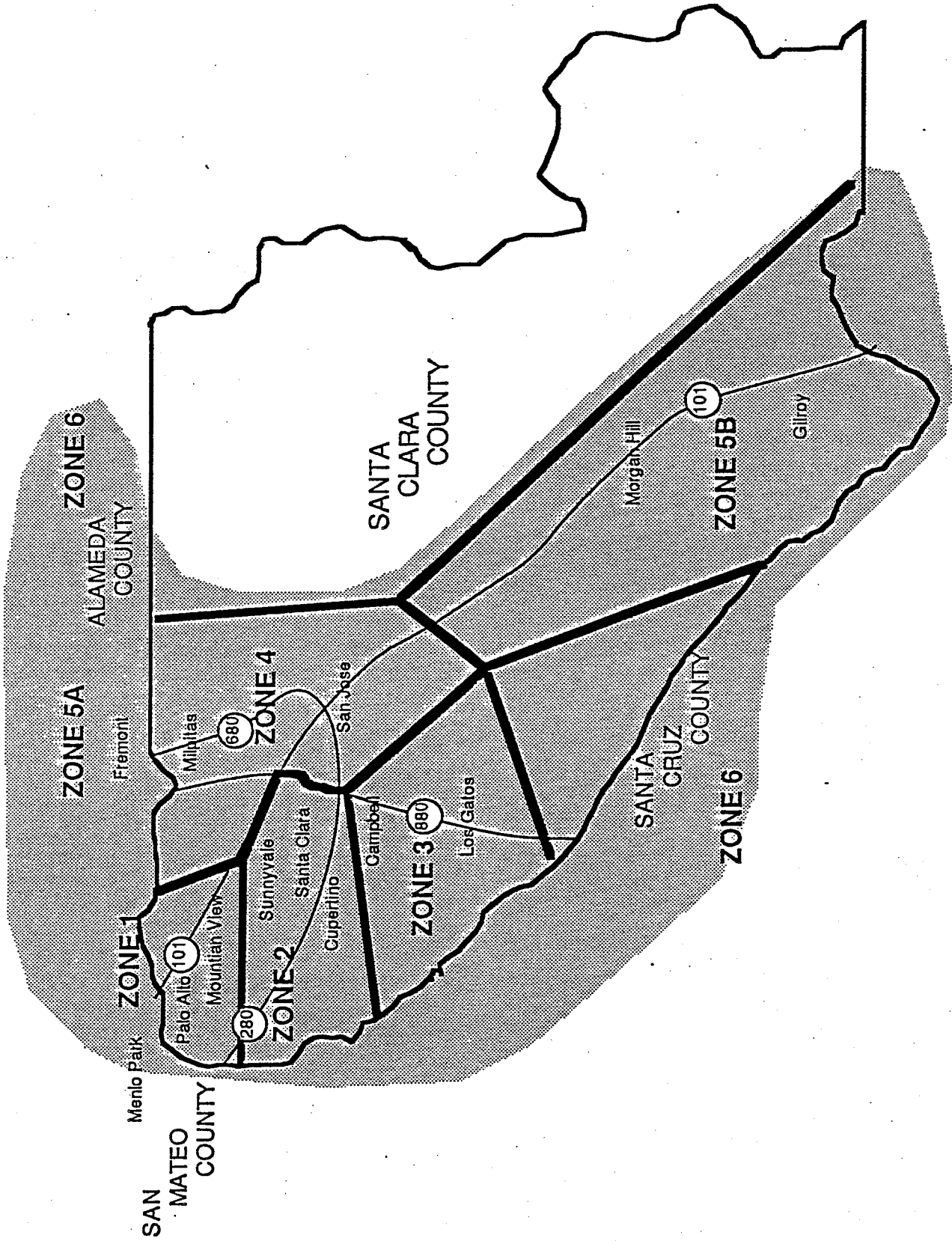
Zone 5--the "peripheral manufacturing area," an area farther from the central activity, that has captured some spillover growth from the Santa Clara Valley.

The zones are illustrated in Figure 2 and are described in more detail in Kroll and Kimball [1986].

Hypotheses that are not tested empirically in this study are that effective rent may vary differently from the way in which contract rents vary by size of tenant (i.e. lease size) or by industrial type. For example, the premium for getting a large tenant may be a significantly lower effective rent, through the types of rental abatements and escalators negotiated.

The following calculations examine differences between contract and effective rents over time and by location.

Figure 2



ZONES OF HIGH TECH ACTIVITY IN SANTA CLARA VALLEY

VII. Comparative Effective Rent Measures in Santa Clara Valley

Table 2 shows the major components of effective rent as analyzed for Santa Clara Valley. Differentials by year and place indicate that effective rent calculations are likely to show a different distribution of rents than is found with contract rent. For example, the percent of leases involving cost of living increases was much higher in earlier years than in later years (reflecting inflation expectations as well as changes in the market place), while the average period of rental abatement went from zero in 1981 to a peak of almost 6 months in 1986. Tenant improvement costs varied much less dramatically over time, but tended to be higher, and less variable in earlier years.

All these variations indicate that contract rent alone does not give a true reading of trends in the market. Identification of trends in factors such as free rent and cost-of-living escalation give further information on trends, but also do not give a clear indication of the net implications for the market, if these trends move counter to the trends in contract rent. With an effective rent measure, the effects of each of these factors on income can be isolated and the net impacts calculated.

A. Free Rent and Escalation Components

Table 3 shows calculations of average rent per year in current and constant dollars, accounting first for free rent, then for an escalation factor, and finally for the two combined. Contract rent, in both current and constant dollars, was highest in 1984. Using current dollar estimates, free rent left the peak

TABLE 2: LEASE TERMS BY YEAR AND ZONE

	CONTRACT RENT	% OF LEASES WITH BUMPS	AVERAGE MONTHS FREE RENT (\$/s.f.)	AVERAGE T.I.'S (\$/s.f.)
YEAR				
1981	0.75	28.6	0.00	14.82
1982	0.87	40.5	0.40	12.49
1983	0.90	42.6	0.47	15.10
1984	0.94	57.7	1.63	12.18
1985	0.90	56.3	3.96	11.32
1986	0.73	34.6	5.65	12.06
1987	0.65	20.9	3.60	10.75
ZONE				
1	0.94	47.8	1.80	9.52
2	0.85	40.4	2.35	9.35
3	0.76	38.5	4.73	11.48
4	0.82	41.6	4.24	14.40
5a	0.67	41.2	4.96	15.22
5b	0.91	50.0	2.20	18.80
TOTAL	0.81	41.3	3.62	12.01
N = 906				

Source: CREUE computations based on Grubb and Ellis lease records

TABLE 3: COMPARATIVE RENT MEASURES INCORPORATING FREE RENT AND ESCALATION FACTORS (AVERAGE RENT, \$/SQ.FT. MONTHLY)

	Comparison A: Current \$				Comparison B: Constant \$			
	Contract	EF	EB	EP	Contract	EF	EB	EP
Year								
1981	0.75	0.75	0.77	0.77	1.00	1.00	1.03	1.03
1982	0.87	0.87	0.90	0.89	1.13	1.12	1.16	1.16
1983	0.90	0.90	0.95	0.94	1.15	1.15	1.21	1.20
1984	0.94	0.92	0.98	0.96	1.18	1.15	1.22	1.19
1985	0.90	0.83	0.97	0.91	1.09	1.02	1.18	1.11
1986	0.73	0.66	0.79	0.71	0.89	0.81	0.96	0.87
1987	0.65	0.60	0.68	0.63	0.77	0.72	0.81	0.75
Zone								
1	0.94	0.91	1.02	0.99	1.15	1.12	1.25	1.22
2	0.85	0.81	0.89	0.86	1.04	1.00	1.10	1.06
3	0.76	0.69	0.89	0.83	0.91	0.84	0.98	0.90
4	0.82	0.76	0.86	0.80	1.03	0.95	1.08	1.00
5	0.67	0.61	0.70	0.65	0.82	0.75	0.86	0.79
TOTAL	0.81	0.76	0.85	0.80	0.99	0.93	1.05	0.99

N = 906

Source: CREUE computations based on Grubb and Ellis lease records

at 1984, with a rental level little different from the contract rent. However, the drop off after 1984 is much steeper when free rent is considered. Adjusting for escalation, alone, in current dollars shifts the whole scale upwards, without major changes in when rents peaked or the spread in rents among years. Adjusting for both free rent and escalation simultaneously, in current dollars, gives a peak rent of \$0.97/sq.ft. in 1984 (compared to \$0.94 in contract rent) and a low rent of \$0.63 in 1987 (compared to a contract rent of \$0.65).

Adjusting to constant dollars (1986 base) gives quite different results. Contract rent continues to peak in 1984. However, average free rent is the same in 1983 and 1984, rent adjusted for escalation only peaked in 1983, and the combined adjustment (free rent plus escalation) also peaks in 1983.

Locational differences using these two types of effective rent adjustments show little change from contract rent when analyzed in current dollars. When rents over time are adjusted for inflation the ranking among locations remains unchanged. However, in zone 1, the most "prestigious," service oriented location, the EP calculation is \$0.07 higher than the contract rent calculation, while in zone 5, a peripheral service and manufacturing location, the EP average is \$0.03 below the contract rent. Thus, the spread among locations is much greater than contract rent figures would imply.

B. Discounted Present Value and Tenant Improvements

Table 4 shows calculations taking into account the discounted value of rental streams, including both rental

TABLE 4: COMPARATIVE RENT MEASURES, DISCOUNTED AND ADJUSTED FOR TENANT IMPROVEMENTS (AVERAGE RENT, \$/SQ.FT. MONTHLY)

	Comparison A: Current \$			Comparison B: Constant \$		
	Contract	ED	ET	Contract	ED	ET
Year						
1981	0.75	0.62	0.34	1.00	0.83	0.45
1982	0.87	0.76	0.51	1.13	1.00	0.66
1983	0.90	0.84	0.54	1.15	1.07	0.60
1984	0.94	0.83	0.54	1.18	1.03	0.73
1985	0.90	0.83	0.60	1.09	1.02	0.73
1986	0.73	0.67	0.44	0.89	0.81	0.54
1987	0.65	0.59	0.39	0.77	0.70	0.46
Zone						
1	0.94	0.89	0.71	1.15	1.09	0.86
2	0.85	0.78	0.60	1.04	0.96	0.73
3	0.76	0.69	0.47	0.91	0.83	0.58
4	0.82	0.73	0.43	1.03	0.90	0.54
5	0.67	0.57	0.28	0.82	0.70	0.35
TOTAL	0.81	0.73	0.59	0.99	0.90	0.61
N = 906						

Source: CREUE computations based on Grubb and Ellis lease records

abatements and escalation. A second calculation subtracts the value of tenant improvements from the discounted value of the rental stream, before amortizing out payments.

Current dollar estimates show little change in the ranking of rental payments by year. However, some locational differences change sharply when tenant improvements are taken into account. For example, contract rents in zone 4 (where routine manufacturing concentrates) are close to those in zone 2 (the central agglomeration point for manufacturing headquarters) and are well above those in zone 3 (the new mixed-service area). When rents are discounted and tenant improvements taken into account, however, the ET rent in zone 4 is 28% below the zone 2 rent and 9% below zone 3 rent.

When adjusted for constant dollars, ED rents peak in 1983, while ET rents continue to peak in 1984. The peak rebound that is seen when tenant improvements are taken into account may reflect the fact that in later years tenants were taking over existing improvements, thus reducing the tenant improvement allowance required from the landlord.

The zonal differentiations continue to be much greater when rents are discounted and tenant improvements taken into account than they are with contract rents. Rents in zone 4, which are very close to zone 2 contract rents, are 6 percent below zone 2 rents when the discounted present value of the rental stream is taken into account and are 26 percent below zone 2 rents when tenant improvements are also considered. The differential between the lowest rent and highest rent zones is also much

greater when a present value calculation and tenant improvements are considered. Zone 5 contract rents (in constant dollars) are 29 percent below zone 1 when measured by contract rents, 36 percent below zone 1 when discounted rents (ED) are used, and 59 percent below discounted rents minus tenant improvements (ET).

VI. Implications for Market Analysis

The effective rent calculations described above show the degree to which contract rents may distort the understanding of trends in the market. First, contract rents made the market appear stronger than it was in 1984, with rents continuing to rise, despite growing vacancies. The addition of free rent alone, however, to the calculation, may exaggerate the weakness of the market in the other direction. Many lease agreements made during the early periods of response to the overbuilt market showed a continued tendency of the landlord to try to recoup the rental give-aways in later years of the lease.

A second important finding is that lease adjustments were not made evenly across all locations. More peripheral areas, with higher vacancies and greater competition for tenants appear to have made far less advantageous deals than the centrally located core of the market. Thus, when factors such as free rent, timing of payments, and tenant improvements are taken into account, differentials among areas may be far greater than they originally appeared.

Information about free rent and cost of living bumps can illustrate any mismatches among contract rents and other costs

over time or by location. The advantage of an effective rent calculation is that it gives a "net" assessment of the impacts of these different factors on the overall income from the lease.

Footnotes

1. The Livingston Index is available only at six month intervals. Because this index appears to change gradually, the intervening months are calculated through interpolation.
2. Most lease agreements were triple-net--i.e. the tenant remained responsible for the operating costs of the property, such as utilities. Gross leases--where all costs were included in the rental payment--were excluded from the analysis.

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