



Changing Emphasis in Appraisal Techniques: The Transition to Discounted Cash Flow

by Peter F. Korpacz, MAI, and Mark I. Roth

The marketplace has never been as dynamic as it is today. In real estate, many factors are affecting the validity and usefulness of traditional valuation techniques. Rent levels in many markets have risen so rapidly in the last two years that a wide margin exists between current economic rents and contract rents—resulting in a greater market differential. As leases expire and space is re-leased at much higher rent levels, opportunities occur for rapidly increasing cash flows. (The occurrence of lease expirations and subsequent re-leasing of the space is commonly referred to as “lease rollover.”)

Rapidly rising economic rents have diverse causes. In some of the country's growth areas, such as Dallas and Houston, expanding companies and relocating corporations have created a high demand that has driven up rent levels. Were it not for continuing construction in those areas, rent increases would be even higher. In our country's mature real estate markets, such as New York City and Boston, internal mobility (movement within the same market area), particularly in the service industries, has contributed to an increasing level of demand. Zoning and other government restraints, citizen action groups, and the high costs of construction and financing prevent new

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construction and renovations from keeping up with the demand. At the same time, physical deterioration and functional obsolescence caused by normal aging and innovations in energy-efficient building materials and systems have reduced supply. Thus, even in mature areas where there is no population growth, rents for prime office space have increased dramatically.

The net effect of these trends is to create unusual opportunities for high rates of growth in the cash flow and equity value of existing multitenanted real estate. This is particularly true for well-located office buildings and is the primary reason why office buildings have replaced regional shopping malls as the most sought after real estate investment. For appraisers, the problem is complicated in any given market by variable growth prospects from building to building. This is caused by the difference in each building's lease-rollover profile and the variety and complexity of escalation provisions in existing leases.

Where the assignment is to value fee simple interest or equity interest in property, subject to existing leases and financing, more than tradition may be needed. A perfect example exists in the recent marketing and sale of the Pan Am Building in New York City, where four important investment criteria, or units of comparison, emerged:

Price/rentable sq. ft.	\$177.00
Gross rent multiplier (first-year estimate)	10.8
Overall capitalization rate (first-year estimate)	3.4%
Cash-on-cash rate of return (first-year estimate)	2.4%

In each case, the criteria were not within the range indicated by existing comparable sales. No other office building in New York City had ever sold at a greater cost per square foot than the Pan Am Building, and in the last five years no New York office building has sold for an overall rate or a cash-on-cash rate as low as 3.4% and 2.4%, respectively. At the time of sale, a gross rent multiplier of 10.8 was far above comparable experience.

The dilemma for the appraiser in any similar situation is to justify investment criteria outside the range of verifiable comparable data. It is not peculiar to the Pan Am Building; it is applicable to most existing multitenanted properties. Real estate markets with rapidly escalating rental rates compound the possibility of error; even when the appraiser adjusts the market data, a risk of error remains.

TRADITIONAL VALUATION

Using the cost approach to determine every type of depreciation found in multitenanted buildings is beyond anyone's ability. More important,

the approach is ignored by the marketplace. Although the cost approach does have relevance to appraisal assignments such as new or planned construction, cost-to-cure estimates, and feasibility analyses, it is not relevant to the valuation of existing multitenanted properties.

The market data and income approaches have become difficult to use. In order to extract meaningful units of comparison and to assess the financial comparability of the sale property with the property being appraised, the appraiser must learn the financial assumptions made by the buyer. This is rarely easy and often impossible. The challenge for the appraiser is to develop investigation and communication skills and to develop contacts with market participants. Verification of price and rentable area is not enough. The appraiser must extract the expected rates of return in the first year of ownership and understand the buyer's perception of both the expected growth in cash flow and equity and the risk in achieving the future financial benefits. Even if all of this information can be verified, it is difficult to relate comparable transactions to the subject property because of differences in lease-rollover profiles, escalation clauses, and market differential—a critical factor in any existing financing.

The direct capitalization technique used in the income approach is ineffective in today's market, because it relies on the capitalization of a single net operating income (NOI) estimate (based on a first-year projection), an average for a holding period, or a stabilized estimate. So many differences in growth prospects currently exist from one property to another that an overall rate may not apply to more than one. Furthermore, overall rates derived from a band of investment analysis are mostly irrelevant, since mortgage financing is either not available or is based on complicated participation (kicker) formulas. How can the appraiser select the appropriate rate from a range of 2%–12% in a market dominated by all- or mostly all-cash transactions with diverse growth prospects? It is not impossible, but it is difficult; sadly, it often results in wide differences of opinion.

The direct capitalization technique no longer reflects the thinking of today's real estate market participants. Buyers are not interested in a contrived single NOI reflecting average or stabilized income expectancy, but they are keenly interested in how much income they are going to receive and when they are going to receive it. The underlying principle of the income approach—"value is the present worth of future benefits"—is more valid than ever. The appraiser, however, cannot accurately and convincingly reflect this in the capitalization of a single NOI estimate.

THE TRANSITION TO DISCOUNTED CASH FLOW ANALYSIS

The marketplace is, and always has been, the source of the solution. The appraiser does not make the market, but researches and investigates market activity, feels the pulse, and reflects market thinking in the analysis and valuation of specific properties.

In the case of the Pan Am Building, the marketplace focused on the internal rate of return (IRR) applied in a discounted cash flow (DCF) analysis. The disposition consultant prepared detailed lease-by-lease, computer-assisted, cash flow analyses. Various potential buyers were allowed to apply their own assumptions to additional analyses to assist them in decision making. The cash-on-cash and overall rates of return applied to a single income figure were given little or no weight. The final decision hinged on the buyer's perception of achieving a specific IRR over a forecast period.

In the two years since the Pan Am deal was completed, numerous commercial-real estate transactions have been based on DCF analysis. Most of the properties have been regional shopping malls or major urban office buildings. This type of income analysis will probably become widespread. Not long ago DCF analysis was used only as a test, or for added support, and was not relied on as the primary value indicator. Today, the only common denominator in real estate's major investment community is an IRR: if it applies to regional malls, it will probably apply to neighborhood centers; if it applies to major urban office buildings, it will probably apply to smaller suburban counterparts.

Because of the market emphasis on DCF analysis, it is imperative that the appraisal community become knowledgeable and proficient in its use. Analyses of properties with few tenants can be completed by hand. In multi-tenanted properties, computer assistance is usually cost effective and clearly more accurate and timely. Its use becomes imperative if there is a need for revising market assumptions and generating multiple valuation scenarios.

DCF'S EFFECT ON TRADITIONAL VALUATION METHODS

The increasing use of DCF analysis does not negate the validity and usefulness of traditional appraisal techniques. The marketplace, however, has relegated their use to one of test and support, similar to the use of DCF analysis, not too long ago. In the 1970s, DCF analysis was used as a valid and rational approach to investment value. Today, so many market participants use DCF analysis that it is also a valid approach to market value.

The traditional appraisal techniques should not be abandoned. They are easily recognized and understood, and without question are valid, but they are no longer easily applied. For instance, in traditional market data and income approach techniques, it is no longer acceptable to merely extract the sales price/rentable sq. ft., gross rent multiplier, overall rate, and cash-on-cash rate, based on last year's financial results or next year's financial expectation. The key today is to extract these units of comparison with a better understanding of the buyer's perception of cash flow and equity growth over the investment period. The verification process must determine the buyer's investment assumptions, including such items as: current economic-rent estimate, growth rates for economic rents and property expenses, re-leasing

costs and vacancies, brokerage commissions, resale, lease-rollover profile, and potential for remeasurement of rentable area. Only when this information is determined for each comparable sale can a fair comparison be made with the property being valued.

It is imperative that the appraiser reflect the marketplace. The appraiser must use techniques utilized by market participants and not techniques used only by appraisers. After all, appraisers are not market participants; they are more like commentators. They report market attitudes and behavior; they do not create them.

A CASE STUDY

For a demonstration of current market-supported appraisal techniques, an existing multitenanted Manhattan office building has been selected. The property, identified as 600 Main Street, is similar to major urban investment-grade properties in demand throughout the country. The property is in a secondary location north of the downtown commercial district and consists of a 50,000-sq.-ft. site improved with a pre-World War II, 25-story office building. It is not encumbered with a mortgage and would likely sell on an all-cash basis. Rentable area totals 951,049 sq. ft. of office and retail space. The retail space is small; it includes five leases with 13,293 sq. ft. of space. The building is fully occupied by 19 tenants under 21 leases. Leases representing approximately 58.4% of the total rentable area in the building will be available for renewal or re-leasing in 1984 and 1985. The very last lease expires in 2003. Thus, the leases will not roll over 100% for 22 years. The lease-expiration profile is summarized in *Table I*.

TABLE I
Lease-expiration Profile
(600 Main Street)

<i>Year</i>	<i>No. of Leases</i>	<i>Rentable Area (sq. ft.)</i>	<i>Percentage of Total Area (cumulative)</i>
1982	0	0	
1983	0	0	
1984	7	268,458	28.2%
1985	6	286,706	58.4
1986	2	51,302	63.8
1987	2	22,730	66.2
1988	1	7,930	67.0
1989	1	45,979	71.8
1990-1991	0	0	71.8
1992	1	924	71.9
1993-2002	0	0	71.9
2003	1	267,020	100.0
Total	21	951,049	100.0%

The current average gross rent/sq. ft. of rentable area is \$8.57. The current average economic rent is estimated at \$18.00/sq. ft. for office space and \$25.00/sq. ft. for retail space. The weighted average economic rent is estimated to be \$18.10/sq. ft. Thus, \$18.10 minus \$8.57 results in an initial market differential of \$9.43/sq. ft.; the total actual rent is 47.35% of market rent (*Table II*). Although the building is old, it was recently remodeled with extensive improvements to its mechanical systems. It is well located (although in a secondary area) and is ideally suited to back-office operations (computer, bookkeeping, storage, etc.), requiring large contiguous space. The market conditions are good, and there is above-average demand for space in this building.

TABLE II
Market Differential Profile

Year	Total Rent	Market Rent	Differential	Total Rent/ Sq. Ft.	Market Rent/ Sq. Ft.	Differential/ Sq. Ft.	Total Rent ÷ Market Rent
1982	\$ 8,150,000	\$ 17,212,000	\$ 9,062,000	\$ 8.57	\$ 18.10	\$ 9.53	47.35%
1983	8,434,000	18,927,000	10,493,000	8.87	19.90	11.03	44.56
1984	9,820,000	20,812,000	10,992,000	10.47	22.20	11.72	47.18
1985	13,839,000	22,477,000	8,638,000	14.69	23.85	9.17	61.57
1986	16,670,000	24,275,000	7,605,000	17.58	25.59	8.02	68.67
1987	17,653,000	26,217,000	8,565,000	18.58	27.60	9.02	67.33
1988	18,427,000	28,314,000	9,887,000	19.38	29.78	10.40	65.08
1989	19,806,000	30,580,000	10,774,000	20.88	32.23	11.36	64.77
1990	22,330,000	33,026,000	10,696,000	23.62	34.93	11.31	67.61
1991	23,421,000	35,668,000	12,247,000	24.63	37.50	12.88	65.66
1992	24,265,000	38,522,000	14,257,000	25.51	40.51	14.99	62.99
1993	25,186,000	41,603,000	16,418,000	26.48	43.74	17.26	60.54
1994	28,037,000	44,932,000	16,894,000	29.90	47.92	18.02	62.40
1995	33,041,000	48,526,000	15,485,000	35.06	51.50	16.43	68.09
1996	36,926,000	52,408,000	15,482,000	38.93	55.25	16.32	70.46
1997	38,681,000	56,601,000	17,919,000	40.72	59.59	18.86	68.34
1998	40,165,000	61,129,000	20,964,000	42.25	64.30	22.05	65.71
1999	42,456,000	66,019,000	23,563,000	44.75	69.59	24.84	64.31
2000	47,161,000	71,301,000	24,140,000	49.88	75.41	25.53	66.14
2001	49,434,000	77,005,000	27,571,000	51.98	80.97	28.99	64.20
2002	51,205,000	83,165,000	31,960,000	53.84	87.45	33.61	61.57
2003	71,050,000	89,818,000	18,768,000	75.77	95.79	20.01	79.10
2004	78,618,000	97,004,000	18,385,000	83.85	103.46	19.61	81.05
2005	89,308,000	104,764,000	15,456,000	94.78	111.18	16.40	85.25
2006	98,331,000	108,606,000	10,275,000	103.67	114.50	10.83	90.54

CASE-STUDY VALUATION PROCEDURES

The income and market data approaches have been used here to estimate the market value of fee simple interest in the property, subject to existing tenancies. Using the DCF technique, equity cash flows (including cash flows and equity reversion) have been converted into value. The discount rate is derived from a comparative analysis of IRRs, anticipated by recent buyers

of Manhattan office buildings. The direct capitalization technique is used to convert the forecasted NOI for the first year of ownership (before debt service and return to equity) into value.

Two units of comparison are used in the market data approach: the annual effective gross rent multiplier and the price/sq. ft. of rentable area. Because marketplace participants place very little weight on these units of measure, they are used mainly as a test or guide in the final conclusion.

The presence of many variables in depreciation and reproduction costs detracts from the accuracy of the cost approach, and because participants in the marketplace do not use it, it is not included.

THE INCOME APPROACH USING A DISCOUNTED CASH FLOW

Investors in Manhattan office buildings typically forecast NOI and cash flow for 10–15 years and then discount the cash flow to estimate a cost that justifies the risk inherent in the proposed investment. The major steps involved for 600 Main Street are enumerated below.

- Analyze current revenue; establish a market rent level for each specific tenant space; and forecast future revenues annually for a 10-year period through 1991, based on existing leases, probable renewals at market rentals, and expected vacancy experience.
- Forecast other revenue, including escalation revenue based on coverage in existing leases for rising operating expenses and real estate taxes and anticipated future coverage.
- Forecast future property expenses based on an analysis of historical operating expenses, the experience of competitive properties, and the 1982 budget for the property.
- Forecast net operating income and pre-tax cash flow to be generated by the property through 1991, which in this debt-free analysis will be identical.
- Estimate a resale price for 1991 by forecasting NOIs and pre-tax cash flows from 1992 to 2001, applying a reasonable overall capitalization rate to the 2001 NOI, and discounting the cash flows and residual to a 1991 present worth, at an appropriate discount rate.
- Determine a discount or yield rate (IRR) which would attract a prudent investor to invest in a similar situation with comparable degrees of risk, nonliquidity, and management burdens.
- Convert the 10-year forecast of cash flows and net resale price into a present value by discounting at the proper yield rate.

It is essential that the application of this methodology reflect the thinking of participants in the marketplace. In this case, we assembled pertinent information—summarized in *Table III*—regarding 12 recent sales of office buildings in Manhattan. To protect confidentiality, the property locations are not included, and actual price, rentable area, and other characteristics have been modified. As part of the verification of the sales, the cash-flow forecast assumptions were reviewed with the participants, usually the buyers. An example of the detailed information ascertained for each comparable sale is shown in the following *Exhibit*.

TABLE III
COMPARABLE IMPROVED SALES
(MANHATTAN 1980 - 1982)

Sale No.	Rentable Area (Sq. Ft.)	Sale Price	Sale Price/Sq. Ft.	NOI Ratio	Eff. Gross Rent Mult.	1st Year		Equity IRR		Remarks
						Cash Flow Rate	Overall Rate	Cash	All	
1	100,000	\$ 35.7M	\$357.26	67.3%	7.2	9.3%	9.3%	13.0%		Moderate growth but very low risk and conservative assumptions.
2	300,000	91.6M	305.50	81.4	6.5	11.4	11.4	14.9		Low-growth property with unused air rights sold on optimistic assumptions.
3	700,000	56.1M	80.14	40.0	6.4	6.2	6.2	25.5		High-growth property with moderate risk; purchased on realistic assumptions.
4	700,000	58.0M	103.51 [†]	36.5	6.3	5.8	5.8	17.9		Sale is an 80% interest in the property; the transaction gives an 11% preferred return to the 80% partner; same property as Sale no. 3.
5	800,000	15.4M	38.29 [‡]	26.3	3.5	7.6	7.6	22.7		A 50% interest in a high-growth, moderate-risk property; purchased on realistic assumptions.
6	450,000	42.7M	94.91	30.2	6.7	2.5	4.5	25.8%		High-growth property with moderate risk; sold on realistic assumptions.
7	325,000	29.9M	91.95	41.6	6.2	5.5	6.7	26.0		High-growth property with moderate risk; sold on realistic assumptions.
6/7	775,000	72.6M	93.68	34.9	6.5	3.7	5.8	25.9		Sale nos. 6 and 7 were purchased as a package.
8	700,000	53.8M	76.86	36.9	6.2	3.9	6.0	20.3		High-growth property with moderate risk; sold on realistic assumptions.
9	650,000	45.8M	70.48	31.6	6.0	1.7	5.3	20.5		High-growth property with low risk; sold on realistic assumptions.
8/9	1,350,000	99.6M	73.78	34.5	6.1	3.0	5.6	20.4		Sale nos. 8 and 9 were purchased as a package.
10	2,254,000	400.0M	177.46	36.9	10.8	2.4	3.4	14.2		High-growth landmark property with low risk; sold on conservative assumptions.
11	1,250,000	50.2M	40.13	15.4	2.9 [‡]	8.4 [‡]	8.4 [‡]	25.9		A high growth over an elongated period of time, moderate- to high-risk property purchased on conservative assumptions.
12	600,000	16.4M	27.34	37.0	6.3	4.1	4.1	30.5		A high growth, moderate- to high-risk property purchased on conservative assumptions.

[†]Cash on cash or equity dividend rate.

[‡]Adjusted to reflect 100% interest.

[§]Adjusted to reflect extraordinary capital improvements in Years 1 and 2.

**EXHIBIT
SAMPLE OFFICE BUILDING SALE ANALYSIS**

Office Building Sale Number: 11
Location: 12 Wall Street, New York City
Property Interest Transferred: Leasehold
Date of Sale: March 1982
Seller: 12 Wall Street Associates
Buyer: LMM Investors
Building Description: 12 Wall Street is a 40-story multitenanted office building built in 1923. The building contains a rentable area of 1,250,000 sq. ft. on floors ranging from 35,000 sq. ft.—40,000 sq. ft.
Land Area: 48,000 sq. ft.
Sales Price: Cash \$50,200,000
Mortgage 0 Price/Sq. Ft. of
Total \$50,200,000 Rentable Bldg. Area: \$40.13

**Cash Flow Forecast:
(Potential)**

	Year 1	Per Sq. Ft.	Ratio to Effective Gross Revenue
Gross revenue	\$17,950,000	\$14.36	—
Vacancy	87,500	.07	—
Effective gross revenue	\$17,862,500	\$14.29	100.0%
Property expenses	15,112,500	12.09	84.6
Net operating income	\$ 2,750,000	\$ 2.20	15.4%
Debt service	0	0	0
Pre-tax cash flow	\$ 2,750,000	\$ 2.20	15.4%

Investment Analysis:

	Indicated	Adjusted*
Overall capitalization rate	5.5%	8.4%
Cash-on-cash %	5.5%	8.4%
Effective gross rent multiplier	2.8	2.9
Anticipated 10-year yield (IRR)	25.9%	—

*Adjusted to reflect extraordinary capital improvements in Years 1 and 2.

Purchaser's Cash Flow Assumptions:

Market Rental Rate An average of \$20.00/sq. ft. increasing 12% for three years, 10% for two years, and 7% thereafter (specific market rental rates were assumed for each of three distinct sections of the building)

Escalation Coverage Pro rata share of real estate taxes and energy plus \$.01/sq. ft. increase for each \$.01 increase in the porter wage rate plus an annual adjustment equal to 25% of the increase in CPI

Expense Growth Utilities — 10%; real estate taxes — 5%; other expenses — 8%

Re-leasing Successive 10-year terms

Vacancy 75% of space being re-leased was assumed to be vacant for three months; plus ½ of 1% of gross receipts

Commissions New York City standard rates

Fix-up \$18.50/sq. ft. growing at 8% for all space on first re-leasing; \$11.50/sq. ft. for all space on second and subsequent leasing

Resale Overall capitalization rate of 12% applied to 10th year less 2.5% selling expense

Comments: At the time of sale, the average rent was \$13.39. This was a purchase of a 200-year leasehold on a free and clear basis. This is a high-growth property.

FORECAST PERIOD

The cash flow forecasts and investment analyses assume 10 years of ownership commencing January 1, 1982. Even though the lease, representing 28.1% of the building's space, does not expire until 2003, 71.8% will be available for re-leasing within 10 years.

MARKET RENTAL RATES

- Office space at an average of \$18/sq. ft., for the year beginning January 1, 1982. The market rate is assumed to grow 10%/year for two years and 8% thereafter.
- Retail space at an average of \$25/sq. ft., for the first year beginning January 1, 1982. The market rate is assumed to grow 8%/year.

These assumptions are supported by an analysis of actual office-space leasing, as summarized in *Table IV*. Conversations with Manhattan rental agents, building managers, and owners revealed: 1) rapid renting due to shortage; 2) fast-rising rent levels; and 3) disappearing blocks of large contiguous space. Growth-rate assumptions are based on an analysis of the assumptions made by buyers of all but number four of the comparable sales (*Table V*).

Actual 1980 and 1981 leases in competitive buildings are shown ranging from \$11.63–\$28.00/sq. ft., depending on the age and location of the building, with most rentals falling in the \$17.00–\$20.00/sq.-ft. range. Rents at the high end of the range primarily reflect newer (post-World War II) buildings with prime locations, such as the financial district; rents at the lower end of the range reflect older (prewar) buildings with secondary locations. Rents do not include electricity unless otherwise noted, but do include full escalation coverage for increases in operating expenses and real estate taxes over a designated base year.

EXISTING BASE RENTS

Base rents and appropriate base-rent adjustments are included in accordance with existing leases.

ESCALATION REVENUE

Escalation income is computed in accordance with the specific terms of existing leases and is assumed to be collected in arrears. In the case of forecasted leases, escalation revenue is based on a *pro rata* share of operating expense and real estate tax increases. Added to this is an annual increase in base rent equal to 25% of the increase in the Consumer Price Index (CPI) multiplied by the initial base rent.

While specific escalation provisions vary, the analysis reveals that prospective investors utilize a combination of escalation provisions. When taken together, these increase total annual tenant collections and prevent excessive lagging behind market rental rates.

TABLE IV
COMPARABLE OFFICE SPACE RENTALS
(MANHATTAN 1980-1981)

Location	Tenant	Rentable Area (Sq. Ft.)	Rent/ Sq. Ft.	Remarks
Downtown	Insurance Company	84,849	\$20.70	Lease term is July 1981 to June 1991 with rent review after five years; electricity additional; full pro rata real estate tax and operating expense escalation; also four 5-year options at 90% of then market rent.
Midtown	Utility Company	28,500	18.50	Lease term is December 1981 to March 1985; electricity approximately \$3.00/sq. ft. additional; escalation for real estate taxes and building energy; \$.015 per \$.01 porter wage; cleaning included; space taken "as is;" lease was a renewal.
Downtown	Law Firm	15,670	15.00	Lease term is October 1981 to April 1990.
Downtown	Stock Brokerage	14,110	14.00	Lease term is February 1981 to April 1991.
Downtown ¹	Stock Brokerage (related)	62,135	26.00	Both leases negotiated October 1980; leased on "as is" basis with extensive renovations required in both cases. Both tenants pay pro rata real estate tax and operating expense escalations and Consumer Price Index with a cap rate of 3% per year.
Downtown	Stock Brokerage	38,000	17.54	Lease term is March 1982 to March 2003; electricity additional; pro rata share of operating expenses and real estate tax; tenant does own cleaning.
Downtown	Union Bank	21,500	11.63	Lease signed on June 14, 1981; 15-year lease; escalation for real estate taxes and energy; \$.015 per \$.01 porter wage.
Downtown	Bank	71,000	21.13	Ten-year lease.
Downtown	Insurance Company	20,295	19.50	Ten-year lease.
Downtown	Communications Co.	23,400	15.80	Five-year lease.
Downtown	Bank	22,751	17.80	Ten-year lease.
Downtown	Stock Brokerage	60,084	15.32	Lease term is 6 years, 3 months.
Downtown	Law Firm	18,006	19.75	Lease term is 10 years, 2 months.
Downtown ¹	Law Firm	98,152	24.00	Ten-year lease; escalation for real estate tax and energy; \$.015 per \$.01 porter wage.
Downtown	Bank	6,237	19.00	Ten-year lease; escalation for real estate tax and energy; \$.015 per \$.01 porter wage; lease was signed in February 1981.
Downtown	Stock Brokerage	5,113	15.00	Ten-year lease.
Downtown ¹	Law Firm	18,000	18.90	Ten-year lease signed on January 4, 1981; escalation for real estate tax and energy; \$.015 per \$.01 porter wage.
Downtown ¹	Law Firm	151,000	28.00	Lease negotiated October 1980; "as is"; electricity additional.

¹Post-World War II building

TABLE V
Analysis of Growth Assumptions
Office Buildings
(Manhattan 1980-1981)

Sale No.	Date	Market Rent Growth Rates					Expense Growth Rates				
		%	(1st Period)		(2nd Period)		Thereafter	Operating	Electric	Real Estate Taxes	All
			No. of Years	%	No. of Years	%					
1	9/81	8.0%	—	—	—	8.0%	10.0%	12.0%	6.0%	—	
2	9/81	10.0	—	—	—	10.0	—	—	—	10.0%	
3	6/81	10.0	2	—	—	8.0	8.0	8.0	10.0	—	
5	7/80	10.0	3	—	—	7.0	9.0	11.0	5.0	—	
6	3/81	12.0	2	9.0	2	6.0	8.0	8.0	5.0	—	
7	3/81	12.0	2	9.0	2	6.0	8.0	8.0	5.0	—	
8	4/80	7.0	—	—	—	7.0	9.0	10.0	5.0	—	
9	4/80	7.0	—	—	—	7.0	9.0	10.0	5.0	—	
10	7/80	6.0	—	—	—	6.0	10.0	10.0	6.0	—	
11	10/80	12.0	3	10.0	3	7.0	8.0	10.0	5.0	—	
12	8/81	10.0	2	8.0	2	6.0	8.0	8.0	7.0	—	

RENEWAL OPTIONS

Renewal options in existing leases, that specify new base rentals or escalation provisions, are assumed to be exercised and are incorporated into the forecast. One lease provides for a seven-year renewal option beginning in 1983 at a specified annual rent that is less than the expected 1983 market rent (\$19.80 market vs. \$13.00 contract). Renewal options not specifying either base rent or escalation provisions are also assumed to be exercised; however, market rental rates and new escalation provisions are applied.

TENANT TURNOVER

Approximately 35% of the building's space is assumed to be re-leased to the existing tenants, comprised of three major corporations. An additional 50% of the building is assumed to be re-leased to other existing tenants. New tenants are assumed to lease the remaining 15% of the building.

NEW LEASE TERMS

Upon expiration of existing leases and renewal options, all space is assumed to be re-leased for successive 10-year terms. Large tenants, having to incur the expense of space planning, actual space preparation, and relocation of operations, typically desire long lease terms. They generally are willing to accept a renegotiation of base rents at least every 10 years.

TENANT-SPACE PREPARATION

Until 1987, all space being re-leased or newly leased is assumed to be "as is" with tenants absorbing any preparation costs. This practice is common in a tight market, particularly for long-term bulk-space users. Beginning in 1987, preparation costs are to be absorbed by the owner. The cost/sq. ft. is calculated by applying an 8% annual growth rate to a 1987 cost estimate of \$7/sq. ft. No space preparation cost was charged for the retail space.

LEASING COMMISSION

A leasing commission of 17.15% of the first year's base rent is applied to all re-leasing activities. This reflects 35% of the space being re-leased to the three major corporations at a commission rate of 14% of the first year's base rent, 50% of the space re-leased to existing tenants at a commission of 14%, and 15% of the space leased to new tenants at a commission of 35%. Commissions are assumed to be paid in full upon occupancy and are deducted from revenue. This commission schedule is consistent with the typical rates of New York City brokers.

VACANCY

Newly available leases, accounting for 15% of the building's space, are assumed to show vacancies for an average of four months. The balance of 85%, re-leased to existing tenants, is assumed to suffer no vacancy, so a weighted average of 0.6 month's vacancy is applied to it. The rent loss is reflected by not accruing base rent or escalation revenue for the 0.6-month period. Further, an allowance for the underlying level of vacancy inherent in any multitenanted office building is calculated at 0.5% of total gross revenue.

OPERATING EXPENSES

Total operating expenses (excluding real estate taxes, leasing commissions, management, ground rent, and capital items) are estimated at \$2,161,000 for 1982, or \$2.23/sq. ft. of rentable area. The HVAC estimate from 1982 to 1983 decreases to reflect the savings in converting from steam to oil. Energy-related items were estimated to increase at 10%/year and other expenses at 8%/year. The growth-rate assumptions are based on those indicated for comparable sales (*Table V*). Expenses for cleaning and tenant electricity are omitted from the operating expense estimate because existing tenants pay them—not unusual for this type of back-office space. The market rent estimate of \$18/sq. ft. assumes that future tenants will continue this practice.

To support the expense estimates, those of six Manhattan office buildings are examined (*Table VI*). Total operating expenses (including cleaning and electricity) range from \$4.12–\$5.62/sq. ft. Excluding cleaning and electricity, operating expenses range from \$1.12–\$1.91/sq. ft. Combining this information with the recent history of 600 Main Street, the estimated operating expenses for 1982 are as shown in *Table VII*.

TABLE VI
Comparable Operating Statements
(Manhattan/per sq. ft.)

	<i>Building A</i>	<i>Building B</i>	<i>Building C</i>	<i>Building D</i>	<i>Building E</i>	<i>Building F</i>
Rentable Sq. Ft.	1,500,000	450,000	525,000	750,000	875,000	300,000
Effective Gross Revenue/ Rentable Sq. Ft.	—	\$12.81	\$11.82	\$12.13	—	\$10.85
Operating Year	1981	1981	1981	pro forma 1982	1981	1981
Operating Expenses:						
Electricity	\$2.50	\$ 2.69	\$ 2.50	\$.81†	\$1.87	\$ 1.80
Heat	.23	.84	.37	.61	.59	.44
Cleaning	1.42	.88	1.04	1.40	1.30	1.18
Payroll (incl. fringes)	.82	.42	.17	.48†	.41†	.37
Insurance	.08	.15	—	.09	—	.14
Repairs & Maintenance†	.51	.38	.57	.58	.65	.43
Water & Sewer	.03	.03	.01	.04	.04	.04
Miscellaneous	.03	—	—	.11	.03	.14
Total	\$5.62	\$ 5.39	\$ 4.66	\$ 4.12	\$4.89	\$ 4.54
Management Fees & Costs	.37	.37	.29	.25	.11	.16
Real Estate Taxes	2.38	2.52	1.28	2.43	2.25	1.91
Total Property Expenses	\$8.37	\$ 8.28	\$ 6.23	\$ 6.80	\$7.25	\$ 6.62

- † Certain large tenants are separately metered for electricity; there, the indicated electricity expense/sq. ft. for the entire building is understated.
† Includes security guard service contract.
† Includes elevator maintenance contract, if any.

TABLE VII
Estimate of Operating Expenses

	<i>1981 Budget</i>	<i>1982 Estimate</i>
HVAC	\$ 500,000	\$ 400,000*
Payroll	154,000	175,000
Repairs & maintenance	385,000	440,000
Building electricity	600,000	660,000
Security	175,000	200,000
Cleaning (public areas)	25,000	30,000
Garbage collection	5,000	6,000
General & administrative	185,000	200,000
Water & sewer	44,000	50,000
Total	\$2,073,000	\$2,161,000
Total/rentable sq. ft.	\$2.14	\$2.23

*Reflects conversion to oil heat for part of the year.

Adding the cost of tenant electricity (\$2.30/rentable sq. ft.) and cleaning tenant areas (\$1.45/rentable sq. ft.) to the total operating estimate of \$2.23/rentable sq. ft. indicates a final total of \$5.98/rentable sq. ft. Thus, the 1982 estimate is slightly above the 1981 estimate.

REAL ESTATE TAXES

Taxes for the year ending 1982 are estimated at \$998,000, or \$1.03/sq. ft. of rentable area. Taxes are predicted to increase by 25% for 1983 and 5%/year thereafter. The 1982 tax estimate and 1983 increase are predicated on the property's reassessment at the time of sale, 1981. This analysis was performed prior to the recent New York City law that provides for assessment increases to be phased in over a five-year period.

MANAGEMENT

Management fees are estimated at \$75,000 for 1982, increasing by 8%/year thereafter. Although the building is large, the small number of tenants engaged in significant leasing activity during the near term are an adequate inducement to attract competent management.

RESIDUAL VALUE

Residual value is estimated by analyzing a second 10-year forecast that begins in 1992 and incorporates the use of a 12% overall capitalization rate applied to the 20th-year NOI. The pre-tax cash flow and residual from the second 10-year analysis are discounted to present worth, using a rate of 23%.

This approach is a departure from the standard practice of capitalizing NOI in the last year of the forecast period. We believe it is an improvement because it 1) mirrors more closely the approach of the second buyer, 2) results in a more accurate estimate based on consistent assumptions, and 3) reduces the rigid effects of an overall capitalization rate tied to a specific NOI.

SELLING EXPENSES

Selling expenses, calculated at 2.5% of the sale price, are deducted from each resale price. This reflects an estimate of brokers' commissions, advertising, and transfer taxes.

CONSUMER PRICE INDEX

The CPI is assumed to increase by 6% for 1982, 7% for 1983, and 8%/year thereafter. This is consistent with assumptions currently being made by market participants.

INTERNAL RATE OF RETURN ANALYSIS

Key considerations for the selection of an appropriate discount rate are: 1) the type of real property interest being evaluated; 2) the degree of risk

inherent in the property; and 3) the relative degree of reasonableness inherent in the assumptions used for comparables.

Type of Real Property Interest

Factors to be considered regarding the type of real property interest being evaluated are:

- *Leasehold vs. fee simple.* Even though a fee simple interest generally has less risk than a leasehold interest, no differentiation in IRRs is noted here. This is consistent with a similar finding regarding cash-on-cash and overall rates in Manhattan office building sales in the late 1970s.
- *Financed vs. all-cash sales.* Market evidence indicates that the risk in obtaining financing is reflected in required IRRs. Properties which sell subject to existing financing, at rates below the market, tend to indicate lower-equity IRRs than those that sell on an all-cash basis, with the anticipation of obtaining financing at market costs.
- *Fractional vs. undivided interests.* Fractional interests (as in a partnership) in real property generally sell for higher IRRs than undivided interests, except when preferential returns are provided. In the case of interests receiving preferential returns, lower IRRs are indicated. Higher IRRs are indicated for the remaining interests.

Risk Perception

The perception of risk is the paramount consideration in the real estate investor's decision-making process. The greater the perceived risk, the higher the discount rate required to attract equity capital. Risk evaluation involves consideration of the following:

- *Location.* Is the property located in a stable economic environment that is likely to remain desirable and competitive?
- *Physical condition.* Does the property require large capital investments to maintain its physical integrity and competitive position?
- *Market-rent differential.* What is the existing differential between total rent (base rent plus escalation rents) and current market rents?
- *Lease-expiration profile.* Does a significant portion of the leased rentable area expire in the near term, permitting an owner to capture the market differential without creating many vacancies during periods of anticipated oversupply?
- *Yield quality.* Is a significant portion of the anticipated IRR derived from low-risk components (such as cash flow and return of original equity) or must the investor rely on high-risk components (such as an inflated residual value or proceeds of refinancing in the distant future)?

Reasonableness of Underlying Assumptions

In analyzing IRRs indicated by comparable transactions, it is necessary to review the reasonableness of the underlying assumptions. If they are optimistic compared to the assumptions for the subject property, the indicated IRR should be reduced. If they are overly conservative, the indicated

internal rate should be raised. Factors to be considered include:

- *Present assumptions*, regarding market rental rates, operating expenses, and real estate taxes for the first year, should be based on a realistic evaluation of market conditions.
- *Future assumptions* of revenues and expenses, for the purpose of estimating future cash flows and residual values, need not have any factual basis. They must, however, reflect the thinking of participants in the marketplace. The IRRs forecast by purchasers are not absolute like an overall capitalization rate. They are based on a forecast of future cash flows that rely partly on the application of growth rates.

MARKET INDICATION

The valuation analysis for 600 Main Street is of a fee simple interest, subject to existing tenancies. The assumptions used to forecast net operating income are realistic and derived from the marketplace. The range of IRRs indicated by the comparable sales is wide; however, the range can be explained. The lowest IRRs are derived from sales of properties having one or more of the following characteristics: landmark status, prime location, or a highly regarded major tenant. Thus, well-located prime buildings in Manhattan can be expected to provide IRRs of 15%, more or less. Examples of IRRs at this level include the sales of the Pan Am Building, the General Motors Building, and the Seagram Building.

At the other end of the range are properties with one or more of the following characteristics: fringe location, high improvement budget, remodeling (to maintain a competitive position), or nondescript tenants who lack strong credit. In Manhattan, properties with these characteristics indicate IRRs in excess of 25%.

The bulk of the indicated IRRs range from 18%–25%. Midtown locations generally reveal lower rates than downtown locations. The three best comparables (*Sales 3, 4, and 11*) are located downtown. They indicate IRRs from 17.9%–25.9%. Each real property interest is assumed to be purchased on an all-cash basis. The indicated IRRs reflect the anticipated net operating income and residual value for the entire interest acquired. Inherent in the indicated IRRs is the anticipation of financing at market rates. *Sale 11* is financed at market terms. The buyer of *Sale 3* has completed financing by selling an 80% preferred interest in the property to an institutional buyer (*Sale 4*). Although *Sale 4* is in reality a partial resale of *Sale 3*, it qualifies as a financing transaction. The lower IRR in *Sale 3*, therefore, is not surprising. As a result of *Sale 4*, the seller expects to increase the IRR beyond the original expectation of 25.5%.

The discount rate to be applied to the subject should be less than the 25% level indicated by the most comparable properties (*Sales 3 and 11*) because: 1) the subject has fewer tenants, reducing the management burden; 2) a majority of the building is occupied by three superior credit-worthy

tenants, likely to remain after expiration of their existing leases; and 3) the need for large blocks of contiguous space is very strong, indicating a readily marketable building and potentially lower vacancy.

As a package, *Sales 8* (20.3%) and *9* (20.5%) are better located and are better investments overall, indicating a discount rate of 20%–25%. In our judgment, the appropriate discount rate to be applied to the fee simple interest in 600 Main Street is 23%, or slightly above the midpoint of this range. The final selection of a discount rate will always be subjective. This is analogous to the subjective selection of a cash-on-cash or overall rate in the traditional income approach. The challenge to appraisers is to understand the range indicated by comparable sales and to arrive logically at an appropriate discount rate. The IRRs derived here are peculiar to Manhattan office buildings with very specific investment characteristics; they should not be indiscriminately applied.

DISCOUNTING PROCESS

The 10-year forecast of NOI in *Table VIII* and residual value in *Table IX* is based on the investment assumptions. By applying the discounted cash flow technique, the indicated value of fee simple interest in 600 Main Street, subject to existing tenancies, is \$47,060,000, say, \$47,000,000.

INCOME APPROACH (DIRECT CAPITALIZATION TECHNIQUE)

The overall capitalization rate (OAR) derived from comparable sales (*Table III*) expresses the relationship between the forecasted NOI in the first year of ownership and the total sale price for each property. The rate can be viewed from two different perspectives—one physical and the other financial. Physically, the rate can be analyzed as providing for returns on and of the land and building values. This viewpoint is rarely encountered in the marketplace. The financial view of the OAR is more relevant. In this view, the rate is seen as reflecting the appropriate returns to the debt and equity interests. In real estate markets where there is available mortgage money at acceptable rates, the band of investment derivation of the OAR is more appropriate than abstracting the overall rate directly from comparable sales. In that type of market, cash-on-cash rates abstracted from the market transactions are very important. This is true of Manhattan office market transactions in the 1974–early 1978 period.

MARKET TRENDS 1974–1978

During the 1974–1978 period, cash-on-cash rates ranged from a low of 7% to a high of 16%. The sales at the low end of the range reflect investments in properties expected to provide above-average cash flow growth, near-term refinancing benefits, or unusually good tax benefits because of recent construction or the 100% depreciable nature of leasehold interests.

TABLE VIII
INCOME/EXPENSES

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
INCOME										
Base Rents	8149802	8149802	9459569	13310714	16043837	16879699	17352971	18350177	20513347	21359450
Escalations	0	283867	360523	528617	625906	772808	1074136	1455791	1816841	2061857
Add'l Vacancy	-40749	-42168	-49100	-69197	-83349	-88263	-92136	-99030	-111651	-117107
Total	8109053	8391500	9770991	13770135	16586394	17564244	18334971	19706938	22218537	23304200
EXPENSES										
Real Estate Taxes	998000	1247500	1309875	1375369	1444137	1516344	1592161	1671769	1755358	1843126
HVAC	400000	400000	440000	484000	532400	585640	644204	708624	779487	857436
Payroll	175000	189000	204120	220450	238086	257132	277703	299919	323913	349826
Repair & Maint.	440000	475200	513216	554273	598615	646504	698225	754083	814409	879562
Electric	660000	726000	798600	878460	966306	1062937	1169230	1286153	1414769	1556245
Security	200000	216000	233280	251942	272098	293866	317375	342765	370186	399801
Cleaning	30000	32400	34992	37791	40815	44080	47606	51415	55528	59970
Garbage	6000	6480	6998	7558	8163	8816	9521	10283	11106	11994
Gen. & Admin.	200000	216000	233280	251942	272098	293866	317375	342765	370186	399801
Water & Sewer	50000	54000	58320	62986	68024	73466	79344	85691	92547	99950
Management	75000	81000	87480	94478	102037	110200	119016	128537	138820	149925
Commissions	0	0	1010580	716834	223514	106953	40299	252348	660461	0
Capital Impvts.	0	100000	108000	116640	125971	136049	146933	158687	171382	185093
Total	3234000	3743580	5038741	5052723	4892264	5135853	5458992	6093039	6958152	6792729
NET OPERATING INCOME										
	4875053	4647920	4732250	8717412	11694130	12428391	12875979	13613899	15260385	16511471

TABLE IX
PRE-TAX CASH FLOW

Yr.	Total Effective Gross Income	Total Operating Expense	Net Operating Income	Mortgage Interest Deduction	Gross Pre-tax Cash Flow	Equity Payments	Refinancing & Non-Ded. Exp.	Net Pre-tax Cash Flow	Adj. Pre-tax Cash Flow	% Cash on Cum. Equity	Equity Cap Rate (%)	Overall Cap Rate (%)	Resale Price	Selling Expense	Loan Balance	Equity Rever- sion	Pre- tax Equity Yield
0																	
82	8109	3234	4875	0	4875	0	0	4875	4875	10.36	9.37	9.37	52051	1301	0	50749	18.20
83	8392	3744	4648	0	4648	0	0	4648	4648	9.88	8.07	8.07	57571	1439	0	56131	18.94
84	9771	5039	4732	0	4732	0	0	4732	4732	10.06	7.43	7.43	63676	1592	0	62084	18.97
85	13770	5053	8717	0	8717	0	0	8717	8717	18.52	12.38	12.38	70429	1761	0	68668	20.21
86	16586	4892	11694	0	11694	0	0	11694	11694	24.85	15.01	15.01	77898	1947	0	75950	21.40
87	17564	5136	12428	0	12428	0	0	12428	12428	26.41	14.42	14.42	86159	2154	0	84005	22.09
88	18335	5459	12876	0	12876	0	0	12876	12876	27.36	13.51	13.51	95296	2382	0	92913	22.47
89	19707	6093	13614	0	13614	0	0	13614	13614	28.93	12.92	12.92	105402	2655	0	102767	22.69
90	22219	6958	15260	0	15260	0	0	15260	15260	32.43	13.09	13.09	116580	2914	0	113665	22.88
91	23304	6793	16511	0	16511	0	0	16511	16511	35.09	12.81	12.81	128943	3224	0	125720	23.00

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Sales at the midpoint of the range reflect relatively stable investments, but they also indicate the prospect of slow cash flow growth and, perhaps, significant refinancing benefits. Sales at the high end of the range reflect property investments not expected to result in cash flow increases or equity-value appreciation in the near future. These sales contrast easily with the sales having low cash-on-cash rates, where buyers are willing to take a low return initially because of the potential for growth.

For the 1974–1978 period, developing an overall rate depends on the proper analysis of cash-on-cash rates and care to focus on those sales with growth prospects similar to the property being appraised. Because market participants focus on available cash-on-cash rates, the OAR band of investment method is clearly relevant.

MARKET TRENDS 1978–1980

The range of cash-on-cash rates, indicated by sales during 1978–1980, reveals a dramatic decline in cash-on-cash rates, reflecting the prime nature of the investments and the effect of the turnaround in office rents and market conditions in Manhattan. The rates range from 5%–9%.

The greater prevalence of cash sales during 1978–1980 reveals important trends. First, overall rates on all-cash sales are consistently higher than on sales with existing financing. Second, in almost every sale, subject to financing, the indicated cash-on-cash rates are less than the overall rates. Although initially this results in negative leverage, positive leverage results as the NOI increases over time.

The 1978–1980 period shows a transition from exclusive use of the cash-on-cash rate to the almost exclusive use of DCF analysis and the difficulty in developing a band of investment OAR as well as abstracting it directly from the comparable sales. The latter is more acceptable for use in the direct capitalization technique even though it is becoming more difficult to develop a supportable and explainable OAR.

CURRENT TRENDS 1980–1982

In the financial climate of the last two years, mortgage money has either been unavailable or too costly; thus, all cash or predominately all-cash sales have become prevalent. Of the 12 comparable sales used in the valuation of 600 Main Street, seven are described as all cash. More important, of the \$921,000,000 total sale price, 88%—\$810,000,000—was cash. Clearly, financing has had little or no effect on overall rates in recent Manhattan office market activity.

As a result, the OAR in today's market takes on the characteristics and role of the cash-on-cash rate of the second half of the 1970s. Sales with low OARs generally reflect high-growth prospects, and sales with high OARs generally reflect low-to-moderate growth prospects. The timing of the growth is also an important factor. Thus, sales with high growth prospects,

but with long time frames necessary to achieve growth, indicate high OARs. Cash-on-cash rates become almost meaningless and are relegated to a purely residual mathematic calculation in sales sold with financing.

The OARs of the 12 comparable sales range from a low of 3.4% to a high of 11.4%. *Sale 10*, which is at the low end of the range, has the potential for very high growth. It is situated at a 100% location in midtown and is a landmark structure with highly regarded tenants. Current total revenues are estimated at less than 50% of market rent. *Sale 2*, which is at the high end of the range, contains a building that is rented at close to 100% market rent, so the growth prospects are low. *Sale 1* is similar in that it, too, is fully rented at close to market rent.

The property being appraised is currently leased at 48% of potential market rent. It certainly has good growth prospects; however, because 28.1% of the building cannot be re-leased until 2003, it will be a long time before the growth is achieved. We reasoned, therefore, that the appropriate OAR should be at the high end of the range, or between 10% and 10.5%.

Because the market differential and the time of growth are the most important considerations, linear regression is applied to the comparative OAR analysis. A definite linear relationship is found to exist between the change in the ratio of total rent to market rent and the time frame during which the total rent approaches market rent. The analysis is applied in nine of the sales where adequate information is available. The sales with the lowest slopes (where the ratio of total rent to market rent increased only slowly) have the highest OARs. Conversely, the sales with the highest slopes (where the ratio of total rent to market rent increased rapidly) have the lowest OARs. When the relationship of the market differential slope of each sale is tested against its OAR, a linear relationship is discovered. The market differential slope for 600 Main Street, applied to the linear regression formula, indicates an OAR of 10.5%. This confirms the estimated range of 10%–10.5%.

The completed direct capitalization analysis is as follows:

Net Operating Income	
(first year of ownership)	\$ 4,875,000
Capitalized at 10.5%	\$46,428,570
10.0%	\$48,750,000
Conclusion	\$46,500,000 – \$48,750,000

MARKET DATA

For the purpose of estimating value through the use of the market data approach, the same comparable office building sales are used as in the income approach. The two units of comparison most often used are: the sale price/sq. ft. of rentable area and the effective gross rent multiplier.

Sale prices, on a square-foot basis, and multipliers have risen since the mid- to late 1970s. This is consistent with the reduction in rate of cash flow return over the same time period and the rapid increase in overall real estate values. The determination of appropriate value indications for 600 Main Street in the application of this approach is somewhat judgmental because of the difficulty of measuring property differences.

In analyzing gross rent multipliers, the most important variable has usually been the difference in NOI ratios among all of the properties analyzed. Assuming no other differences, the multiplier should increase as the ratio of NOI increases. Statistical analysis of the comparable sales reveal that it is not true in this case. Rather than the elimination of the multiplier, those multipliers that do not fit the overall pattern are substituted by a midpoint estimate. On this basis, the pattern of the multipliers suggests a range of 6.0 to 6.5; a multiplier of 6.25 is used.

The price/sq. ft. of rentable area from the sales was selected primarily from the properties that possessed the most comparable physical characteristics. The most similar sale properties were improved with pre-World War II buildings; they are *Sales 5, 11, and 12*. They range in price from \$27.34/sq. ft. to \$40.13/sq. ft. Six Hundred Main Street was far superior in physical characteristics to the sale with the \$27.34 indication and most comparable to the sale with the highest indication. Allowing for the continued increase in real estate prices since the date of the most comparable sale (late 1980), we arrived at a range of value of \$45.00–\$50.00/rentable sq. ft.

The values indicated by the market data approach, therefore, are:

(a) 951,049 rentable sq. ft.		
	@\$50.00/sq. ft.	= \$47,552,450
	@\$45.00/sq. ft.	= \$42,797,205
	(say)	<u>\$45,000,000</u>
(b) \$8,109,000 effective gross revenue @6.25		= \$50,681,125
	(say)	\$51,000,000

CONCLUSIONS

The purpose of the valuation discussed here is to estimate the market value of the fee simple interest in property, subject to existing tenancies. The indicated market value estimates for the real property interest are:

Income Approach (Discounted Cash Flow Technique)	\$47,000,000
Income Approach (Direct Capitalization Technique)	\$46,500,000 – \$48,750,000
Market Data Approach	\$45,000,000 – \$51,000,000

All three approaches are well founded by actual and extensive market data and logically support a market value conclusion between \$45,000,000 and \$51,000,000.

A value of \$47,000,000 (as determined by DCF analysis) provides an investor with an anticipated IRR of 23%, which is a reasonable yield requirement for an investment in 600 Main Street. Further analysis of the 23% IRR on a before-tax basis reveals that 66.30% of the 23% IRR is provided by the cash flow during the 10-year forecast. Equity appreciation provides approximately 21.09% of the yield. The remaining 12.61% of the yield is provided by the recovery of the original equity investment (\$47,000,000) at resale.

The challenge of appraising in the 1980s is to keep up with and reflect the actions of real estate-market participants. Appraisers, as a group, have tended to a) isolate themselves from the techniques utilized in the marketplace, and b) argue endlessly about appropriate valuation techniques. A good example is the ongoing debate concerning the validity of DCF analysis and the relevance of traditional valuation techniques.

Better market research, detailed sales verification, familiarity with all contemporary market-supported tools (including DCF analysis statistics and small business computers), and relevant continuing education may mean the difference between the growth and prosperity of appraisers in the 1980s or their ultimate demise.

The 600 Main Street case study provides a vehicle for sharing valuation techniques and findings for a specific property. The techniques have widespread application and, in fact, are an appropriate market-supported basis for valuation of major income properties throughout the country. The use of DCF analysis in real estate should not be ignored by the appraisal community. Almost every step of the appraisal process requires some subjective judgment; however, given existing market data, the DCF technique involves the least subjectivity. Furthermore, since in today's market most major office building sales are based on the application of this technique, the appraiser should place the greatest reliance on DCF. As institutional buyers become a greater part of the marketplace, DCF analysis will probably grow and become entrenched in most future real estate decision making.

Letters to the Editor

Selected for relevance, edited for brevity

We are concerned that our article, "Changing Emphasis in Appraisal Techniques: The Transition to Discounted Cash Flow," published in January 1983, contains ambiguities as a result of the *Journal's* editing process.

We are particularly concerned that the published article ended by stating that "the discounted cash flow technique involves the least subjectivity" and "the appraiser should place the greatest reliance on discounted cash flow." In the case study, the authors relied on the discounted cash flow technique because of strong evidence that participants in that market did. The authors do not believe that discounted cash flow is the only way to go in every market, for all types of property, but that the use of discounted cash flow, or any valuation technique, depends on the availability of data and the actions of market participants. Our conclusions on the subject and our reasons for writing the article are best described in the following five paragraphs, which under the heading "Concluding Thoughts" should have constituted the ending of the published article.

CONCLUDING THOUGHTS: The challenge of appraising in the 1980s is to keep up with and reflect the actions of real estate market participants. The authors believe that appraisers as a group have tended to (1) isolate themselves from the techniques utilized in the marketplace, and (2) argue endlessly about appropriate valuation techniques. A good example is the ongoing debate concerning the validity of discounted cash flow analysis and the relevance of traditional valuation techniques. If it continues unabated, appraisers themselves may become irrelevant.

Better market research, detailed sales verification, familiarity with all contemporary market-supported tools, including DCF analysis, statistics, and small busi-

ness computers, and relevant continuing education may make the difference between the growth and prosperity of appraisers in the 1980s or their ultimate demise.

The 600 Main Street case study provides a vehicle for sharing valuation techniques and findings for a specific property and real estate market. The authors believe that the techniques have widespread application and, in fact, are an appropriate market-supported basis for valuation of major income properties throughout the country. The arrival of DCF analysis on the real estate scene should not be ignored by the appraisal community. It is a relevant form of analysis used by investors. As institutional buyers become a greater part of the marketplace, DCF analysis will probably grow and become entrenched in most future real estate decision making.

At the same time, the traditional approaches have validity. They are more difficult to accurately apply than DCF, but they offer additional insight and at least provide readily understood checks and tests.

The marriage of traditional techniques and discounted cash flow analysis has already taken place in the marketplace. Let's take off the blinders and stop arguing about the validity of various valuation techniques. Instead, let's do serious research into the current thinking of market participants, use these findings in our work, and share the results with the entire appraisal community. Will the marriage last? One thing is certain — the marketplace will decide, not the appraiser. And that is the way it should be.

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