

JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS

III. REAL ESTATE DEPARTMENT ADMINISTRATION

K. Evolution of the UW Real Estate Program

2. Richard U. Ratcliff: Selected Works and
Correspondence: Includes course descriptions

Real Estate Economist
3418 Lake Mendota Drive
Madison, Wisconsin

July 13, 1964

Mr. John E. Shiels
National Mutual Benefit
119 Monona Ave.
Madison, Wisconsin

Dear John:

In response to your recent request, I have been considering the matter of the Insurance Building and the various alternatives which the owner has under consideration for optimizing its productivity as an investment. The following outline suggests the nature and scope of the investment analysis which would be required to arrive at sound decisions with respect to the several alternatives which you outlined in our brief conversation.

The Problem

The Insurance Building, owned and in part occupied by the National Mutual Benefit is situated on one of the best sites in the city for office building use. However, the increasing competition of new and modernized office space in the Square area and in suburban locations and the substantial additions to State of Wisconsin office complexes have forced clear and less attractive office buildings into an unfavorable competitive position. To maintain occupancy and rent levels, the older buildings must meet the new competition by modernization and the provision of convenient parking for tenants and their clientele. The investment problem is to determine the nature and extent of the improvements which are required to meet competition and to determine the optimum balance between additional capital expenditure and added net income from the property after modernization.

The Alternatives

You have indicated that the following possible steps are under consideration:

1. Modernization of the structure and its equipment.
2. Acquiring an adjacent site for the provision of parking.
3. Moving the offices of the National Mutual Benefit to a different location in the building.
4. Moving the National Mutual Benefit out of the building to office space elsewhere which might be either rented or owned.
5. Selling the Insurance Building and moving the National Mutual Benefit to other office space which might be either rented or owned.

Mr. Shiels

July 13, 1964

Market Analysis

Before considering the alternative courses of action, it will be advisable to analyze the present and prospective market for centrally located office space in Madison and the relative competitive position of the Insurance Building. Such a demand and supply analysis will be necessary in order to judge the probably effect on rents and occupancies of the various possible steps under consideration.

Analysis of Alternatives

A productivity analysis of each of the alternative courses of action will start with a financial analysis of current operating experience as a basis of comparison. Each of the possible alternatives can then be evaluated by comparing the situation after the change with the situation before the change. Such analysis involves estimates of the capital costs of making the change, the changes in revenues which will occur and the change in operating costs after the steps are taken. In some cases, where depreciation allowances are involved, income tax benefits may accrue.

The following paragraphs suggest some of the special problems in analyzing the net effect of the various alternative steps:

1. Modernization

A first step is to judge what changes need to be made in order to maintain or improve the competitive position of the Insurance Building in the office space market. The costs of the various possible improvements will be estimated and their effects on operating expenses after installation. This change can be judged against the estimates of the effect on occupancy and rent levels after the improvement to determine whether the improvement is economically justified.

2. Parking

It is assumed here that consideration is being given to the acquisition of the adjacent Community Center property as the site for a parking lot or ramp. In order to determine how large an investment would be justified in this property, a first step is an estimate of the effect which such parking facilities would have on rents and occupancies in the Insurance Building. This estimate calls for an assumption on how the parking property would be developed and operated, i.e., would a ramp be erected and if so, how high; how much would office tenants be charged for a reserved parking space; would a ramp be a profitable operation as such in addition to providing assured parking for the office building tenants? These and other questions could be answered only after a study of the parking possibilities in the proposed location in light of overall parking demand in the vicinity. An analysis of the capital investment involved in developing the parking site would be required as well as estimates of revenues and operating expenses.

Mr. Shiels

July 13, 1964

3. Moving to a different location in the Insurance Building

This question is primarily a matter of the rentability of the lower floors now occupied by the National Mutual Benefit and a review of the assumption that the location within the building does not affect its operation materially.

4. Moving out of the building but retaining ownership

The first question here is that of the importance to National Mutual Benefit of continued occupancy in the building as compared with alternative locations. Two possible alternatives should be considered: - a location within easy walking distance to the Square, and an outlying location in or near a suburban shopping center such as Hilldale. Consideration should be given to the effects on business operations and employee turnover.

Analysis of the rentability of the released space in the Insurance Building will be required, to be considered against the cost of alternative space in another location.

The question of whether to rent space or invest in a new building will call for a financial analysis of the alternatives starting with the locating and pricing of available rental space in acceptable locations. The possibility of a new building can be studied on the basis of land costs in acceptable locations, costs of construction and the market for other tenants for the new building. There may be special advantages from a tax standpoint in the depreciation allowances on a new structure.

5. Selling the building and moving to a new building

The main problem here is to determine the price for the building which would be sufficiently attractive to justify its sale and to judge whether that price could probably be secured in the present or future market. The questions concerning a new location are the same as in the foregoing paragraph.

It is difficult to estimate the time required for the above analyses without knowing how much of the spade work has already been done by National Mutual Benefit and without some guidance on which items you wish covered and whether you wish a study in depth to the extent required for a final decision. I will be willing to provide an estimate of the probable fee within a reasonable range if you will give me guidance on the foregoing points.

Sincerely,

Richard U. Ratcliff, Ph.D., M.A.I.
Real Estate Economist

RUR:db

(Re-typed by Landmark Research, Inc. on April 30, 1995)

ORIGIN OF DEFINITION OF "MOST PROBABLE PRICE"

July 26, 1974

Mr. Henry C. Entreken, Jr.
Glenn B. McCormick Co., Inc.
3443 First Avenue North
St. Petersburg, Florida 33733

Dear Mr. Entreken:

In a recent letter from Jim Graaskamp, he requested that I send to you a "specific concise definition of probable price . ." for defining value at the beginning of the appraisal report. I am tempted to reply that this simple, down-to-earth concept is self-defining through the literal meaning of the words. But on mature thought, I realize that you need something to incorporate in the report for the benefit of your client. Try this: "The most probable price is that selling price which is most likely to emerge from a transaction involving the subject property if it were to be exposed for sale in the current market for a reasonable time at terms of sale which are currently predominant for properties of the subject type."

Sincerely,

A handwritten signature in dark ink, appearing to be 'Ratcliff', with a large, sweeping loop at the end.

Richard U. Ratcliff

RUR:dbr

(Re-typed at Landmark Research, Inc. May 7, 1995)

Richard U. Ratcliff
~~1722 Columbia Street, Apt. 207~~
Santa Cruz, California 95060

890 W. Cliff Dr. #6

Dear Jim:

Your annual travelogue at the top of the pile and your nice letter of Nov. 28, at the bottom have combined to stimulate this response. Just in case that I have not mentioned it, the new address(above) reflects our purchase of a seashore condominium apartment where I now sit at my desk, gazing across the lawn(which our Japanese gardener is mowing - included in the monthly payment), and across W. Cliff Dr. to the blue Pacific and when there is no sea fog, to a glimpse of the Monterey peninsula against the background of the Big Sur range. The move is working out very well. We are on the first floor, with not even a threshold step - for your convenience when you stop in for a visit. As for the weather (didn't I hear you inquiring about it ?) we have had a perfect fall, with two rainy days, and warm daytime sun - yesterday I played golf in 70 degree sunshine. Nights are cool - sometimes near freezing but by late morning, it is delightfully warm- at least, compare with Wisconsin. Of course, this fall weather, according to the natives is "unusual" - but Ratcliff principle #1 is that the weather is always unusual. I have never been anywhere anytime in "usual" weather. Ratcliff Principle #2 will not interest you much, but just for the record it states that there are no ordinary grandchildren. The world is peopled with outstanding, brilliant and extraordinary grandchildren uncontaminated by a single representative of the average. May I express my deep sympathy on the loss of your father. I remember meeting your parents on the occasion of your teaching award. They were charming and interesting people. I judge that much of your personal philosophy stemmed from your father and that he was a major influence in molding your character. I know that you will miss him. It is hard not to personalize this parental reference; my own father was a nice guy and very good to me but I should be hard put to identify attitudes or philosophies of my own which originated with him, though they must be there, I suppose. *****

(Note passage of time) Lunch and short nap, and then to the golf course. The weather conditions were quite different - a bright sun but a wind and much lower temperatures. However, with a jacket, it was comfortable enough but by the end of 9 holes, the sun was low and so was the temp. I finished about 4:30 and judged that in another half-hour, it would be too dark to play.

Your reference to Mack Hodges' letter brings back memories not too clear. I seem to recall my reaction to the effect that Mack was looking for a rationalization of his position and that I could not honestly twist my own views to perform this function. I wrote him something, but not very helpful to his cause, I fear. Based on the comments in your letter and the stand of the Sage of Arlington, I have only this to say: it is impossible, literally, to dissect complex transactions in order to provide the in-puts for the analyst's after tax flow model except as subjective and informed judgments of investor behavior. This may be the best he can do and may provide a useful basis for prediction - but the output is not objectively market-determined in a mathematical sense, as it is, for example, in multiple regression. It is simulation, with subjective in-puts. Why not say so ? incomplete investor not market

Please excuse another desertion of this unilateral conversation - I must check of how the Golden State Warriors are doing against Boston - they were 19 points ahead at the end of the half.**At the end of the 3rd quarter, the Warriors lead 110 to 68.

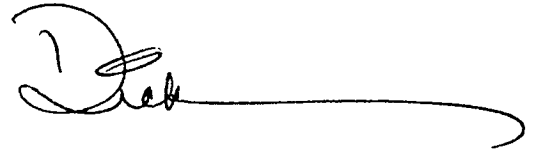
Richard U. Ratcliff
 222 Columbia Street, Apt. 297
 Santa Cruz, California 95060

Thanks for the suggestion that I come to Madison in July to join the fun but it seems unlikely at the nonce. We do have one expedition in the making - this February south to Santa Barbara, Pasadena, Phoenix Tucson and perhaps to Roswell NM to see Earl Lostetter, if he is able to have visitors. We have a score of friends and relatives to visit on this trip, including Ch Center, and will take about 3 weeks for it. As a product of my article in the October issue of the Appraisal Journal, I am invited to speak to the NW AIREA Regional conference at Coeur d'Alene in June. Otherwise, we will probably be here looking at the Pacific for the Dallas meetings - you boys will have to get along without me. I am gradually withdrawing from the professional circuit and have resigned from the Counselors, AIREA and others.

Incidentally, I note that we now have three members of our original MS appraisal group of students as members of ASREC - John Hoppe, Dennis Anderson and Don Evans. Earl Lostetter will get a big kick out of this accomplishment, particularly since one of them, John Hoppe, enjoyed the honor and benefits of an ASREC fellowship. Going way back, well before your time, when I started the real estate program at UW right after the war, our most helpful patron was Warner Baird. I have kept in touch with him ever since and a couple of years ago, visited him at his winter palace at Hobe Sound, Fla. We exchange Christmas cards and the one this year mentioned the fact that he is now 90 years of age - and still has an office in the company headquarters. Our program at Wisconsin owes him a great deal - he got us national publicity among Realtors and raised a fund of \$12,000 which he turned over to us without strings as to its use. I stretched it out over many years for all manner of items; perhaps some of it is still around.

Time to retire, but I may go back to an interesting paperback (first), a true account of how the British broke the ultra secret German code and through most of the war, had advance notice of all important Axis moves. The Germans never caught on.

Hope to see you out here again one of these days and in 1977, we will be back in Madison for our 50th class reunion.



RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

January 3, 1980

Dear Jim:

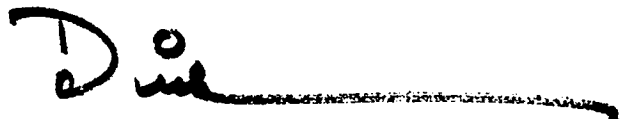
Great day in the morning - the BOOK has arrived in all its glory, and I have been pouring over it as if it were a new masterpiece just unveiled. I am indeed intrigued by the clever cover design and the 8 $\frac{1}{2}$ /11 format. Of course, I first re-read the Introduction, for who finds anything more exciting than himself. I suppose that everyone will recognize your fine hand in its authorship, but somehow I wish you might have signed it.

I dearly wish that I could adequately express the special kind of gratification which warms the cockles of this old heart as this publication sees the light of day. For an old goat who feels just a little bit out of it - no one wants to be ignored or forgotten - what could be a greater morale booster? And I know that you are solely responsible; it was your idea in the first place and your project from start to finish. I shall be forever grateful. Thanks, Jim. Your loyal friendship is beyond price.

And my thanks for the copy of Techniques for Writing. I have been paging through it and am very well impressed with its content and with the potential as a guide, much needed, for the report writer. It looks like a very competent job of writing and presentation. We are looking forward to seeing you toward the end of the month. Right now, Dorothy is in Janesville at the funeral of her brother who has been suffering from leukemia for several years. He died rather suddenly when cancer spread. Thus the event is a release and not such a shock as it might have been.

A note with the BOOK says that a letter follows. I wait with impatience. Thanks again for a job well done, - and immensely appreciated.

Cordially,

A handwritten signature in dark ink, appearing to read "Dick", with a long, horizontal, slightly wavy line extending to the right.

RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

April 4, 1980

Dear Jim:

This is a hurried letter and I am hoping that I will get a hurried reply. The occasion is a very persuasive plea by McGraw-Hill and Lynn Woodward that I participate in a revision of my REAL ESTATE ANALYSIS book. Woodward's letter is a particularly good job of salesmanship but of course I do not know him from the Biblical originator of the tribe of men. Can you give me a quick analysis of his competence to re-write portions of the book, write 3 or 4 new chapters and contribute an up-dated point of view. I would expect to keep a hand in the whole effort and do some of the re-writing. He proposes to give me the veto power and I would not have it otherwise. I realize full well that collaboration is a difficult deal. Would he accept my guidance and direction even when at odds with his preferences. His letter suggests an ambitious, energetic person but gives little clue to intellectual capacity and originality. He is academically young and has no publication record.


I would greatly value your judgment on Woodward as a collaborator. You know what the job involves and the many questions in my mind with respect to a perfect stranger.

Is there some other person who has been close to him and who could give me an objective analysis.

In a more leisurely situation, I would ask about your present assignment and the local fishing. But I must get this in the mail to compete with the Census.

The notes on Warner Baird will be written next week and sent to your Madison address.

Sincerely,

A handwritten signature in dark ink, appearing to be 'Dick' with a long, sweeping horizontal line extending to the right.

RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

April 10, 1980

Dear Jim:

This letter will cover a number of subjects, which I will address seriatim:

1. Warner Baird Recognition

I am enclosing a 3 page statement which I wrote blind, not knowing how it is to be used. As written, it is a tribute by me to an old friend and colleague but the information contained therein could be adapted to some other presentation approach. This is your show, so use it as you will.

I am very regretful that I cannot be present. Please tell Warner that only this rare visit by Becky and family could keep me away.

The photo copy of the 1945 Headlines bulletin should be passed around for all to see. I doubt that the present generation will appreciate the enormity of Baird's accomplishment getting this distributed. I dare say that there were some bloody heads.

When I last saw Warner, in Florida last spring, his hearing was good but it occurs to me that if it has deteriorated since, you might provide him with a copy of the statement which he could read along as it is presented orally.

2. 1917 Wis R E. Course Bulletin

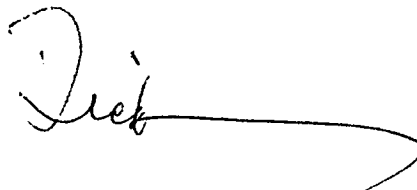
This is unrelated to the Baird affair, having appeared much earlier. I may have already given you a copy. Dean Elwell and I made a deep search to determine its date but the best we could do was to be certain that it was not after 1917, probably a year or so before.

3. REAL ESTATE ANALYSIS Revision

My plan is to write Woodward and McGraw -Hill to the effect that when you called me on another matter, I inquired of your interest in collaboration and, much to my surprise, you agreed to consider it. Between us girls, my primary concern is whether your many other commitments will permit you to get at the job before, say, 1982. If I tackle it, a year is as long as I want to spend on it. I would handle the details with the publisher and the author-editorial matters. You would just have to write and review what I might produce. With undue modesty, I would say that a combination of our names on the book could help stimulate the sales volume considerably.

Time for golf - so let me hear from you soon about the revision decision. I will be in touch with the publisher and will turn off Mr. Woodward.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dick", followed by a long horizontal flourish line extending to the right.

RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

May 27, 1980

Dear Jim:

First, I will report on the state of my health. I am making progress if slowly. My strength is restored to the point that I can manage a 1 3/4 mile walk twice a day without fatigue. We will stretch this to 2 miles in the next few days. I feel well but not like re-joining the world, or swinging a golf club. I have a few side effects, such as sleeplessness and lack of appetite but these are not basic. I am not quite ready to go back to work which is not surprising only 4 1/2 weeks after major surgery.

In my files there is a communication from you committing your talents to a collaborative revision of good, old REA. Incidentally, I had a recent phone call from Janet Tandy of San Jose State who is off to New Zealand but who would like to collaborate on the revision of REA. I told her that arrangements had already been made but did not specify with whom.

In thinking about various aspects of the revision, I have first tried looking at it from your standpoint. Your decision to undertake the work is somewhat sentimental, I would guess. Certainly the financial rewards were not a major consideration for they are not likely to be great. I do not know how much weight you attach to academic benefits but I can see that they might be considerable for you. To be joint author with a "respected scholar" will give you Brownie points in the academic records. Another aspect which you may not fully appreciate is publication by a prestigious house such as McGraw Hill. Self-publication may be justified under certain conditions but the author cannot escape the inference that he could not find anyone else. Back to money: I fully appreciate the importance of money to you. You have an expensive household and your travel costs must be excessive. I can understand why you are loaded up with projects. I can also understand how you, as an optimistic activist (Ever hear on one?) believe that you can work in the revision in spite of commitments which could be expected to demand all of your time. But I can also see that it might be very difficult to push aside existing profitable opportunities or reject new ones which are bound to come along in order to make time for writing with its limited material rewards. For example, Janet Tandy said that they are trying to get you to come to New Zealand. Very tempting and more rewarding in many ways than book writing.

Perhaps I am presumptuous in writing so bluntly but as a good friend I am sure that you will take it as intended, a mulling over of the situation which be are about to create. Now, I have a few problems of my own to discuss with you.

This little physical contretemps of mine has crystallized a basic issue. My next birthday is #75. Should I devote my few remaining years to productive scholarship, working at my desk as I have for 40, these many years, or shall I undertake to learn how to loaf and spend the time vouchsafed to me in the relaxed pursuit of things I want to do? There is always golf but I am not yet assured that

-OVER-

I can continue to play. And golf will not take all my time. What do I do with the rest of it? Write books; go to Planning Commission meetings; read and study developments in urban land economics and city growth and structure? Or loaf and do the things "I have always wanted to do"? What are these things? I cannot afford a lot of travel but I would like to spend a month in and about the Austrian Alps. And for no rational reason, I would like to learn German, enough to read and to understand the spoken word if not to speak it. And another consideration - I am moving into the time of life when there are increasing uncertainties for both Dorothy and for me. Our way of life may well be altered in response to such changes. I am sure that you can see the possibilities.

During the next few weeks, I shall weigh the alternatives and try to choose a course of action as between productive work and relaxed loafing. I write you all of this not only because I would value your reactions but because of possible impacts on our book project.

Dick

August 15, 1980

Mr. Donald W. Burden
Executive Editor
College Division
McGraw-Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

Dear Mr. Burden:

My surgical episode on April 24 has delayed the resolution of the book revision matter but I am now well on my way to recovery. I can report that I have been in touch with Professor Graaskamp and that he is willing, even eager, to join me in a collaborative revision of REAL ESTATE ANALYSIS. Whether or not his other commitments will permit him to meet the deadline of next fall which you suggest in your letter, we have not discussed, but I would judge that the end of the year would be a more practicable limit.

On the basis of your April 24 letter and my own dealings with publishers, I judge that your proposal of a "15% net contract" is not negotiable. To be perfectly clear, I would ask you to spell out your definition of a "net contract". Graaskamp and I will have no difficulty in agreeing on a proper split between us.

An advance is almost a necessity if I am to carry my share of the revision load. If I were actively a member of a university faculty, the assistance of a graduate research assistant or a student in a graduate seminar would be available for bibliographical search and other necessary leg work. In the absence of this kind of help, I shall have to hire someone, probably a graduate student at the University of California-Santa Cruz. I estimate that the total cost will be of the order of \$7,500. I will enquire of Graaskamp whether he would require an advance.

If you were to make an advance against royalties and if you rejected the manuscript, what about the obligation to repay the advance? If, after the manuscript is completed you decide not to publish, is the author free to seek other publishers? Does my original contract with McGraw-Hill permit the publisher to issue a revised version of the book without my consent?

I will write to Dr. Graaskamp and will await your answers on the contractual and fiscal aspects of the publishing arrangement.

Sincerely,

RUR:dbr

Richard U. Ratcliff

RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

August 24, 1980

Professor James A. Graaskamp
202-A Breese Terrace
Madison, Wisconsin 53705

Dear Jim:


I dare say that as this letter is being written, you are still in Alaska. But your faithful staff will hold the letter for your return. I have a letter dated August 8 from Don Burden of McG-Hill inquiring about our interest in the revision of REA. He alleges that his failure to write earlier is not to be interpreted as a disinterest, "quite the contrary!!!" He says that "we are most anxious to proceed", and agrees that you are the best possible collaborator. He asks whether there is a possibility that "we could receive a revised manuscript in the fall of 1981". In my response, I addressed this question, but we need to know your reaction. (See copy enclosed.)

My August 15 letter to Burden in effect accepts the fact that publishers have a tight little monopoly, for my own experience in bargaining has revealed no flexibility. We can try for the gross basis, for inclusion of foreign sales and for an advance, if the terms are right. As to a split between us, give me a clue on what would be acceptable to you.

I am the world's worst horse trader but in the matter of a split between us, I start with the fact that I conceived and wrote the original book, that we will incorporate a good deal of the original in the revision, that I will do at least my half of the work in revision, and that the sales of the original have created a considerable portion of the market for the revised edition. At this point, I am merely opening the subject for discussion and my starting point is the hypothesis that my share should be perhaps a soupçon above 50%.

So that I can proceed in trying to get an acceptable deal from Burden, please give me answers to the explicit and implied questions in my letter. I will avoid making any firm commitments until confirmed by you.

Sincerely,



Richard U. Ratcliff

RUR:dbr
Enclosure

MRS. RICHARD U. RATCLIFF
890 WEST CLIFF DRIVE #6
SANTA CRUZ, CALIFORNIA 95060

November 11, 1980

Dear Jim,

This is just a short note to tell you the sad news that Dick is seriously ill in the hospital. He was making such a good recovery from his open-heart surgery, but in August a liver irregularity appeared, and in September he developed a severe pain in his back, and after 10 days of pain & pain pills, he went to the hospital -- on October 3 -- and has been there ever since, with the exception of two days when he came home. He has had chemotherapy and radiation therapy and his illness is diagnosed as severe lymphoma with myeloma in the bone marrow. We've been "up and down" all month -- with hopes of a complete recovery, then a very limited recovery -- and now, with the severe chest congestion which he has developed, the situation is very serious indeed.

When he was home, those two days, we had Visiting Nurses in, and I thought we could make it, especially since he would be able to walk better when he recovered his strength. He was having trouble, even with a walker. His spine was affected.

This has been a severe shock to me, of course, and I have spent every day all day in the hospital with Dick, doing what I could and trying to cheer him. But he has been very depressed, and at times the outlook was very depressing.

He is such a wonderful person, as you know, and it seems so unfair that this should happen to him. I try to believe that God is good and that He intends all good for us and will make all things right. I can only go along one day at a time. I'll keep you informed. You have meant a great deal to Dick, and he has always valued your friendship and your ideas, support, courage, tremendously.

Affectionately,

Dorothy -

A Memorial Service
for
Richard U. Ratcliff

Born
February 17, 1906
Madison, Wisconsin

Entered the Life Triumphant
December 6, 1980
Santa Cruz, California

United Church of Christ
First Congregational Church
900 High Street, Santa Cruz, California
December 13, 1980
3:00 P.M.

J. Bernard Corneliusen, Minister
Dr. George Stauss
Bill Hansen, Soloist
Alice Ish, Organist

Christmas 1980

Dear Jim,

Thank you for the lovely memorial tribute you sent. It was read and much appreciated. The whole service was lovely — a celebration of the life he lived — his contribution to his family, his friends and also his profession. It was a service of hope and good memories and not despair.

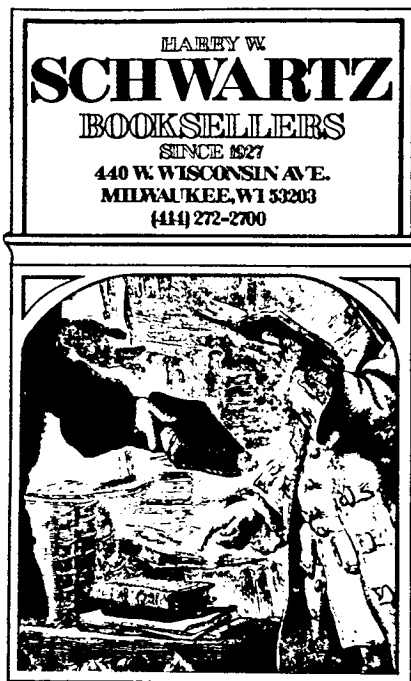
Jim Curtis came down from San Francisco and I was so pleased and only wished I could have had a longer visit with him.

I understand from John Hoppe (and you?) that a memorial fund will be established at U. Wisconsin. I'd like to know more— where to send and The family of Richard Ratcliff expresses appreciation for your presence how to make check. The suggestion on this in sharing with them their walk card is only for local Santa Cruzans who enjoy through "green pastures" and "beside still waters". so many fine concerts at our church—the Symphony orchestra often gives concerts here as well as outstanding organists, the Univ. of Calif at S.C., etc

The family is establishing a Richard Ratcliff Memorial Fund to assist in completing the Aeolian Skinner Organ in the church sanctuary. Contributions to this fund will be most gratefully received.

The "Center" you talk of establishing sounds great! More power to you! Dick really loved you and was so proud of your many achievements. Ann & her daughters Lisa & Becky B. will come for Christmas

But - Dorothy -



Dr. James A. Graaskamp, Chairman
Real Estate and Urban Land Economics
University of Wisconsin-Madison
School of Business
Madison, Wisconsin 53706

Dear Dr. Graaskamp,

Regarding the Richard U. Ratliff Collection of texts
given to the Business School, consisting of 314 volumes:
174 hardbound and 140 softbound;

These texts, all in prime condition, should prove to be
a valuable contribution to the Reference Library. Most
of them are out-of-print, and very difficult to obtain
through regular sources. It is our understanding that
they will be housed and catalogued as part of the
Business School Library.

We have evaluated the worth of the collection at

Three Thousand, One Hundred and Fourteen Dollars
(3114.00)

Respectfully

HARRY W. SCHWARTZ

A large, handwritten signature of Harry W. Schwartz in cursive script, written over the typed name.

hws;rps

copy to Mrs. R.U. Ratliff



HEADLINES

Vol. 12 • No. 40

October 1,

1945

UNIVERSITY EDUCATION in REAL ESTATE *at the* UNIVERSITY OF WISCONSIN

Madison, Wisconsin

For students wishing to take college training in fundamentals and principles of real estate.



Bascome Hall, University of Wisconsin

**Courses
Available
Fall, 1945**


THE WISCONSIN CURRICULUM IN REAL ESTATE

For many years, Realtors have felt the need of a college or university where students could obtain professional training in the various aspects of the real estate business. While an increasing number of educational institutions have offered various courses in real estate subjects, few have arranged full-fledged college courses leading to a degree in real estate.

The need for such a curriculum in a recognized university has been obvious. Realtors wishing to send their children to a university or college for training in real estate problems have generally been unable to find an institution which could offer a degree in this field. They have had no pool of young people with college training in real estate on which to draw to staff their offices and fill positions in the various departments. While real estate work has steadily gained in professional character, there have been no colleges graduating students with degrees in this subject.

A NEW OPPORTUNITY

This great need now will be met by the University of Wisconsin, which is offering, in its School of Commerce, a curriculum in real estate leading to the degree of Bachelor of Business Administration in real estate. Thus, for the first time, a great state university will make it possible for young people to receive professional college training with a degree.

 Direction of the courses will be under Dr. Richard U. Ratcliff, Associate Professor of Land Economics, well known for his educational work in real estate problems. It will be the objective at Wisconsin to prepare students for careers in various professional aspects of the real estate business, with particular emphasis on the analysis of real estate problems. The courses offered will seek to train students to have a thorough and fundamental understanding of real estate problems and to know how to use the latest and most effective techniques of analyzing them.

The courses at Wisconsin have been arranged so that they fit into the normal pattern of university work. The first two years of the curriculum will provide a cultural basis which must be part of any university education, and will offer courses in the subjects ordinarily studied during this period of university work. In his junior year, the student enrolls in the School of Commerce, where he is given various general commerce subjects and courses in his specialized field. The senior year is concentrated largely upon real estate matter.

NAREB's INTEREST

Details of the curriculum at Wisconsin follow. They were arranged by the School of Commerce to meet the need for trained students in this field. After reviewing the courses offered by a number of institutions of higher learning, the Education Committee of NAREB's Board of Directors recom-

mended to the Association that it encourage interest among students in the curriculum offered by the University of Wisconsin. NAREB proposes to assist the program of the School of Commerce in whatever way may be practical. One of the most important ways will be to see to it that enough students are interested to make the courses practicable for offering in the general program of the University. To the extent that is feasible and helpful to the University, and possible for us, THE NATIONAL ASSOCIATION OF REAL ESTATE BOARDS will support the program.

The curriculum will be completely under the guidance, and will be the responsibility solely, of the University of Wisconsin. But to the extent of its interest in seeing that professional educational opportunities are available in the field of real estate, THE NATIONAL ASSOCIATION OF REAL ESTATE BOARDS has undertaken to promote recognition of the courses among its members. As the opportunity is extended to it, NAREB will make recommendations about the courses for the consideration of University authorities. In general, NAREB will regard the University of Wisconsin courses as "pilot" work in this field.

THE COURSES

Courses for the first two years and some of the subjects to be taught in the last two are available at the University now. Students may enroll this fall to work toward the real estate degree. To assist Realtors who are interested in enrolling their children or other students in the courses, details of the curriculum and general information about the University are given below. The statement was provided by the University for NAREB at its request in order that member boards and member Realtors might have the information available.

CURRICULUM IN REAL ESTATE SCHOOL OF COMMERCE, UNIVERSITY OF WISCONSIN

Freshman Year

The student enrolls in the Pre-Commerce course. In his first year, he covers general cultural subjects with enough mathematics to provide a solid foundation for later courses in accounting, statistics and appraisal.

Course	First Semester	Credits
Mathematics (including mathematics of investment).....		4
History.....		3
Natural Science (chem., physics, biology or botany).....		5
English 1-A.....		3
<i>Second Semester</i>		15
Mathematics.....		4
History.....		3
Natural Science.....		5
English 1-B.....		3
		15

Sophomore Year

The student continues with cultural courses but with emphasis on fields which form a background for his ultimate field of specialization. He takes basic courses in accounting and in the appropriate social sciences.

Course	First Semester	Credits
Economics 1-A.....		4
Accounting.....		3
English.....		3
Philosophy.....		3
Municipal Government.....		3
<i>Second Semester</i>		16
Economics 1-B.....		4
Money and Banking.....		3
Accounting.....		4
Psychology.....		3
Sociology.....		3
		17

Junior Year

At this point, the student formally enrolls in the School of Commerce. To be admitted, he must have done creditable work during his first two years as measured by a grade point average of not less than 1.3. During the Junior year the student takes a mixture of general commerce subjects and courses in his field of specialization. Course descriptions follow the curriculum outline.

<i>First Semester</i>	
<i>Course</i>	<i>Credits</i>
Corporation Finance	3
Statistics	3
Architecture and Building	3
Business Communication	3
Urban Land Economics	3
Electives	0-3
	<u>15-18</u>
<i>Second Semester</i>	
Real Estate Finance	3
Marketing	3
Urban Sociology	3
Architecture and Building	3
Public Utilities	3
Electives	0-3
	<u>15-18</u>

Suggested Electives

The University affords scores of other courses which are open to Junior and Senior students providing that they have the necessary prerequisites. The following subjects are suggestions only.

Degree Given at Completion of the Course

**Bachelor of Business
Administration.**

COURSE DESCRIPTIONS**Required Subjects Junior and Senior Years**

Corporation Finance. The financial principles applicable to the operations of business units, especially corporations, under present-day conditions.

Statistics. Elementary theory and technique of statistical methods, with application to typical production, distribution, accounting and general administrative problems of business organizations.

Architecture and Building. The objective of this course is to give the student an appreciation of the problems of the design and construction of buildings. He should be able to read blueprints, to distinguish between good and bad architecture and planning, to judge the quality of the construction of a proposed or existing building, to understand the relationship between the costs of building and the quality of the product. He will be instructed in the successive steps in the design and construction of a building not with the objective of training him as an architect or a builder, but to provide a technical basis for the development of good judgment.

Business Communication. Instruction in organizing executive reports, effective business letters, appraisal reports,

market analyses, and other types of business communications.

Urban Land Economics. This is the basic course within that group of courses dealing particularly with problems of real estate. It is aimed at giving the student a background of principles and understanding which will help him tie together the subject matter of later, more specialized courses. The nature of urban land is first considered, covering such subjects as the classification of land, the significant physical characteristics of space such as indestructibility, immobility and heterogeneity. The institution of property is studied, its origins, its evolutionary nature, the various kinds of property and the limitations on private property found in the police power, eminent domain and taxation. The legal forms of ownership are covered to give the student an understanding of the various legal interests, forms of tenure, and principles of conveyancing. The process of urbanization is next discussed with reference to the factors which have created our cities, the location of cities, and the complex relationships between the city and the surrounding region. Another important topic is the city as

Senior Year

The Senior year is devoted almost entirely to the real estate field but with allowance for one or two elective courses each semester to permit the student to pursue other lines which may appeal to him. Course descriptions follow the curriculum outline.

<i>First Semester</i>	
<i>Course</i>	<i>Credits</i>
Business Law	3
City Planning	3
Property Management	3
Insurance	3
Electives	3-6
	<u>12-18</u>
<i>Second Semester</i>	
Real Estate Law	3
Real Estate Valuation	3
Housing Problems	3
Advanced Real Estate Problems	3
Electives	3-6
	<u>12-18</u>
<i>Credits</i>	
Advertising	2
Personnel Management	3
Management and Labor Relations	3
Business Ethics	2
Fire and Casualty Insurance	3
Problems in Property Insurance	2
Advanced Statistical Technique	3
Architectural Drawing	3
Sanitary Engineering for the Home	3
Materials of Construction	2
Properties of Wood	4
Taxation	3
Land Economics	3
Farm Land Income	3
Economics of Population	3
Municipal Administration	3
Modern Population Problems	3

a social complex, emphasizing the fact that the city is made up of people and dealing with many sociological factors of urban life.

Turning to the demand side of the real estate market, the course deals with the demand for housing and for non-residential space. On the supply side, it covers an analysis of the building industry, and the problems of land development. The subject of real estate taxation is studied.

The mechanics of the real estate market are explained and the complex interactions of the many market forces and factors are considered. The theory of real estate valuation is explained in its relationship to the operations of the market. The growth and structure of cities are shown to be the product of the market forces. Finally, some of the leading urban problems are considered, such as city planning and housing.

Real Estate Finance. This course is designed to provide an understanding of the functions of real estate finance, the types of contracts utilized in financing residential and business properties, the institutions which make up the mortgage market, the relation of mortgage markets to other investment markets, the elements of mortgage risk, tech-

niques for analyzing mortgage risk, the institutional problems of administering mortgage investments, and the participation of government in the field of real estate finance.

Marketing. Principles and practices followed by the producer, wholesaler and retailer in the distribution of goods to the consumer.

Urban Sociology. History of the rise of urbanism; distributive and selective aspects of the city; social relationships in the city; organization of life in the city; planning and control of urban society; the city as a center of dominance over a trade area and hinterland.

Public Utilities. The development of public utilities in the United States; legal basis of public utility regulation; development of regulatory agencies; valuation, depreciation and public ownership.

Commercial Law. History of legal development, contracts, agency, negotiable instruments and sales.

Real Estate Law. Nature of real property, various types of estates in land, acquisition of title to real estate, co-ownership of land, contracts of sale, closing of title, deeds and other instruments, mortgages, liens other than mortgages, leases, rights and liabilities of landlord and tenant, title records and title searches, rights in fixtures,

easements and restrictive covenants, real estate brokers and agents.

City Planning. This course deals with the objectives and techniques of city planning; it is designed to acquaint the student with general principles and problems rather than to prepare him for city planning practice. It considers the kinds of plans which are needed so that the community may reach desired goals; the relationship between the planning process and various aspects of community well-being; the necessary steps in the planning procedure; the methods and devices for carrying out the plan; the master plan, zoning and subdivision controls; administrative arrangements; regional planning.

Real Estate Valuation. Economic theories of value applied to real estate; valuation as a guide to business decisions; the factors and forces in the real estate market which affect value; the principles underlying the valuation method; variations in the valuation method; the selection, collection and analysis of evidences of value; special valuation problems in appraising residential and income properties.

Property Management. The objectives and functions of property management; accounting and statistics as tools of management; analyzing income potentialities; maximizing and maintaining income returns; administration of income; purchasing; maintenance; per-

sonnel management; tenant relations; special problems incurring sick properties.

Insurance. Nature of risk; uses of insurance, theory of probability; underwriting and distribution of risks; reinsurance; coinsurance; types of insurance carriers; elements of contract law; insurable interest; agency; negligence and liability; life insurance contracts; mortality tables; fire insurance; automobile insurance; claim adjusting; insurance laws and state supervision; price fixing and rate making; workmen's compensation insurance; social insurance.

Housing Problems. The causes and proposed remedies of housing ills; nature of the demand for housing; production and supply; the housing market; housing in the urban structure; housing remedies and governmental participation; war housing experience; post-war problems.

Advanced Real Estate Problems. This course represents the culmination of the student's work in the field of real estate. The class will be a seminar with each student assigned a special case for analysis and solution. The cases will deal with complex real estate problems which will involve the application of the knowledge gained in previous courses and the integration of this knowledge in its focus upon the matter at hand. The solutions will be discussed by the group under the guidance of the instructor.

GENERAL INFORMATION

The Campus

The University Campus, situated in the city of Madison, a mile west of the State Capitol building, spreads for nearly a mile along the crest and on the wooded slopes of an irregular ridge bordering the southern shore of Lake Mendota, the largest of Madison's four lakes. On this attractive site are located approximately one hundred buildings comprising classrooms and experimental laboratories, libraries, hospitals, a large community center, residence halls, a stadium and gymnasiums, observatories, the Forest Products Laboratory, and other buildings essential to the operation of a large university.

Experimental farms and athletic playing fields occupy much of the lower western part of the grounds which extend almost another mile along the lakeshore.

Entrance Requirements

The usual means of gaining admission to the University is by presenting a certificate of graduation from an accredited four-year or an accredited senior-high school showing satisfaction of the requirements and bearing the principal's recommendation of the candidate's fitness for admission to college. In general the principal is advised not to give this recommendation to a student whose record places him in the lowest quarter of the graduating class.

Students who have had some college work at another institution of higher learning may gen-

erally secure admission to the University by submitting the proper credentials.

Tuition and Fees

Students who are residents of the state of Wisconsin are required to pay semester fees of \$48 or a total of \$96 for the school year. Students who are residents of other states will pay \$148 per semester or \$296 for the school year.

Financial Aspects

Although it is difficult to give a definite set of figures, it is reliably estimated that student expenses average approximately \$750 per academic year, exclusive of clothing, transportation to and from Madison, and non-resident tuition. Many students spend more than \$750, but others are able to manage for as little as \$500 without doing any outside work. The largest items of expense are charges for University fees and for board and room. Clothing, transportation, textbooks and materials, laundry, and sundry personal items make up the balance of the student's costs.

The University Student Employment Bureau is maintained to assist men and women students who are partly or wholly self-supporting. More than half of the students at the University of Wisconsin must depend upon themselves for part or all of their resources.

For worthy students in need of assistance there are available loan funds and a limited number of scholarships providing varying amounts of financial assistance.

MEMORANDUM

RE: Investment Analysis of Insurance Building

TO: R. U. Ratcliff

FROM: James V. Burkhard and James A. Graaskamp

An investment analysis of the Insurance Building in regard to four alternative courses of action could provide material as outlined below to assist in the decision making process:

Alternative #1

Appraisal of building value "as is" considering prospects of supply and demand for office space to 1970 in the Square.

Increment in appraised value should Community Center building be purchased, razed, and converted to parking for tenants of the building.

Using given costs for conversion to parking, an estimate of justified price for purchase of Community Center site.

Impact of parking improvement on cash flow and rate of return for building owner.

Alternative #2

Increment to appraised value which could be expected from remodeling of interiors, elevators, etc. and central air conditioning.

Alternative rental policies for remodeling or renovation of space currently occupied by tenants.

Alternative #3

Increment to appraised value that might be possible were the owner to relocate his own offices in the suburbs in new owned or leased quarters while his present space was rented to those with important ties to the downtown area.

Cost of ownership or lease of Class A office space in the suburbs as alternative space for owner operations.

Tax advantages of a new depreciation base with a second building to offset income from fully depreciated present building. Demonstration would require cash flow analysis.

Impact on profit analyzed as a return on invested capital.

Analysis of alternative floor occupancy or new office location in terms of employee and customer linkages.

Alternative #4

Estimate of possible outright sale price, potential purchasers.

Outline of alternative forms of sale and relative advantages of each in light of potential customers' needs.

University of Wisconsin Madison

School of Business
1155 Observatory Drive
Madison, Wisconsin 53706

Graduate School of Business

November 25, 1981

TO: Dean Blakely

FROM: James A. Graaskamp

RE: Gift of Real Estate Reference Library from Mrs. Richard Ratcliff

Mrs. Richard Ratcliff gave the Real Estate Department first choice on the late Professor Ratcliff's library, and I took advantage of the opportunity to select 314 volumes while in California in August. Mrs. Ratcliff shipped these to Madison at her expense, and I have 17 cases of books presently in my office.

We have now had a professional appraisal of the books for \$3,114.00 by the well-known used book experts, Mr. and Mrs. Harry Schwartz of Milwaukee, their appraisal letter is attached.

I need instruction as to how we now proceed to make this a charitable contribution to the Foundation or the University. A secondary issue is providing shelf space and security in the Business School Library. We recently did a sample of the Real Estate card file and the reality of those books which still existed and discovered an evaporation of at least 20 per cent. It would seem imperative that the School of Business fund the electronic book detection system.

Ideally such a system could be installed in time for the summer semester, when we will be running our first Ratcliffian seminar.

ECONOMIC ANALYSIS
and
PLANNING RECOMMENDATIONS

GISHOLT TRACT

Monona Wisconsin

Richard U. Ratcliff

ECONOMIC ANALYSIS
AND
PLANNING RECOMMENDATIONS
GISHOLT TRACT
MONONA, WISCONSIN

JANUARY 1966

REAL ESTATE ECONOMIST . RICHARD U RATCLIFF . MADISON WISCONSIN
PLANNING CONSULTANTS . CARL L GARDNER & ASSOCIATES INC CHICAGO ILLINOIS

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INTRODUCTION

Well known to native Madisonians as the site of the Royal Airport in the early days of local aviation, the Gisholt tract has been slow in ripening for urban development. For urban use, it has a number of significant characteristics:

- 1 It is one of the largest parcels in single ownership which remains undeveloped in a location close to existing urbanized areas. Of its 465 acres, about one-half is high and dry enough for immediate use—most suitably in a variety of land uses.
- 2 From a locational standpoint, the highway connections linking the site to the important points in the community and to highways radiating in all directions are excellent. Travel time is short to areas of business activity in the Madison area, to employment centers on the east and west sides of town, to the University campus, the Madison central business district and to population concentrations on the west, south, and east.
- 3 The Gisholt Tract is at the north end of a sector of open land including large areas of lake and marsh, bounded on the east by Highway 51 and on the west by Highway 14, which has a delayed growth potential. Between the site and Lake Monona there is a small, low density residential area. A basic and significant uncertainty exists with respect to the relocation of the Beltline Highway. However, for

purposes of this analysis, it is assumed that the relocated right-of-way will cut through the Gisholt property in a line parallel with Broadway and about 1,200 to 1,500 feet to the south of Broadway.

Our purpose is to provide a basis for a judgment on the speculative risks involved in developing the land to its highest and best use. Among the factors analyzed are:

- 1 the alternative uses for the land as a basis for maximizing the productivity of the tract as a development project;
- 2 the competitive situation for each suggested land use type, in terms of alternative sites which exist in the land market;
- 3 the probable absorption rate of the suggested land area for each use type;
- 4 the uncertainties which affect the dependability of predictions, and which create speculative risks for the land developer;
- 5 the amount of land to be set aside for various potential uses; and
- 6 the proper juxtaposition of uses on the tract.

It is not intended to present a feasibility analysis in a financial sense, though such a study would be desirable before a final commitment for development.

Plan of Analysis

The following potential uses were selected as representing the most probable demand for land in the subject location:

Industrial (including distributive, service, and warehouse uses)

Retail

Office

Housing

Motel

Marina

Miscellaneous commercial

Very few of the factors to be taken into account in arriving at conclusions regarding the proper use of the property are directly measurable in quantitative terms. There is sufficient factual evidence, however, to develop perspective and scale. Uncertainties in growth rates and the uncertainties in the actions of public agencies which are able to exercise great control over the future pattern of land utilization on the subject property make accurate predictions hazardous.

INDUSTRIAL USE

Location. There is no question about the desirability of the location of the Gisholt tract for industrial use. The availability of railroad trackage is an important asset. The highway connections to the interstate highway system and to all parts of the Madison area plus accessibility to highway connections running in all directions from the city are excellent. For accessibility to the labor market, the site is convenient to the homes of workers in all parts of the community. The location is also well

situated for warehousing and city-wide distribution of products and goods. From a competitive standpoint, the site is as well located for general industrial and distributive uses as any in the city. However, for research-type facilities, a west side location on or near the Beltline or in the Middleton area might be preferable from the standpoint of possible University associations and as more favorably located to the probable housing of employees in the white collar and professional categories.

Competitive lands. A few years ago, there was a shortage of industrial land in the Madison area but this situation has changed. A comparison of the lands which are presently zoned for industrial use with existing industrial land use demonstrates that there is an adequate supply of industrial lands available to accomodate industrial expansion. Particularly on the west side of Madison, there is little industrial land supply with railroad trackage at hand. Some east side industrial locations are accessible to railroad facilities in addition to the Gisholt tract.

Recent announcements by the military establish the fact that the Traux Field Air Force activity is to be greatly reduced by the phasing out of the interceptor operation. There is a strong possibility that much of the field will be returned to civilian use and probably to the ownership of the City of Madison. In any case, there are substantial areas of the land to be made available which are suitable for industrial use and which could add to the competing lands in the industrial land market. Locationally, Traux Field is ideal for industrial operations, with the convenience of the airport for air freight shipments and executive travel to be accorded considerable weight. The uncertainties in the ultimate disposition of Truax Field are substantial

but it stands as a possible competitor to the subject property. If such competition eventuates, the absorption of the available industrial lands will be further extended in time.

Absorption. The MATS study projects an increase in industrial land use in the study area between 1962 and 1985 in the amount of nearly 1,000 acres or an increase of 23 percent at about 44 acres per year. Commercial land use is projected to increase about 720 acres during the same period or 31 acres per year. The study has this to say about industrial growth:

"The Madison community is not normally thought of as a manufacturing community. ...Projected by 1985 is a manufacturing employment base in the Madison area that will total approximately 20,100 employees.

This represents an average annual addition of about 420 employees.

...The major employment increases are predicted to occur in the existing industrial base, especially the non-durable production categories.

Food and kindred products and the printing and publishing industries are the two key non-durable producers where growth increases are projected. Only moderate increases are projected for the durable goods producers located in the Madison area. ...The large unknown at the present time is how successful Madison will be in encouraging growth of present employers and attracting new industries and if so, what types of industries."

The key idea in this forecast is that the major employment increases are to occur in the existing industrial base. This does not presage the need for large tracts of land

for new industries. It is the prediction of the MATS study that increases in industrial land use will be far greater in the Northwest and Southeast areas than elsewhere; the expected increase is to 187 acres and 264 acres respectively. In the South area, where the subject property is located, the increase by 1985 is projected to be 80 acres with much of this in the western sector of the area.

An analysis of new industrial plant construction from the records of the Wisconsin Department of Resource Development suggests that during the last seven years in the Madison area, new plants have averaged not more than three or four per year, ranging in size from the 4,000 square feet in the Madison Research and Development Laboratory in Middleton to 102,000 square feet in the new Graber plant in Middleton and 117,000 square feet in the Dairy Equipment plant on the East Beltline. The majority of the plants were under 10,000 square feet.

The foregoing predictions and records suggest that industrial use as such will not absorb new lands at a very fast rate unless some dramatic change should occur in Madison's industrial base. From this conclusion and from observations of the types of enterprise which are appearing along the Beltline system of the south and west of the city, it would seem that the greatest demand for industrial-type land will probable come from non-manufacturing enterprises mainly in the distributive, construction and service categories. This type of activity is absorbing lands which are zoned for industrial use and commercially-zoned lands. This fact means that commercially-zoned land must be considered as potential competition for the subject property and that the amount of land in competition is greater than the industrial zoned land.

Some observations concerning the industrial land market in Madison along the Beltline system are relevant. For some two years, an industrial park development promoted by Freeman and located at the northeast corner of the intersection of Highway 51 and Cottage Grove Road has been available for industrial use. At present it is improved with roads and lots have been staked out but no buildings grace the landscape and there have been almost no sales of building sites. After nearly 10 years on the market, the industrial and commercial subdivision laid out by Gill on the south side of the Beltline just west of Fish Hatchery Road is not fully developed. The industrial lands purchased by a non-profit corporation to promote Madison's industrial growth and located on Highway 12-18 east of Highway 51 still lies fallow. Well-located lands along the East Beltline and available for commercial and industrial use are still vacant after more than 10 years. In short, there is ample market evidence of the slow rate of absorption of outlying industrial land.

There is danger in being misled by the recent boom in industrial and commercial lands along the South Beltline west of Fish Hatchery Road. It has been generated in part by the movement of auto dealers and by the plans of Ray-o-Vac for a new structure in this general area. Land prices have sky-rocketed but this is to be interpreted as largely a speculative boom not supported by the aggregate demand-supply relationship in the industrial land market.

Incidentally, new competition has recently appeared at the intersection of Highway 12-18 and I-90 where there has been opened a "prime location for commercial, light industrial, research and warehousing facilities" and some 80 acres are being offered for sale. A filling station and a Holiday Inn unit are already assured.

The southwestern portion of the Gisholt tract is well suited to use as an industrial and commercial park.

Allocation. It is recommended that 90 to 100 acres be allocated for this purpose. It is our conclusion that taking into account the probable rate of industrial growth and the needs for land for distributive and service activities, and considering the land in competition with the subject property and the relative locational attributes, it will require from 8 to 10 years to sell off the 94 acre industrial park area which is provided for in the General Development Plan dated September 1965. Much of the demand for this land will be for non-manufacturing purposes.

RETAIL USE

Neighborhood conveniences shopping facilities. There are almost no convenience goods outlets — groceries, drug stores, hardware stores, laundry-dry cleaning outlets, — to be found along the South Beltline in the vicinity of the Gisholt property. The nearest supermarket to the subject property is on Monona Drive. In the stretch of the Beltline between Olin Avenue and Highway 51, the uses are a mixture of filling stations, taverns, used car lots and in general, activities which are related to auto transportation. Exceptions are an animal hospital, a bottling plant, and an insurance company office. The absence of a convenience center of any size attests to the low density of residential occupancy along this segment of the Beltline.

Population concentration of sufficient importance usually attracts convenience outlets to serve the resident families. In the vicinity of the subject property, the primary present population concentration lies in the area north of the Beltline and from the Milwaukee tracks on the west to Monona Drive on the east. West of the river in this sector there was a population of 1,449 in 1964. The population now living south of this sector is scattered and negligible. There can be some additional growth in the area between the Beltline and Lake Monona. Considering planned construction and the potential use of the now-vacant land near the river, about 1,500 additional persons will find housing in the medium density developments which will be built there. If 250 families live on the subject property in medium density rental housing, this will add another 750 persons. Growth south of the Beltline will be small. The MATS forecast is for slow extension of the urbanized area in this direction. The conclusion is that the market area for a convenience goods shopping facility in or near

the subject property will consist of not more than 4,000 persons in the foreseeable future or 1,200 to 1,500 households. Only about 500 households are presently living in the area. Thus, it is doubtful if a new convenience center is justified at the present time; although, when the Palmer estate property north of the Beltline is developed, such a center may appear. In addition to the persons living east of the river, it might be expected that such a center would draw from the southwestern portions of Monona Village because of the convenient access across the Black Bridge.

If a major shopping center were built on the northeast corner of the subject property, it would be logical to include convenience goods outlets in such a complex. However, since this is not a likely occurrence in the near future, these convenience facilities will probably appear at some other location. The conclusion is that no provision should be made for a convenience goods outlet as such as on the subject property. If a major center should develop, these facilities would appear as a matter of course in connection with the development.

Regional Shopping Center. We should first define this term. In the Madison area, we are referring to a center such as Madison East on East Washington Avenue, Westgate on Gilbert Road, and Hilldale on Midvale Boulevard. Each of these centers is supported by a trading area which encompasses up to one-half of the Madison metropolitan area. For a center with department store facilities, a trading area population of approximately 75,000 would be required.

There is some evidence, based primarily on the interest of merchandising organizations, that the time will soon come when a major shopping center on the southeast side of Madison will be justified. In the meantime, the existing concentrations on Monona Drive, particularly the C&P center, is expanding. A new center of considerable extent is being developed at Northport Road in the northeast sector. Growth to the south in the Madison metropolitan area will be to the east and to the west of the segment running south of the subject property and between Highway 51 and 14. The MATS projections foresee a population growth of only 7,000 persons by 1985 in the South area, which runs from Fish Hatchery Road to the Yahara River on the east, with most of this growth occurring west of the Milwaukee tracks.

It is clear that the subject location is not favored by present or prospective close-in population concentration. It is on the far edge of the East side population and growth areas, and far away from the West side concentrations and growth areas. On the other hand, it is highly accessible to a considerable portion of both east and west side purchasing power. This fact strongly suggests a type of use which would, in effect, draw on the entire city. Such a use would have to possess a strong magnetic power either by reputation or through extensive use of advertising. Montgomery Ward might meet these tests and would be a logical occupant. It is possible that other strong merchandising operations such as a large department store of good reputation with a goodly complement of supporting retailers might have enough pull to draw from both sides of town. This possibility is more speculative and thus more doubtful of realization.

A major advantage of the subject site is the availability of a large area. While other locations may have locational advantages there are none which provide the possibility of a large enough parcel to accommodate a substantial retail operation.

Montgomery Ward is said to require 30 acres. Any major shopping center should have 40 to 60 acres to provide for present uses and future expansion. No other such tract is available on the south Beltline until the far west side is reached. Thus the subject site has a unique combination of two advantages: (1) a convenient location which is accessible to east, west and south sides of the community; close in to the center in terms of travel time and convenient to major centers of employment; (2) ~~an~~ an area of land large enough to accommodate any type of retail development.

The basic question to be faced in deciding upon the feasibility of a major regional shopping center on the Gisholt property is whether there is a supporting population of sufficient size which can be attracted from their present trading habits with presently operating shopping centers and the central business district, or which will be supplied in the reasonably near future through population increase. It is a reasonable assumption on which to start this analysis that the Madison area is presently adequately supplied with central and outlying shopping facilities and that the existing centers are doing well. Whether they could afford to share a part of their trade with a new center and still do well is a question. It follows from this assumption, that a new center would have to attract trade away from existing centers or depend on population growth. The ability to attract trade will depend on two important factors — the competitive location of the new center and the reputation and offerings of the primary merchants, in this case, one or more department stores. Since the location

of the Gisholt property is at some distance from population concentrations which are presently being more conveniently served by the existing centers at Westgate, Hilldale, and Madison East, it would follow that the success of a new center in the relatively isolated location on the subject property would depend upon its drawing power in attracting trade from both east and west sides and thus upon the reputation and offerings of major stores in the new center. Whether or not such stores can be attracted to the new development will depend to a considerable extent on the growth potential of the trading area which is tributary to the location.

If the trading area of Madison East were assumed to be the South, Southeast, East and Northeast area of the MATS study district plus additions from the hinterland and adjacent communities to the east and southeast, more than 75,000 persons could be counted in 1960. On the other hand, Hilldale and Westgate divided a trading area of well under twice 75,000 but of a higher average income than the east side sector. But expected population increase in the area tributary to the subject site is far below this approximate standard. It is expected that by 1985, the population increase above the 1960 level in the South, Southeast and Southwest areas will be 42,300. These areas represent a liberal interpretation of the tributary area for they form a wide band starting on the east side at Milwaukee Street, swinging all the way across the south of the Madison area to the far west side. Nearly half of the expected population increase will occur west of Fish Hatchery Road in the immediate trading area of Westgate and convenient to Hilldale. The obvious conclusion is that the population increase during the next 20 years, since a substantial increase since 1960 has already occurred, will not in itself support a regional center. Admitting that the MATS

forecasts may be conservative, a new center would have to count on drawing on the trading areas of existing centers to a considerable extent in order to have a sufficient base for financial success. This conclusion again leads to the suggestion that only an extremely strong center in terms of merchandising establishments with a powerful draw is likely to be successful.

Consideration should be given to the possible competition of a more favorably located site at the intersection of the South Beltline and Highway 51, on the northwest corner. At the present, 20 acres are in the ownership of McKenzie and his partner Nevaizer. Separated from this 20 acres by the present Femrite Drive, is a 102 acre farm in undeveloped state. There are plans for relocating Femrite Drive, and this fact raises the possibility of assembling a site of sufficient size to accommodate a regional shopping center at a location superior to the Gisholt site. Since the Gisholt site is not presently ripe for developing a major center, there is a good chance that an assembly of sufficient land at the Highway 51 intersection might permit a development to get underway in this spot before it could get started on the Gisholt property. There are uncertainties in both locations — the highway relocation on the Gisholt property, and at the competing spot, the re-design of the intersection and the shift in Femrite Drive.

Allocation. It is recommended that 60 acres be provisionally set aside for retail development at the corner of the Beltline and Raywood Road. It is our conclusion that a major regional shopping center is an uncertain and speculative possibility. Neither the growth prospects nor the location favor such a development, yet conditions can

change and the possibility of a future project cannot be denied. To plan for such a possibility need not interfere with the allocation of lands for other less uncertain uses. Planning can be flexible so that the land allocated for retail use can later be shifted to other office, commercial or industrial use as future conditions may dictate. A tract of 60 acres is sufficient in size for a major center and may be reduced in extent for less ambitious projects.

OFFICE USE

Demand

The incidence of new office facilities in outlying locations in the Madison area is testimony to the demand for office space away from the urban core. General occupancy office buildings are appearing at Hilldale and some other parts of the areas such as the Smithback building on the South Beltline near Rimrock Road. Home office buildings in outlying areas are represented by CUNA on Mineral Point Road, Wisconsin Life in Hilldale, and American Family Insurance on East Washington Avenue. The office type activities which find outlying locations to be satisfactory and desirable are those in which central area linkages are relatively unimportant, convenient parking for employees and customers is valued, and where sales or service activities seek locations outside of the central area which are accessible to all parts of the community, or to points outside of the Madison area by convenient highway connections. Another attraction of outlying locations is the opportunity to secure modern office space at rents well below equivalent space in the Square area. Medical buildings provide the opportunity for doctors and dentists to locate near the homes

of their patients and to provide easy parking for them. Another reason for the construction of so many outlying medical buildings is the investment advantage to the doctor owner-occupants.

The location of the Gisholt property is such that it is suitable to all types of off-center office occupancy. A general office facility would provide the small accommodations required by many types of office use which find outlying locations to be satisfactory and economical. A medical clinic might conveniently serve patients in southern Monona Village, the McFarland area, the district north of the Beltline and the hinterland to the south and east. A number of small single-occupancy office structures might serve sales and service activities which serve the entire city and possibly a wider region of the State. There is always the possibility that some organization, possibly in the insurance business, might want a substantial site for a home office operation.

Competition

Considerable competition exists for any outlying office development. The substantial surplus of new office space in the Square area, to be increased on the completion of the medical center at Park and Regent which will draw away many of the doctors' offices on the Square, means that there is also a surplus of central office space of secondary quality which has been vacated by activities moving to the new buildings. This secondary space is being offered at reduced rents and thus diminishes the advantages of economy attached to outlying locations.

The Hilldale development provides one of the most attractive locations off the Square for many types of office activity. A substantial amount of general office space has been provided there and most of it is occupied. However, the continuing vacancies in the newest buildings suggest that there may be a temporary surplus in this location. A number of sites are still unimproved and it may be expected that new buildings will appear as soon as the demand develops and the present surplus is absorbed. Other competing lands available for office development are found on University Avenue, East Washington Avenue, Mineral Point Road and the entire West, South and East Beltline system. Areas zoned either commercial or industrial may be used for this purpose.

The Gisholt site is as well located as most of the competition for general office purposes or for home office purposes for such activities as insurance. It has the advantage of good connections with both sides of the City, a fact which is valuable to activities of a sales or service nature where optimum convenience to all parts of the City is important and where calls by customers are infrequent.

Absorption

An analysis of office building projects in the City over the past five years suggests that the annual rate of office building in outlying areas is from one to three general office buildings, two to three single occupancy (non-warehouse) office facilities and two to three medical office buildings. In 1963, there were as many as 12 such projects but this activity dropped to a low point of three in 1964. These data reflect activity only within the City limits but office buildings outside the City represents

only a minor factor except for such a project as the Smithback building. Though these facts are only approximations and may be somewhat of an understatement depending on the definition of an office facility, they indicate a slow absorption of outlying land for office purposes and suggest only a modest allocation of space in the Gisholt tract for this purpose in light of the competition in the land market.

Allocation

It is recommended that ten to 15 acres be allocated to office use. This space might be arranged in a location back from the highway in order to allow for miscellaneous commercial use where visibility from the highway is more important. The office complex might consist of a highrise general office building flanked by a number of one and two story office buildings designed primarily for single occupancy and built to tenant specifications or by owner occupants. Imaginative planning and an open and appealing environment could improve the competitive position of the site. This land would probably be absorbed in five to eight years. Specific business organizations or institutions such as an insurance company or trade association, might want substantial acreage up to five to ten acres; for a home office site. Flexible planning will allow for meeting this opportunity should it arise.

HOUSING

Multi-family Dwellings

The locational attributes of the subject property strongly suggest the appropriateness of multi-family dwellings. Assuming that the South Beltline Expressway is located as proposed by the MATS advisory committee, the general location of the proposed apartment project would be north of the Expressway and toward the east end of the property. We propose that about 15 acres be set aside for the construction of about 250 dwelling units in walk-up structures.

Housing demand. The population projection prepared for the MATS study foresees an increase in the study area from 1960 to 1985 of about 148,000 persons at an average increase of nearly 6,000 per year. Between 1960 and 1965, the City of Madison alone grew at an average increase of 6,600 per year. To house 6,000 persons, nearly 2,000 dwelling units are required; the MATS study estimates the need for an average of 1,900 dwelling units per year and foresees that the Madison area will maintain its present ratio of single-family to multi-family dwellings of 55/45.

Housing construction. In the Madison area in 1964, over 3,000 dwelling units were built. About two-thirds of these dwellings were in multi-family structures. In Madison alone in 1963, 1,806 dwellings were added with 1,135 of these units in multi-family buildings. In 1964, Madison's total was 2,636 dwelling units; multi-family accounted for 1,844, and in addition, the Dane County building permit office approved the construction of 429 multi-family units within its jurisdiction. The 1965 rate of housing construction is not quite keeping pace with last year, but will be

substantial. In the near future, it is expected that the proportion of multi-family units will drop somewhat but the number of such units in the Madison housing market is not expected to drop below 1,000 in the foreseeable future. If we can expect this rate of construction, it is not unreasonable to set aside land for 250 units to be built over a two-year period in order to assure profitable absorption.

Market indicators. A vacancy survey made by the State Office of Finance as of January 1965 indicated a rising vacancy in multi-family dwellings as compared with an earlier survey in 1963. The increase in the overall vacancy rate from 2.8 percent to 3.5 percent was not alarming, but there was a substantial increase in the vacancy rate for newly-completed apartments to a level of 14 percent in 1965. The conclusion of the report was that "absorption is obviously slow and overbuilding may be imminent." In spite of this situation, multi-family construction in Madison continues at a fast pace and many new projects are in the planning stage.

Locational considerations. The subject site provides an excellent location for an outlying apartment development. The apartment complex across the highway and the planned project between Monona Way and Simpson to provide 292 units strongly suggest that this neighborhood is attractive to tenants. The MATS study foresees the now-vacant land west of the river and along the lake as developing into medium-density housing. The subject property is within 10 to 12 minutes drive of the Capitol Square, the University and the East Side centers of employment. It is accessible to employment centers along the South and East Beltlines. This general convenience to the major employment centers of the community will be increased as various highway

improvements are completed, such as the Monona Causeway and the South Beltline Expressway. In effect, the subject site is linked with the entire community in a most advantageous fashion and will attract tenants who are both west-side and east-side oriented.

An analysis of the occupancy of a sample of 100 apartment units located just north of the subject property reveals only 14 school-age children. Of these 14, four were living in three-bedroom units. The typical tenants are young married couples with no children or with infant children. There are also a fair number of elderly couples and a few households of unrelated persons. Turnover is fairly high with nearly one-half of the households having lived in their units for less than one year. The occupants were asked for their reactions to the odor from the sewage disposal plant. With only insignificant exceptions, the tenants said that the odor was not an important consideration. Vacancies in the sample of apartments ran ten percent, a figure typical of outlying units in the Madison market under present market conditions.

Allocation. It is proposed that land be set aside at the east end of the property for about 250 dwelling units in medium-density walk-up structures on about 15 acres of land. This density will permit open and attractive planning and might be combined with a water-front development and marina facilities as an added attraction of competitive advantage. The project should provide one-and-two bedroom apartments with only a few three-bedroom units. Occupancy of existing rental units in the neighborhood suggests a low incidence of school-age children and such occupancy characteristics should be encouraged by project planning in order to minimize the

objections of the Village of Monona to residential zoning. The planning for the project might be aimed at developing features attractive to childless households. One portion of the project might be planned for young couples and young persons living in groups of unrelated individuals. Another section might be planned to attract older couples without children and single adults of mature age.

MOTEL

On such a busy highway, the possibility of motel use immediately suggests itself. However, an analysis of the origin and volumes of the predicted 1985 traffic past the site indicates that the volume of tourist traffic will not be as great as might be expected. It is also the case that the I-90 tourist trade will be intercepted by many other motel opportunities before reaching the site and that the same will be true of tourists coming from the northwest, west and southwest. At the present time, there are several motels between I-90 and the subject site with two large new installations about to start construction. One of these is a Holiday Inn at the intersection of Highway 12-18 and I-90 to provide 200 rooms and convention facilities for over 1,000 plus a swimming pool. The other project is a Quality Court motel located west of I-90. These facts support the conclusion that only a large unit in a national chain would have a chance of success on the Gisholt site. With the growth of the community and the increasing need for the Holiday Inn kind of facility, it is possible that there might be a demand for five to six acres for this purpose. This is a speculative possibility in light of the availability of competing sites more strategically located, but the probabilities justify an initial allocation of five or six acres for this purpose.

MARINA

The water front on the Yahara River suggests the possibility of a marina on the Gisholt property. Several uncertainties confront such a plan. In the first place, there is a good chance that the water-front and marsh lands up to 160 acres will be acquired as permanent public open space by the State Conservation Commission or a local public body. Such acquisition might not prevent a marina development but would create complications. Another question is the nature of the bridge which will carry the relocated or widened highway over the river. If this is as low as most highway bridges, it will permit only small fishing boats to pass underneath and would seriously handicap the commercial success of a marina which finds the sale and servicing of the larger craft to be the major source of profit. Another question is whether the costs of dredging and filling required for a marina development might not make the project impracticable from a commercial standpoint. In spite of these uncertainties, it is recommended that land be set aside in the planning scheme for this purpose. In part, this procedure is justified by the fact that there is no other probable use for this low water-front land in the near future. The area allocated for the marina should not include any of the land which is high enough for present use for building purposes. If the marina is to be constructed, the dredging material can be used for filling the low land and the necessary building sites can be provided.

MISCELLANEOUS COMMERCIAL

The land allocated for this type of use should be in the general vicinity of the office area and should have highway frontage with maximum visibility for as many sites as possible. The amount of land is uncertain but this area can be expended or contracted in accordance with area availability after taking care of other use types. Flexible planning will be required because of the unpredictability of both the nature and the amount of the demand.

An analysis of commercial uses in outlying locations reveals a great variety of uses for beltline frontage. Among the recreational uses are theaters, bowling alleys, skating rinks, pitch and putt golf courses and miniature golf courses. Other possible uses include restaurants and drive-ins, furniture stores, and garden centers. The chances of developing an automobile center are somewhat diminished by the current development of such a concentration on the West Beltline.

LAND USE PROBABILITIES AND ADAPTATIONAL PLANNING

There are important incommensurables and substantial uncertainties of various degrees in regard to the optimum utilization of the Gisholt property. But this is a situation which is common to most business decision-making. The decision-maker must judge the odds of various possible occurrences, and make his bets as best he can. To guide land use decisions, we have identified the major factors on which the plan must be built; and set forth below the odds for each of our primary predictions by classifying the forecasts as (a) Almost Certain, (b) Probable, and (c) Possible.

Almost Certain

What are the expectations about which we are more or less certain? First, that the Gisholt tract is admirably located for industrial, wholesale, and warehouse use, for mechanical service activities, building materials distribution, and related uses.

We are certain that this tract is one of the best now served with trackage and capable of being put to use in a relatively short time. We are certain that there is some demand for industrial land with trackage, though how much and how soon is uncertain.

With respect to other types of use, we are certain that in the course of time, the frontage on the Beltline will be absorbed by a variety of commercial uses such as have already appeared along other sectors of the west and east beltlines. We are certain that there will continue to be increasing demand for land for light manufacturing, research facilities, warehouses, and distribution centers and that the Gisholt tract is in a good competitive position to get its share of the demand.

Probable

What are some of the Probabilities, which are short of certainties?

While it may be certain that there will be a highway relocation to straighten out the curve and widen the right-of-way, the manner of this relocation is uncertain. We are assuming that the probable relocation of the Beltline Expressway will follow a line parallel with Broadway and some 1,200 to 1,500 feet south of Broadway in much the same location as shown in the earlier plan.

The location of the tract and the appearance of a substantial amount of rental housing in the area make it probable that there would be a demand for a reasonable amount of rental housing on the Gisholt property and that the number of school-age children in the occupant families could be kept to a small number by designing the project for childless households.

It is probable that there would be some demand for office space in this location.

Possible

Finally, what are some of the eventualities which are possible but so uncertain as not to be classed as probable?

It is possible that some large concern might acquire a substantial tract for its regional headquarters.

Demand for a motel site is a possibility though there are competing sites in better locations which may get first call.

The development of a marina is a possibility in spite of the problems of dredging and filling and the chance that the water frontage may be taken over by a public agency.

It is possible that sometime in the future, when the site ripens and the demand for retail services on the south and east sides of Madison show a substantial increase, a major shopping center could be developed on the site. It is also possible that some retail operation such as Sears, Wards, or a discount house might find the site advantageous only after the highway relocation matter is settled.

GENERAL DEVELOPMENT PLAN

The proposed General Development Plan (see last page — folded) is predicated upon the economic conclusions recited above. It is not intended to be a rigid blueprint, but rather a starting point for negotiating the initial disposition of the property in a rational manner.

In translating into a specific plan the economic analysis which has led to certain conclusions in respect to land use probabilities, it is proposed to allow for the maximum of flexibility in order to accommodate to the significant uncertainties which are necessary residuals. Specific allocations can be made for the more or less certain demands and provisional allocations can be made for the probable demands. In addition, sectors can be reserved for possible uses until such time as some of the uncertainties are removed. This approach to planning can be discussed in connection with each of the general use types.

Industrial. One of the certainties in the Gisholt situation is the adaptability of a substantial area for industrial use. The land to be allocated for industrial use can be placed in three categories: (1) large tracts for major industries which require railroad trackage; (2) small tracts for light industry, wholesale and distributive types of operation which require trackage; and (3) small sites for commercial and service operations which require no switching facilities.

Industrial land of some 94 acres is shown at the south-westerly corner of Raywood Road and the South Beltline Expressway. The southern portion of this land is proposed to consist of major industrial sites and the northern portion to be reserved for smaller

enterprises engaged in light industry, distribution, and service activities. The plan projects 22 potential sites of which 12 enjoy rail service — although these sites could be divided or combined to meet the varying requirements of specific industries.

Retail. At the west end of the tract, lying between Broadway and the proposed South Beltline right-of-way, the plan suggests the provisional reservation of an area of 50 to 60 acres for retail use. The retail center enjoys an almost ideal location. It benefits from the proposed interchange at Raywood Road and its proximity to the collector street from the south — Raywood, and that from the north — Monona Drive. It could contain two department store branches — one having as much as 160,000 square feet of floor space and a second one somewhat smaller. There could also be 25 or more smaller shops and service establishments occupying perhaps 80,000 square feet of floor space. The appropriate ratio of off-street parking areas to floor space in such a center would be approximately five to one as shown on the plan.

Offices. Fifteen acres of land along the proposed South Beltline Expressway is allocated for office use. The office complex contains a high-rise general office building and several smaller office buildings designed primarily for single occupancy.

Housing. Fifteen acres of land has also been designated at the Yahara River for the development of 250 dwelling units in medium-density walk-up structures. There would be approximately 28 dwelling units per structure and a ratio of 1.5 parking spaces per dwelling unit. The dwelling units are proposed to have one-and-two bedrooms. By providing for the development of the apartments on an island, the dwellings are distinctly separated and protected from the commercial area and at the same time can

assume a unique and attractive water-front orientation — with perhaps private boat docking.

Motel. A motel site has been located along the South Beltline Expressway. This area contains six acres and is situated so as to maximize the benefits of the expressway frontage and exposure. The motel also takes advantage of the marina facilities providing over-night accommodations for visiting boaters. Included in the motel facilities are a restaurant, meeting rooms, swimming pool, and chip and putt golf course.

Marina. Between the housing area and office space is a 23-acre marina. The marina includes dock facilities for up to 300 boats. A sales and service center is proposed at its north end. Marine repair facilities and enclosed winter storage docks could be made available within this building. A yacht club is depicted to provide lounge areas, meeting rooms, and eating facilities for boaters.

Additional fill for the housing development will come from the excavation of the marina basin and river connections. Two such channels are provided to facilitate water and boat circulation.

Miscellaneous Commercial. An area of 11.5 acres along Broadway has been allocated for miscellaneous commercial development. This location would permit maximum exposure to passing traffic along Broadway. Facilities suggested are an indoor theater, bowling alley, restaurants, garden center, and home-furnishing center. This complex features a central parking compound which will accommodate approximately 250 cars. Supplementary parking is provided in the adjoining shopping center.

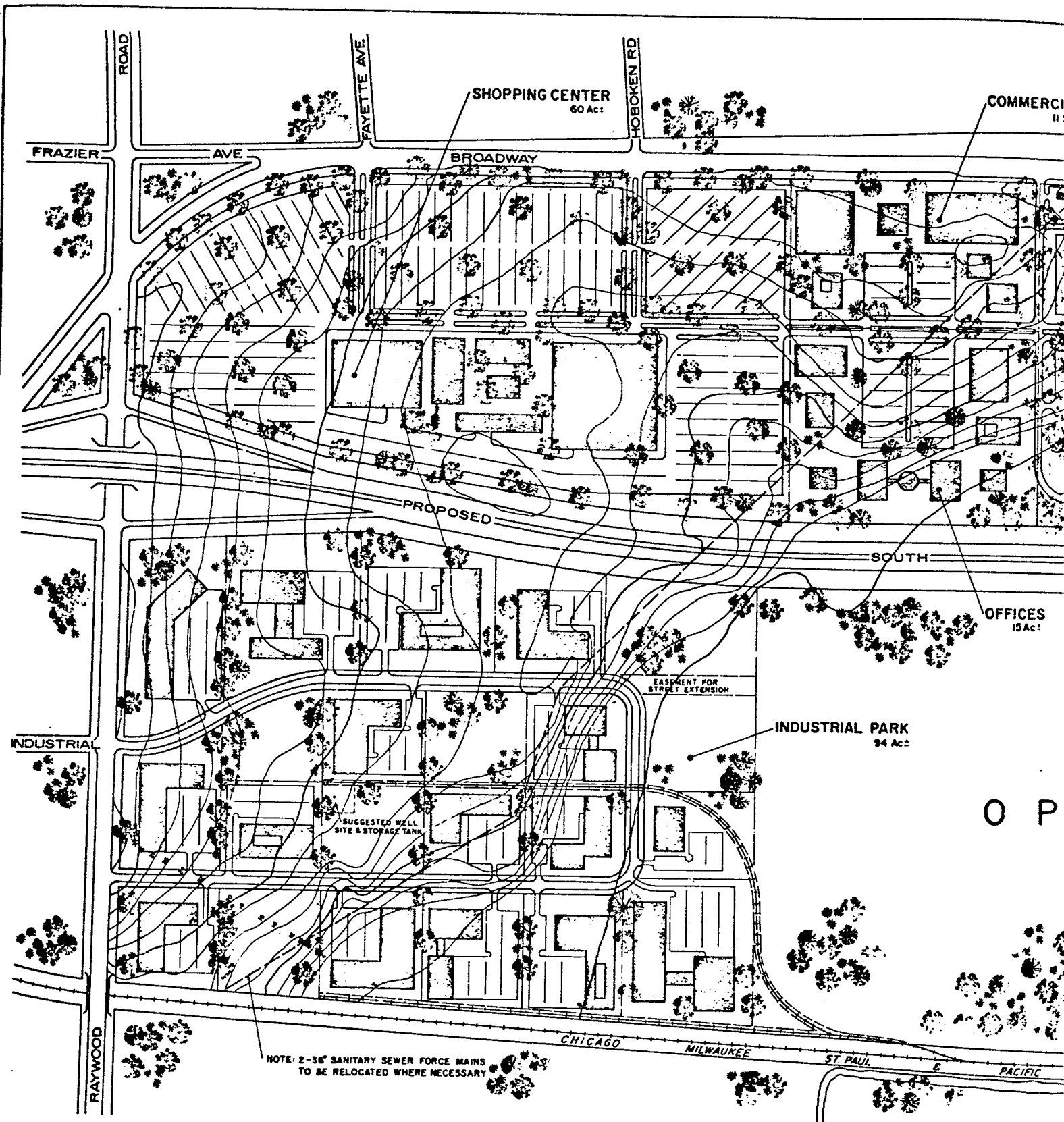
ZONING

One of the required steps in implementing the development objectives which are outlined on the Plan is obtaining proper zoning in advance of, or concurrently with, negotiation for specific sales. Because the Gisholt tract is now zoned, in its entirety, for industrial purposes, the areas which should be rezoned lie north of the projected east-west beltline expressway.

The rationale for this rezoning has already been adduced. Briefly, the impact of the projected highway upon the property makes the replanning of this part of the tract from industrial usage to a broad range of business, commercial, recreational, and residential uses feasible and appropriate.

The suggested complex of land uses (1) would be consonant with the already established character of the general area, (2) would promote the highest and best use of the Gisholt tract and its orderly development, (3) would materially augment the value of the land, and in turn, the anticipated tax revenue to Monona, (4) would not establish isolated and unrelated districts (spot zoning), and (5) would not unduly increase the need for additional community services and facilities.

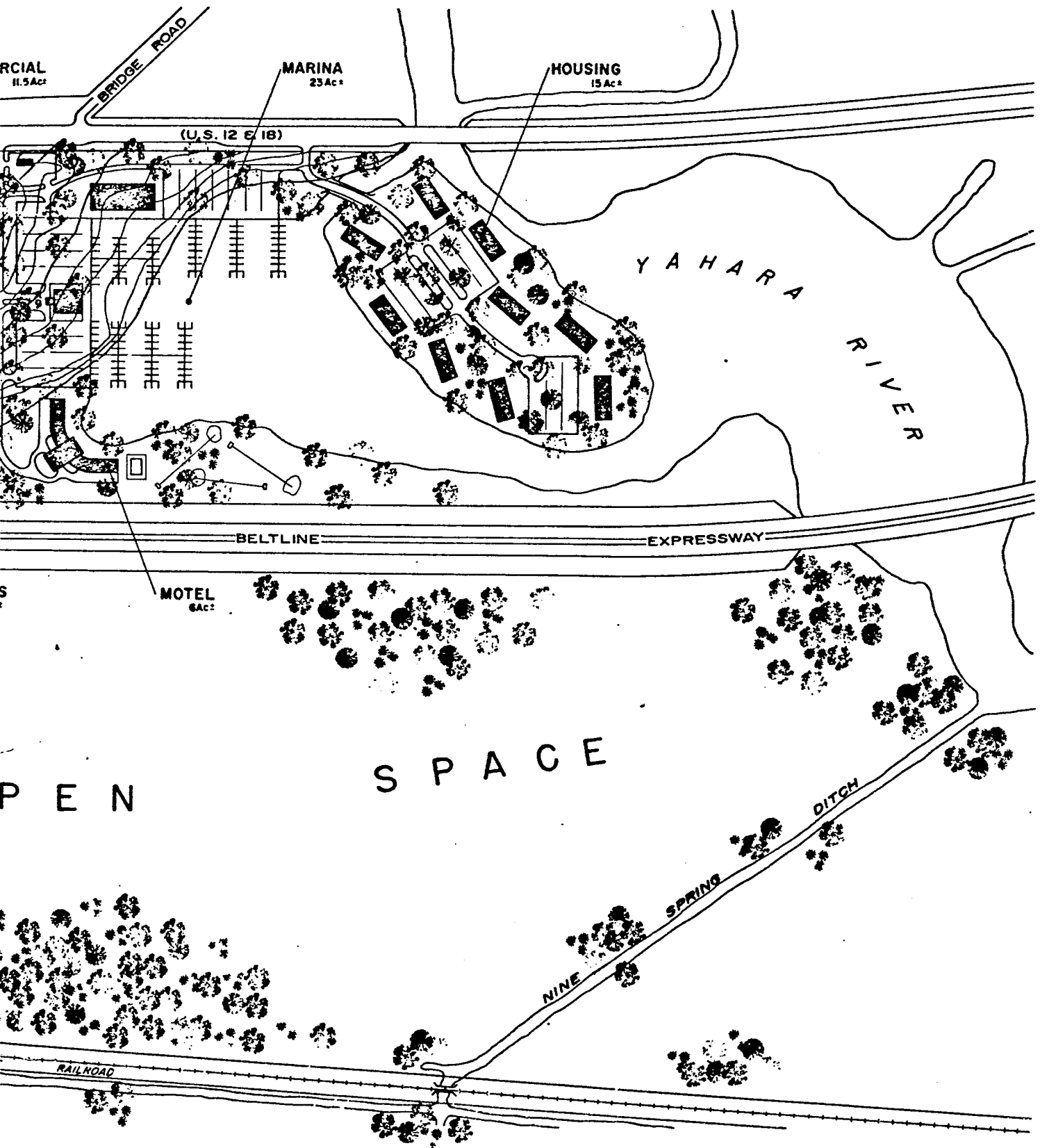
In conclusion, it is our opinion that the planning and zoning proposals set forth in this report are reasonable. Their effectuation would tend to establish a better balance of land use within the community, and enhance its appearance and economic stability.



GENERAL DEVELOPMENT GISHOLT TRACT

MONONA · WISCONSIN

PLANNING CONSULTANTS · CARL L GARDNER &



RCIAL
11.5 Ac.

MARINA
23 Ac.

HOUSING
15 Ac.

(U.S. 12 & 18)

YAHARA
RIVER

BELTLINE

EXPRESSWAY

MOTEL
6 Ac.

OPEN
SPACE

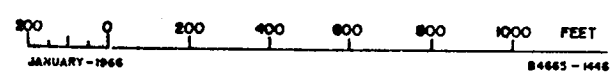
DITCH

NINE
SPRING

RAILROAD

T PLAN

NORTH



PRIMARY AREAS AND COURSE CONTENT
FOR CURRICULUM
of
PROFESSIONAL EDUCATION
in
REAL ESTATE APPRAISAL AND INVESTMENT ANALYSIS

Prepared by
Richard U. Ratcliff, Ph.D., MAI
for the
APPRAISAL INSTITUTE OF CANADA

October, 1967

Basic Premises

This statement presents a program of professional education for real estate appraiser-counselors who will meet the highest standards of professional competence which is practicable in the present state of the art.

This proposed educational program is based upon an expanded concept of the appraisal function to include not only the prediction of market value or most probable selling price of the property but also an advisory function through which the appraiser provides his client with the professional counsel which leads to a sound investment decision in solving the problem which confronts him.

We conceive of the appraisal-counseling function as an analytical process which calls for economic forecasting under conditions of uncertainty and which requires employment of the latest and most effective methods of economic analysis.

Under this broader definition, the appraisal function includes two phases. One of these phases is the prediction of the most probable selling price of the property with a probability qualification which enables the client to judge the odds that the predicted value figure will actually be realized. The prediction of the most probable selling price calls for an analysis of the value-generating characteristics of the property in order to judge its long-range productivity. This step also involves an analysis of general real estate market conditions and of the special aspects of the real estate market which have particular bearing on the subject property.

The prediction of the most probable selling price may be accomplished through the use of methods of statistical inference or by a process of simulation involving all of the many factors which will determine the actual selling price of the property. The counseling function requires reliance on the analysis which is undertaken for purposes of prediction of the most probable selling price but adds to this process a relating of the productivity characteristics of the property to the investment objectives and financial situation of the client. It is only by relating the characteristics of the property to the circumstances and desires of the client that the appraiser-counselor is in a position to make a sound recommendation of a course of action.

Implementation

The following subject matter outlines of course content cover the major areas which are deemed to be essential fields of knowledge as a basis for professional service in appraisal and real estate investment analysis. It is the expectation that ultimately these subject areas will be covered in credit courses in Canadian universities and that degree programs with appraisal as a field of specialization will be made available to candidates for both baccalaureate and advanced degrees. In addition, these course outlines can provide a basis for extramural programs administered by universities and involving correspondence, lecture or institute methods of instruction.

Primary Subject Areas and Course Content

The following division of subject matter into eleven courses divides them into two groups -- Basic and Professional. The plan is suited to an extra-mural diploma program which would require four years for completion with ten weeks allotted to each course; except for Courses 10 and 11, which will require 15 weeks.

Basic

1. Principles of Economics
2. Real Estate Mathematics and Statistics
3. Land Law
4. Urban Land Economics
5. Land Planning and Development
6. Building Design and Construction
7. Real Estate Financing
8. City Growth and Structure

Professional

9. Market Value Estimation
10. Real Estate Investment Analysis
11. Advanced Real Estate Problems

Handwritten notes:
 1000 1700 1800
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 2300 2400 2500

PRINCIPLES OF ECONOMICS

Purpose

The purpose of this course is to provide the student of appraisal with a better understanding of the economic system of which the real estate market is a part and of the basic economic principles and relationships which regulate its operation. A course in general economics is a necessary prerequisite for a later course in one of its specialized branches, land economics.

Course Outline

I. Introduction

- A. The Nature of Economics
 - 1. Defining Economics
 - 2. Production
 - 3. Distribution
 - 4. Consumption
 - 5. The Methods of Economics
- B. Economic Organization: Basic Problems and Concepts
 - 1. The Functions of an Economic System
 - 2. The Principle of Scarcity
 - 3. Demand
 - 4. Central Planning and Private Initiative
 - 5. The Market Mechanism
 - 6. The Circular Flow of Income
- C. The Role of Government
 - 1. An Administrative Framework for Economic Activity
 - 2. Health, Security, and Working Conditions
 - 3. Regulating Economic Decisions
 - 4. Public Enterprises
 - 5. Providing for Stability and Growth
 - 6. Mixed-Enterprise Capitalism
 - 7. The Welfare State

II. Income and Growth

- A. The National Income
 - 1. Calculating the GNP
 - 2. Net National Product
 - 3. National Income
 - 4. Distributive Shares
 - 5. Real Income

B. Economic Growth and Welfare

1. Income and Welfare
2. The Meaning and Measure of Economic Growth

C. The Roots of Progress: Population and Labor Force

1. The Race between Men and Resources
2. World Population Growth
3. Projecting the Future Population
4. The Labor Force
5. The Quality of Population

D. The Roots of Progress: Natural Resources, Capital and Technology

1. Conservation of Natural Resources
2. Capital Resources
3. Technology
4. Economic Growth and Finance

III. The Financial Organization of Society

A. The Organization and Financing of Business

1. The Role of the Business Firm
2. Forms of Business Organization
3. The Sources of Corporate Funds
4. The Management of Corporations
5. Separation of Ownership and Control

B. Public Finance

1. The Rise of Government Expenditures
2. The Changing Role of Government
3. The Pattern of Expenditures
4. Taxation
5. Borrowing

IV. Money and Banking

A. The Nature of Money

1. The Functions of Money
2. The Value of Money
3. Types of Money

B. The Supply of Money

1. The Commercial Bank
2. How Currency Reaches the Public
3. Reserve Requirements
4. Creating Deposits

V. Prosperity and Depression

- A. Consumption, Saving, and Investment
- B. The Theory of Income Determination
- C. Business Fluctuations and Forecasting
 - 1. Are Business Cycles Obsolete?
- D. Full Employment, Stable Prices, and Growth: Monetary Policy
- E. Fiscal Policy

VI. Prices and Production

- A. Demand
 - 1. The Nature of Demand
 - 2. Elasticity of Demand
 - 3. The System of Demand Curves
- B. Supply and Price Determination in Pure Competition
 - 1. Market Structures: Pure Competition
 - 2. The Law of Supply
 - 3. Increasing, Constant, and Decreasing Costs
 - 4. Shifts in Supply Curves
 - 5. Price Determination
- C. The Firm in Pure Competition
 - 1. Average Costs
 - 2. Marginal Cost
 - 3. Costs in the Long Run
 - 4. Output of the Firm in Pure Competition
- D. Price and Output in Pure Monopoly
- E. Imperfect Competition

VII. The Distribution of Income

- A. How Income is Distributed
 - 1. The Functional Distribution of Income
- B. The General Theory of Factor Prices
 - 1. A General Qualification
- C. Wages and Union
 - 1. Wages in General
 - 2. The Backward-Bending Supply Curve
 - 3. The Role of Unions
 - 4. Monopsony and Oligopsony
- D. Rent and Interest
 - 1. Rent
 - 2. Land Rent
 - 3. Interest
 - 4. The Demand for Loans
 - 5. The Supply of Lendable Funds
 - 6. Long-Run Functions of the Interest Rate
 - 7. Capitalization

- E. Profits, Operations Research, and the General Equilibrium
 - 1. The Foundation of Profits
 - 2. Managerial Decisions and Operations Research
 - 3. General Equilibrium and the Input-Output System
- F. International Trade
- G. International Finance

REAL ESTATE MATHEMATICS AND STATISTICS

Purpose

In using modern methods of analysis, the appraiser-counselor will need the basic tools of statistics and investment mathematics. This course deals with the fundamentals of these quantitative methods.

Course Outline

Part I - Statistics

- A. Statistical description
 - 1. Tables
 - 2. Charts
 - 3. Averages
 - 4. Dispersion
- B. Statistical induction
 - 1. Probability
 - 2. Sampling
 - 3. Tests of significance
- C. Time series
 - 1. Trends
 - 2. Seasonal variation
 - 3. Cyclical fluctuations
- D. Index numbers
- E. Regression and correlation analysis
- F. Computer applications

Part II - Mathematics of finance

- A. Present value of future receipts
- B. Present value of a stream of receipts
- C. Loan amortization
- D. Calculations of yield
 - 1. Loan with discount or premium
 - 2. On equity in a real estate enterprise
- E. Capitalization
- F. Depreciation calculations

LAND LAW

Purpose

In a strict sense, it is the rights in property rather than the physical property which is the subject of appraisal. Thus the appraiser must understand the legal nature of real property, the limitations imposed by public controls, the various forms of interest in land, how these interests are created and conveyed and the systems of public recording of interests in land.

Course Outline

- A. Nature of real property
 - 1. Historical development of land law
 - 2. Real property, personal property and fixtures
- B. Freehold estates
 - 1. Fee simple estate
 - 2. Life estate
 - 3. Dower, homestead rights
- C. Leaschold estates
 - 1. Term certain
 - 2. Periodic tenancy
 - 3. Tenancy at will
 - 4. Tenancy at sufferance
- D. Concurrent interests in estates
 - 1. Tenancy in common
 - 2. Joint tenancy
- E. Future interests
 - 1. Estates in possession
 - 2. Estates in expectancy
 - a. Reversions
 - b. Remainders
- F. Interests less than estates
 - 1. Easements
 - 2. Covenants
 - 3. Liens
 - a. Mortgage lien
 - b. Mechanics lien
- G. Recording of interests in land
 - 1. Registry system
 - 2. Torrens system

H. Transfer of interests in land

1. Public grant
2. Descent and will
3. Adverse possession
4. Expropriation
5. Foreclosure
6. Private grant
7. Contract to sell

I. Public limitations on ownership

1. Expropriation
2. Zoning
3. Building restrictions
4. Land development controls

URBAN LAND ECONOMICS

Purpose

This subject area is a subdivision of general economics. It presents the factors and forces which determine the productivity and value of urban real estate. It describes the processes of individual investment decision making, the interactions of demand and supply in the real estate market and the manner in which price is established and land use is determined through the market mechanism. An understanding of the economics of urban land is an absolute requirement for the appraiser.

Course Outline

- A. Functional basis of urbanism
 1. Early urban forms
 2. Specialization and change as an urbanizing force
 3. Manufacturing and urbanism
 4. Location of cities
 5. Functional variations among cities
- B. Internal organization of cities
 1. Economic organization
 2. Social structure
 3. Political organization
 4. Anatomy of land uses
- C. Physical characteristics of urban real estate
 1. Land description
 2. Limited supply
 3. Physical fixity
 4. Long physical life
 5. Geological characteristics
 6. Urban land as a manufactured product
 - a. Off-site improvements
 - b. On-site improvements
- D. Locational basis of land value
 1. Basic elements of location
 2. Dynamics of location
 3. Locational analysis
- E. Legal dimensions of real estate
 1. The changing institution of property
 2. Market implications of legal limitations on ownership

F. Real estate credit

1. Functions of real estate credit
2. Forms of financing arrangements
3. Sources of loanable funds
4. Types of mortgage lending institutions
5. Governmental programs in the mortgage market

G. Construction

1. Nature of the construction industry
2. The building process
 - a. Land development
 - b. Organization of production
 - c. Building materials distribution
 - d. Building labor
3. Home building
4. Multi-family and commercial structures

H. Real estate market

1. Market functions
 - a. Price establishment
 - b. Rationing existing space
 - c. Determining land use
2. Organization of the market
 - a. Participants
 - b. Communication
 - c. The agent or broker
3. Submarkets
4. Market imperfections
5. Market analysis and forecasting

I. Real estate investment decision-making

1. Productivity prediction
2. Investment objectives
3. Investor valuation

J. The appraisal process

K. Home ownership as an investment

L. Managing the investment

M. Urban land problems

1. Congestion
2. Transport
3. Blight
4. Housing
5. Dispersion
6. Multiplicity of political subdivisions

LAND PLANNING AND DEVELOPMENT

Purpose

It is the purpose of this course to provide the student with perspective on the relationships between project land planning and development and general community-wide planning by public agencies; to present the legal, physical and financial aspects of processing raw or cleared land to provide usable urban building sites; to establish criteria on the basis of which the appraiser-counselor may judge the quality of land planning and development; and to identify the cost factors of production, waiting and marketing which are considerations in feasibility and investment analysis studies.

Course Outline

- A. Relationships of project and community planning
 1. The project as part of the community structure
 2. Relationships of project development and the community master plan
 3. Community or town planning in Canada
 - a. Legal background
 - b. Local administrative organization
 - c. The planning process
 - d. Elements of the plan
 - e. Major area classifications
 - f. The plan programme and the capital budget
- B. Market analysis
 1. Objective of determining optimum use of site
 2. Metropolitan siting
 3. Local facilities available to the site
 4. Local environment of the site
 5. Legal limitations on use
 6. Physical and geological characteristics of the site
 7. Demand analysis for alternative uses
 8. Present and prospective competition
 9. Decision on optimum utilization of site
- C. Local land use regulations
 1. Zoning
 2. Subdivision control by-laws
 3. Highway powers
 4. Mortgage and CMHC standards
 5. Building by-laws

- D. Land development process
 - 1. General design considerations
 - 2. Recent developments in project planning
 - 3. Streets and roads
 - 4. Lot planning
 - 5. Locating community service facilities
 - 6. Utilities
 - 7. Restrictive covenants
- E. Subdivision financing
 - 1. Methods of financing
 - 2. Sources of credit
- F. Marketing the product
 - 1. Subdivision lots
 - 2. Urban renewal sites
- G. Special project types
 - 1. Industrial parks
 - 2. Holiday subdivisions
 - 3. Garden apartments
 - 4. Commercial complexes
 - 5. High rise apartments
 - 6. Re-subdividing
- H. Project investment analysis
 - 1. Estimating revenues
 - 2. Estimating costs
 - a. Production
 - b. Waiting
 - c. Marketing
 - 3. Risk analysis
 - 4. Yield potential

BUILDING DESIGN AND CONSTRUCTION

Purpose

Structural improvements to land constitute the mechanism which extracts the utility from the site and which serves the activities to be carried on at the location. The productivity and thus the value of the property as a whole is a function of the quality of the design and structural characteristics of the improvements. The appraiser-counselor must understand the economic processes of the construction operation, the methods of estimating costs of construction and the effects of the qualitative features of design and structure on productivity and value.

Course Outline

- A. Relationships of design and construction to productivity
- B. The building process
 - 1. Site selection and analysis
 - 2. Product design
 - a. Design and cost
 - b. Modular design
 - 3. Site preparation
 - 4. Organization of the construction process
 - a. Synchronization of sub-contractors
 - b. Critical-path method
- C. Organization of the construction industry
 - 1. General contracting
 - 2. Home building
- D. Building regulations
 - 1. Building codes
 - a. Specification codes
 - b. Performance codes
 - 2. Safety and sanitary regulations
 - 3. Zoning ordinances
 - 4. Mortgage and NHA standards
- E. Single and duplex residences
 - 1. Design criteria
 - 2. Architectural treatment
 - 3. Site development
 - 4. Structural systems
 - 5. Construction materials and finishes
 - 6. Mechanical equipment
 - 7. Cost estimating

F. Apartments

1. Design criteria
2. Architectural treatment
3. Site development
4. Structural systems
5. Construction materials and finishes
6. Mechanical equipment
7. Cost estimating

G. Offices

1. Design Criteria
2. Architectural treatment
3. Site development
4. Structural systems
5. Construction materials and finishes
6. Mechanical equipment
7. Cost estimating

H. Stores and shopping centers

1. Design criteria
2. Architectural treatment
3. Site development
4. Structural systems
5. Construction materials and finishes
6. Mechanical equipment
7. Cost estimating

I. Light manufacturing and warehouses

1. Design criteria
2. Architectural treatment
3. Site development
4. Structural systems
5. Construction materials and finishes
6. Mechanical equipment
7. Cost estimating

J. Miscellaneous buildings

1. Design criteria
2. Architectural treatment
3. Site development
4. Structural systems
5. Construction materials and finishes
6. Mechanical equipment
7. Cost estimating

K. Modernization and repair

L. Maintenance

REAL ESTATE FINANCING

Purpose

In functioning as an appraiser-counselor, the student will find essential an understanding of the forces which influence the flow of credit into the mortgage market, of the various forms of financing arrangements, of the institutional factors in mortgage lending and of the nature of governmental programs. Not only are these matters important in the functioning of the real estate market but also in their influence on property values and in their impact on real estate investment decisions.

Course Outline

- A. Functions of real estate credit
- B. Mortgages on land
 1. Concept of a mortgage
 2. Development of mortgage law
 3. Rights of mortgagee and mortgagor
 4. Mortgagee's remedies
 5. Sale by mortgagor of his interest
 6. Second mortgages
 7. Mortgagee's rights compared with those of other creditors
 8. Mortgage as a contract
 9. Mortgage as a transfer of an interest in land
 10. Provincial variations
- C. Sources of loanable funds in the money market
 1. Sources of funds
 2. Uses of funds
 3. Factors determining the mortgage market's share
 4. Fluctuations in interest rates
 5. Role of governmental fiscal policy and debt management
- D. Importance of the mortgage market sector in the general economy
- E. Types of mortgage lending institutions
 1. Insurance companies
 2. Trust companies
 3. Commercial banks
 4. Mortgage companies
 5. Private lenders
 6. Pension funds
 7. Sources of second mortgage money

- F. Comparative lending policies
- G. Differentials in local mortgage markets
- H. Mortgage risk analysis
 - 1. Nature of mortgage risk
 - 2. Analysis of borrower risk
 - 3. Analysis of property risk
 - 4. The mortgage pattern
- I. Governmental programs
 - 1. D. H. A.
 - 2. N. H. A.
 - 3. C. M. H. C.
- J. Forms of financing arrangements
 - 1. Use of leverage
 - 2. Mortgage- first, junior
 - 3. Installment contract to sell
 - 4. Mortgage bond
 - 5. Open-end mortgage
 - 6. Purchase-money mortgage
 - 7. Sale-leaseback
- K. Significant mortgage terms
 - 1. Amortization provisions
 - 2. Pre-payment privilege
 - 3. Escalator clause
 - 4. Insurance
 - 5. Taxes
 - 6. Term
- L. Financing income properties
- M. Construction financing
- N. Subdivision financing



1987

**CURRENT PRACTICES IN INCOME
PROPERTY APPRAISAL—
A CRITIQUE**

**CENTER FOR REAL ESTATE AND URBAN ECONOMICS
INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT
UNIVERSITY OF CALIFORNIA, BERKELEY**

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The opinions expressed in this study are those of the author. They do not necessarily represent the views of the Institute of Urban and Regional Development or of the University of California.

CURRENT PRACTICES IN INCOME PROPERTY APPRAISAL -
A CRITIQUE

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I express my appreciation to the Center for Real Estate and Urban Economics for providing the occasion and the facilities for the research on which this study is based. A most treasured reward was the close personal contact with the graduate student research assistants and the professional staff of the Center who have been my office neighbors and who created a friendly and stimulating environment and testing ground. I am equally grateful for the cooperative and efficient administrative and secretarial staff of the Center whose help has been indispensable--Mrs. Dorothy S. Cole, Mrs. Fern L. Shugart, Mrs. Barbara A. Thunen, Mrs. Helen Way, and Mrs. June Aiman, Librarian.

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The author assumes sole responsibility for the design, methodology, and conclusions of this research project. The questions which are raised concerning conventional appraisal assumptions and procedures are directed to general appraisal practice and not in particular to the reports which comprise the representative sample studied.

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CHAPTER I

BASIC VALUATION CONCEPTS

This study is another step in the author's continuing analysis of conventional real estate appraisal methodology. In other writings, basic appraisal theory on which conventional methods are founded has been examined and certain rationalizations have been suggested.¹ The validity of the classic Three Approaches to market value was questioned in support of numerous earlier writers who have found this formula to be wanting. The Cost-less-accrued depreciation formula was again shown to be defective and misleading as recognized by various authorities as early as 35 years ago. The Market Data Approach was validated as a useful, if imperfect, device for interpreting real estate market behavior which is recognized as the only possible source of evidence of market value. And finally, certain aspersions were cast upon the Income Approach. But the expressed doubts concerning the Income Approach were tentative and have waited as hypotheses to be tested by the kind of inquiry which is reported in this monograph.

Objectives of the Study

We shall explore the Income Approach in the context of the Three Approaches as it is actually employed by real-life appraisers in the valuation of income-producing properties. We shall be interested in whether or not appraisers tend to follow faithfully the instructions for the use of the Income Approach as it appears in the publications of the several professional appraisal organizations and in the current textbooks and journals. We shall examine the models for income appraisal promulgated in textbooks and instructional materials and will test them for their potential contribution to the market value estimate which

¹ Richard U. Ratcliff, A Restatement of Appraisal Theory (Madison: University of Wisconsin, Bureau of Business Research and Service, Graduate School of Business, 1964).

Richard U. Ratcliff, Modern Real Estate Valuation (Madison: Democrat Press, 1965).

Richard U. Ratcliff, Real Estate Valuation and Condemnation Awards (Madison: University of Wisconsin, Bureau of Business Research and Service, Graduate School of Business, 1966).

the appraiser seeks to derive. The various inputs or independent variables in which the appraiser quantifies his estimates of income, expenses, economic life and other factors of which the derived market value is a function are of particular interest. We will consider the reality of these estimates in terms of the probabilities of error which are inherent in the prediction. We are also interested in the sources upon which the practitioner actually relies in his application of the income appraisal formula in real-life appraisal situations.

A substantial sample of 84 appraisal reports from 53 different appraisers has been assembled in order to provide a solid basis of fact in the matter of current and predominant appraisal practice in the application of the Income Approach. The majority of the appraisers are members of the leading professional societies; thus the reports may be said to represent the best of current practice. Our interest in these reports is primarily in the methods used and the assumptions made. We have no basis for testing the validity of the value estimates. A detailed summary of methods and assumptions will appear in Chapter IV but let it be reported here that with very few exceptions, all of the appraisers faithfully employed methods promulgated by the leading professional organizations in their training courses and text materials. It follows that our critique of income appraisal methodology is directed not to the individual appraiser who generously cooperated in supplying the sample reports but to the almost universally accepted techniques of income property appraisal which would dominate any similar sample of income appraisals drawn from leading appraisers throughout the country.

Before dissecting and testing the several income valuation formulae, it is essential that there be a clear understanding of the appraisal objective, i.e., the nature of the value to be found. In other writings we have discussed the ambiguities in the term "market value" and the different meanings which it has come to connote in appraisal theory.² Appraisal procedure is inextricably linked to appraisal objective and we cannot discuss any aspect of valuation methodology without a clear definition of the concept of the value to be found. It would appear to be a truism that the inclusion of the Income Approach among the Three Approaches to market value requires that the value to be found through the Income Approach shall be market value. We shall discover that such an outcome is virtually impossible. We will consider a common line of reasoning which leads to the conclusion that the Income Approach will produce a justified or warranted investment value. But, such a value is not inherent in any real estate enterprise and the income formula or model which produces the value figure can at best be a simulation model of one individual investment conclusion which does not reliably represent a consensus of investors. But before presenting the origins of these conclusions, we will review some basic appraisal theory and will attempt to clarify and justify certain basic concepts as the foundation for what is to follow.

² Ratcliff, Modern Real Estate Valuation, op. cit., p. 46.

By definition, real estate appraisal is the estimating of value. By overwhelming consensus, the value to be estimated is market value. But the definition of market value which is well-nigh universal in appraisal literature, in court decisions and in the appraisal reports of practicing appraisers is ambiguous and misleading. Before we can proceed to evaluate appraisal methodology, we must establish a clear, unequivocal concept of the value to be found. A derivative of clarifying the definition of value is the clarification of the distinction between appraisal and real estate investment analysis. We shall see that this distinction becomes important in arriving at a later conclusion that conventional income appraisal models are of small value in predicting market value but may have some utility in individual investment decision making.

All of the 84 appraisal reports in our sample, with one exception, presented the standard willing buyer-willing seller definition of market value in faithful replication or paraphrase.³ The ambiguities of this definition have been discussed at length by various authors,⁴ but the practical result of its defects is that appraisers, at various times and under various appraisal situations, base their findings on two different and distinct concepts of value under the same familiar definition; and in an occasional case, still a third notion of value creeps in to distort the reasoning of the appraiser.

The only value concept which can logically be labelled "market" value, is the common sense idea that market value is the price at which the property will probably sell if exposed to the market for a reasonable length of time. In earlier writings, the author has been so bold as to suggest the symbol V_p for this concept, not in any proprietary sense but to provide a clear separation from the fuzzy connotations of the standard definition.⁵ V_p is market-determined; it is not a subjective value attached to the property by a single person nor is it a consensus of buyers and sellers; it is not an inherent or intrinsic quality or property of the real estate nor is there any ethical implication that it is a "fair" value. V_p is simply the appraiser's best judgment of what would happen if the property were put on the market; it is a prediction of the transaction which would most probably transpire and the transaction price which would most probably emerge. Since the appraiser's prediction is necessarily under conditions of uncertainty, i.e., under conditions in which the factors affecting the market price cannot be measured in precise terms, it is possible only to express the prediction in terms of the probabilities of its occurrence. Generally, the

³ American Institute of Real Estate Appraisers, Appraisal of Real Estate (Chicago: American Institute of Real Estate Appraisers, 1964), p. 21.

⁴ See Paul F. Wendt, Real Estate Appraisal (New York: Henry Holt and Company, 1956), Chapter 1.

⁵ Ratcliff, Modern Real Estate Valuation, op. cit., p. 36.

appraiser reports to his client the most probable price at which the property would sell, but we have argued elsewhere that of almost equal importance to the client, is the appraiser's judgment on the probabilities of commanding various prices over a range of possible prices.⁶

A second and conflicting value concept which can be derived from the conventional willing buyer-willing seller definition of value is the notion of intrinsic or inherent value.⁷ Presumably, the fully informed, willing buyer and willing seller can look through the actualities of market reactions to the intrinsic productivity potential of the property; a transaction between these all-wise characters will produce a value figure which is alleged to be the "true," "normal" or "fair" value of the property regardless of what the market may have to say on the subject. It is not difficult to understand why this concept of an intrinsic value persists. Under conditions of market imbalance such as characterized the early 1930's or in time of rapid real estate value inflation such as began in the late 1940's, it is a natural human reaction to view the market-determined values as abnormal and as failing to reflect the "real" or "true" intrinsic "value" of the properties consistent with potential use-value or long-term productivity. Thus, in a depression, the distress sales are deemed to be at "unfair" prices; under inflationary pressures, market-determined prices are judged to be "speculative and unsound." Under stable conditions, market-determined prices are generally accepted as representing sound, fair, and normal values. But it is not logical that the concept of market value should change with changing market conditions. Furthermore, the measurement of intrinsic or normal or fair value is impossible by objective means. If value is a price, only a market-determined price can be objective. If value is intrinsic, by what means is it to be measured save in the necessarily subjective judgment of an individual. It is no answer to say that we should seek a value consensus and that such consensus may be at variance with the market-determined price. We have no tests of the existence of a consensus save the price decisions of individuals as revealed by their market behavior in the process of establishing a market-determined price.

The third concept of value which at times is injected into the appraisal process is subjective value, value in use, or value to the owner. Such a value necessarily varies from person to person, from user to user, or from owner to owner. By any stretch of logic, value to the owner cannot be a species of market value, nor is there any authority in appraisal literature for such a conclusion. It is not unusual, however, to encounter attempts to inject this concept into appraisal findings as for example, in condemnation cases where the owner is attempting to secure indemnification for the loss of property which has a special value for him or to his enterprise.

⁶ Ibid., p. 61.

⁷ Wendt, op. cit.

We shall proceed from this point in our argument under the assumption that the appraisal objective is V_p , the most probable selling price; certainly, it is not difficult to demonstrate that it is V_p which most appraisal clients prefer and most expect as the end product of valuation.

Having defined the value to be found, we have substantively defined the nature of the appraisal process. In predicting the most probable selling price of the property, the appraiser must foresee how buyers and sellers in the market will arrive at their individual investment decisions and how the market will act in performing the price-establishing function. It is a truism that the prediction of market behavior can only be based upon observations of past market behavior. Thus, the materials out of which the appraiser performs his price prediction are records and impressions of human behavior in the market.

It is on the basis of the foregoing concept of value defined as V_p and the derivative nature of the predictive process that we have suggested the term Market Simulation as descriptive of realistic real estate valuation methodology. In effect, the appraiser conceptually constructs a model of which the building blocks are the totality of the factors which will affect the transaction and the transaction price which is to be expected if the subject property is offered in the market place. These factors include the institutional framework within which the real estate market must operate, the productivity characteristics of the property, the procedures of individual investment decision-making, the market conditions expected to be current at the time of the transaction, and the known processes of market interactions leading to the critical transaction and the concurrent price establishment. Against this concept of the appraisal objective and the appraisal process we can test any device which purports to lead to a value conclusion. No appraisal procedure can be accepted as valid unless the materials to be processed are market derived, unless the procedure is a true representation or replication of the realities of the real estate market, and unless the procedure contributes to a more dependable forecast of V_p .

The Confused Rationale of Capitalization

This section is dedicated to the testing of the hypothesis that conventional income appraisal methodology is founded on an unsound premise and that its widely accepted rationalization involves confusion and logical inconsistencies. If this be true, it follows that the mathematical rigor of capitalization arithmetic resolves into an anesthetic to sound thinking by its votaries, the appraisers, and imposes a specious imputation of scientific exactitude on the consumers, the clients. To test the conceptual confusion in the conventional Income Approach, we will explore selected samples of the received literature beginning with Babcock.⁸ We include

⁸ Frederick M. Babcock, The Valuation of Real Estate (New York: McGraw Hill Book Company, 1932).

Schmutz,⁹ whose rationalization of reconciliation firmly established the Three Approaches, the AIREA text as a committee product revised from time to time without any substantial departure from the party line,¹⁰ and a more recent text, Kahn, Case and Schimmel,¹¹ which makes some tentative forays into new territory. Professor Wendt's well-known Real Estate Appraisal¹² will provide demonstration that our present doubts have been voiced elsewhere.

Basic Rationale of Income Approach

There are no serious inconsistencies among the appraisal authorities with respect to the theory of the Income Approach. It is based upon the accepted fact that the value of an economic good is the present worth of future benefits. The AIREA textbook says: "... the value of a property is the present worth of the net income it will produce during the remainder of its economic life."¹³ For the appraiser, this statement leaves several questions unanswered:

1. Present worth to whom?
2. Present worth based on net income predictions and estimates of economic life made by whom?
3. Is this value equated with "market value"?

While the AIREA text equivocates at other points, it makes clear that the income expectation is that "which an informed investor would be justified in expecting . . ."¹⁴ The text apparently accepts the standard willing buyer-willing seller definition of market value which requires that buyer and seller be fully informed. We may infer, then, that "present worth" is equated with "market value" but that market value is not Vp.

Babcock makes no bones about it. Market price is the price actually brought in the market. Value is a "concept in which a thoroughly informed buyer is present." "Market price is a competitively established price but it is not necessarily equal to the

⁹ George L. Schmutz, The Appraisal Process (North Hollywood, California: The Author, 1951).

¹⁰ American Institute of Real Estate Appraisers, op. cit.

¹¹ Sanders A. Kahn, Frederick E. Case, and Alfred Schimmel, Real Estate Appraisal and Investment (New York: The Ronald Press Co., 1963).

¹² Wendt, op. cit.

¹³ American Institute of Real Estate Appraisers, op. cit., p. 236.

¹⁴ Ibid.

present worth of future benefits."¹⁵ The appraiser is the expert who is to judge the present worth based on the productivity of the property as revealed to him. He is the judge of the "warranted" price, the "justified" price, of the "fair market value." Babcock says: "The fact that several hundred purchasers have been found who were willing to buy certain undesirable subdivision lots at exorbitant prices would in no way be presentable as evidence of fair market value."¹⁶ Appraised value, then, may have no necessary relationship with the attitudes, preferences, or market behavior of real life buyers and sellers. We cannot escape the implication that the income approach as set forth in the 1932 book was designed to express in capital terms the intrinsic or inherent value residing in the property in the form of a productivity potential; the appraiser was not to trust market evidence of the present worth of this potential if it failed to conform to his judgment. Clearly, in Babcock's view at that time, the appraiser did not seek to predict V_p . In a speculative apartment boom, his appraised value of an apartment building would be far below its most probable selling price.

Schmutz comes very close to a clear-cut definition of value as V_p . "Most appraisals of real estate contemplate an estimate of market value, or value-in-use to persons generally, in contradistinction to value-in-use to any particular person . . . the essence of the concept lies in the exchangeability of property as the test of value."¹⁷ He would appear to be saying that value is market determined on the basis of investor behavior rather than on the all-wise judgment of the appraiser or any other sufficiently informed person. Thus we may judge the Income Approach as outlined by Schmutz as a device for predicting V_p . Although the AIREA has adopted the Schmutz methodology, the apparent acceptance of the legal definition of value with the requirement of the informed parties conforms more closely to the concepts of Babcock than of Schmutz.

Kahn, Case and Schimmel¹⁸ recognize value as market determined. Taking a realistic view of the market, the definition of value presumes that "persons in the market place have individually reached their own decisions about the value of the rights to themselves" . . . and "the range of prices within which the majority of transactions are completed provides a range within which a reasonably accurate value estimate can be made."¹⁹ Consistent with this view, we might expect that the Income Approach would be an effort to predict market behavior. It is not clear whether the authors have this

¹⁵ Babcock, op. cit., p. 15.

¹⁶ Ibid.

¹⁷ Schmutz, op. cit., p. 31.

¹⁸ Kahn, Case and Schimmel, op. cit., p. 28.

¹⁹ Ibid., p. 19.

end in mind. "The usual problem facing the appraiser is the estimation of the income and rate of return that will attract a typical investor . . ." and "By applying to the results of his study a mathematical capitalization technique, he is able to arrive at an estimate of market value that reflects the economic value of the property."²⁰ And "Capitalization is thus a means by which appraisers express their opinions of the amount of money a typical investor would be justified in spending for ownership . . ."²¹

From the foregoing quotations and from other authorities in the appraisal field we conclude that the conventional Income Approach is viewed by most appraisers as a device for expressing a value (V_s) which an investor would arrive at if he were as informed and sophisticated as the appraiser. Some of the authorities state that this value figure is "market value" and define market value under the informed investor restraint. Only Schmutz states explicitly that the appraiser seeks V_p and implies that the Income Approach is to aid in this prediction.

Wendt, in his examination of the origins of the capitalization of income method, concludes that "The apparent close relationship between the capitalization of income and the market comparison methods caused some writers to reject the view that there is such a thing as capitalized value distinct from market value."²² He quotes Medici to the effect that "Capitalization value does not constitute an independent aspect to be sought, because it is not distinguishable from market price. In fact, in every case, capitalization value emanates from a market price represented by a return (price of use) from a source of wealth and from a number (capitalization rate) which serves to translate that price into capital."

Capitalization Rate

The dominant view that the appraiser seeks a value figure which reflects the conclusion of informed investors implies that an informed forecast of future returns from the property is to be converted into present worth by a capitalization rate wisely selected by the same informed investors. The sensitivity of the final value answer to changes in this rate justifies special attention to the rationale of its selection as set forth by the authorities.

Babcock apparently conceives of the capitalization rate as a function of the qualities of the earning expectancy: " . . . one of the characteristics of earning expectancy is that it can be purchased for a present lump sum, and that the price . . . is proportional to

²⁰ Ibid., p. 100.

²¹ Ibid., p. 120.

²² Wendt, op. cit., p. 144.

the amount, character and certainty of the earning expectancy."²³ On another page, the author says, "The rate applicable to a given risk is a market phenomenon."²⁴ He seriously qualifies this statement on the next page when he says that a sale in which the buyer purchases "for the purpose of reselling at a profit at some future time" does not constitute evidence which the appraiser can utilize. This restraint on market evidence is consistent with the author's concept of warranted or investment value. Of course, in the pursuit of V_p , an appraiser might encounter a market in which most of the sales and purchases are speculative in nature; such sales would seem to be of prime predictive utility.

Schmutz views the capitalization rate as a market phenomenon. "The selection of the rate for use in any capitalization appraisal should be that rate which, in the capitalization process, will develop a capitalized value which is equivalent to the amount for which the property probably can be sold."²⁵ Schmutz's rate is an over-all rate which relates expected income to total selling price. It is affected by the motivations which prompt the buyer. The appraiser may develop the rate by analyzing sales of similar properties, by synthesis (band of investment) or by summation of the component elements of the rate. Like Babcock, Schmutz presents elaborate rating devices for rate construction as does the AIREA text. In the words of Wendt " . . . the concepts and techniques employed differ so widely that it appears that a capitalization rate must be conjured out of the appraiser's head."²⁶

The AIREA text urges the use of "a rate which is believed to represent the proper relationship between the capital good or property and the net income it produces."²⁷ What is the "proper" rate? The text says, "The rate to use . . . is the rate which investors in that type and class of property require as a condition for making their purchases . . ."²⁸ Throughout the discussion of this subject, the book suggests a reliance on market evidence though it does present the techniques of summation, band of investment, and comparison of quality attributes following the Schmutz methods. It also sets forth methods for extracting the interest rate from transactions where direct comparison is possible. The validity of these devices in the prediction of V_p is the subject of a later consideration.

²³ Babcock, op. cit., p. 129.

²⁴ Ibid., p. 427.

²⁵ Schmutz, op. cit., p. 125.

²⁶ Wendt, op. cit., p. 162.

²⁷ American Institute of Real Estate Appraisers, op. cit., p. 269.

²⁸ Ibid., p. 276.

Kahn, Case and Schimmel appear to follow Babcock in the statement that "the appraiser's chief function lies in estimating the original justified cost," and "The capitalization rate is determined by the characteristics of the property to be appraised"; ". . . it is the expected . . . rate of return necessary to attract capital to the investment compared with all other forms of investment opportunities."²⁹ Although the implication is that the rate is market determined, the emphasis in the discussion is on mechanical devices for comparing the qualities of investment opportunities to be used in ranking the property in the hierarchy of investment quality and thus capitalization rate. An interesting and revealing viewpoint is expressed in evaluating the capitalization approach where the authors state that the chief virtue of the capitalization approach is in judging the level of the real estate market. "The capitalization process can create an independent standard of value" against which the appraiser can "measure whether the level of prices is too high or too low."³⁰ This value standard does not sound like a market determined value nor does it suggest that the appraiser's rate is to be market determined.

Clarifying the Confusion

With the exception of Schmutz, whose insights have been diluted by the AIREA textbook writing committee which took over his methodology for purposes which he did not foresee, the authorities talk "market value," define appraised value in a manner which excludes as evidence a market consensus if unsound in the view of the appraiser, and propose a capitalization of expected income methodology which is one of the Three Approaches to market value. If they really mean value as determined in the market, or V_p , then the Income Approach has serious limitations as a basis for prediction. If they really mean that the appraiser is to seek a warranted or justified or fair or sound value, then the income methodology fails, for it can only produce a figure representing the value to a given investor in reflection of his special motivations and his financial situation, for no independent or intrinsic value inheres in the real estate. There is no point in using a formula which produces V_s when the appraiser is instructed to estimate either market value or intrinsic, warranted value. There is no consistency in looking for an economic value as a standard against which to judge price levels in the market and then, as instructed, seeking a market-determined capitalization rate.

Among the authorities, only the Schmutz logic is unassailable when he states that ". . . the conventional income approach should lead to a reasonable estimate of the probable sale price of the property. . . . Variations in approach are governed by the motivation

²⁹ Kahn, Case and Schimmel, op. cit., p. 122.

³⁰ Ibid., p. 132.

of purchasers."³¹ Unfortunately, the methodology which he proposes for predicting V_p is of questionable utility for this purpose, but his objective is clear and sound.

The Market and Cost Approaches

Applying the test of predictive utility to the Market Data Approach, more descriptively termed the Direct Sales Comparison Approach by Professor Kinnard,³² and not to be confused with the Market Simulation method,³³ we find that the test is met provided that the "comparables" are truly competitive properties, that the sample is sufficiently large to yield statistically dependable conclusions, and that the adjustments to the sales prices are not arbitrary but represent market-determined reactions of real buyers under analogous conditions. The Market Data Approach uses comparable sale prices for predictive purposes; it is a process of statistical inference in which the materials of prediction, the sales prices, are of high theoretical significance but from which, in too many practical applications, the prediction is of questionable statistical validity. There is much more to be said about the predictive utility of the Market Data Approach but it must wait for another time and place.

For nearly 40 years commentaries have appeared on the Cost of reproduction less accrued depreciation Approach which have totally destroyed it on logical grounds as a device for estimating market value. These attacks have never been refuted and need not be repeated in full in this discussion. The most damaging defect of this approach for the prediction of V_p is that it requires the separation of the real estate into two physical components, land and building, and the separate estimation of the value (market price) of each component so that the total may represent the market price of the combination. Clearly, in an economic good which is physically complex like an automobile or an apartment project, the individual and separate contribution of each component to the market value of the total going concern is not determinable.

In 1931 the Appraisal Division of the National Association of Real Estate Boards, in a publication edited by Henry A. Babcock, in the Standards of Procedure which it promulgated, stated that "... such summation appraisals are condemned as unsound, inaccurate and

³¹ Schmutz, op. cit., p. 89.

³² See William M. Kinnard, Jr., "New Thinking in Appraisal Theory," The Real Estate Appraiser, August, 1966, Vol. 32, No. 8.

³³ Ratcliff, Modern Real Estate Valuation, op. cit., Chapter 8.

misleading."³⁴ It is a sobering and puzzling phenomenon, supported by the evidence in our sample of 84 appraisals, that as a conservative estimate, 90 percent of all current income property appraisals present the Cost-less-accrued-depreciation calculation as evidence of market value. The oft-posed question of how else to appraise a special purpose property or one for which no market evidence is available, is simply answered by the logical conclusion that in such cases market value (V_p) may be an impossible prediction through lack of evidence and that any other value figure presented, such as cost less depreciation, must not be labelled "market value." A further footnote might be added to the effect that the discrediting of the Cost-less-depreciation Approach does not infer that cost estimates are never acceptable in the appraisal process. Cost of reproduction or replacement new may be useful in establishing an upper limit to value or to set the price of acquisition of a hypothetical new property which is competitive with the subject property--a hypothetical comparable which in the view of a buyer is a potential alternative to the purchase of the subject property. Incidentally, cost is a market determined price of acquisition and thus meets our test of acceptability when used as an upper limit or as the acquisition price of a competing though non-existent property.

Appraisal and Investment Analysis

Having briefly suggested the outcome of applying our tests of validity and predictive utility to the Market Approach and to the Cost Approach, we have cleared the way for the main task of diagnosing the Income Approach with the exception of distinguishing between real estate appraisal and real estate investment analysis. The appraisal object, V_p , and the appraisal process have been amply treated but it remains to define real estate investment analysis and to clarify the relationships of this analytical process with the appraisal process.

Real estate investment analysis is a term often applied to the process of judging the potential productivity of the investment in terms of the quantity and quality of the investment returns which are expected. While similar in nature, security investment analysis starts with an established price and relates expected productivity to the price. In real estate investment analysis, the analysis of productivity is for the purpose of arriving at an appropriate price rather than a testing of a predetermined market price as in the case of security analysis. We shall use the term in this latter sense--the judging of investment productivity for the purpose of equating the investment returns with a capital amount or indifference value. We shall show that this value figure is a subjective value, V_s , for

³⁴ Henry A. Babcock, Editor-in-Chief, Real Estate Appraisals. Published by the Appraisal Division, National Association of Real Estate Boards, 1931, p. 232.

each investor views each investment through different eyes, with unique expectations, against a personal value system, and with a special set of investment objectives which reflect, in part, a given financial status. Thus, in this connection, investment analysis is the process employed in investment decision-making; investment decisions are individual, personalized decisions; thus the process is subjective and unique to each investor.

Under the definitions of appraisal and investment analysis which we have established, investment analysis becomes a sub-process of appraisal. In order to predict price behavior in the real estate market so that V_p may be predicted, the appraiser must analyze the potential investment productivity of the subject property and must simulate the investment decisions of competing buyers and sellers. He must understand investor behavior and investor calculus in order to simulate investor expectations and investor decisions. It is a peculiarity of this application of investment analysis that realism rather than perfection is to be sought; the appraiser is concerned with replicating the predictions of traders in the market and their conversions of these expectations into capital values, V_s . For purposes of prediction, he must simulate real-life investor behavior whether or not it is informed and rational. His simulation sub-model of investor behavior is then combined with other sub-models into the final over-all model of the market process out of which the most probable price for the subject property is to emerge.

Real estate investment analysis which is to form the basis for investor counseling is quite another thing. Here the counselor is to recommend a course of investment action to a given individual. He calls upon his own expert knowledge to predict productivity and then relates the investment characteristics of the property to the financial status and investment objectives of his client. On the basis of his findings, he will recommend a course of action which he judges to be most advantageous for his client. As a part of his analysis the counselor will necessarily arrive at the appraised value, V_p , of the property under consideration for the price at which it will probably sell is an important parameter of his investment recommendation.

CHAPTER II

THE ECONOMICS OF PRICE ESTABLISHMENT

Purpose

We have found that the appraisal process is economic prediction, more particularly, price prediction. Thus the appraiser must simulate the price establishing mechanism of the local real estate market in its special application to the property to be appraised. On the basis of this model, with the appropriate independent variables supplied by the appraiser's knowledge and understanding of the constraining market conditions and his estimates of the productivity characteristics of the property, he forecasts the price at which it will probably sell and establishes his estimate of the probability qualification. That we may be better able to judge the predictive utility of the various methods of appraising income properties, it will be useful to discuss the process of real estate market price establishment and to identify the factors which the appraiser must consider in developing his price prediction. On this basis we can gain perspective in evaluating the reality of conventional income appraisal methods in terms of consistency with actual real estate market operation.

The Apparatus of Price Establishment

We will examine two phases in the process of price establishment in the real estate market. One phase is the investment decision-making of buyers and sellers. Decision-making involves not only the decision to buy or to sell but also a determination of the acceptability of given combinations of price and terms. In the typical case, the buyer or the seller enters the market with a first approximation of an acceptable price-terms combination which is often modified during the bargaining process. The first approximation may be the product of more or less sophisticated investment analysis or it may be a price recommended by a friend or a real estate broker or a skilled counselor. In any case, the first approximation and the finally accepted price are highly subjective in reflection of the buyer's or seller's investment objectives, financial situation and individual value system. In the terminology suggested earlier, the price dimension of the initial investment decision is expressed as V_s , the value to the present or prospective owner.

The second phase in the process of real estate price establishment is the competitive interactions of buyers and sellers within

the market framework. It is a rare case where there is not more than one seller of competing properties and where there is not more than one competing buyer. While the number of competitors and the degree of competition may vary widely from case to case, both buyer and seller usually have alternatives--acceptable alternative properties under consideration by the buyer and other potential buyers who are interested in the subject property. The transaction price which actually eventuates is not necessarily V_s for any one of the competing buyers and sellers for the successful bidder may find that he can buy at less than he would have been willing to pay and the seller may obtain a higher price than that for which he would have been willing to sell. The implication sometimes drawn from the willing buyer-willing seller definition of market value that both the ultimate buyer and seller, being fully informed, arrive at the same V_s and that the transaction takes place at this figure, is most unrealistic.

This description of the manner in which real estate prices are established for income properties as well as all other types of property highlights the importance of knowledge of real estate market behavior as the basis for the prediction of V_p . The appraiser must understand how real life buyers and sellers go about the making of investment decisions to be expressed as V_s ; how they enter the market in a competitive interaction which eventuates in a transaction; and what market factors and what market facts are significant in affecting the ultimate transaction prices and where and how to secure information on these matters and how to analyze this information. Thus the central field of expertise for the appraiser must be the economics of the real estate market and the methodology of real estate market analysis and forecasting.

It may be well to point out, parenthetically, that the appraiser of income properties must analyze two sub-sectors of the general real estate market--the market for space and the market for ownership. Our general concern in this monograph is with the latter, for the price we are discussing is the price at which the ownership of the property exchanges and it is this sub-market in which investors operate. But the appraiser, in his productivity analysis of the property, will be dealing with another set of market considerations, i.e., those which affect occupancy and rents for the type of space which the property provides. If it is an apartment property, the residential rental market will be put under analysis; the appraisal of a downtown office building may involve the appraiser in market analysis of both the office space and the retail space markets. This paragraph is to make clear the fact that, unless otherwise specified, further references to the real estate market will be limited to the market for income property ownership.

The well-known imperfections of the general real estate market are multiplied in the sub-market for income properties. The frequency of transactions is particularly low. Information concerning sales is hard to come by and often unreliable. Large and sophisticated investors are usually reluctant to give out any information on purchases or sales and are sometimes deliberately misleading. Income

properties are heterogeneous in physical characteristics and locational attributes. Their large size and complexity and the substantial capital requirements result in a delayed response of new supply to changes in demand and a typical carry-over momentum in new construction activities which often produces an oversupply. Only a small proportion of the standing stock of income-type properties is on the market at any one time and the shift in and out of the effective supply is less a response to price movements in the income property market than to exogenous changes in market conditions, such as in the availability of credit, changes in tax laws, and to changes in the individual circumstances of owners and investors. The result of this combination of disproportionate imperfections is a sluggish market in which price movements are hard to discern.

Several factors are operative in the income property market which may be observed in other sub-markets but which have impact of special force in price establishment for income properties. In the first place, as compared with the residential sales market, the demand for income properties is highly diversified, i.e., the individual circumstances of the investors and their investment objectives are highly varied. This fact contributes to the difficulty of predicting market behavior.

A second fact of significance is the importance of debt financing. There are two implications here--the effects of liberal credit on market activity and the general level of transaction prices, and the influence of the lender and his judgment of the value of a given property on the price at which it sells.

In large transactions as compared with house sales, the parties are more likely to rely on the findings of appraisers and consultants. These specialists often play a major role in the investment decision-making of the parties and thus in the establishment of the transaction price.

Income tax laws and regulations are of particular importance to investors in income properties who seek tax shelter or other tax advantage.

The implications for the appraiser arising out of the special imperfections of the income property sub-market are found in the special difficulties of predicting market behavior, i.e., market price. For the appraiser, one small offset to the disadvantages of a sluggish market is the fact that changes take place slowly and that the time horizon of market forecasting is thus farther removed than in some of the other sub-markets.

Investment Criteria in Decision-making

We have described in broad terms some of the more significant characteristics of the real estate sub-market in which buyers and sellers bargain in the exchange of income properties. We now turn to the process of individual decision-making of buyer and of seller

by which the buyer decides to buy and the seller to sell and by which each party to a transaction decides upon an acceptable price. Because the focus of the appraiser is on price, we will need to explore the manner in which the traders in the market employ a price expression in the bargaining process.

When the seller decides to sell, unless it is an act of desperation, he usually decides upon a price which he would accept if offered. This is an individual and subjective figure reflecting his own value system and investment objectives; it may or may not be related to his estimate of V_p , the highest price which he is likely to be able to get. When the seller has decided upon his initial private V_s , he must then determine what figure to use as an offering price. The seller usually is aware that there exists a range of value figures which represent the V_s values of buyers, and his initial offering price is usually set high within this range in the hope of attracting the exceptional buyer. The margin by which the asking price is in excess of V_s will depend upon the seller's expectations of market behavior in light of his understanding of the current state of the market. In an inactive or declining market the gap tends to be narrower than in an active and rising market.

Buyer behavior usually follows the same rationale as seller behavior save in an opposite direction.

When the seller actually receives an offer, it is almost always at a level below his asking price. He must then decide upon the acceptability of this third price figure. If it is above the personal and private V_s with which he started the bargaining process, he will usually accept it unless he believes he can succeed in securing a better price by making a counter offer to the buyer. If the offer is below the initial V_s , and there appears to be no probability that the buyer will raise the offer, the seller must decide whether or not to accept it or to refuse and risk losing the opportunity to sell to this buyer. He may very well modify his original V_s in light of having acquired a more realistic understanding of current market conditions during his effort to sell; or he may feel that he would rather take a little less and have the matter settled and the money in hand. Or, in the rare case, he may decide to withdraw the property from the market, or perhaps to raise his asking price.

The purpose of this earthy look at price behavior of buyers and sellers is to demonstrate that the initial price approximation, V_s , even when the product of sophisticated investment analysis, is first an individual, subjectively-determined figure, and secondly, that once the marketing and bargaining process has begun, it is an instable figure. This characterization has equal application to the price figures used by buyer and seller. It should be clear that there can be no certainty that the ultimate transaction price will be the same as the V_s of either the buyer or the seller. In most transactions, the chances of such equality are very small indeed.

Sources of Variability in Pricing Behavior

Investor Prediction under Conditions of Uncertainty

All business decisions rest on predictions which are made under conditions of uncertainty. No less uncertain than in other business situations are the conditions under which each real estate owner and investor must make his predictions of future returns on the subject property. These uncertainties are accentuated in the variable interpretations of traders in the market which necessarily reflect individual attitudes and analytical skills. Contributing to uncertainty of prediction are the multitude of exogenous factors which constitute the dynamic real estate market environment. These factors include general business conditions, money market factors, trends in capital formation, tax policies, technological change, demographic factors, political shifts, social attitudes, wars and rumours of war. The imperfections of the real estate market itself contribute to the difficulties of individual productivity forecasting and risk estimation.

In light of the uncertainties under which the owner and investor develop their expectations of future returns and the variety of logical and intuitive processes which real-life investors employ in converting these expectations into a first approximation value figure or Vs with which they enter the market, it may be assumed without challenge that in most sub-markets of the real estate market, no two owners or traders would arrive at the same Vs for the same property and that the dispersion among the Vs value figures is likely to be substantial.

Much of the rationale of the conventional Income Approach is related to the assumption that the real estate investor seeks to maximize the return on the investment and will choose that investment which promises the most favorable combination of return and certainty. The description of investor pricing behavior which is to follow will support a different view and will suggest that the conventional assumption is a dangerous over-simplification. Each investor views each investment opportunity in its relationship to his personal attitudes, financial capacities and needs and in many cases, as a portfolio investment in which over-all investment objectives are controlling. Determining the acceptability of a given rate of return is not the simple matter of making a comparison with rates of return on alternative opportunities in real estate and in other forms of investment.

We now propose to explore investor pricing behavior in greater depth, first in respect to the seller, by identifying some of the many variables which enter into his decision-making in the matter of each of the three prices employed in the bargaining process--Vs, the asking price and the finally acceptable price. We shall not attempt to deal with each of these price figures as the product of a separate decision-making process, but the variables to be itemized are those which enter into each of these price decisions though, perhaps, in differently weighted combinations. Because there have been few

systematic studies of investor behavior in the real estate market, this analysis is based on informal but considerable personal observation of real estate market phenomena by the author and on trade and academic literature dealing with related subject matter.

The first group of factors which enter into seller pricing decisions are personal and individual; the combinations and permutations become complex indeed when the decisions are group decisions as in the case of jointly or commonly held property or when the process is one of corporate decision-making. These factors include:

1. Personal value system
2. Temperament and bargaining ability
3. Financial status and tax bracket

A second group of factors relate to the liquidation objectives of the seller; more than a single objective may be involved. The usual purposes of selling income property include:

1. To secure cash for consumption purposes
2. To secure cash for re-investment advantages
3. To stop a loss
4. To settle an estate
5. To facilitate corporate reorganization
6. To liquidate at termination of use by an owner-occupant

In the third place, we recognize that the seller's understanding of real estate market conditions will influence his price decisions. In particular, his expectation of what the property will most probably sell for if exposed to the market for a reasonable time (V_p) is an important constraint, whether the forecast be his own or secured from an expert appraiser.

Finally, most sellers have a preconceived or intuitive notion of what the property is "worth" though in many cases this figure is simply what they would like to get for the property. In some cases, this value figure is related to the price which was paid for the property at acquisition. Sometimes the owner bases his judgment on an accountant's book value though this is not usual. In many cases, the owner is strongly influenced by market experts such as real estate brokers and appraisers. Mortgage lenders are also free with their opinions on value and these opinions are respected because of the great importance of financing.

We now turn to the buyer or investor for the purpose of identifying the variety of considerations and factors which affect individual investment decisions expressed in V_s or the investor's first

approximation, the bid price with which he begins negotiation and the final transaction price which he finds acceptable in the end. As in the case of the seller, there is a group of the same individual and personal constraints which condition all of these price decisions:

1. Personal value system
2. Temperament and bargaining ability
3. Income level
4. Capital resources.

We also recognize that like the seller, the buyer's understanding of real estate market conditions, particularly V_p for the investment under consideration, will influence his price decisions.

In considering the relationship of investment objective and pricing decisions, we recognize that the investor often acts with mixed or multiple motives. However, it is possible to identify the central objectives which account for most real estate investment acts.

1. Use

Many real estate investments are made to provide space and shelter for the investor. Individuals may purchase a small multi-family income property in part to provide accommodations for their own households. Business enterprises purchase warehouses, retail store buildings or office buildings for their own occupancy. Usually, the primary purpose is to effect economies but there are often intangible returns such as pride of ownership, prestige and security of tenure which are motivating factors. In some cases, the business enterprise finds it necessary to buy a building when no satisfactory rental quarters are available or when purchase is necessary in order to secure a particularly advantageous location for business operations. It is usually possible to measure opportunity costs objectively, but the importance attached to the intangible returns and the estimates of comparative advantage are individual and subjective for each investor.

2. Periodic Cash Return

A primary investment objective is the periodic receipt of a cash return or cash flow. The investor may intend to use this income for consumption purposes or for reinvestment and accumulation. In either case, his expectations are founded on his individual estimate of the productivity of the property and his prediction of future revenues is qualified by his judgment on the probabilities that the actual income will be higher or lower than the most probable level of revenue. The investor usually has some opinion on the reliability of his prediction and his investment decisions reflect his individual risk-taking or gambling propensities, i.e., his willingness to trade off the risk of loss against the possibility of gain. His willingness

to gamble will, of course, be influenced by whether the expected income is required for subsistence or whether it is to be used for estate building on top of an already large accumulation of wealth.

3. Capital Gains

Although it is possible that capital gains may be used for consumption purposes, the usual expectation is use for estate building. Capital gain as an investment objective is usually combined with an expectation of periodic cash return until liquidation, or at the least, no cash deficit. The investor who is looking for a capital gain must forecast V_p or liquidation value of the property at various times in the future, ideally as a time series over its productive life. Since this process is prediction under conditions of uncertainty, his forecast, as in the case of the productivity forecast, must include the probability distribution expected. The investor must also take into account his judgment on the reliability of his prediction. These various forecasts and evaluations are conditioned by the investor's personal and financial characteristics and modified by his propensity for gambling before making the various pricing decisions in the market process of making the investment.

4. Tax Advantage

The depreciation and capital gains provisions of our tax laws make it possible for some investors in income property to reduce or postpone portions of the income tax burden. Through individual ownership or ownership by a partnership or real estate trust, it is possible to avoid the double taxation which is loaded on the stockholder by corporate ownership. The depreciation provisions provide a tax-free cash flow which is offset by a postponed capital gains tax at liquidation at a lower rate than that levied on ordinary income. Depreciation provisions may create a tax loss which can be offset against other income with limited carry-over privileges. Thus, income tax reduction or postponement is often one of the motivations for investment in income real estate. An investor's estimate of these advantages will require his prediction of both productivity and liquidation value over time. The strength of his motivation will be a function of his financial situation and tax bracket.

Simulating Price Establishment

The foregoing discussion has led to two basic and unquestioned conclusions: For any given income property;

1. The supply price (the seller's V_s) and the demand prices of competing buyers (their V_s value figures) will typically vary substantially.
2. V_s for any one investor or owner is not a dependable basis for predicting the most probable selling price, V_p ; therefore a model or formula which simulates investor analysis and produces V_s is of limited utility in income appraisal.

From these conclusions flows the inference that price prediction must proceed either by use of devices of statistical inference or by a process of real estate market simulation. By statistical inference we refer to conclusions of measurable predictive reliability arrived at by statistical methods which permit the analyst to draw conclusions from a sample of past transactions. We will give consideration to statistical methods of this kind in a later discussion. This section is devoted to evaluating conventional Income Approach models as devices for the prediction of V_p .

A model has been defined as "an effort to describe the more important characteristics and relationships of a real world system or activity with a series of mathematical and statistical relationships." The real world system with which the appraiser is concerned is that apparatus by which the price of a real estate investment is established in the market. This system involves factors of demand and of supply and operates within a complex and ever-changing institutional framework. The first question is whether the conventional Income Approach models or formulae conform to this description. By examining one of the more sophisticated of these models, the Ellwood model, we shall see that the conventional capitalization model does not replicate the price establishment process and therefore is of restricted value in price prediction.

The Ellwood formula, which is advertised as an appraisal method, presumes to produce market value as the dependent variable. For the most part, the Ellwood text adopts a realistic view of the appraisal process as a reflection of real life behavior. But it appears to accept the conventional definition of value in which the informed investor is the arbiter of the inputs. To quote: "And, since the objective of appraisal usually is to determine a price at which the property would present a good investment opportunity and therefore attract a well-informed and prudent buyer, . . ."¹

In employing the Ellwood model, the investor or the appraiser must supply the following inputs as the independent variables from which the final value figure is derived as the dependent variable:

1. Period of ownership;
2. Net income before depreciation for this period;
3. Liquidation proceeds at the end of the ownership period as a percent of present value;
4. Rate of return on equity investment;
5. Terms of initial debt financing--debt as a percent of present value, interest rate, amortization schedule.

¹ L. W. Ellwood, Ellwood Tables (Ridgewood, N. J.: The Author, 1959), p. 3.

The conventional land, building and property residual formulae such as presented in the American Institute of Real Estate Appraisers text require the same inputs except for the omission of debt financing terms and the application of the capitalization rate to the total net income rather than to the return to equity only.

It is immediately apparent that the Ellwood model is not a market simulation model and therefore is not capable of predicting market price under the assumptions used as inputs. There is no provision for any of the factors of supply which are active in the real estate market. On the demand side of the market, the Ellwood calculation is only a sub-model which arrives at a single demand price based on estimates of one individual, presumably a prospective investor or his proxy, the appraiser. No provision is made for independent variables which represent the exogenous factors such as business conditions, credit conditions and others mentioned earlier as active in the price establishment process. We must conclude that neither the Ellwood model nor any of the simpler and more naive models of the conventional capitalization process are, in fact, real estate market simulation models. They are, therefore, incapable of simulating the "real world system or activity" which gives rise to real estate transactions in which price is established. They have no more predictive value than can be extracted from a single sub-model imperfectly describing the process or activity by which a single investor arrives at a demand or supply price in the form of a first approximation with which he enters the market. This price is V_s and the model is a form of investment analysis model. We may end our consideration of the conventional Income Approach as an appraisal device with the conclusion that it is useful in predicting V_p only to the extent that all traders in the market, buyers and sellers, use the same model in their private determinations of V_s , employ similar estimates as inputs, and enter the market with a V_s which is the same as all other traders. This is a most unlikely circumstance but we will later consider the possibility that in certain sub-markets, traders do, in fact, enter the market with V_s value figures which are within a reasonably narrow range. But such an outcome is not the product of the use of Ellwood or any of the other conventional income appraisal formulae.

CHAPTER III

CAPITALIZATION AS INVESTMENT ANALYSIS

It is the purpose of this chapter to examine the Income Approach as an investment analysis device and to evaluate its usefulness to the appraiser in this context. We have already reached the conclusion that the conventional capitalization formulae are not real estate market models capable of predicting market price. But we are not quite ready to say that capitalization of income by the appraiser is a futile exercise. Certainly it would be absurd for the appraiser to ignore the income-producing qualities of a real estate enterprise in seeking a value figure under any definition of value. Dollar productivity is the most important characteristic of this type of property and dollar return is the primary form of benefit, return or utility to the owner. It might be argued that in spite of the weaknesses of the Income Approach in its conventional form as a predictor of market price, the appraiser may be performing a useful service in presenting to his client, as an investment analysis device, a calculation which relates yield and capital value. We shall show that even for this purpose, conventional capitalization models are crude and unsatisfactory. We will also conclude, however, that real life investors do use capitalization devices in their decision making and that where the appraiser finds a market consensus in the use of some device and in the results in terms of the Vs of investors, he has at hand a most useful predictive tool. The essence of this conclusion is that the calculus of real life investors, whether or not it conforms to the textbook forms, is highly significant market behavior for the appraiser. But in the majority of appraisal situations, the appraiser has no effective method of measuring investor consensus and is hard put to discover a usable central tendency in investors' analytical methods or in their productivity projections.

An examination of investor behavior in various situations, in both the real estate and the securities field, would indicate that as the textbooks suggest, except for the pure gambler type, the investor seeks the most favorable combination of return and certainty in the allocation of his capital. This is a subjective determination which must be based on the investor's estimates of future return and its certainty; the decision among alternative investment opportunities on which is the most favorable will reflect a unique combination of personal qualities and investment objectives. Many of these considerations are not quantifiable so that no investment analysis model could be constructed in the present state of the art which would reflect the impact of all decision-making or influencing factors. Nevertheless, within limits, some form of investment analysis model

can be useful to the investor in his decision-making and our question here is whether any of the conventional income capitalization formulae might be effective devices for this purpose. Another and more difficult question is the extent to which any of them are actually being used for this purpose.

We might start by defining the rate of return which is a factor in the conventional income appraisal and for this purpose we shall use the formula which was most frequently encountered in the sample of 84 income appraisals subjected to analysis. In 40 percent of the reports, the straight-line depreciation straight capitalization model was employed. In this formula, two rates, separately determined, are added to provide the factor applied to the "building return." One of these rates, the "interest" rate, is also applied to the land return. The other rate, the recapture rate, is a direct function of the estimated economic life of the improvements--two percent for a 50 year life, for example. In the conventional appraisal application of this model, the interest rate is to be market-determined as a rate of return on capital which is an acceptable yield on comparable investments. If the model is used for investment analysis, the interest rate would be the conversion factor acceptable to an individual investor in relating expected returns to capital value.

Is this formula a useful analytical tool in investment decision-making? In the first place, it is designed to treat net income before depreciation and to produce a capital value representing total present value of the enterprise, as if free and clear of debt. The straight-line constant recapture assumption requires that the entire depreciable portion of the initial capital investment be recaptured during the period covered by the calculation. Thus the arithmetic does not lend itself to replicating the usual situation of a prospective investor contemplating a holding period less than the remaining economic life. Failure to include debt service as an independent variable omits one of the fixed obligations which affect the margin of safety between effective income and total fixed outlays and which the investor will take into account in selecting an appropriate capitalization rate based on the risk position of the equity return. In short, this calculation is unrealistic and yet it is actually employed by some investors and in many cases by the real estate brokers and appraisers who influence the investor's decision.

The residual formulae which employ the Hoskold and sinking fund arithmetic can be given short shrift on the grounds that no investors employ the kind of rationalization which is reflected in the setting up of a hypothetical sinking fund at a safe rate where the proceeds of recapture are presumed to accumulate at compound interest during the life of the enterprise to an amount equal to the depreciable portion. Investors who foresee reinvestment opportunities at more or less favorable rates than the subject property return may find the double rate calculation of use but most investors proceed on the assumption, usually tacit and even unrecognized, that recaptured capital will be invested at the same rate as assumed for the return on capital in the subject property. This assumption is implicit in the Inwood or present worth tables.

In the rationale of real estate investment analysis, the land and building residual formulae are not reflective of investor decision-making for the real life investor does not attempt to allocate the dollar returns from the property to separate physical components, in this case, land and improvements. His view is analogous to that of the mortgage lender who relates the amount which he is willing to lend to the return flow of cash. Like the lender-investor, the equity-investor is concerned with the recovery of his capital and a satisfactory return, during the period which it is outstanding, on that portion of the capital which is outstanding. The lender's return, popularly called "interest," is analogous to the "internal rate of return" of capital budgeting literature. It is the rate of discount which equates the cash flow from the mortgage payments with the initial amount of the debt investment. The cash flow, or debt service payment by the borrower, may follow any pattern--level payment until the loan is fully amortized, a declining payment of constant principal repayment plus interest on the unpaid balance, or a constant payment plus a balloon payment at the end of the term. This last form most faithfully reflects the calculus of the real estate equity investor in income property for he typically foresees a period of holding in which the property will generate a positive cash flow with an ultimate liquidation of the investment producing a substantial cash lump sum. He has no reason to concern himself with the origins of these dollars as between land and building nor, in fact is there any basis for such an allocation. It is the present worth of the cash flow, installment payments and lump sum, discounted at the acceptable internal rate of return, which determines what the lender will lend or what the equity investor will invest. Or, to reverse the formula, given an investment in mortgage or equity, and given the pattern of cash returns to the lender or equity investor, it is possible to calculate the return on capital, interest rate, discount rate or internal rate of return. This is the rate which equates the present worth of future returns with the amount initially invested.

It is by no means clear how extensively this type of calculation is actually used by real life investors in income properties. Various definitions of yield or return are extant and serve as investment tests. Another variation lies in the income flow to which the rate is applied. For example, the discount rate may be applied to net income before depreciation as in the conventional Income Approach; it may be applied to net income or cash flow after debt service; or it may be applied to cash available after debt service and income tax payments. It is probable that among those investors who use this investment test, the most frequent practice is to apply the discount rate to cash flow after debt service. To employ conventional appraisal terminology, the discounting process involves the use of the Inwood tables.

In light of the foregoing description of investor calculus, it is clear that among the conventional appraisal models, the Property Residual calculation is the most realistic. This fact has long been recognized and has at long last received implied approbation by AIRF in its promotion of the Ellwood formula which employs the property

residual format with the discount rate applied to net income after debt service and liquidation value after debt retirement.¹ Thus, among all of the conventional income appraisal models, Ellwood's is most useful for investment analysis purposes for it includes more of the independent variables and processes them in the most realistic fashion. It is this fact which makes the Ellwood formula less useful for appraisal purposes.

It will appear inconsistent to state that at the same time, the Ellwood model is more realistic and less useful for appraisal purposes. But reconciliation lies in the fact that because of its apparent complexity, few investors actually use the Ellwood calculation to arrive at a logical measurement of investment return. However, most real estate investors do take into account the realities of debt financing and do adjust their expectations to the period of expected holding rather than to full economic or productive life. But the measurements of investment results are likely to be more crude and to reflect, though imperfectly, other financial considerations such as tax shelter or a portfolio viewpoint which integrates with the financial results of a specific real estate investment, the financial results of other investments. For example, an investor who seeks tax shelter measures the advantages of a real estate enterprise which promises to operate at a tax loss for the next five years in terms of savings in taxes on other income. He would balance this advantage against a possible capital gains tax on the proceeds of the sale of the real estate and would have no occasion to calculate an internal rate of return on the real estate enterprise. There are many other investment situations in which the investor does not calculate or estimate a rate of return. The unsophisticated investor does not know how. The majority of real estate brokers use other measures, such as the "broker's rate" or the gross income multiplier and are not capable of calculating or explaining to their clients the more sophisticated ratios. Many investors have only a passing interest in the rate of return on capital for their motivations are only indirectly related to a regular return; some are interested only in capital gain, some in the amount of the cash flow, some in an inflation hedge, some in building an estate, some in portfolio diversification, and some have an emotional urge to own real estate. Thus we conclude that only the more sophisticated investors calculate the internal rate of return and are unlikely to use the Ellwood model for this purpose either because it does not employ net income after income taxes or because they do not understand how to use it.

For the analysis of an investment opportunity where the analyst makes assumptions or forecasts of productivity, liquidation value, financing terms and internal rate of return, the Ellwood tables are a great convenience in calculating the capital value as a dependent variable. The formula may be used as an impact model to measure

¹ American Institute of Real Estate Appraisers has acquired publication rights to Ellwood Tables and is publishing a revised edition.

changes in the dependent variable as a result of differing inputs. Thus, the model is a useful device for gaining an understanding of the relationships between the inputs or estimates and the derived value figure and for testing the estimates for reasonableness. The model is useful in calculating the internal rate of return of an investment of a given dollar amount when the analyst accepts as given his own estimates of productivity, liquidation value and financing pattern. In this case, by interpolation, he can approximate the rate within sufficiently close limits.

In amplification of our statement that the Ellwood model is of small predictive value to the appraiser in search of V_p , we do not mean to imply that it is a useless exercise for an appraiser to analyze the investment as he would analyze it if he were a counselor who is called on to recommend to a client an investment decision. We only insist that the analyst's conclusions under these conditions may give only the most general clue to a market-determined transaction price.

The Ellwood formula has been described as one of the more sophisticated analytical tools for real estate investment analysis. But there are available even more sophisticated models which include income tax burden as an independent variable and which permit easy calculation of significant ratios and capitalized values. However, these models involve computer programs. One such model, developed at the University of Wisconsin by Professor James Graaskamp, calls for the same inputs as in the Ellwood model plus an assumption on tax depreciation and income tax rates. The computer will print out income statements for any number of future time periods of selected duration. The statements present net operating income, net taxable income and net cash flow. It will calculate significant ratios at each selected point in time and will appraise the project as of the present using the property residual formula and given financing assumptions. The capitalized value may be based on a number of selected discount rates and can be figured on net income before depreciation, net before depreciation and after debt service, and net before depreciation and after debt service and income tax.

A model developed by Professor Paul F. Wendt at the University of California, Berkeley, will calculate the internal rate of return given the initial cost of acquisition, a cash flow forecast and a prediction of the liquidation value at the end of the ownership term.

The knowledgeable need not be warned that the computer performs no magic; that the output is no better than the quality of the estimates and quantities which are the inputs. The income statements, ratios, and capitalized values can be done by hand with no limitations save the time required. But this is a highly significant difference, for the computer program permits the analyst to vary the inputs experimentally and to have the results of each variation available within seconds at reasonable cost. He can study the investment results under the assumptions as a time series and he will have available refined measures and ratios which without the computer would probably not be calculated because of time limitations.

CHAPTER IV
A DESCRIPTION AND CRITIQUE OF CONVENTIONAL
INCOME PROPERTY APPRAISAL PRACTICE

The Factual Basis

In the foregoing chapters we have occasionally alluded to the sample of 84 income appraisal reports which have been analyzed as a basis for conclusions on the characteristics of predominant and accepted appraisal practice. The objective of securing the sample was not to develop a definitive description of American appraisal practice; the original intent was to check typical appraisal methods and assumptions against the methods and assumptions which are promulgated by the appraisal societies in their text materials and course offerings and which have been parroted in appraisal textbooks and manuals from other sources. Does the practicing appraiser follow the party line? If the sample is representative, the answer is that with few exceptions, he does.

The sample of appraisal reports was assembled largely through the kind offices of the Northern California Chapter of the American Institute of Real Estate Appraisers and as a result of a notice which appeared in the December, 1966, issue of The Appraiser. A request was made for the loan of a recent appraisal report covering any type of income property, with not more than two reports from any one appraiser. The result of this request was a random sample of 84 reports distributed among property types as follows:

Office Buildings	- 18
Commercial	- 32
Industrial	- 12
Apartments	- 17
Mixed Types	- 5

The properties were located in 15 states and Canada, with 55 in California of which 36 were in the San Francisco Bay Area. The average value was nearly \$2 million, with a range from \$11,000 to \$22 million. A total of 53 appraisers submitted reports; the affiliations of these men give assurance that the appraisals represent the best of current appraisal practice. We may also assume that the reports which were sent on loan were selected by the lender as representing his best work. All but 15 of the appraisers were affiliated with either the AIREA, the SREA or the ASA. A total of 34 were MAI's. Tables 1 through 5 summarize the methods and assumptions contained in the reports, with a break-down by type of property. The small size of the sample makes unreliable any distinctions in the

methods used or the assumptions adopted for the different property type classes. In the aggregate, however, the findings are believed to be representative. The methods used to assemble the sample give assurance that much the same facts would be revealed by any similar sample drawn from any similar group of appraisers. The critique presented in the monograph, therefore, is directed to appraisal practice in general and not specifically to the reports which happen to make up the examples at hand.

The Three Approaches

Some form of Income Approach was used in each sample case involving income properties. In respect to the other two Approaches, Cost alone was employed in addition to the Income Approach in 31 reports, Cost and Market in 40 cases, and Market alone in three appraisals.

Table 1
Approaches Used

	<u>Office Buildings</u>	<u>Com- mercial</u>	<u>Indus- trial</u>	<u>Apart- ments</u>	<u>Total</u>
Income and Cost	6	13	5	7	31
Income and Market	0	2	0	1	3
Income, Cost and Market	10	16	6	8	40
Income Only	2	1	1	1	5

The Income Approach without either of the other two was employed in five cases. Thus the Cost Approach appeared in 71 out of 84 appraisals and the Market Approach in only 43.

In an attempt to judge the relative importances of the various Approaches in the final value finding, the "correlation" process was analyzed with the following result: in 31 cases out of 79 for which a conclusion was possible, primary weight was accorded the Income Approach. In 23 reports the Income Approach shared the primary position with either one or both of the other Approaches. In nine reports, the Cost Approach was the most heavily weighted, and in 15 cases it was the Market Approach. The Cost Approach shared primary importance with one or both of the other Approaches in 13 instances; the Market Approach shared first place in 15 appraisal conclusions. These facts demonstrate that even in the appraisal of income-producing properties, the appraiser bases his value conclusion primarily on the capitalization process in only 40 percent of the valuations.

The Cost Approach

This Approach was made in 71 out of 84 cases in the sample; in 22 appraisal reports the appraiser indicated that his cost-less-accrued depreciation finding received or shared top weighting in his final value conclusion. Clearly, the American appraiser remains unconvinced that this formula is illogical, unworkable and without intrinsic predictive value.

The Market Approach

In a substantial number of cases, calculations involving Gross Income Multipliers or Over-all Capitalization Rates were reported by the appraisers as a part of the Market Approach. Such calculations will be considered here under the special heading of Direct Conversion Ratios. The high frequency with which these ratios are employed in income property appraising is one of the significant findings of this study and is deserving of intensive analysis.

The typical method for processing comparable sales under the Market Approach was to reduce the selling price, after adjustment, to a unit basis either in dollars per square foot or dollars per dwelling unit in the case of apartment properties. These techniques are familiar to most appraisers; no new or unusual methods appeared in the reports.

The Income Approach

Among the conventional capitalization formulae, the Straight Line-Straight Capitalization building residual model was by far the most popular among the appraisers (see Table 2 on the following page). It was employed in 35 cases while the land residual form appeared in only seven cases. The preference for the building residual form seems to have been based on the availability of a market basis for arriving at land value.

Among the appraisal reports in the sample, the present value calculation, using the Inwood tables, appeared in two reports using the building residual formula and in 11 which used the property residual. In addition, the Ellwood formula, which is a variation of the property residual model, was used on seven occasions.

By way of a summary, 13 appraisers were able and willing to use the present value concept in the capitalization process, plus the seven applications of Ellwood, and 42 used the simple arithmetic of the straight-line depreciation-straight capitalization formula. The building residual model, with 37 users, was the most popular with the property residual (including Ellwood) appearing in 18 cases.

Critique of the Residual Models

We have already made the point in earlier chapters that the conventional income appraisal models are not market simulation models and therefore have limited utility in predicting market price behavior

Table 2
Capitalization Method

	Office Buildings		Commercial		Industrial		Apartments		Total	
	With Other Method	Used Alone	With Other Method	Used Alone	With Other Method	Used Alone	With Other Method	Used Alone	With Other Method	Used Alone
Building residual, straight-line depreciation	8	4	18	7	4	2	5	4	35	17
Land residual, straight-line depreciation	2	-	5	-	-	-	-	-	7	0
Building residual, Inwood	2	1	-	-	-	-	-	-	2	1
Property residual, Inwood	-	-	6	1	4	2	1	-	11	3
Property residual, Ellwood	1	-	3	1	-	-	3	2	7	2
Gross income multiplier	6	2	11	2	3	-	5	1	25	5
Price - net income ratio	7	2	11	2	5	4	10	3	33	11
Price - net income after depreciation ratio	1	1	1	-	-	-	1	-	3	1
Price - net income after debt service ratio	2	-	2	-	1	-	-	-	5	0

for purposes of appraisal. We have argued that, used independently, they are inadequate for purposes of investment analysis. But the facts are that appraisers use these conventional models and present them in their reports as the primary bases for their value findings. Tested by logical analysis, what is the validity of these formulae? What are the inherent capabilities for producing a useful value figure? What does the appraiser really accomplish by this mathematical exercise?

Income Prediction: Income processed in almost all of the valuations was the conventional net income before depreciation and projections were in these terms. Only in 45 cases did the appraiser do more than extrapolate or project as a constant amount the current net income of the property; for 19 new properties, this income was estimated on the basis of market comparisons, and in 16 other cases the actual net income of an existing property was adjusted to economic rent based on a market study.

Table 3
Basis of Income Prediction

	<u>Office Buildings</u>	<u>Com- mercial</u>	<u>Indus- trial</u>	<u>Apart- ments</u>	<u>Total</u>
Estimated Present Economic Rent	11	11	6	7	35
Actual Present Income	5	16	6	7	34
Stabilized Income	2	5	0	3	10

In only 10 cases was the initial income figure lowered or raised to represent the stabilized level of an expected rising or falling income. Typically, then, the current level of income was extended as a constant for the full remaining economic life of properties ranging from eight to 60 years in the cases at hand. In no case did the appraiser forecast an increasing or decreasing income in step or curve form.

The productivity behavior of income properties in the real world departs so markedly from the predominating appraisal format of a straight-line income projection over the remaining economic life, that this practice is hard to accept. An easy explanation, and one which may well account in large part for this form of income forecast, is that the mathematics of capitalization is thereby considerably simplified. Another rationalization often heard is that since prediction is so difficult and uncertain, a constant income expectation is as probable as any. But the facts of life are that properties differ in productivity patterns and that few if any income properties continue to produce today's income unchanged up to

the very end of economic life. The appraiser purports to be the expert in real estate market forecasting and, it might be expected that he could do better than to simply extrapolate current income into the far distant future. The arithmetic of capitalization permits the treatment of variable income projections with no great complications though perhaps requiring more time and effort.

One oft-stated justification for the projection of a constant income in connection with the straight-line depreciation-straight-capitalization model, is that the formula has the effect of a declining income if the rate of interest return on the unrecaptured portion of the investment is assumed to be constant. The AIREA text explains that the rate of revenue decline which is implied in the calculation is a function of the interest rate applied by the appraiser and the recapture period which is assumed, and that the rate of decline thus changes with changes in either of the factors.¹ The Institute textbook provides the following formula for determining the rate of decline of the building return where R is the rate of interest and D is the rate of recapture:

$$\frac{R \times D}{R + D}$$

In none of the sample appraisals did any appraiser discuss the rate of revenue decline which was a function of the interest and recapture assumptions which he used.

A defect in the logic of using the straight-line method where a declining income is expected lies in the inconsistency between the time when building return declines to zero and the time when the recapture period comes to an end. Presumably they should be the same, but under the assumptions of a five percent interest rate and a 20-year recapture period, for example, the formula indicates a rate of decline in the "income attributable to the building" of 2.5 percent per year. In other words, at the end of the recapture period of 20 years, building return will have declined by only 50 percent from the first-year level and the property still will be producing a substantial net income above land return, hardly the situation which suggests the end of economic life.

Assuming the absence of a net lease, it is our conclusion that the extrapolation of current income as a constant over the entire economic life of the income property is a crude and unrealistic assumption and unjustified on any logical grounds. Since the pattern of future income is the most important value-generating characteristic of the property, a carefully refined and realistic income projection would seem to be essential to a sound value conclusion by any process.

¹ American Institute of Real Estate Appraisers, The Appraisal of Real Estate (Crawfordsville, Indiana: R. R. Donnelley & Sons, 1964), p. 294.

Recapture

The recapture calculus which is built into the conventional residual capitalization methods is artificial and unrealistic. The intrinsic assumption of the formulae is that the investment analysis calculation calls for the full retirement of the improvements over the economic life of the enterprise. This span of time ends when net income just equals the land return at the assumed interest rate and based on the present value of the land. As Ellwood and others have pointed out, the real life investor does not look forward to recapturing his capital in installments until, after perhaps 40 years, he recaptures the balance in a lump sum equal to the original land value.² The real life investor does not distinguish between the dollars which he has invested in land and the dollars represented by building. He is concerned only with the total enterprise or total investment and makes no attempt to allocate the cash flow as between recapture and interest on investment still unrecaptured. In short, economic life is not a realistic measure of the recapture period for the investment in the building. Investor calculus is much more closely simulated in the Ellwood version of the property residual calculation than in the land or building residual models. Like the mortgage investor, the equity investor in a real estate enterprise relates the expected net cash flow to his original investment and expects these cash returns, in whatever pattern, to return his invested capital and to pay a return on the unretired portion at all times. If expected ownership is for a period shorter than the productive life of the improvements, as is usually the case, the cash flow will take the form of a series of installments terminating in a lump sum representing the liquidation proceeds of the enterprise when ownership is terminated. No calculation of economic life is required nor is the separation of revenues or of capital value between land and building.

Land (Residual) Value

In an article many years ago, we pointed out that the terminology of conventional literature used to explain the land and building residual methods was incorrect and misleading.³ From the investor's viewpoint, there is no breakdown of the investment as between land and building. The investor is interested in the difference between the amount which he initially invested and the expected proceeds of liquidation at the end of the period of his ownership. This difference may be positive or negative and if negative, the recapture of the difference between cost and liquidation value must come out of earnings during the period of ownership. Conventional literature talks of "land value" and "building value" and "income imputed to

² L. W. Ellwood, Ellwood Tables (Ridgewood, N. J.: The Author, 1959), pp. 7-8.

³ Richard U. Ratcliff, "Net Income Can't Be Split," The Appraisal Journal, April, 1950.

land" or "imputed to building." "Land value" is said to be the present value at zero years. "Building value" is value at the beginning of ownership represented by the depreciable portion of the physical assets. These concepts are erroneous, misleading and inappropriate as implied investor calculus.

In the first place, "land value" actually refers to that portion of the investment which does not waste away during ownership; and the significant point in time, in fact the only time when this value can be actually determined, is at the end, not the beginning of ownership. "Building value" is in fact that portion of the original investment which is lost by a decline in the market value of the investment to a point below the amount originally invested in the property. This change is a change in the total investment value and that portion which is in land or building is undeterminable. Since the real estate enterprise produces an undifferentiated stream of income, there is no basis for measuring that portion which is to be "imputed" to either land or building. In the arithmetic of the conventional residual calculations, the so-called "building return" is simply that annual sum which is required to recapture the difference between investment and liquidation value during the period of ownership and, in addition, pay the assumed rate of return on the unrecaptured portion at all times. "Land return" cannot in fact be identified as to origin; it is simply an amount which represents the application of an assumed rate of return to the liquidation value of the property which, physically speaking, may or may not be land alone.

With very few exceptions, appraisers have adopted the AIREA textbook terminology with no indication in the reports that they see through to the essential mathematical relationships involved in the residual calculations. In addition, there stands the unfortunate and unrealistic implication that the dollars of net income produced by an income property can be neatly split into two streams on the basis of origin in land or building. In six cases, the appraiser followed the long-discredited practice of using different interest rates in capitalizing the land and building returns.

Interest Rate

The conventional capitalization procedure involves the assumption that the capitalization rate (not including recapture in the straight-line depreciation model) applies to the total stream of net income before depreciation. In discussing this discount or interest rate in this context, we will be relating to the capitalization rate used in 55 of the 84 cases in the sample. The other cases involved the use of a return on equity in connection with a mortgage assumption in the Ellwood variation or a direct conversion ratio such as a gross income multiplier or a price-earnings ratio. (See Table 4 on the following page.) Rates of return on equity ranged from 8 to 17 percent; the conversion ratios or over-all rates will be discussed separately.

Rates and Ratios

	<u>Office Buildings</u>		<u>Commercial</u>		<u>Industrial</u>		<u>Apartments</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Return on equity, Ellwood	10.0	-	9.0	13.0	-	-	8.0	17.0
Gross income multiplier	5.25	8.7	4.0	9.0	8.33	10.07	7.7	10.5
Price - net income ratio	7.0	10.0	7.25	10.95	7.5	10.0	7.5	13.2
Price - net income after depreciation ratio	6.0	-	-	-	-	-	6.29	-
Price - net income after debt service ratio	8.0	10.0	9.0	12.0	12.0	-	-	-
Discount or interest rate	6.0	8.0	5.0	9.0	6.0	10.0	5.75	7.0
Recapture rate, straight line	1.5	7.0	1.67	10.0	2.0	8.3	2.0	4.0

The following summarizes the range of various interest or discount rates used by appraisers in the sample reports:

<u>Type of Property</u>	<u>Low</u>	<u>High</u>
Office	6.0 %	8.0%
Commercial	5.0	9.0
Industrial	6.0	10.0
Apartment	5.75	7.0

Table 4 reveals a range of interest rates assumed for industrial properties which is somewhat higher than the rest. The widest range in rates is in the case of commercial properties with the range beginning at what is the lowest rate, five percent. There is a narrow range for apartments. Even considering the fact that these appraisals were made before the recent times of credit stringency, one might question the narrow spread between the interest rates, which are applied to total net income, and what must have been the concomitant mortgage interest rate. A somewhat wider spread would have been expected. Another interesting relationship is that between the interest rate and yields on securities. High grade commercial bonds were yielding four to six percent during the time when the appraisals were made. In light of the accepted uncertainties of real estate investment and the illiquidity of real estate, a wider difference would have been anticipated. In answer to the speculation that real estate investors were expecting a capital gain, it may be pointed out that in all of the 84 appraisal reports, no capital gain was anticipated for none predicted a residual value higher than the appraised value.

As a whole, the appraisal reports were something less than illuminating in the matter of the source of the assumed interest or over-all rate. In 38 cases, the appraiser did not mention his authority for the selected rate; 35 reports indicated that "the market" was the source, and a few of them presented relevant market data; in one case, a built-up rate was synthesized and there were 10 applications of the Band of Investment method.

Table 5

Derivation of Rates and Ratios

	<u>Office Buildings</u>	<u>Com- mercial</u>	<u>Indus- trial</u>	<u>Apart- ments</u>	<u>Total</u>
Band of Investment	2	4	3	1	10
Market	10	13	5	7	35
Built-up	1	-	-	-	1
Not Reported	6	17	5	10	38

We have pointed out that it is impossible for an appraiser to extract from an actual transaction the interest or discount rate of which the selling price was a function or which the buyer or the seller employed in his private calculations. Not only is the transaction price a function of a market situation in which many buyers and sellers will influence the selling price through competitive forces, but also several other variables which are used in the capitalization formula along with the interest rate and which the analyst cannot determine from the selling price.⁴ The AIREA method of extracting the interest rate by applying the straight-line depreciation-straight-capitalization model to the selling price of a comparable property is a fine example of futility of the effort.⁵ Only if the appraiser's predictions of the future net income of the comparable property are the same in level, pattern and duration as that made by the buyer, and only if his estimate of the residual value (land value) is identical will he be able to calculate the interest rate which the buyer used provided, of course, that the buyer employed the same straight-line depreciation-straight-capitalization model for his own calculations.

In an effort to discover how appraisers actually arrived at their interest rate assumptions on the basis of the market, as claimed, we made a special examination of those reports which referred to "the market" as the basis for their interest rate determination. In no case was it logically demonstrated that the interest or discount rate was objectively extracted from comparable sales. There were only a few reports which included specific market data in this connection.

Direct Conversion Ratios

We are considering here the ratios which appraisers use to convert income, usually current actual or economic rental income, to a capital figure representing market value of the property. Gross income was used for this purpose in 25 cases with the ratio which is commonly known as the Gross Income Multiplier.⁶ In 33

⁴ The level and pattern of income, economic life, and residual value.

⁵ American Institute of Real Estate Appraisers, *op. cit.*, p. 283.

⁶ In a broad sense, the application of the direct conversion ratio to income is a capitalization process which carries the implication that the income is a perpetuity. As used by appraisers, these simple ratios are market-derived relationships and do not require estimates of economic life, residual value, or any of the other variables which are required in the use of the conventional capitalization formulae. The term "direct conversion ratio" is used here to emphasize the distinction from the conventional formulae. The term "price-earnings ratio" refers to the ratio of sales price to

cases net income before depreciation was converted into a capital value by the use of a ratio variously called "over-all rate," "brokers' rate," or "price-earnings ratio." In three cases the income took the form of net income after depreciation, and in five other cases it was net income after debt service or cash flow. In all cases, the ratios which were applied to the income of the subject property were explicitly or implicitly derived from the market, i.e., from actual sales of comparable properties for which selling price and income facts were available. Thus many of the appraisers, because the ratios were market-derived, included this part of the analysis under the Market Approach classification. In only a relatively small number of cases did the appraiser present the comparable sales from which he derived the ratio. In 19 of the reports, the direct conversion ratio was the only income capitalization device employed.

Special mention of the Ellwood formula is required to distinguish the over-all rate which it generates from the other direct conversion ratios. The Ellwood over-all rate is a function of assumptions which the appraiser makes with respect to income, term of ownership, liquidation value, financing terms, and return on equity. It is not a market-determined rate as is the case of the Gross Income Multipliers or Price-Earnings Ratios which are derived from actual sales data.

The following sets forth the conversion ratios used by the appraisers in the sample classified as Gross Income Multipliers and Price-Earnings Ratios:

<u>Type of Structure</u>	<u>Gross Income Multiplier</u>			<u>Price-Earnings Ratio</u>		
	<u>Low</u>	<u>High</u>	<u>Average</u>	<u>Low</u>	<u>High</u>	<u>Average</u>
Office Building	5.25	8.7	7.02	7.0	10.0	8.26
Commercial	4.0	9.0	7.1	7.25	10.96	8.48
Industrial	8.33	10.07	9.47	7.5	10.0	8.50
Apartments	7.7	10.05	8.47	7.5	13.2	9.31

To avoid possible confusion, we might point out the fact that all of these ratios are multipliers, i.e., the factor by which the gross income or the net earnings are multiplied to derive the capital value. As might be expected, the Price-Earnings Ratios run higher than the Gross Income Multiplier ratios with the interesting exception of industrial properties. The reports give no useful clue to explain

current net income before depreciation. This term is used here because of the close analogy to a similar relationship which is widely employed in security analysis. For an excellent discussion of gross-income multipliers, see Wendt, op. cit., Chapter 7.

this discrepancy. The sample of properties upon which this tabulation is based is too small and the properties too diverse to provide a reliable basis for interpreting the ratios. They are presented only as a matter of general interest, but we might note that for the Price-Earnings Ratios, there is a notable consistency except for the apartment-type property.

The most interesting fact revealed by the analysis of the use of direct conversion ratios is that in 77 percent of the cases the appraiser reported that he placed at least some reliance on these ratios, in one form or another. It is quite likely that in other cases the appraiser employed some locally accepted ratio as a first approximation or even a final control without recording the fact in his appraisal report. In any case, there is sufficient evidence that direct conversion ratios are important bases for value estimates in addition to the classic Three Approaches as usually defined and that such a ratio is a part of the appraiser's calculus in the great majority of income property appraisals.

Comparative Value Conclusions: As an inferential though not definitive indicator of the reliance which appraisers place on the value product of the direct conversion ratios, we have tabulated a comparison of the final value estimate and the value produced by whichever of the conversion ratios was used.

Table 6

Frequency Distribution of the Property Values
Calculated by Direct Conversion Ratios
Expressed as Percentages of the
Appraiser's Final Value Estimates

<u>Percentage</u>	<u>Frequency</u>
Below 95.0	3
95.0 - 95.9	3
96.0 - 96.9	1
97.0 - 97.9	1
98.0 - 98.9	4
99.0 - 99.9	8
100.0 - 100.9	28
101.0 - 101.9	4
102.0 - 102.9	6
103.0 - 103.9	0
104.0 - 104.9	2
105.0 and Over	5
Total	65

Table 6 reports this comparison as a frequency distribution of the percentage relationship of the property value calculated by the direct conversion ratio to the appraiser's final value figure. In the 65 cases tabulated, the property type distribution was much the same as in the basic sample of 84; the type of conversion ratio employed was predominantly either the Gross Income Multiplier, with 25 appearances or the Price-Earnings Ratio, with 33. The sample is too small to justify any conclusions with respect to differences among property types or types of ratio. Among the total of 65 cases, there were 25 where the two values were identical (a percentage of 100.0). Out of 65 observations, 50 fall between 98 and 103 percent. The arithmetic mean of the percentages was 100.1 percent. These facts, together with the observable narrow dispersion of the percentages about 100 percent, suggest that if, in fact, the Direct Conversion Ratios employed by the appraisers were based on independently observed market behavior, such ratios constitute a simple and powerful tool for the prediction of market value. These ratios could have been used alone in substitute for the conventional Three Approaches to arrive at the final value figure, and the results in almost every case would have been very close to the value figure which the appraiser reported as his final estimate.

We can only speculate on the reasons which might explain the close coincidence of the appraiser's final value estimate and the product of the direct conversion ratio which he employed. This phenomenon deserves intensive exploration of a kind which is not practicable in connection with the present study. We might, however, with some benefit, suggest certain hypotheses worthy of exploration.

In the following chapter, there is reported a tentative exploration of the reliability of direct conversion ratios for purposes of predicting V_p , the most probable selling price of income properties. The results support the conclusions that these ratios can be a powerful tool for the appraiser, for it is demonstrated, within the limits of the data analyzed, that most of the variation in selling price is explained by variation in gross or net income. Such a conclusion could be deductively derived but the exploratory statistical tests in the next chapter reveal an extremely high correlation. It is well known that in the trade, among real estate brokers, mortgage lenders and appraisers, the direct conversion ratios are the basis for at least first approximations of value for some classes of property in some markets. It is an hypothesis worthy of testing that these ratios become built-in market guides to investors who are buying or selling this kind of property and to lenders who are considering the advance of capital on mortgage security. Thus the ratios become powerful factors in market price establishment, a fact which imparts predictive value to these same ratios. Over time, no doubt, with changing market conditions and changing attitudes and expectations, these ratios change. However, except in a dynamic market situation, the gross income multipliers or broker's over-all rate are used as rules of thumb by many of the market participants and probably impart stability to market price levels for certain classes of property.

Another possible explanation for the close coincidence of the appraiser's final value figure and the product of the direct conversion ratio is that the appraiser places primary reliance on the ratio and in the "correlation" step, adjusts the other Approaches to produce value figures of respectable consistency. We have no evidence that such adjustments are, in fact, made by appraisers. The circumstantial evidence which is reported here, however, does justify raising the question for further exploration. The inference is further justified by our analysis of the conventional Income Approach which demonstrates that it has small predictive usefulness and by the widely recognized fact that in using the Cost-less-accrued-depreciation Approach, many appraisers adjust cost or depreciation estimates to force conformity with a prior value conclusion based on market data. The only possible basis for predicting the most probable selling price of a property is past market behavior. Thus, in the case of income properties, it is necessary for the appraiser to place major reliance on prior sales of comparable properties. Because the income productivity of this type of property is the primary determinant of its market value and ultimate selling price, the ratio of income to selling price is the most useful expression for the appraiser to apply to the subject property. Furthermore, there is every reason to believe that these ratios, under many market circumstances, will produce highly accurate sales price predictions. Having learned this fact by experience, it is not surprising that appraisers use this simple and practicable device.

CHAPTER V

EXPERIMENTAL TESTS OF THE PREDICTIVE RELIABILITY OF DIRECT CONVERSION RATIOS

It is our conclusion, based on inferences drawn from the analysis of the 84 representative income property appraisals, that appraisers place considerable reliance on direct conversion ratios in arriving at their value conclusions. Much more study would be required to measure the degree of this reliance, but the evidence at hand is sufficient to create a strong presumption that it is heavy. We have suggested that appraisers have learned by experience that direct conversion ratios can produce dependable forecasts of selling price. We propose to present a statistical demonstration that this potential does, in fact, exist.

In employing direct conversion ratios for income property appraisal, the appraiser typically collects a sample of recent sales of comparable properties and averages the ratios of current income to selling price. He applies this average ratio to the current income of the subject property to calculate a probable selling price if the property were to be offered for sale. In our experimentation, we employed a somewhat more refined measure of the relationship between income and selling price in the form of a simple linear regression equation. The first step was to select a sample of recent sales of relatively homogeneous income properties. With the current potential income as the independent variable and the selling price as the dependent variable, a regression equation was calculated. At the same time, the relevant regression statistics were calculated. These statistics include the F and the t values for the regression as well as the coefficient of determination. This procedure was applied to several different samples of actual sales using data which would have been available to an appraiser working in the given market areas. The procedure followed in drawing the samples was intended to replicate the approach of a practicing appraiser who might have been carrying out an actual appraisal assignment. No use was made of refined scientific sampling methods.

The first sample of actual sales involves four-family structures located in Alameda County, California, with the data made available from the appraisal plant of a leading Berkeley appraiser. Twenty-five properties were included in the sample with the primary basis of selection being close comparability in total annual gross income. All of the properties were less than 10 years old and all were sold during the years 1963 through 1966. This sample is called Sample 1; the details are given in the Appendix together with a description of all of the other samples and the results of the statistical treatment.

Sample 2 is composed of 25 four-plex structures in Alameda County which were selected primarily to secure sales within a limited time-span, from 1963 to 1965; all properties were less than 10 years of age. Sample 3 covered the same structure type with an attempt to minimize the range in age of structure. All properties were from 1 to 6 years old with sales during the 1963-1966 period. Sample 4 is composed of apartments from 5 to 10 dwelling units in capacity with the spread in date of sale minimized, limited to 1963 to 1964. All properties were less than 7 years of age.

Samples 5 through 9 include properties which had been included in Samples 1 through 4, but the cases were restricted to those where operating expense information was available and where it was possible to relate net income and selling price. The samples were smaller, ranging from 14 to 18 sales.

Sample 9 consists of 24 sales which occurred during 1958 and 1959 in Alameda County involving apartment properties ranging from 6 to 10 units in size and from 1 to 10 years in age. Gross rent was related to selling price.

Samples 10 to 12 cover Chicago rental properties, both elevator and walk-up types, in Chicago and in the suburbs. The number of dwelling units ranged from 12 to 98 and the sample sizes from 12 to 15 cases. Details are given in the Appendix.

In ten of the samples, the application of statistical tests showed that 80 to 96 percent of the variation in price was explained by the variation in income. There were two samples where the ratio was lower, 66 percent and 70 percent. The statistical measures of confidence, the Student *t* and the *F* statistics were extremely high, giving assurance that the relationships underlying the equations were close to the measured relationships.¹

Another measure of the predictive usefulness and accuracy of the regression equation is the mean deviation of actual and predicted prices calculated by applying the regression equation to each of the income figures for the items in the sample and comparing the prices so determined with the actual sale prices as reported. The average deviation of predicted to actual price may be expressed as a percentage of the actual price. In only one of the samples was the average deviation more than two percent of actual price, a degree of accuracy of prediction which is well within the usual limits of tolerance in appraisal.² The net income samples showed a higher limit of confidence than where gross income was the independent variable but with

¹ For an introduction to the regression statistics and their measuring, see E. E. Nemmers and J. H. Myers, Business Research: Text and Cases (New York: McGraw Hill Book Company, 1966), Chapter 3.

² The mean deviation of actual from predicted prices is in no way meant to yield an independent statistical measure of the accuracy of

a tendency for the average deviations of predicted from actual prices to run a bit higher. These differences are not significant in the present context but suggest the obvious conclusion that the greater the degree of homogeneity within the sample, the greater will be the degree of dependability as indicated by the statistical measures.

An interesting conclusion from this exploratory experiment is that if an appraiser had been required to appraise all of the properties included in all of the samples and if he had used only the reported current incomes and the direct conversion ratios derived through using the regression equation representing the basic relationship in the appropriate sample, his value answer would have been within two percent of what the property actually sold for on the average. This is certainly an acceptable degree of accuracy, and the simple procedure would allow a substantial saving in time and effort which otherwise would go into pursuing the Three Approaches.

One of the results of the regression analysis was to suggest that the use of the average of the gross or net income multipliers found in a sample of sales may produce an erroneous value result. Most brokers and appraisers use the average. The regression equations showed a large positive intercept with the y axis. Thus the regression equation implies that at zero income, the property would sell for a positive price (equal to the intercept).³ On the other hand, the simple average of ratios applied to zero income yields a zero value for the property.

Another observation from this experimental exercise is that none of the samples was larger than 25 and that even the smaller samples of 14 or 15 provided regression equations of high reliability of prediction. Carefully stratified samples of equal size would produce even better results, or equal results with smaller samples. The clerical work involved in calculating a regression equation involving 15 to 25 observations is a minor burden requiring less than one hour with a hand calculator. The machine time on an electronic computer for this calculation is a matter of a few seconds after the input cards are punched.

There is a by-product of this statistical approach to valuation of income properties which relates to our contention that the appraiser should provide his client with some form of probability qualification to the value figure which represents V_p . We have elsewhere

the regressions. Quite obviously it cannot, because both the numerator and denominator are functions of the original data used to fit the regression in the first place. The "average deviation" is used here only to illustrate to the layman how well the regression replicates the data over which it was fit. In a strictly technical sense, therefore, it is not really a measure of accuracy.

³ It is recognized that the relationship between the variables may not be linear in the lower income range.

suggested that in the absence of statistical measurements, the appraiser must fall back on a judgmental expression such as a range for his estimate along with the odds that the actual sales price would fall within this range.⁴ But when the prediction is based upon a regression equation calculated from a sample of actual transactions, there becomes available explicit measures of confidence which express the probability that the predicted value will fall within a specified range of values. For example, an appraisal based upon the regression equation derived from Sample 4 consisting of East Bay four-plexes might be based on a gross income of \$9,708. The predicted selling price would be \$81,161, and there would be only a one-out-of-ten chance that the actual price would fall outside of the range of \$74,314 to \$88,009. With these statistical measures of the reliability of the prediction, the client is in a position to judge the reliability of the appraiser's value figure. It is a prediction based on actual transactions of similar properties in the real market, and the statistical indicators of the reliability of the prediction provide the best possible scientific basis for judging the probability of its realization as a guide to the decision which the client must make with respect to the investment.

For those who are statistically literate, it is not necessary to point out that the regression equation derived from any one sample is useful in application only to properties which have the same characteristics as the cases which make up the sample. Thus the regression equation for a group of four-plexes in Berkeley which were sold in 1963 and 1964 cannot be applied to a 25-unit apartment in San Francisco in 1967. To be most useful, the sample should be composed of properties as homogeneous as possible in all significant respects; it should be constantly improved in quality by replacing the older cases with newer sales and increasing the size of the sample as more appropriate data become available. Periodically, a new regression equation must be calculated on the basis of the modified sample.

We began this discussion of regression analysis of direct conversion ratios with a disclaimer of any pretense that our experimentation was more than tentative and exploratory. The results have been surprising. Based on samples selected with no real attempt at stratification on a scientific basis, the regression equations show high predictive reliability by all the established tests of confidence. This fact, combined with our inferential conclusion that in real life appraisers rely heavily on these conversion ratios in arriving at value conclusions on income properties, is strong justification for a deeper exploration of this type of value indicator. For example, multiple regression analysis could provide useful measures of the relative importance of various qualitative characteristics in explaining the variance in price. These weights would be useful in the scientific stratification of samples to be used in calculating the regression equations. We need definitive testing of

⁴ Ratcliff, Modern Real Estate Valuation, op. cit., p. 139.

the linearity of the price-earnings relationship. Many other aspects of this problem cry for exploration, for there is great promise for improved accuracy and enormous time saving in the proper use of the direct conversion ratio in appraising certain classes of income properties in many types of markets.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The analysis of the sample of 84 appraisal reports on income properties revealed that almost all of the appraisers followed the conventional format. In only 5 cases did the appraiser employ the Income Approach alone. The Cost Approach appeared in 71 out of the 84 reports. In only about 40 percent of the cases, did the Income Approach receive the greatest weight in the final value "correlation," and in another 27 percent, primary weight was shared with one or more of the other two Approaches. The straight line depreciation--straight capitalization model was the predominant form of the Income Approach with building residual in 35 cases and land residual in 7 cases. The Inwood capitalization formula was employed in 13 cases and Ellwood appeared in 7 reports.

The independent variables which the appraisers adopted as inputs in their investment analysis models were examined and were found to be subject to question by tests of logic and reality. For example, in every case, the income forecast was a straight line projection for the full remaining economic life of the enterprise ranging from 8 to 60 years. In 34 cases, the level was at presently existing income; in 35 cases the income level reflected current economic or market rents; and in 10 cases, rents were "stabilized" or adjusted to a lower than current level. In no case was the income projection expressed as a rising or falling revenue.

In accordance with conventional practice, the period of recapture of "building value" was in each case equated with full remaining economic life. This is an unrealistic representation of actual investor calculus. Equally misleading is the common assumption that "land return" is a function of the present or initial value of the land as if vacant. The interest rates, discount rates or direct conversion ratios were supported by specific market evidence in less than 20 reports. In none of these cases was it logically demonstrated that the interest or discount rate was, in fact, extracted from the comparable sales.

Some form of direct conversion ratio was encountered in 77% of the reports. In 25 instances, the Gross Income Multiplier was used and in 33 cases, the ratio expressed the relationship between net income before depreciation and sales price. Other forms of net income were used in 8 reports to calculate the ratio. The high frequency in the employment of direct conversion ratios creates the presumption that it is an important relationship in the calculus of the appraiser. The close correspondence between the appraiser's

final value figures and the capital value calculated by the use of the direct conversion ratios gives rise to the inference that appraisers may frequently arrive at an initial value conclusion by the use of the direct conversion ratios and adjust other estimates, assumptions and calculations to assure conformity.

Our deductive analysis of the Income Approach to value, one of the three classic Approaches to market value which is widely employed by practicing appraisers, had led to the conclusion that the capitalization processes employed in the conventional procedures are of doubtful usefulness to the appraiser in predicting the most probable selling price of the property. Because the capitalization formulae or models are not market simulation models, i.e., because they fail to include as independent variables many factors of demand and supply which are active in the market in determining market price, the dependent variable which these formulae produce can in no sense be "market" value or price.

The conventional capitalization formulae can best be described as simplified investment analysis models. On the basis of assumptions made by the analyst, independent variables in the form of predictions of income, remaining economic life, residual value and a capitalization rate are established as the inputs with a capital value figure as the output. This figure may be helpful to an individual investor in arriving at his investment decision but does not reflect many of the important considerations which influence his final decision. The model, therefore, has only limited usefulness for the investor. The Ellwood variation of the property residual model includes additional significant independent variables, notably an assumed pattern of financing. Even more sophisticated investment analysis models are available in the form of computer programs. None of these models will produce a capital value which can be characterized as market determined. The practicing appraiser may establish the initial income level on the basis of a study of the market but his prediction of the pattern of income over the economic life of the property has no inductive basis. His assumption of remaining economic life is subjective and arbitrary for systematic studies of structure mortality are not available to him. His assumption of the residual or liquidation value of the property at the end of the period of ownership or the economic life is typically that it will be worth the same as the land would be worth today if it were vacant; this assumption has no factual basis. Finally, the capitalization rate which he chooses cannot mathematically be extracted from actual market transactions and therefore must be his subjective determination. Thus, with almost all the inputs based on the personal judgments of the analyst or appraiser without benefit of reliable empirical measurements, it is inevitable that different analysts would arrive at different estimates and assumptions and therefore different value outputs. Such a variation is natural and acceptable where the objective of the calculation is to guide an individual investor to a sound investment decision in the context of his own individual investment objectives and personal attitudes. However, such variation is inconsistent with the notion of market value when defined as the most probable selling price of the property, V_p .

The only truly objective guides for the appraiser's predictions of V_p can be found through methods of statistical inference. These methods can be used to process facts of actual market behavior to derive predictive formula together with statistical measures of the reliability of the predictions. On the basis of the sample of 84 appraisals of income properties, it would appear that many appraisers use crude devices of statistical inference, in particular direct conversion ratios which are derived from small samples or accepted market rules of thumb. There is some circumstantial evidence that the value which the appraiser derives through the application of such a ratio to the current income of the subject property receives the greatest weight in arriving at the final value conclusion. An experimental study of a number of samples of actual sales of income properties where the income and the selling price are known has demonstrated that regression equations derived from samples of 14 to 25 cases are predictive tools of a surprisingly high degree of reliability by all the accepted statistical tests and that for properties of the appropriate characteristics, the predicted selling price, using only the regression equation, would fall within a range of less than two percent plus and minus the actual selling price on the average. Our conclusions on the potential utility of direct conversion ratios are not definitive but they are sufficient evidence to justify further and more intensive exploration of their potential in appraisal applications. With the Cost Approach discredited and with the Income Approach shown to be invalid as a market simulation model, it is our hypothesis that for many types of income property in many different real estate markets, a carefully selected and relatively small sample of recent sales where the income of the properties can be ascertained will provide a regression equation which can predict the selling price of the subject property within close limits and will require only general checks for reasonableness to eliminate atypical situations.

It is a further hypothesis, subject to intensive research check, that the apparent stability in the relationship of income and value as expressed in the Gross Income Multiplier or Price-earnings Ratio is based on a widespread acceptance of given ratios in local real estate markets by brokers, appraisers, buyers, sellers and lenders as rules of thumb for arriving at a first approximation of the value of various income property types. To the extent that this is true, an accepted ratio becomes a price-determining factor in the price establishment process since all parties to each transaction tend to employ the same or nearly the same ratio in arriving at their first approximations of the price which they might be willing to accept, the bid which they might be willing to make or the basis for the loan which they consider to be sound in relationship to the value of the collateral property. If this generally accepted ratio becomes well established and a major factor in price establishment, it follows that a small sample of actual sales, properly processed as the basis for a regression equation, will provide a highly dependable basis for predicting the most probable selling price for a comparable property.

We would infer from the evidence provided by our sample of actual appraisals, from the statistical analysis, and on the basis of considerable observation of the workings of the real estate market, that appraisers explicitly or intuitively accept the direct conversion ratio as a major evidence of market behavior and a prime basis for predicting V_p . Because the conventional capitalization models cannot, for reasons made clear by deductive logic, provide a figure representing market value, we cautiously infer that the typical appraiser, having used a direct conversion ratio to arrive at a first approximation of V_p , may be forced to select that combination of independent variables as inputs in the conventional capitalization model which will produce a value figure respectably close to the first approximation arrived at by the application of the direct conversion ratio.

A clear implication of our findings is that for some classes of income properties in some markets, a small, carefully stratified sample of recent sales of a given property type, where income information is available, can generate a regression equation which will predict V_p for the subject property with a high level of reliability by any test. A by-product of this method is an objective statistical measure of the reliability of the prediction.

It is our general conclusion from this study, that the conventional Income Approach in any variation is not well suited to the analytical task of predicting the most probable selling price of the property. It fails basically because it is not a market simulation model; because, at best, it is an imperfect and over-simplified investment analysis model, it has no capacity for predicting market price. Confronted with the impotence of the conventional Income Approach or capitalization model, the appraiser necessarily resorts to the only fertile source of evidence which possesses predictive utility--actual market behavior. The direct conversion ratios are easily ascertainable and understandable expressions of an objective, market-determined relationship between income productivity and market selling price. No better evidence is available of the combined price impact of all market forces than actual transactions and no property characteristic is more significant than income productivity. It is natural and correct for the appraiser to rely heavily on this relationship as evidenced in actual market transactions involving comparable or competitive properties; in fact, he has little other choice.

There is little question but that participants in the real estate market rely extensively on direct conversion ratios in investment decision-making. This hypothesis should be tested in connection with a comprehensive study of investor behavior and his investment calculus which could provide a sounder basis for the appraisers' predictions. The evidence of the appraisers' necessary reliance on market data in the valuation of income properties suggests that increasing efforts should be carried on among appraisers to secure more reliable data on relevant market behavior and more comprehensive and penetrating studies in academic circles on the predictive reliability of such data.

APPENDIX

The following sections describe the sources and characteristics of the 12 samples of sales data for which regression equations were calculated. The relevant regression statistics are also summarized.

Data Sources

Samples 1 to 8: The primary market data were collected from the personal record files of Mr. George Hoyt, an independent appraiser in Berkeley, who has been in active practice for the past 58 years. The geographical coverage of the apartment sales was confined to the East Bay region in Alameda County, California.

A total of 109 apartment sales was considered. The apartments selected were predominantly small properties, ranging in size from four-plexes to 10 units. Their ages ranged from new to 10 years old, and the dates of sale from 1963 to 1966.

Sample 9: A sample group of 24 apartment sales was selected from the Donal Hedlum MBA thesis, "Survey of Gross-Rent Multipliers for Apartment Buildings in Alameda County 1959-60." Hedlum's study was made in December, 1960, and was carried on with the assistance of the Real Estate Research Program, University of California, Berkeley, California. The selected sample sales were comprised predominantly of apartment properties of sizes ranging from six to 10 units, of ages from one to 10 years old, and sold in 1958 and 1959.

Samples 10 to 12: These apartment sales data were taken from The Appraiser, April, 1967, pp. 10-11. This bulletin is published by the American Institute of Real Estate Appraisers. The statistical data were prepared by George L. Mercer, MAI, Assistant Vice-President and Assistant Manager of the Appraisal Division, Bell Savings and Loan Association of Chicago.

In Sample 10 there were 12 low-rise elevator apartment sales located in the Chicago area. They ranged in size from 26 to 80 units, in age from new to four years old, and were sold from July, 1964, to August, 1966.

For Sample 11 the sales covered 15 walk-up apartments, located in the Chicago area, ranging in size from 12 to 38 units, in age from one to 10 years old, and were sold from 1964 to 1966.

Sample 12 consisted of 15 walk-up apartment sales located in the Chicago suburbs, containing 12 to 98 units, of ages from two to eight years old, and sold from 1964 to 1966.

Definitions for Samples 1 to 8

Annual gross income: Potential rental income at 100 percent occupancy at current rental rates. Only unfurnished buildings were included in the sample.

Operating expenses: Operating outlays as reported by the owners. Those cases included in Samples 5 to 8, where net income was related to sales price, were selected from Samples 1 to 4 and were limited to cases where the owner reported expenditures on each of five types of expense: real estate tax, hazard insurance, repairs and maintenance, trash collection, and utilities.

Net income: As used in Samples 5 to 8, the difference between annual gross income and operating expenses as defined above.

Summary of Regression Analysis

Sample 1: Four-plex Apartment Sales in Alameda County, California

Number of Cases in Sample: 25
 Primary Basis of Selection: Annual Gross Income
 Age Range: One to Ten Years
 Date of Sale Range: 1963 to 1966

Regression Statistics:

Independent Variable: Gross Income
 Regression Equation: $\text{Price} = \$1,323 + 8.395(\text{Earnings})$
 Coefficient of Multiple Determination: $R^2 = 0.666$
 Significance of Multiple Correlation: $F(1, 23) = 48.768$
 Student t of Regression Coefficient: 6.983

Actual and Predicted Results:

Actual Price, Mean = \$45,158
 Deviation, Mean = \$610
 Percent of Predicted = 1.35%

Sample 2: Four-plex Apartment Sales in Alameda County, California

Number of Cases in Sample: 25
 Primary Basis of Selection: Date of Sale
 Age Range: One to Ten Years
 Date of Sale Range: 1963 to 1965

Regression Statistics:

Independent Variable: Gross Income
 Regression Equation: $\text{Price} = \$3,552 + 8.076(\text{Earnings})$
 Coefficient of Multiple Determination: $R^2 = 0.812$
 Significance of Multiple Correlation: $F(1, 23) = 104.827$
 Student t of Regression Coefficient: 10.238

Actual and Predicted Results:

Actual Price, Mean = \$45,738
 Deviation, Mean = \$546
 Percent of Predicted = 1.19%

Sample 3: Four-plex Apartment Sales in Alameda County, California

Number of Cases in Sample: 25
 Primary Basis of Selection: Age
 Age Range: One to Six Years
 Date of Sale Range: 1963 to 1966

Regression Statistics:

Independent Variable: Gross Income
 Regression Equation: $\text{Price} = \$3,755 + 8.0262(\text{Earnings})$
 Coefficient of Multiple Determination: $R^2 = 0.802$
 Significance of Multiple Correlation: $F(1, 23) = 98.366$
 Student t of Regression Coefficient: 9.918

Actual and Predicted Results:

Actual Price, Mean = \$45,738
 Deviation, Mean = \$560
 Percent of Predicted = 1.22%

Sample 4: Apartment Sales in Alameda County, California

Number of Cases in Sample: 25
 Primary Basis of Selection: Date of Sale
 Size of Apartments: Five to Ten Units
 Age Range: One to Six Years
 Date of Sale Range: 1963 and 1964

Regression Statistics:

Independent Variable: Gross Income
 Regression Equation: $\text{Price} = \$7,851 + 7.551(\text{Earnings})$
 Coefficient of Multiple Determination: $R^2 = 0.950$
 Significance of Multiple Correlation: $F(1, 23) = 458.481$
 Student t of Regression Coefficient: 21.412

Actual and Predicted Results:

Actual Price, Mean = \$81,162
 Deviation, Mean = \$1,156
 Percent of Predicted = 1.42%

Sample 5: Four-plex Apartment Sales in Alameda County, California

Number of Cases in Sample: 15
Primary Basis of Selection: Annual Income
Age Range: One to Ten Years
Date of Sale Range: 1963 to 1966

Regression Statistics:

Independent Variable: Net Income
Regression Equation: $\text{Price} = \$2,166 + 10.4285(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.702$
Significance of Multiple Correlation: $F(1, 13) = 33.963$
Student t of Regression Coefficient: 5.828

Actual and Predicted Results:

Actual Price, Mean = \$46,700
Deviation, Mean = \$664
Percent of Predicted = 1.42%

Sample 6: Four-plex Apartment Sales in Alameda County, California

Number of Cases in Sample: 18
Primary Basis of Selection: Date of Sale
Age Range: One to Ten Years
Date of Sale Range: 1963 to 1965

Regression Statistics:

Independent Variable: Net Income
Regression Equation: $\text{Price} = \$2,367 + 10.4764(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.830$
Significance of Multiple Correlation: $F(1, 16) = 84.261$
Student t of Regression Coefficient: 9.179

Actual and Predicted Results:

Actual Price, Mean = \$46,014
Deviation, Mean = \$611
Percent of Predicted = 1.33%

Sample 7: Fourplex Apartment Sales in Alameda County, California

Number of Cases in Sample: 16
Primary Basis of Selection: Age
Age Range: One to Ten Years
Date of Sale Range: 1963 to 1966

Regression Statistics:

Independent Variable: Net Income
Regression Equation: $\text{Price} = \$4,227 + 10.0811(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.819$
Significance of Multiple Correlation: $F(1, 14) = 68.797$
Student t of Regression Coefficient: 8.294

Actual and Predicted Results:

Actual Price, Mean = \$46,953
Deviation, Mean = \$639
Percent of Predicted = 1.36%

Sample 8: Apartment Sales in Alameda County, California

Number of Cases in Sample: 14
Primary Basis of Selection: Date of Sale
Size of Apartments: Five to Ten Units
Age Range: One to Six Years
Date of Sale Range: 1963 to 1964

Regression Statistics:

Independent Variable: Net Income
Regression Equation: $\text{Price} = \$4,383 + 10.0495(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.884$
Significance of Multiple Correlation: $F(1, 12) = 99.865$
Student t of Regression Coefficient: 9.993

Actual and Predicted Results:

Actual Price, Mean = \$68,860
Deviation, Mean = \$967
Percent of Predicted = 1.41%

Sample 9: Apartment Sales in Alameda County, California

Number of Cases in Sample: 24
Size of Apartments: Six to Ten Units
Age Range: One to Ten Years
Date of Sale Range: 1958 to 1959

Regression Statistics:

Independent Variable: Gross Income
Regression Equation: $\text{Price} = \$4,180 + 7.2654(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.954$
Significance of Multiple Correlation: $F(1, 23) = 479.131$
Student t of Regression Coefficient: 21.889

Actual and Predicted Results:

Actual Price, Mean = \$64,802
Deviation, Mean = \$673
Percent of Predicted = 1.04%

Sample 10: Low-Rise Elevator Apartment Sales in Chicago Area

Number of Cases in Sample: 12
Size of Apartments Range: 26 to 80 Units
Age Range: New to Four Years
Date of Sale Range: 1964 to 1966

Regression Statistics:

Independent Variable: Gross Income
Regression Equation: $\text{Price} = \$34,088 + 5.8987(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.959$
Significance of Multiple Correlation: $F(1, 10) = 262.113$
Student t of Regression Coefficient: 16.120

Actual and Predicted Results:

Actual Price, Mean = \$554,500
Deviation, Mean = \$9,096
Percent of Predicted = 1.64%

Sample 11: Walk-up Apartment Sales in Chicago Area

Number of Cases in Sample: 15
Size of Apartments Range: 12 to 38 Units
Age Range: One to Ten Years
Date of Sale Range: 1964 to 1966

Regression Statistics:

Independent Variable: Gross Income
Regression Equation: $\text{Price} = \$18,442 + 7.1211(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.898$
Significance of Multiple Correlation: $F(1, 13) = 124.730$
Student t of Regression Coefficient: 11.168

Actual and Predicted Results:

Actual Price, Mean = \$221,833
Deviation, Mean = \$6,035
Percent of Predicted = 2.72%

Sample 12: Walk-up Apartment Sales in Chicago Suburbs

Number of Cases in Sample: 15
Size of Apartments Range: 12 to 98 Units
Age Range: Two to Eight Years
Date of Sale Range: 1964 to 1966

Regression Statistics:

Independent Variable: Gross Income
Regression Equation: $\text{Price} = \$18,576 + 6.1349(\text{Earnings})$
Coefficient of Multiple Determination: $R^2 = 0.964$
Significance of Multiple Correlation: $F(1, 13) = 374.007$
Student t of Regression Coefficient: 19.339

Actual and Predicted Results:

Actual Price, Mean = \$277,033
Deviation, Mean = \$8,971
Percent of Predicted = 3.24%

MONOGRAPH SERIES NUMBER 2



COLLOQUIUM ON
COMPUTER APPLICATIONS
IN REAL ESTATE
INVESTMENT ANALYSIS

Richard U. Ratcliff, *Editor*

FACULTY OF COMMERCE AND BUSINESS ADMINISTRATION
UNIVERSITY OF BRITISH COLUMBIA

Monograph Series

Number 2

1968

COLLOQUIUM
ON
COMPUTER APPLICATIONS
IN
REAL ESTATE INVESTMENT ANALYSIS

Papers Edited By

RICHARD U. RATCLIFF
Professor of Urban Land Economics

Sponsored by the

Faculty of Commerce and Business Administration
University of British Columbia

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FOREWORD

The Colloquium was comprised of 33 invited members. Over two days, beginning February 1, 1968, in sessions at Cecil Green Park on the campus of the University of British Columbia, a number of topics were presented in prepared papers with commentaries by assigned discussants and open discussion among the members of the Colloquium. The prepared papers form the content of this publication.

It was the aim of the Colloquium to exchange information on both progress and problems in the application of computer-aided analysis leading to real estate investment decisions. There recently has been a considerable advance in the employment of analytical models at various steps in the investment decision-making process both in the measuring the market-determined value of investment opportunities and in arriving at a value to the investor on the basis of productivity expectations. Computers have made practicable the use of impact models in studying predicted investment behavior of proposed developments under differing assumptions of location, design, cost and market conditions. Among the several participants in the real estate investment process who are developing and using computer applications are included private investors, appraisers, tax assessors, real estate developers, architects, land planners and mortgage lenders. This Colloquium was arranged in the expectation that each of these agencies would profit from an exchange with the other participants and that the analytical art of investment analysis might be advanced thereby to the benefit of all.

The Colloquium was arranged and organized under the auspices of the Faculty of Commerce and Business Administration, University of British Columbia. Grateful acknowledgement is given to the following agencies which provided financial assistance to meet Colloquium expenses and publication costs:

Real Estate Council of British Columbia

Real Estate Institute of British Columbia

- Real Estate Education and Research Foundation
- Professional Membership Division
- Realtor Division

Society of Real Estate Appraisers Charitable Foundation

PHILIP H. WHITE

Dean

Faculty of Commerce and
Business Administration

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COLLOQUIUM PROGRAM

Chairman of the Colloquium
Professor Richard U. Ratcliff
Professor of Urban Land Economics
Faculty of Commerce and Business Administration
University of British Columbia

February 1, 1968

Morning Session

Chairman:
Professor Richard U. Ratcliff

Economic Impact Models for Architectural Design

Charles B. Thomsen, A.I.A.
Associate Partner, Caudill Rowlett Scott
Architects, New York

Investment Decision Making for Lenders

G.L. Work
Assistant Vice President
Management Science
Wells Fargo Bank
San Francisco, California

Discussant

Professor James C.T. Mao
Professor of Finance
Faculty of Commerce and Business Administration
University of British Columbia
Vancouver, B.C.

Afternoon Session

Chairman:
Professor Fred E. Case

Urban Information Systems

Professor Edgar M. Horwood
Professor of Civil Engineering and
Urban Planning, and Director, Urban
Data Center
University of Washington
Seattle, Washington