

**RESEARCH APPLICATIONS OF THE
MULTIFAMILY HOUSING INSTITUTE'S
APARTMENT DATABASE**

by

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ABSTRACT

This article was originally prepared in the Spring 1999 for presentation to AREURA, and then publication in the ARES Journal of Real Estate. It has been updated to reflect the changes that have occurred to the Multifamily Housing Institute (MFHI), and the efforts of Multifamily Information Solutions a for-profit successor to MFHI to pick up this historic effort.

Data on the financial performance of multifamily rental housing has not been available nearly as long as such information for single-family housing. It is believed that this lack of information has increased the cost of debt and equity capital to apartment housing and thus has increased the rents paid by apartment residents.

Data on apartments, which is now becoming available through an industry-sponsored initiative, has the potential of narrowing this information gap. This article has several objectives: to describe this new database, "APTData," to housing researchers; to assess the strengths and weaknesses of APTData for housing market and policy research; to compare estimates from APTData with those from other sources; and to offer several potential research applications of this new data resource.

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THE MULTIFAMILY HOUSING INSTITUTE'S APARTMENT DATA BASE

I. Introduction

Housing researchers often complain about the lack of data to understand how housing markets work and what public policies are effective. However, researchers interested in multifamily housing have always had particularly good reason to complain. There has long been a dearth of even the most basic information on the financial performance of the nation's multifamily rental housing stock.

The lack of timely data on the financial performance of apartments has been not only frustrating to researchers, but costly to the multifamily industry and ultimately to apartment residents. Imperfect information adds to the risk premia charged by equity investors and mortgage lenders, and these additional costs show through eventually in higher rents charged to multifamily residents.

In recognition of that information need, the apartment industry, with participation and support from the federal government, has developed a database to better inform the decisions of multifamily investors and lenders. This study is an early report to the housing research community on that database. The intention is to introduce the database and offer suggestions for, possible research applications.

II. A Brief History of the Multifamily Housing Institute and APTData

The Multifamily Housing Institute (MFHI) was created in 1994 by some of the apartment industry's largest lenders, owners, managers, and servicers. The support of several major sponsors (Fannie Mae, Freddie Mac, the U.S. Department of Housing and Urban Development and the Urban Land Institute) and its founding members helped raise over \$3,500,000 that allowed the Institute to develop the APTData system, collect performance information from over 100 initial data providers and then finally launch the data service on March 30, 1998. The original major data providers include Equity Residential Properties Trust, HUD, Fannie Mae, Freddie Mac, Insignia Financial, NHP, Boston Financial, and Midland Loan Services. This group provided data for the pilot phase of APTData development and served as a proving ground for refining the data collection process.

The Institute's primary mission was to provide good, industry-wide information and standardized financing practices that promote an efficient, liquid, stable financing and capital market for multifamily housing, including affordable housing. To that end, MFHI was dedicated to helping centralize the collection and unbiased delivery of information and data services for the industry, promoting the creation and use of standards, and providing related educational services and conferences. The first service from MFHI was a web-enabled data warehouse containing property and loan performance information on about 25,000 properties with over 3,000,000 apartments. It contains the largest and most

comprehensive source of multifamily financial information ever collected thus far.

However, due to funding issues and the fact that the Institute was precluded by its non-profit status from offering various services that were necessary to generate adequate revenues, it has ceased operations. Its staff, along with the support of a number of its Board and other members, decided to try and continue the Institute's work in a for-profit organization called Multifamily Information Solutions, Inc (MISI) at the end of 1999. They are working to pick up this historic effort where the Institute left off, and have added the largest current survey of asking rent data available, as well as various custom data warehousing, benchmarking and reporting services. The company's current focus is addressing the need for a more accurate and consistent source of quarterly asking rent, occupancy, and traffic data to meet the market tracking and due diligence needs of the industry. Once this effort is stabilized, it plans to continue collecting at least the annual income and expense information that its principals used to build APTData, as well as try and support the original research mission of the Institute.

At the time of this analysis, the core data in the system had come from a pilot group of 105 data providers. The information received covers various time periods, depending on how each provider maintains asset level information. For example, property managers supply the timeliest information on property performance. By contrast, information from lenders provides the most current information on loan performance, while their property performance information is often based on annual audited financial statements and may therefore lag by a number of periods. Over time, the quarterly updates from data providers will create a continuous, comprehensive history for APTData's asset level information.

One of greatest strengths of APTData is that information for individual properties is often received from multiple sources such as owners, managers, lenders and servicers. This information is combined to create a "composite" record for each asset by drawing information from the source that is "closest" to the data. For example, when both a lender and a manager provide information related to property performance, the manager's information has precedence and is used because the manager is the closer source for property data. In the case of missing information, the availability of multiple sources allows gaps to be filled by looking across the sources. A manager, for instance, may not report the property's square footage, but the "asset matching" feature of the APTData system may find this is available in the information provided by the property owner. Likewise, a similar set of relationships exists for loan performance information. In addition, this algorithm also provides a quasi-audit function by allowing the comparison of data from multiple sources for the same asset.

-- The APTData Service

Intended to provide timely, reliable, and unbiased independent apartment performance data, APTData gives investors, lenders, owners and managers more financial and operating data about apartment properties and loans than has ever been available before. The database covers the entire nation, and it will let users analyze trends either nationally or in regions, states, MSAs, cities and individual zip codes.

- APTData contains financial and performance data on more than 3 million apartment units in more than 25,000 rental properties throughout the U.S. - representing over 30 percent of the country's larger (greater than 50 unit) multifamily properties.
- It contains up to 225 data fields on each property, including rents, income, occupancies, expenses, loan status and much more. The information will be updated on an annual, quarterly, and in some cases, monthly basis.
- Data providers to date include more than 100 apartment owners, lenders, loan servicers and managers of various sizes.

Establishing confidence within the industry that critical proprietary information would be handled confidentially and securely was essential for getting participation commitments from data providers. APTData's confidentiality provisions assure data providers that their proprietary asset level information is protected. The system never releases information on individual assets. Instead, reports focus on regions, markets and submarkets. The system gives users blended, statistical information, aggregated from 5 or more properties provided by at least three different sources.

Data providers supply information to APTData because of their interest in supporting MISI's mission and because of the direct benefits they receive. Upon receipt, the system performs validation checks on the data for correctness of values and consistency with information received from other sources. MISI staff review edit exceptions with the provider to determine if a problem exists in the source system. In return, these data providers get a valuable data confirmation service from APTData with each submission. Supplying information also helps provider organizations examine their own portfolios using the APTData service. By providing data, the provider becomes one of the three sources of information required before aggregate information can be reported from the system. This means that analyses can be more tightly targeted to a particular area or a particular property type.

Using a flexible on-line query tool, and the largest data warehouse of apartment properties and loans ever created, APTData's on-line service gives users the power to slice and dice peer groups in several ways, then call-up aggregated performance characteristics for each peer group selected.

Users define peer groups using:

- Geographic parameters such as zip codes, counties and metropolitan statistical areas (MSAs).
- General property characteristics including number of units, amenities and whether residents or owners pay for utilities.

- Financing type from a menu that includes FHA - insured and various conventional options.

APTData can be used to produce two basic reports:

- A summary report covering various measures of performance, property data and financial characteristics.
- A more detailed, aggregated profit and loss statement that includes rent and expense levels by unit size.

With these reports, APTData users can get answers to many questions, and pursue many lines of inquiry that can greatly enhance performance. For instance, users can ask: "What has been net income growth for properties in the Chicago MSA with 100+ units? Then, compare property income growth in the central versus suburban counties."

To supplement its basic reporting, MISI can create custom reports for users with special information needs. As part of its service to the multifamily housing industry, the Institute is also creating regional and national indexes and benchmarks tracking specific aspects of property and financing performance. The company's Research and Publications Committee, whose members include a cross section of the industry owners, managers, lenders, and researchers, is responsible for overseeing the development and dissemination of these indexes.

-- Looking back and looking ahead

Perhaps the most challenging aspect of creating APTData has been understanding the characteristics of each provider's data. Collecting a large amount of asset level information requires a shared understanding about the content of each data element that only becomes fully mature over time, as MISI and its data providers work together. For example, differences naturally exist in the way providers maintain and aggregate accounting information that is supplied about property performance. Some differences among providers are immediately identified by the data edit process and are quickly resolved while others become apparent only as the data is subjected to deeper analysis and the data cleansing procedures are refined. In order to develop this common understanding, each data provider receives detailed documentation on the definition of all data field definitions and extensive initial handholding by MISI staff. To make it easier for providers to map their chart of accounts to the APTData chart of accounts the Institute has focused on commonly understood summary categories (e.g. total income, total expenses, utilities expense, etc..).

Experience has also demonstrated that providers can generally supply only current data and are not able to retrieve recent historical information from their systems. Though historical information was an early goal of the APTData initiative, the historical view will be created quickly as multiple time periods, such as are received from different sources, are joined through the asset matching process. Obviously, the database will also grow through the regular updates that data providers will supply.

The bulk of the APTData information is now an operational database available for custom reporting requests for subscribers to MISI's data services. While focus has temporarily shifted to collecting quarterly asking rent, occupancy, and turnover information, as the database moves into the next phase of development there will be two major areas of interest to the real estate research community. Perhaps most important, the data collection effort will move out of the pilot phase, in which the definitions and procedures were refined, and will shift into accepting submissions from the broader group of providers that has committed to participating. The resulting increase in the number of properties and the number of data providers will soon allow tighter targeting of peer groups and geographic sub-markets for "comparables" analyses. In addition, reports for mortgage loan performance will be developed and available through an interactive interface on the web.

III. Content and Structure of APTData

APTData will open new opportunities for housing researchers, even though its primary purpose is to bring needed information to multifamily investors and lenders. The same attributes that promise to make the database uniquely valuable to market participants are the qualities that should prove attractive to the research community.

What APTData provides that is not available elsewhere are repeat observations on the financial performance of apartment properties in local markets nationwide, together with the ability to generate customized tabulations from the basic property reports. The data are intended to be comparable from property to property and from market to market. Some data providers will be reporting annually, and others will report quarterly. The goal is to get the data into APTData and make it available to users within 60 days of the close of the accounting period. The database combines static indicators of property and loan characteristics with dynamic annual or quarterly readings of financial and operating variables. The full set of variables that APTData seeks to record are listed in Tables 1 and 2.

Despite its unique strengths, APTData is not all things to all people. For one, it is still in shakedown mode. Many data providers are sending in only partial data in their first submissions. And while the objective is to have at least annual data, and hopefully bi-annual data shortly, available on line in APTData within 90 days of the close of the applicable ending period, this timeliness is not yet there. Currently, property information in the database is received 6 months after year-end, while the mortgage information is received quarterly.

As for topical coverage, while APTData is strong on project operating income and expenses and mortgage information, the database has no information on resident demographics, and the physical information about the properties and their amenities is not very complete due to the disparate applications and primarily unintegrated systems that house this type of data.

The APTData system is built using a relational database. This means that some users may find that they have to adjust from a mind set of rectangular micro data files to the notion of sets used in the relational model. While some analyses will be easier because of the relational database, other types of analyses may require extracting the necessary data records from the system for use in the statistical software packages typically used in research efforts. In particular, APTData is designed to provide local area data, and compilation of regional or national totals is not as straightforward as it is with some other databases.

One adjustment researchers will have to make is to the not-quite-micro nature of data available from APTData. Balancing the strict confidentiality requirements imposed by data providers against the need for investors and lenders to have very specific information about property performance, APTData has an ingenious system of permitting users to specify properties by characteristics. Subject to the confidentiality minimums of 5 properties and 3 data providers, APTData will provide grouped performance responses on a set of properties meeting whatever profile the user wishes to specify. Geography, size, age, rent range, or many of the other characteristics can be used to identify the properties to be examined.

The multiple selection possibilities allow researchers to approximate the controls available through multiple regression analysis. If, for example, the researcher wanted to estimate the independent effect of property age on maintenance and repair expenses, s/he could examine the per unit expenses of two separately selected groups of properties, differentiated by age, in which the selection parameters would “hold constant” important variables such as location and property size.

The standard reports currently available from APTData are shown as Tables 3 through 5, in this example for the Dallas metro area (MSA) for 1996. Table 5, indicating the number of properties, highlights one feature of which researchers should be aware. APTData will provide estimates for all variables that meet the minimum 5/3 rule, but if some properties only report some data items, individual variables may be suppressed in the report.

In addition to performing their own analysis from the on-line database, users can request customized tabulations that would be undertaken by the staff of the Multifamily Housing Institute on a cost-reimbursable basis. This is a way for researchers to access data and perform, for example, multivariate analyses on the micro data without compromising the confidentiality of individual respondents. Users would, for example, commission the Institute to run a regression specifying the dependent variable, the independent variables, and the properties to be included in the run. In this respect, using APTData is similar to procedures established by the National Council of Real Estate Investment Fiduciaries (NCREIF) for allowing users to perform statistical analyses on individual property records in its database without revealing the identity of any one property.

IV. Comparing APTData to Other Data Sources

APTData complements information on the multifamily housing stock available from other national surveys and databases, including the 1995 American Housing Survey (AHS), the 1995-96 Property Owners and Manager's Survey (POMS), the 1991 Residential Finance Survey (RFS), and the annual surveys of Apartment Income and Expense fielded by the Institute of Real Estate Management (IREM).

1 The differences among these surveys in topical and stock coverage are substantial, as are the differences in the flexibility and accessibility of the data.

APTData's coverage in terms of both the apartment stock and data items is most like those from the Institute of Real Estate Management's annual survey of apartment income and expense. Both of these surveys most fully represent the properties owned by large apartment companies, either public or private. While APTData is much larger and more diverse sample of the stock (see Table 6), APTData and the IREM sample both are the result of "open enrollment" programs, in which the sponsors were interested in including as many properties as possible in the database rather than drawing a statistically representative sample of the stock. Because of the importance of local area data, the emphasis on number of properties is appropriate for these efforts.

But as a result of their open enrollment, neither APTData nor the IREM database are fully representative of the national housing stock. The properties in these two databases tend to be newer and to command higher rents than the typical apartment property nationwide. The national average apartment is better estimated by the AHS, POMS, and Residential Finance Survey (RFS), each of which is designed to be representative of the national apartment stock.

V. Potential Research Applications of APTData

–Price Indexes for Multifamily Housing

Historically, price indexes for multifamily rental housing have been difficult to accurately estimate for the nation as a whole. APTData opens the possibility of adding to the available measures not only for the nation, but for individual metro areas as well. One method of potentially estimating market value of apartments is to capitalize the net operating income from the property. The "cap rate" used in this conversion is known to vary not only across time, but also across property type and by location. With APTData, each of these three dimensions can be selected. From other national surveys of apartment sales, the cap rate being applied to apartments by investors can be determined quarterly. (CB Commercial's National Real Estate Index does this now for "Class A" apartment properties.) Within a

1 Background information on these surveys is available at the websites of the sponsoring organizations: HUD (www.huduser.org), the Census Bureau (www.census.gov), and IREM (www.irem.org).

metro area or within a quality grade of apartment, changes in the market value of apartments over time are, as a first approximation, proportional to changes in NOI, as adjusted for any changes in the national average cap rate. For example, let's say that the NOI/unit for high rent apartment properties in Dallas rose 7 percent from 1996 to 1997. Let's say that the national average cap rate declined from 9.0 percent to 8.5 percent during that same period. Then assuming that the cap rate for this Dallas submarket changed proportionally to the national cap rate, the property values for top-end Dallas apartments rose approximately 13 percent from 1996 to 1997 (that is, a 7 percent value increase from NOI growth plus approximately a 6 percent increase from the cap rate reduction.)

--Measuring the Performance of Nonprofit Housing Developments

There is a great deal of interest in the provision of affordable rental housing by nonprofits. However, there's relatively little systematic information about the long term viability of these developments.² APTData has the potential to compare performance measures by type of ownership. Nonprofit properties in different localities could be compared with either the for-profit stock or the stock of other affordable rental properties. (Affordability could be measured in relation to the median income or to a dollar standard.) Performance measures could be computed for nonprofit developments and for the comparison group. If there are sufficient properties in the database, the tabulations could control for different property sizes and types. Multivariate analyses could also be conducted to control for a variety of characteristics. Among the performance measures that might be compared are: the ratio of net operating income to value, the debt coverage ratio, the ratio of operating expenses to value or total rent, operating reserves, collection of the rent roll, and indicators of vacancy and turnover.

--Mortgage Performance

The development of the secondary market for multifamily mortgages is well behind that for single family mortgages. Fully 37 percent of single family (1-4 units) conventional mortgages are securitized, defined here to be those in the form of mortgage pools. Only 10 percent of multifamily (5 or more units) conventional mortgages are securitized. Although there are a variety of explanations for the difference, including the lack of a standardized mortgage instrument, some is surely related to the large gap in the availability of high quality data on the performance of multifamily mortgages relative to single family mortgages. APTData offers the possibility of closing this data gap substantially.

One basic issue on which substantial disagreement exists is the amount of multifamily mortgage originations. Crews, Dunsky, and Follain (1997) recently reviewed this issue. Unfortunately, there is no definitive source of information on multifamily loan originations. Estimates of the annual volume of

² Recently, HUD sponsored the collection of data on properties benefiting from the Low-Income Housing Tax Credit (LIHTC) and Cummings and DiPasquale created an LIHTC data base relying on data from four national tax-credit syndicators (Abt Associates, 1996 and Cummings and DiPasquale, 1998). The LIHTC database does not include information about the ongoing operation of the properties.

multifamily mortgage originations vary between \$15 and \$40 billion per year. HUD's Survey of Mortgage Lending (SMLA) is produced each quarter, but it is based upon a small and, seemingly, less than representative sample. The Residential Finance Survey reports holdings of mortgages in 1991. The Home Mortgage Disclosure Data (HMDA) set is meant to be a census of particular types of lenders, but Crews, et al (1997) raise doubts about its coverage. Although APTData is not a census of all multifamily mortgages, it may in time be able to supplement the information available in other sources. For example, originations reported in APTData can be cross-checked with the HMDA data.

APTData may also be able to provide useful information in the area of multifamily mortgage termination due to default and prepayment. There is little research on these topics. Boyer, et al (1998) survey much of this literature. Although there are disputes about the applicability of models designed for single family mortgage default and prepayment to multifamily default and prepayment, the limited state of the literature is primarily due to the limitations of potential data sets. FHA data are difficult to collect. Data based upon the lending of the GSEs (government sponsored enterprises, i.e. Fannie Mae and Freddie Mac) are either of short duration or proprietary. APTData seems to offer a new and valuable alternative. It includes variables indicating loan status and termination (that is, whether or not the loan has been paid off or terminated due to foreclosure, workout, or other reason). Initially, it should be possible to obtain descriptive information about defaults or delinquencies by property type, location, or other characteristics. When sufficient quarterly data becomes available, a hazard model might be estimated using the standard variables such as the contemporaneous loan-to-value ratio, the debt coverage ratio (which could be calculated from dynamic variables in the APTData file), and certain property and neighborhood characteristics.

APTData may be particularly helpful in building a new generation of models of multifamily mortgage performance that take account of time varying information about the financial condition of the property prior to mortgage termination. This is particularly helpful because multifamily borrowers faced with financial difficulties have the potential to alter their cash flows in ways unlikely to happen in single family, owner-occupied housing. For example, landlords may reduce the amount of revenue directed to maintenance and repairs or to reserve accounts during difficult financial circumstances. In such a situation, mortgage default may lead to much greater loss severity rates. APTData offers the potential to develop models capable of monitoring the income statement of the property over time and to identify unusual departures from trends. Such information may lead to better policies regarding loan forbearance and lower losses from mortgage foreclosure.

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TABLE 6

National Databases of Multifamily Rental Housing

	<u>APTData</u>	<u>IREM</u>		<u>AHS</u>	<u>POMS</u>	<u>RFS</u>
		convent.	subsidized			
<u>Total</u>						
# of Properties	22,384	4,464	1,857	n/a	4,153	19,161
# of Apartments	2,733,280	829,237	195,757	6,655	710,163	2,969,955
<u>Properties by Region (% of total)</u>						
Northeast	4924 (22)	525 (12)	489 (30)	1735 (26)	783 (20)	4843 (26)
Midwest	5124 (23)	1053 (24)	489 (30)	1544 (20)	870 (21)	3463 (22)
South	5555 (25)	1806 (40)	443 (27)	1587 (29)	1437 (32)	5874 (21)
West	6733 (30)	1080 (24)	219 (13)	1789 (25)	1063 (27)	4981 (26)
<u>Year Built (% of total)</u>						
<1960	3679 (21)	545 (13)	37 (2)	2011 (30)	845 (21)	4128 (50)
1960-79	8455 (49)	1670 (39)	682 (43)	3084 (46)	1948 (49)	9464 (35)
1980+	5192 (30)	2088 (49)	858 (54)	1560 (23)	1184 (30)	5576 (15)
<u>Property Size (# of units)</u>						
mean	58	186	105	27	171	25
median	45	n/a	n/a	16	95	8
<u>Median Rent</u>	\$679	\$528	n/a	\$500	\$499	\$347
<u>Apartment Sizes</u>						
% efficiency or one bedroom	48%	n/a	n/a	54%	n/a	n/a

Notes to table: Property counts shown are actual sample totals, but percentages and descriptive statistics are based on sampling weights where applicable. Property counts for APTData are based on the data it provided to *The Dollars & Cents of Multifamily Housing*, 1997, published by the National Apartment Association and the Urban Land Institute. IREM data are for conventional apartments in 1996 and federally subsidized properties in 1995. Regional geographies do not exactly match Census regions in APTData or IREM statistics. AHS data refer to occupied, rent paying apartments in structures with 5+ apartments; for property size, AHS refers to units per structure. POMS and RFS refer to properties with 5+ apartments. Detailed tabulations may not sum to property totals due to missing data on some survey questions. APTData, IREM, POMS, and RFS numbers refer to properties, which may have more than one structure. IREM age groups are pre-1965, 65-77, and 1978+. IREM average rent is for a garden apartment, the most common property type in the IREM database.