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BASELINE AUDIT PLAN

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PREFACE

This Working Note was prepared for the Office of Research and Policy Development, U.S. Department of Housing and Urban Development. It presents a plan for auditing data obtained from baseline surveys of residential properties in each of two sites in which the Housing Assistance Supply Experiment will be conducted. These surveys include inspection of each property, an interview with its owner, and interviews with its current occupants.

The survey audit is distinct from recoding, editing, and cleaning operations which are performed as part of the process of constructing machine-readable master files from hardcopy questionnaires. The audit is designed to assist the user of survey data to evaluate the quality of data obtained from particular respondents, for particular properties, or on particular subjects, thus enabling him to tailor his analyses to its strengths and weaknesses. It will also provide guidance for future instrument design and field procedures.

This Note was prepared pursuant to HUD Contract H-1789, as amended in June 1973, and fulfills task 2.6 of that contract.

Leonard Chesler and David M. de Ferranti are jointly responsible for the development of the audit plan and the text of this Note. De Ferranti guided its initial development; Chesler augmented the plan and supervised production of this report.

Detailed audit specifications are contained in eight appendixes. Leonard Chesler prepared Appendix A; Richard Stanton prepared Appendixes B, C, and D; Joseph A. Grundfest prepared Appendixes E and F; and William L. Dunn prepared Appendix G.

Several persons who did not share directly in authorship contributed in other ways. Carolyn Ivie supervised development of the data-cleaning procedures described in Sec. II. Laurence A. Dougharty prepared the data for Appendix H. Larry A. Day provided advice and technical support in designing various audit procedures and also programmed several of them. Daniel A. Relles is the author of several statistical computing programs used by the audit, including SRVANL, used for

analysis of linear relationships and multivariate outliers. Sandra H. Berry, Timothy M. Corcoran, Deborah Hensler, and Tiina Repnau all offered valuable comments and advice. Jennifer Hawes and Ann Wang, because of their earlier work on the screener audit, were able to provide many helpful suggestions.

A draft of this Note was reviewed by Ira S. Lowry. Charlotte Cox edited the typescript and supervised production of final copy.

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I. INTRODUCTION

During the course of the Housing Assistance Supply Experiment, Rand proposes to undertake a comprehensive audit of the survey data collected at each experimental site. The basic purpose of this audit is to assure that analysis of the data proceeds in an environment of full awareness of its strengths and weaknesses. Additionally, the audit will aid in detecting and correcting problems of all kinds, from simple blunders in data transcription to unforeseen field problems that seriously endanger the experimental design. Finally, it will provide feedback needed to plan survey instruments and field procedures for annual resurveys.

An audit would be a good idea in any data collection project, but we think it is especially important for a project as large as ours. A conservative estimate is that over the full term of the experiment, more than ten million questions will be posed to survey respondents in over two dozen surveys.

We believe our audit will be an innovation in the field of social experimentation: first, because it will represent a larger commitment to the problem of checking the validity of survey data than we have seen before; and second, because we are developing new ways of tackling the problem.

Responsibility for the several aspects of an effective audit naturally divides among individuals with diverse talents. At the first stage, survey managers supervise the administration of the survey instruments; their job is to see that interviewers ask the right questions of the right respondents, with a quality of performance meeting prespecified standards. Next, data editors oversee the transfer of information from completed questionnaires to machine-readable files; they act as a filter, sifting out mistaken coding from valid responses. Data-processing managers superintend the storage of the edited data; their task is to ensure safe storage of and efficient access to an immense library of recorded evidence. Later, statisticians examine the data to test whether they conform to expectations based on the assumptions under which they were supposed to have been collected; they

must judge the degree of confidence that can reasonably be attached to inferences from the data.

These are tried and familiar activities in any survey operation. We will perform them as carefully as possible, but we also propose to go further, analyzing the *substance* of the data more closely and with more varied tools than is generally done.

In this Working Note, we present our plan for auditing the baseline surveys. Section II explains the essential elements of the plan. Appendixes A through H provide supporting details.

II. THE BASELINE AUDIT PLAN

In this section, we describe our plan for the audit of the baseline surveys. The section begins with a discussion of the scope of the audit and the specific tasks we propose to carry out. Each task is outlined briefly, with the details reserved for eight appendixes. We then address the issue of communicating the results of the audit to users in a form that will be useful to them in their analysis of the data. The section concludes with a statement of the limitations of an audit, as we now perceive them.

SCOPE AND TASKS

Our concept of an audit is a broad one. We believe that an audit should draw on information from all phases in the "life" of survey data--data collection, quality control processing (field editing), field validation, data cleaning, simple tabulations of the data, statistical analysis, and comparison with external sources.

We propose to undertake all of these tasks on each baseline survey, but will devote the greatest attention to the two surveys most critical to the planned analysis, namely, the landlord and tenant/homeowner surveys.

Accounting for the Entire Sample

We believe a data audit should begin by establishing that the sample units selected for surveying can all be accounted for. To this end, we propose for each survey to secure exact counts of the number of sample units in each of the following categories:

1. Interview completed.
2. Interview partially completed.
3. No interview conducted, respondent unavailable.
4. No interview conducted, respondent refused.
5. No interview conducted, other reasons (by reason).*

*In practice, more categories may be both practical and desirable, depending on the survey. For example, the survey group currently plans to use three definitions of "completion" on some surveys; additional categories may be defined to reflect the distinctions between these definitions.

If the sum of the sample units in all categories is not the same as the total from the original master list, the survey group will advise Mathematica that additional field efforts are necessary to locate the missing addresses.

These counts are important for assessing the performance of a survey in a general sense; but they are also particularly significant in the context of the issue of nonresponse bias, which we propose to make the second concern in the audit.

Checking for Nonresponse Bias

In the Housing Assistance Supply Experiment, as in most survey efforts, the procedures that will be followed in selecting samples and then generating estimates from the sample data once it has been collected assume that the addresses where interviews are completed constitute a representative subsample of the total attempted. Distortions could occur if, as a result of refusals to answer questionnaires, nonresponse bias is introduced into the results--i.e., we no longer have an entirely representative sample.

Another form of nonresponse bias concerns individual questions in a questionnaire. A completed interview may contain responses (e.g., "don't know" or "declines to answer") that are not usable for analytic purposes. One method for dealing with this problem is to assume that cases with usable data are representative of all cases in the sample. When this assumption is not true, the result is nonresponse bias.

We plan to test for nonresponse bias in three ways: by analyzing refusals; by examining partially completed interviews; and by analyzing cases with unusable data in certain key fields.

For our analysis of refusals, we will tabulate interviewers' judgments about individuals who refuse to be interviewed and compare the results with identical tables on those who responded. Interviewer judgments on refusals are to be recorded on special sections (or supplementary forms) of each survey questionnaire. These sections ask for judgments on the age, sex, income class, and ethnicity of persons who refuse.

Perhaps more important than these basic data will be information gained through cross-checks between surveys. Thus, for refusals in the landlord survey, data available from the residential building (SRB), the neighborhood, and the tenant surveys allow additional cross-checks for possible differences associated with this group (e.g., differences in building, area, or landlord characteristics). For tenant/homeowner survey refusals, in addition to the above procedures, cross-checks with the associated landlord survey questionnaire may also be useful in some cases. In addition, the screener survey will provide useful cross-check information for either landlord or tenant/homeowner survey refusals.

An analysis similar to that for refusals will be performed for partially completed interviews; we will compare results with those of fully completed interviews. Since, in the case of partially completed interviews, the respondent will have answered at least some questions, more extensive comparisons may be feasible than for refusers, who answer no questions. As a minimum, we propose to investigate basic descriptors such as age, income class, household size and composition, and ethnicity.

Finally, we will identify for each questionnaire a list of particularly important questions for analyzing the results of the experiment. For each question, we will compare respondent characteristics for completed interviews having usable responses with those for interviews having unusable responses, drawing on data elsewhere in the questionnaire for the comparison.

Analyzing Field Operations Records

Records kept during the on-site review of completed questionnaires will provide a valuable source of information for the audit. These records--in effect, data on the data--contain first-hand observations on the evolution of the final set of responses. With this consideration in mind, we propose to examine four types of records from the field, which, by prearranged plan, Mathematica will send to Rand in Santa Monica:

1. Contact reports.
2. Quality control reports.

3. Validation reports.
4. Interviewer performance ratings.

Contact reports will indicate the number of appointments, refusals, and interview attempts made before a questionnaire is returned from the survey site. They will also describe any problems involved with the contact.

Quality control reports will show the results of at least one quality control review on every questionnaire returned from the field in which problems are detected. Special forms have been prepared for these reports, detailing each problem and its resolution, which may entail discussion with the interviewer or a second contact with the respondent.

Validation reports will be prepared on a randomly selected 20 percent of the questionnaires in each survey. Validation will consist of a call or a second visit to respondents, who will be asked to verify that various parts of a questionnaire were covered by their interviewer. They will also be asked selected questions, and their responses will be compared to those on the original questionnaire. The purpose of validation is to ensure that interviews are actually being made and, to a very limited extent, verify the reliability of responses.

Mathematica plans to assign performance ratings to each interviewer. Since interviewer identification numbers are recorded on each questionnaire and can also be related to the other data reports described above, it may be possible to detect differences between performance groups for various types of problems.

We plan to examine each of the reports for completeness, provide data for use in evaluating survey operations, and search for patterns indicating the quality of field operations. We will develop procedures to do the following (these procedures are discussed in more detail in Appendix A):

1. Verify that all documentation required from the field has been properly prepared and accounted for.

2. Provide statistics on field error rates, effectiveness of correction procedures, and other information useful for the survey group in evaluating survey procedures.
3. Test for possible biases in responses that could be introduced as a result of field operations.
4. Provide information that will supplement other parts of the audit in helping to resolve the status of contradictory or implausible responses.

"Cleaning" Survey Data

When completed questionnaires have passed through quality control procedures in the field, they will be transmitted to Rand in Santa Monica. There, after being logged into an internal accounting system designed to safeguard them against loss or unauthorized access, they will be transcribed into machine-readable form and subjected to extensive data cleaning. In data cleaning, every response field on every completed questionnaire will be checked to be sure it contains one of the possible entries for that field. Further checks will investigate whether an interviewer asked the right questions (e.g., questions on rent for renters and on ownership costs for owners) and whether a respondent contradicted himself (e.g., gave a figure for the number of bedrooms in his home that is greater than the figure he gave for the total number of rooms).

These cleaning checks are made with a special editing program called RECODE.* Special instructions for detecting errors and editing the data will be prepared for each survey. When violations of the cleaning tests are detected, data editors will inspect the original hardcopy questionnaire for transcription errors. For items critical to the analysis, editors will consult appropriate field records and personnel. In some cases, respondents may be called back.

When these efforts resolve a problem, the editors will revise the machine-readable record, substituting the correct information for the incorrect data. When there is some doubt, or when no new information

*Developed by the National Opinion Research Center (NORC) at the University of Chicago.

is uncovered, they will replace the incorrect data with special error codes indicating the nature of the problem and that it has not been resolved.

The result will be a classification of all data into one of the following categories:

1. Data are usable.
2. Respondent refused to answer.
3. Respondent answered "don't know."
4. Entry on the questionnaire was not legible.
5. Entry was legible but meaningless in the context of the question.
6. Interviewer skipped the question by mistake.
7. Interviewer did not skip the question but should have.
8. Question is not applicable.

From tabulations of the data by these categories, we will generate statistics on the number and type of problems in each response field. These statistics will enable us to calculate nonresponse and error rates for each field, for each module, and for each survey. This information will augment data described above in aiding the survey group to evaluate field operations, and will also be used later in the audit as part of a measure of data reliability.

Analyzing "Atypical" Cases

After a questionnaire has passed through data cleaning, it may still contain inconsistent or implausible combinations of responses too complex to have been caught by the relatively simple tests feasible for a data-editing operation. We plan to search for these problems by several means. First, we have devised a large number of diagnostic checks more subtle than those applied during data cleaning. Then, for problems that slip through these checks undetected, we will examine distributions of questionnaires along numerous dimensions. A sophisticated package of statistical computer programs will be used to perform both univariate and multivariate tests for outliers in these distributions.

Questionnaires flagged as "atypical" by any of these procedures will be manually reviewed. In most instances, we do not expect these reviews to indicate clearly that certain data are right or wrong, only that the data are questionable, with some informal assessment of the degree of our doubts.

The analysis will be implemented using four types of procedures:

1. Checks of internal consistency between responses within a questionnaire.
2. Univariate distribution checks.
3. Distribution checks involving transformations of responses.
4. Multivariate outlier checks.

Internal consistency checks will be made on each questionnaire for combinations of responses that are not directly contradictory (and thus not isolated in data cleaning) but seem implausible. For example, a landlord might indicate that his property's value is increasing, while five or more buildings in the neighborhood have been recently abandoned. Lists of many such possible checks have been developed for the landlord and tenant homeowner instruments; these are presented in Appendix B. Additional checks may be identified later as the questionnaire data are processed. Also, at that time, the present checks will be reevaluated.

Univariate distribution checks will be made based on marginal frequency distributions generated for each question in each survey. The distributions will be reviewed to identify unusual outliers or other unexpected characteristics. Individual questionnaires in which these outliers occur will also be identified and tabulated.

Distribution checks involving transformations of responses will be performed. A number of useful relationships between questions may be expressed as ratios or other transformations of the original data. These transformations are often of interest in themselves--e.g., the ratio of an individual's rent to his income. The marginal distributions of these transformations will be generated in a manner similar to the univariate checks above, and similar analyses will be performed. Lists of transformations for the landlord and tenant/homeowner surveys are presented in Appendix C.

Multivariate outlier checks will be performed with the SRVANL computer program (for survey analysis), a statistical tool available at Rand. Among other things, this program determines the shape of a multivariate distribution of data and isolates a user-specified percentage of the observations that lie at the fringes of the distribution. The percentage threshold may be varied, thus increasing or decreasing the region beyond which observations are designated as outliers.

This statistical procedure is more easily described in graphic terms. Suppose the check to be performed will include just two variables--e.g., landlord age and number of years the landlord has had experience in real estate. (Ordinarily, more variables will form the multivariate distribution, up to a maximum of twenty.) In our example, the distribution may take a form similar to that depicted in Fig. 1. The best-fitting ellipsoid is placed at the threshold beyond which lies the specified percentage of outliers. In this example, outliers are found in three places--low age, high experience; high age, low experience; high age, high experience.

Multivariate outlier tests are useful supplements to other audit procedures, catching problems that might otherwise be missed. Thus, a point flagged as an outlier might actually be a contradictory case that was overlooked, because of the complex of variables involved, in designing the data-cleaning tests. Similarly, implausible cases overlooked by the internal consistency checks might be detected as outliers (provided they were also relatively infrequent in the data) in the appropriate multidimensional space. The multivariate checks can detect outliers where the variable values themselves are within usual limits, but the combination of occurrences is unusual. These outliers would be missed by the univariate distribution checks. Multivariate checks can also detect outliers that, when they lie close to the regression hyperplane, might otherwise be missed by procedures based on analyses of regression residuals.

Preliminary lists of multivariate outlier checks for the landlord and tenant/homeowner surveys are presented in Appendix D.

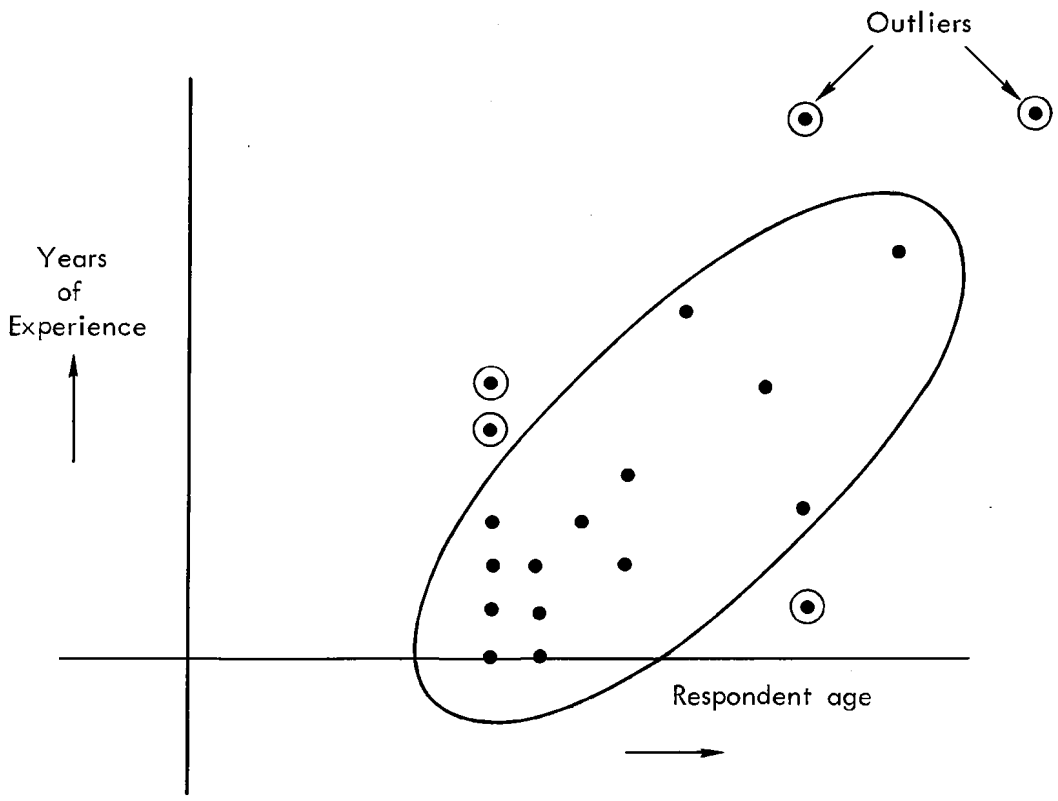


Fig. 1 — Multivariate outlier check.

Checking Across Questionnaires

The experimental design calls for several surveys (with different respondents) on the same sample of residential properties. By matching a completed questionnaire from one respondent with the data from another respondent for the same property, it will be possible to check for problems that would otherwise not be apparent. We propose to make a large number of these cross-questionnaire checks by merging records of the tenant/homeowner survey, the landlord survey, the screener survey, and the survey of residential buildings for each sample property.

To make these checks, several problems inherent in cross-questionnaire analysis will have to be taken into account. Consider the problems involved in aggregating tenant questionnaires to obtain results comparable to those of the landlord survey. In the case of vacancies or large multiple-unit structures, a complete census of tenants will not be available. We may, therefore, have to compare landlord data that refer to the entire property against tenant data that refer to only a portion of the property. Furthermore, much of the building-specific information from the landlord survey pertains only to the main building on the property; when there is more than one building, it may be difficult to determine which building the tenant data describe. If either tenants or landlords changed during 1973, there may also be ambiguities in crossreferencing either landlord or tenant responses. Many other sources of discrepancy can be imagined, but these seem to be the most likely.

When we add the operational complexities of aggregating data over several tenant/homeowner questionnaires and the intricate record-keeping needed to document and track missing data to the difficulties above, then it seems prudent to restrict our initial comparisons to statements that do not require delicate data manipulation. Consequently, the initial set of comparisons will draw heavily on statements by landlords that should be true for every tenant, and on individual tenants' statements that should be true for the structure in general and the landlord in particular. Additional comparisons using aggregated tenant data may be developed later, should the initial analysis warrant them.

There are similar issues for comparing screener questionnaires and landlord and tenant/homeowner questionnaires. In this case, time lags between surveys may also be important. For cross-comparisons involving the survey of residential buildings (SRB), ambiguities in building identification must be accounted for.

Specific cross-checks for the initial audit analysis are described in Appendix D.

Analyzing Linear Relationships in the Data

We believe a survey audit should include an analysis of linear relationships in the data. Such an analysis will be valuable for two reasons: First, linear relationships are useful in their own right for future investigations. Second, linear relationships can be used to diagnose problems in the data. If, for example, we find a relationship that contradicts previous research findings or one that seems anomalous, then that result will be subjected to closer scrutiny, to see if the survey responses are somehow misleading.

Our analysis of linear relationships will focus on the degree of interdependence among responses to different questions, as measured by the R^2 of each response regressed on all the others; on pairwise simple and partial correlations; and on full-scale regression analysis to test relationships. A detailed discussion of the prodedures for this phase of the audit is presented in Appendix F.

Comparing with External Sources

Possibly the most important aspect of auditing survey data is comparing tabulated results from the survey with findings from other sources. We propose to carry out a large number of such comparisons, drawing on decennial census data, on-site data bases, and a few other sources.

Our experiences to date convince us that this aspect of an audit is more difficult than it might first appear. The chief difficulty lies in finding or constructing directly comparable figures. Sources differ in the definitions they follow and the time spans they cover, and such discrepancies often obscure differences due to the quality of the data.

There is also the difficulty that external sources generally have biases of their own. Thus, a discrepancy between survey data and data from an external source may not mean that the survey data are wrong.

Initially, we have identified the tables from the 1970 Census of Population and Housing that can be directly compared (with a minimum of definitional problems) with data in the landlord and tenant/homeowner surveys, after adjustments are made for sampling weights and differences in survey dates. A detailed description of these tables is presented in Appendix G, which also includes a list of local sources that might provide useful comparisons with our data.

In the case of the landlord survey, it may prove useful to compare our data on landlord income and expenses with that for other regions. Such comparisons could indicate the similarities and differences between our experimental site and other areas. One source for such comparisons is the *Apartment Building Income/Expense Analysis Report*.* Average figures derived from this report for eight northern and midwestern cities are presented in Appendix H; we may also make comparisons with similar data from other sources.

PRESENTING THE RESULTS OF THE AUDIT

By completing the tasks described above, we expect to produce several types of information. First, we will provide statistics and other information useful for managing on-going field operations and for improving the design of future surveys. Second, some data will have been shown to be wrong and will either have been corrected or properly labeled. Third, other specific data items will have been identified as questionable; these will be items which, *prima facie*, appear not to be credible, but might be plausible under unusual circumstances. Fourth, suspicious patterns identifying possible biases in specific variables, groups of variables, or groups of respondents will be described. These patterns, which could result, for example, from incomplete responses, problems in the sample design, or problems with field procedures, will be important to know about when we analyze the results of the experiment and attempt to account for the effects

*Institute of Real Estate Management, Chicago, 1972.

of the patterns. Fifth, significant interrelationships (correlation and linear regression) between variables in the data will be described, allowing for comparisons with previous research findings and the early detection of unexpected results. Finally, results of comparisons with external data sources, such as the census and local data bases, will provide additional validation checks for the experiment, indicate the degree of comparability that exists between our experiment and such sources, and indicate the potential usefulness of these sources for future analysis.

The information developed in the audit will be presented in three types of documentation. The first will contain the detailed results of each of the audit tests performed on the data. In many cases, the information will be presented in the form of computer printouts. Generally, these will be detailed enough to allow further analysis on the reported data as appropriate or needed. Thus, for example, in the case of the analysis of linear relationships, computer printouts will contain full correlation matrixes and regression parameters.

The second type of documentation will be reports interpreting the audit results. Careful references will be made throughout such reports to underlying source data contained in the more detailed reports described above, to which analysts may return to extend or modify the interpretative material for use in particular contexts.

The third type of documentation will index detailed findings and the interpretative reports to individual questionnaires and questions. Audit findings pertinent to a particular questionnaire or to responses to a particular question will be retrievable with this index system. Later, we may include parts of this index system in the permanent computer record on the data.

It is hoped that the results of the audit can be quickly and easily communicated, as they are produced, to all potential users. To accomplish this, in addition to the formal documentation effort, we will rely on close interaction between topical analysts and the audit staff and on regular staff seminars to help disseminate audit findings. Finally, potential users will be encouraged to participate in the specification and design of future audit procedures and in the analysis of audit results.

Since many of the audit checks are computerized, much of the basic information on their outcomes (i.e., the first type of documentation described above) will automatically be produced in machine-readable form. It may thus be feasible to implement a relatively simple computerized message system that presents findings on questionable data each time the data base is used. This is one way to ensure that the user has complete information for assessing the data. The organization of documentation would be similar to that described above, except that some of the information would be in computer-retrievable form. We plan to pursue this concept at least to the point of evaluating its feasibility and practical value.

We are also investigating the possibility of developing a generalized index of reliability to measure the responses in particular questionnaires. Such an index might be used to weight or select data to be included in the analysis, or to evaluate changes in the "quality" of survey results from one survey to the next. For the first purpose, a method of selection must be developed to eliminate poor data without introducing sampling biases. We are currently evaluating several ways to achieve this result.

LIMITATIONS OF AN AUDIT

The purpose of our audit is to assure that the analysis is performed with full awareness of the strengths and weaknesses in our data. In some instances, the audit will lead to correction of errors, but for the most part, it will result only in documenting problems, not in alleviating them.

We have devised an extensive set of checks, but we cannot claim that our checks will identify every error in the data. Manifest errors are easy to locate, but problems deeply imbedded in a set of survey responses may be untraceable by any means.

Finally, while an audit can document problems, it cannot tell an analyst how to deal with them. We will provide assistance to users of the data in interpreting the findings of the audit; but they must make the final decision on its use, depending on their requirements for analysis.

Appendix A

ANALYSIS OF FIELD OPERATIONS

OBJECTIVES

It is important to evaluate, where possible, the effect of field operations on the responses obtained in the surveys. The issue is whether any significant omissions or biases are introduced as a result of survey procedures, or whether procedures have been correctly specified and implemented. Detection and evaluation of such problems when they arise may allow corrections to be made in on-going field activities and in the design of future surveys. This knowledge will also affect how we analyze results of the Supply Experiment when suspicious data items cannot be corrected. In some cases, if certain essential data items are not obtained, further survey efforts may be necessary.

The first part of the verification procedure is the quality control (field editing) reviews and validation surveys conducted in the field by Mathematica. Details of these procedures are discussed in quality control and validation manuals developed for the landlord and tenant/homeowner instruments. The present discussion deals with the following auditing procedures, which can be implemented once data are sent to Rand in Santa Monica:

1. Verify that all documentation required from the field has been properly prepared and accounted for.
2. Provide statistics on errors detected in the field, and on the effectiveness of correction procedures, and other information useful for evaluating survey procedures.
3. Test for possible biases in responses that could have been introduced during field operations.
4. Provide data on field operations that will supplement other parts of the audit in recoding contradictory or implausible responses.

Below, we describe the types of records obtained from the field and procedures for using them in these audit tasks.

AVAILABLE DATA

Four types of records will be available from the field, in addition to the instrument itself:*

1. A contact card for each instrument.
2. A quality control report for each instrument in which problems are detected.
3. Validation reports for a random sample of approximately 20 percent of the instruments.
4. Interviewer performance ratings prepared by field supervisors.

Contact Cards

The contact card records each contact made for a specified questionnaire. It shows the dates, times, and status of each contact. It indicates how many appointments, refusals, and interview attempts are made before the questionnaire is returned to Rand and comments on any problems with the contact. If the card is returned without a completed instrument, the reasons for retirement of the card are indicated. Sample contact cards are illustrated in Figs. 2 and 3.

Quality Control Reports

Each questionnaire for which responses are obtained will undergo extensive quality control checks (field editing) by two quality control readers in the field. Each problem will be stated along with an indication of the method of resolution. Resolution, in many cases, will involve discussion with the interviewer; for some questions considered essential to the analysis, respondents will be recontacted. A quality control report will be sent to Rand from the field for every questionnaire in which problems were discovered. It is possible, but unlikely,

*When appropriate, there also will be refusal records previously discussed in Sec. II.

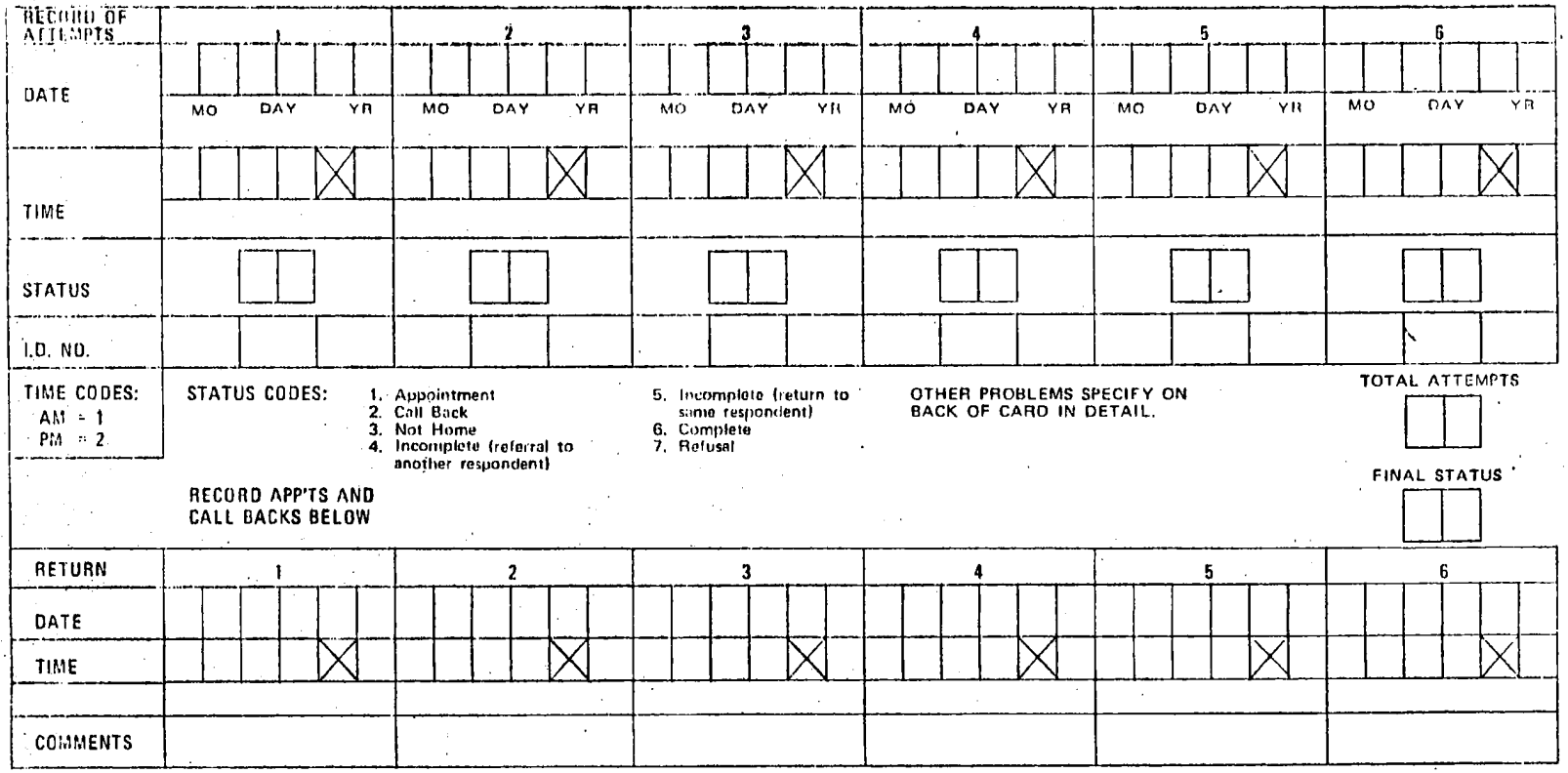


Fig. 2--Landlord contact card.

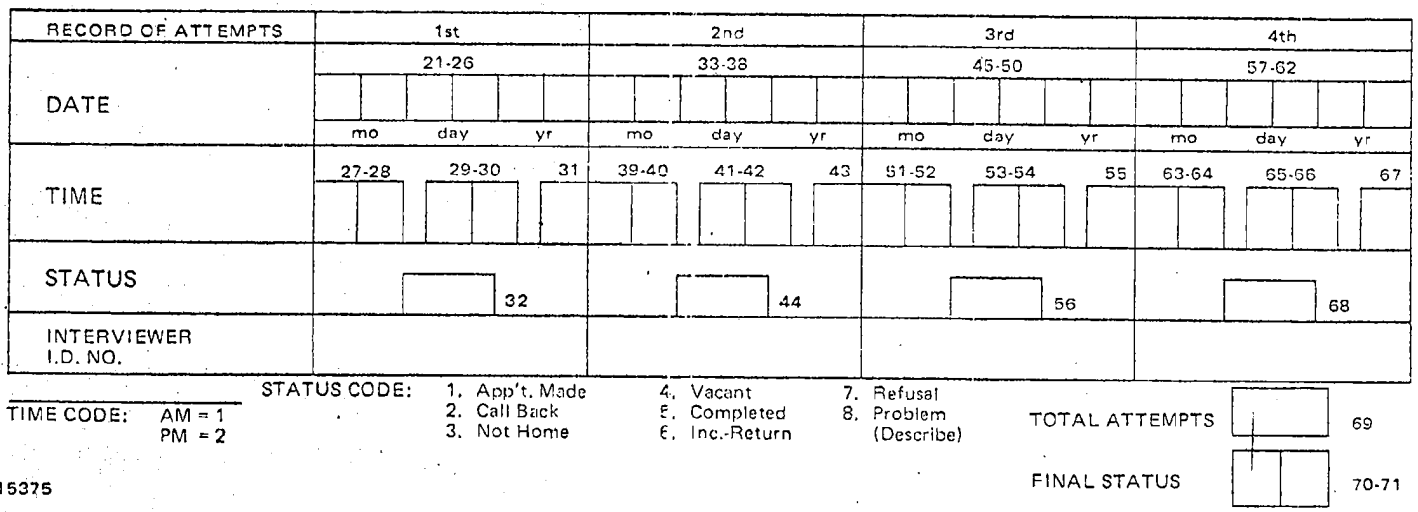


Fig. 3--Tenant contact card.

that the quality control readers will discover no problems in a questionnaire. A sample report is presented in Fig. 4.

Validation Reports

A validation survey will be conducted for a random sample of about 20 percent of all interviews. Respondents will be contacted by telephone or in person and asked to verify that the questionnaire was properly administered by the interviewer. They will also be asked for responses for selected questions, which will be then compared to their original responses. The purpose of validation tests is to ensure that interviews are actually being conducted and, to a limited extent, to verify the reliability of responses. Sample questions from the landlord validation report are presented in Fig. 5.

Interviewer Performance Ratings

Mathematica plans to assign performance ratings to each interviewer. Since interviewer identification numbers are recorded on each questionnaire and can also be related to the other data reports described above, it may be possible to detect differences between various interviewer performance groups for various types of problems.

AUDIT PROCEDURES

Verification of Documentation

Procedures will be established to ensure that all survey documents have been received from Mathematica or have been adequately accounted for. Each document will also be inspected by a combination of automated and manual procedures to ensure that it has been properly prepared. Any questions or problems will be resolved through discussions with appropriate field personnel or through data obtained from field management information records.

Statistics on Field Operations

Once the field data have been verified and properly prepared for processing, many useful statistics can be compiled for evaluating survey

HASE QUALITY CONTROL PROBLEM SHEET Page _____ of _____ pages

1st Q.C. Reader: _____

2nd Q.C. Reader: _____

Interviewer Name: _____

CARD

Questionnaire I.D. # [ ][ ][ ][ ][ ][ ][ ][0][1] 1-9

Interviewer I.D. # [ ][ ][ ] 10-12/

1st Q.C. Date: [ ][ ][ ][ ][ ][ ] 13-18/ (MO. DAY YR.)

Final Resolution Date [ ][ ][ ][ ][ ][ ] 19-24/ (MO. DAY YR.)

Q# [ ] 25/ [ ][ ][ ][ ] 26-29/

C-R Q# [ ] 30/ [ ][ ][ ][ ] 31-34/

Statement of Problem

[ ][ ] 35-36/

Resolution

[ ][ ] 37-38/

STATEMENT OF PROBLEM CODES

01. Failure to follow interviewer directions (e.g., skip error, omission, incorrect or incomplete entry of information, outlying codes, improper or inadequate probe).
02. Illogical response (inconsistency, unreasonable answer).
03. Illegible response (alpha or numeric).
04. Don't Know or Refusal meriting callback.
05. Q.C. decision needed (supersedes other codes).

RESOLUTION CODES

01. Resolved by Interviewer (office).
02. Resolved by Respondent, phone call.
03. Resolved by Respondent, personal visit.
04. Resolved by Q.C.'er (e.g., checked out questionnaires, discussed problem with Q.C. supervisor. If the Q.C.'er calls the respondent, the resolution is "02").
05. Resolved by Q.C. decision.
06. Resolved by reference to public sources (e.g., a call to get or verify taxes).
07. Resolved by Research (e.g., address problem discovered in Q.C. and resolved in Research).
08. Unresolved callback item, interviewer explanation adequate.
09. Unresolved callback item, callback attempted.
10. Other unresolved (all other problems that were not resolved).

Fig. 4--Sample quality control report form and codes.

1. Did an interviewer from Urban Opinion Surveys visit you to ask about your property at (ADDRESS)?

YES..... 1 *35/*

NO...(THANK RESPONDENT AND END VALIDATION)..... 2

2. About how long did the interview take?

OF MINUTES [ ][ ][ ] *36-38/*

CAN'T TELL, INTERVIEW TOOK SEVERAL SESSIONS..... 999

INSTRUCTIONS: ASK ALL QUESTIONS. CHECK APPROPRIATE RESPONDENT.

I'd like to ask you a few questions to make sure the interviewer recorded the correct information.

3. Did the interviewer ask you questions about:

OWNER	2ND R		YES	NO	NOT SURE	
√		A. How you got your property	1	2	3	*39/*
√		B. Your future plans for the property	1	2	3	*40/*
√		C. Your own experience in real estate	1	2	3	*41/*
		D. How much money you collected in rents and spent on maintenance and management	1	2	3	*42/*
		E. Repairs and improvements on your property	1	2	3	*43/*
		F. Mortgages, taxes, and insurance on your property	1	2	3	*44/*
		G. The area around your property	1	2	3	*45/*
		H. Tenants on your property	1	2	3	*46/*

INSTRUCTIONS: VALIDATOR SELECT THREE QUESTIONS FROM THE FOLLOWING LIST TO ASK THE RESPONDENT. CIRCLE LETTERS FOR QUESTIONS TO BE ASKED. CHECK RESPONDENT AS APPROPRIATE.

OWNER	2ND R		YES	NO	NOT VALIDATED	
√		A. ASK OWNER ONLY: Did you ask the interviewer to speak to your representative to answer specific questions in the survey?	1	2	3	*47/*
		B. Are there any regular full or part-time employees who helped with the management or repair of this property in 1973?	1	2	3	*48/*
		C. In 1973 were there any repairs or improvements that cost more than $10 done on the property?	1	2	3	*49/*
		D. Are there any commercial units on the property?	1	2	3	*50/*
		E. Are there any mobile homes or mobile home spaces on this property?	1	2	3	*51/*
		F. In 1973 did anyone live on this property at reduced rent or without paying rent?	1	2	3	*52/*
		G. Are there any mortgages or loans that are outstanding on this property?	1	2	3	*53/*
		H. In 1973 were there any special tax assessments on this property for things like sewers, sidewalks, or streets?	1	2	3	*54/*
		I. Was there any insurance coverage on this property in 1973?	1	2	3	*55/*
√		J. ASK OWNER ONLY: Do you plan to make any major improvements on this property within the next twelve months?	1	2	3	*56/*

Fig. 5--Sample questions from the landlord validation report.

procedures. Data from the validation surveys will have an obvious impact. While specific procedures for using validation results have not yet been worked out, it is clear that negative responses (i.e., questions not asked or responses differing from the original questionnaire) will cast doubt on the validity of a questionnaire. In these cases, additional validation checks may be required, possibly leading to the elimination of additional questionnaires. In extreme cases, all the questionnaires prepared by a specified interviewer may have to be eliminated, or interview procedures for a class of respondents changed. If negative validation response rates are higher than expected, the sampling rate for validation checks may be increased.

The quality control records can be used to compile statistics on the problems encountered in the survey and the methods used to solve them. These statistics can then be tabulated by question number, module, and instrument type. High error rates for specific questions or modules might indicate the need for revised training, interview procedures, or question wording in future surveys. A match between types of errors and methods of solution might indicate problems with current review procedures. Tabulations by grouping interviewers or quality control checkers might lead to the development of more effective management procedures.

The contact card records will provide useful statistics on the number of contacts and intermediate refusals per completed questionnaire. These can be compared for various respondent and interviewer categories, leading, perhaps, to improved contact and interviewer assignment procedures and more accurate budget calculations.

All the statistics developed for the survey analysis group will also be of value in the other audit tasks.

Tests for Bias

Various tests for biases in responses can be developed using the field data reports described above. By grouping questionnaire responses according to various categories developed from the field reports, statistical tests for significant differences between responses in each category can be made. Such differences may be evidence of possible

bias in the results. However, additional analysis will usually be necessary to verify the existence of bias. For example, responses to the landlord survey as categorized by two interviewer groupings might indicate significant differences. However, additional examination might reveal that one interviewer group had a higher proportion of multiple dwellings than the other. Adjusting for the effects of this discrepancy may yield a nonsignificant difference between the groups. Finally, even when there are differences between groupings, they will be unimportant to the analysis if their individual effects have been properly randomized over the survey sample.

Tests for analyzing possible biases in the data will be developed, which will take into account discrepancies such as the above. These tests will be made on various data groupings--e.g., by type of error, by type of error resolution, by interviewer, by quality control reader, and by time for interview completion--in the quality control records. In addition, the contact card may allow tests for the effects on the responses obtained of the number of appointments and intermediate refusals before interview completion. If significant effects exist, they may have an important bearing on future survey procedures, as well as on the methods used to analyze the results of the Supply Experiment.

Relation to Other Audit Methods

Information resulting from the tasks above will supplement other parts of the audit in resolving contradictory or implausible responses. Additional tests in these other areas (e.g., outlier analysis, comparisons with external sources) may, in turn, help resolve potential problems discovered in the audit procedures above.

Appendix B
INTERNAL CONSISTENCY CHECKS

The internal consistency checks between questions within the landlord and tenant/homeowner instruments are listed below. A brief description of each check is followed by its logical equivalent in terms of question number (including module) and response.

LANDLORD SURVEY

1. Owner's main reason for acquisition was to provide a residence for his own family, yet he has never lived there.

   A6 = 4 and A17 = 2

2. Owner acquired property after moving out of same property.

   A18 < A1

3. Owner rented to someone prior to owner's reaching age 18.

   B1 + B2 < 1992

4. Owner has a job or occupation other than real estate and spends more than 40 hours weekly on real estate business.

   B3A = 1 and B14 > 40

5. When owner has only one property in the site, his time spent on real estate is not the same as the time he spends on his one property.

   B9 = 2 and D1 ≠ B14

6. Principal activities of corporation owning property include any of the following: mortgage lending, title search, general investments, legal work, public accountants, commercial banking, savings and loan; and corporation's share of revenues from real estate exceeds 5 percent may imply possible conflicts of interest or unusual business arrangements.

   6 < B16 < 14 and B18 > 5

7. Real estate or property owner organization provides mortgage financing.

   B23 (grid) = 5

8. Owner belongs to property owner association which he attends regularly, yet is unaware of any tenant or fair housing organizations in the site.

   B24 = 2 and B22 (grid) = 1 when B20 = 1

9. Respondent is black owner who has had negative experience with a fair housing organization.

   BB = 1 and B31 = 2 and B29 (grid) = 2 when B28 (grid) = 1 when B24 = 1

10. Number of permanent residential units on property reported by respondent differs from number of units from tax data on parcel.

    C5 $\neq$ units from tax source

11. Respondent indicates there has always been the same number of units on the property when the building was originally a church or other public building.

    C9 = 1 and C8 = 7

12. Monthly rent decreases as unit size increases on the property.

    NOT (C23A $\leq$ C23B $\leq$ C23C $\leq$ C23D $\leq$ C23E)

13. Respondent reports that his units are not currently on the market (with respect to increasing/decreasing revenues), yet he has received cash revenue from the property.

    C57 = 5 and (C48 or C39 or C33 or C11) > 0

14. Cost to hire someone to replace respondent on property results in an hourly wage rate less than the $1.60 minimum wage.

    D2 < D1 * $1.60

15. Owner relegates critical decisions or major improvements and financing to a property management firm.

    D22a = 2 or D22b = 2

16. Building is without electricity in a nonrural area.

    D27A = 2 and location (tax source) = 1

17. Building has no expenses associated with the following utilities, when the property was not totally vacant:

    (i) Electricity D28A = 2 and C5 > 1

    With at least two units, would expect some security lighting, etc.

    (ii) Gas D28B = 2 and C5 > 2

    Likely that hot water or heating centrally provided.

18. Fuel oil was used on the property, which has built-in electric heating.

    D28C = 1 and D26 = 3

19. Building has no piped-in water in a nonrural area.

    D31A = 2 and location = 1 (from tax source)

20. Building is attached to public sewerage system in a rural area.

    D31B = 1 and location = 2 (from tax source)

21. Expenses were not incurred for piped-in water while building was not vacant.

    D32A = 2 and vacant

22. Expenses were not incurred for public sewerage while hooked up to sewer (when costs not included in taxes).

    D32B = 2 and D31B = 1

23. Land contract price exceeds acquisition cost for property

    F3 > A9

24. Length of mortgage loan exceeds 30 years when lender is private lending institution or government agency.

    F14 (grid) ≥ 30 and F26 (grid) = (1 or 2)

25. Length of mortgage loan exceeds five years when lender is previous owner.

    F14 (grid) > 5 and F26 (grid) = 3

26. Length of mortgage loan exceeds 10 years when lender is friend or relative.

    F14 (grid) > 10 and F26 (grid) = 4

27. Lender not private lending institution, government agency, previous owner, or friend or relative.

    F26 (grid) = 8

28. Length of loan extension exceeds 30 years.

    F20 (grid) > 30

29. Reason for loan was to improve or repair property when lender was previous owner.

    F24 (grid) = 3 and F26 (grid) = 3

30. Mortgage is FHA or VA insured and number of units in building exceed FHA or VA limit.

F25 = 1 and limit exceeded

31. Mortgage is FHA or VA insured when acquisition price exceeds federal FHA or VA limits.

F25 = 1 and A9 > limit

32. Maker of loan outside Wisconsin.

F27 = outside Wisconsin code

33. A balloon payment is required on a conventional loan.

F28 = 2 and F26 = 1

34. A balloon payment is required on a government loan.

F28 = 2 and F26 = 2

35. More than two mortgages, contracts, or loans paid off during last year.

F32 > 2

36. Property has more than three insurance policies in force.

F41 > 3

37. Insurance policies cover flooding.

F42E = 5

38. Flood insurance has been cancelled.

F49C = 3

39. Interviewer indicates that the area around the property is unblocked, yet tax records indicate that the property is in an urban area.

G1 = 2 and location (tax data) = 1

40. Interviewer indicates that area around the property is blocked, yet tax records show it to be in a rural area.

G1 = 1 and location (tax data) = 2

41. Respondent says yards of nearby buildings are in fair or better condition, while those buildings are in poor or worse condition.

G3 < 3 and G2 > 2

42. Respondent says yards of nearby buildings are in poor or worse condition, while those buildings are in fair or better condition.

G3 > 2 and G2 < 3

43. Five or more new buildings were built in neighborhood over last three years, while surrounding buildings are considered to be in poor or worse condition.

G5B = 1 and G2 > 2

44. Over last three years, there were no conversions of residential buildings to nonresidential, while five or more new commercial or industrial buildings were constructed.

G8B = 1 and (G6 = 2 or G6 = 3) and G5B = 1

45. Five or more buildings are said to have been abandoned or boarded up in last three years, while more than five new buildings constructed in same period.

G9B = 1 and G5B = 1

46. Five or more buildings are said to have been abandoned or boarded up in last three years, while condition of buildings in neighborhood is fair or better.

G9B = 1 and G2 < 3

47. Five or more buildings were removed without replacement in last three years, while condition of buildings in neighborhood is said to be fair or better.

G10B = 1 and G2 < 3

48. Respondent indicates this is a worse place to own property compared with three years ago, while no buildings have been abandoned and at least one new building has been constructed, or surrounding buildings and yards are in fair or better condition.

G12 = 2 and {(G9A = 0 and G5B > 0)
or (G3 < 2 and G2 < 2)}

49. Respondent indicates this is a better place to own property compared with three years ago, while buildings have been abandoned and no new ones built, or surrounding buildings and yards are in poor or worse condition.

G12 = 1 and {(G9B > 0 and G5A = 0)
or (G3 > 2 and G2 > 2)}

50. People living in or moving into the neighborhood have higher incomes than three years ago, yet respondent claims this is a worse place to own property.

G13 = 1 and G12 = 2

51. People living in or moving into the neighborhood have lower incomes than three years ago, yet respondent claims this is a better place to own property.

G13 = 2 and G12 = 1

52. People living in or moving into the neighborhood have higher incomes than three years ago, while buildings have been abandoned, or surrounding buildings and yards are in poor or worse condition.

G13 = 1 and (G9B > 0 or (G3 > 2 and G2 > 2))

53. Respondent expects one year from now that the new ethnic/racial group in neighborhood will comprise a smaller proportion than now.

G18 < G17

54. People in neighborhood are considered better than three years ago, while this has become a worse place to own property.

G19 = 1 and G12 = 2

55. People in neighborhood are considered worse than three years ago, while this has become a better place to own property.

G19 = 2 and G12 = 1

56. There have been no newcomers to neighborhood in last three years, while there have been changes in racial/ethnic composition there.

G13 = 4 and G14 = 1

57. People in neighborhood are considered worse than three years ago, while no racial/ethnic change has occurred, and incomes are higher or about the same.

G19 = 2 and G14 = 2 and G13 = (1 or 3 or 4)

58. People in neighborhood are considered worse than three years ago, while no new people have moved in.

G19 = 2 and G13 = 4

59. People in neighborhood are considered better than three years ago while no racial/ethnic changes have occurred while incomes have decreased.

G19 = 1 and (G14 = 1 or G13 = 2)

60. Property values have risen in last three years, while a major ethnic/racial shift has occurred.

G20 = 1 and G14 = 1

61. Property values have risen in last three years, while people in neighborhood have lower incomes.

G20 = 1 and G13 = 2

62. Property values have risen in last three years, while surrounding yards and buildings are in poor or worse condition.

G20 = 1 and (G2 > 2 and G3 > 3)

63. Property values have risen in last three years, while five or more buildings have been abandoned.

G20 = 1 and G9B = 1

64. Property values have risen in last three years, while area has become a worse place to own property.

G20 = 1 and G12 = 2

65. Property values have dropped in last three years, while area has become a better place to own property.

G20 = 2 and G12 = 1

66. Property values have dropped in last three years, despite construction of five or more new buildings.

G20 = 2 and G5B = 1

67. Property values have dropped in last three years, while people now have higher incomes in conjunction with no racial shift.

G20 = 2 and (G13 = 1 and G14 = 2)

68. Streets are in bad repair, yet five or more new buildings have been constructed.

G23A = 1 and G5B = 1

69. Noise is a major problem, yet auto and truck traffic has decreased.

G23C = 1 and G11 = 2

70. Air pollution is a major problem, yet property values have risen.

G23D = 1 and G20 = 1

71. Litter in streets or vacant lots is a major problem, yet surrounding yards are in good condition.

G23E = 1 and G3 = 1

72. Street gangs and delinquents are a major problem, yet it is safe to walk around after dark.

G23F = 1 and G21 = 1

73. Drunks or drug users are a major problem, yet it is safe to walk around after dark.

G23G = 1 and G21 = 1

74. Dangerous street traffic is a big problem, yet traffic has subsided in last 3 years.

G23H = 1 and G11 = 2

75. Dangerous street traffic is not a big problem, yet traffic has increased in last three years.

G23I = 3 and G11 = 1

76. Number of evictions exceeded number of ordinary move-outs.

H17 > H15

77. One of reasons for eviction was violation of lease provisions, when tenants are not usually required to sign a lease.

H18D = 4 and H19 = 2

78. Interval of rent payment is not monthly, when lease in on a month-to-month basis.

H25 ≠ 5 and H21 = 1

79. Interval of rent payment is less than monthly, when lease period is usually at least one year.

H25 < 5 and H21 > 1

80. There was a general rent increase in past year, when a major problem with the neighborhood existed (gangs, air pollution, etc.).

H28 > 0 and G23 (any) = 1

81. There was a general rent increase in past year, when this property is in a worse location now than three years ago.

H28 > 0 and G12 = 2

82. The major ethnic/nationality change in neighborhood (from or to group) does not match largest ethnic nationality group here now.

H30 versus G16 - 21 (need codes)

83. Tenants complain about personal safety at least sometimes, while owner feels there is not a problem from street gangs or drug addicts.

H32K < 3 and (G23G = 3 or G23F = 3)

84. Property is completely vacant and unavailable for rent, while respondent plans are uncertain pending better mortgage terms, yet indicates that adequate financing for improvements is available.

12I = 10 and 18 = 1

85. Owner has had trouble with housing code enforcement, while the condition of the property is fair or better.

16 = 1 and 13 < 3

86. Owner has not had trouble with housing code enforcement, while condition of the property is poor or worse.

16 = 2 and 13 > 2

87. Owner plans major residential improvements on property, while converting to full or partial commercial use.

(111A = 1 or 111B = 2 or 111C = 3 or
111D = 4) and 111K = 11

88. Owner does not plan to raise rents while claiming an adequate return now, while, with all things considered, he is also getting an inadequate return.

119A = 1 and 132 = 2

89. Federal rent controls were claimed to have encouraged improvements on property or better maintenance or more building services.

120F = 6 or 120H = 8 or 120J = 10

90. Owner's reason for holding onto property differs from his reason for acquisition.

123 = 1 and A6 ≠ 1
123 = 2 and A6 ≠ 9
123 = 3 and A6 ≠ 2
123 = 4 and A6 ≠ 10
123 = 5 and A6 ≠ 5
123 = 6 and A6 ≠ 11
123 = 7 and A6 ≠ 7

91. Owner last tried to sell property before his latest date of acquisition.

124 < A1

92. Respondent feels market value of property is likely to increase or stay the same over next five years, while stating that the building has a poor future.

(130 = 1 or 130 = 3) and 126 = 5

93. Respondent feels future financial return from property will be better, while expecting its market value to decline.

134 = 1 and 130 = 2

94. Respondent feels future financial return from property will be worse, while expecting market value to increase.

134 = 2 and 130 = 1

95. Respondent feels future financial return from property will be worse, while expecting poor future for property.

134 = 2 and 126 = 5

96. Respondent feels that return will be better due to higher rents, while he has no plan to raise rents in next year unless he just raised them.

(135B = 2 or 135C = 3) and

(118 = 4 and 119G ≠ 7)

TENANT/HOMEOWNER SURVEY

1. Residence has no inside bathrooms.

   B5 = 0 and B6 = 0

2. Residence has a living room; respondent claims he needs another.

   B7a = 1 and B3b = 1

3. Residence has a kitchen; respondent claims he needs another.

   B7b = 2 and B3a = 1

4. Respondent wants more bedrooms than he has residents.

   B7c + B3f > G11

5. Respondent wants more bathrooms than he has residents.

   B7d + B5 + B6 > G11

6. Residence has a dining room; respondents claims he needs another.

   B7f = 5 and B3c = 1

7. Unit has no heating equipment.

   B19 = 7

8. Unit has been without operable flush toilet for more than 3 days in past 3 months.

   B31 > 3

9. Windows in good condition, yet insufficient ventilation.

   B32 = 1 and B30 = 2

10. Not all locks on windows and doors work.

    B35 = 2

11. Yards around building in bad condition and building in good condition.

    B43 > 2 and B42 = 1

12. Building in good condition; respondent very dissatisfied there.

    B42 = 1 and B44 = 4

13. Building in poor condition; respondent very satisfied there.

    B42 > 2 and B44 = 1

14. Repairs to building are slow in coming, yet respondent very satisfied there.

    B54 = 2 and B44 = 1

    Respondent complained to landlord about (15-21) and was satisfied with response; yet (15-21) is in poor condition; or was not satisfied with landlord response while (15-21) was in good condition.

15. Trash collection.

    B59b = 2 and (B52a or B526 part 3) > 2

16. Trash collection.

    B59b = 3 and (B52a or B52b part 3) < 2

17. Children.

    B59c > 1 and (B56c and B56b) = 2

18. Heating.

    B59e = 3 and B21 = 1

19. Hot water.

    B59f = 3 and B22 = 1

20. Pests.

    B59i = 3 and (B40 or B41) = 2

21. Safety.

    B59j = 2 and (B85 or B86) = 2

22. Children can get help from neighbors despite their unfriendliness.

    B82 = 1 and B81 = 1

23. Unsafe during day while safe at night.

    B89 = 2 and B88 = 1

24. Children under 12 are in household; landlord policy is no children.

    B91 = 1 and (B56b or B56c) = 2

25. Household contains children under 6 years; landlord policy is no young children.

    B97 = 1 and B56b = 2

26. Trash and litter are a neighborhood problem when yards are clean.

    B105e < 3 and B65 < 3

27. Neighborhood has gang problem; yet it is safe there.

    B105f < 3 and (B85 or B86) = 1

28. Neighborhood has problems with drunks or drug addicts; yet it is safe there.

    B105g < 3 and (B85 or B86) = 1

29. Area is worse than three years ago although schools are better and area is safer.

    B107 = 2 and B93 > 2 and B87 = (1 or 3)

30. HH prefers not to live near relatives, yet some live within 10 minutes.

    B109 = 4 and B110 = 1

31. Respondent dissatisfied with area while indicating that it is one of the better areas in the site.

    B127 ≥ 3 and B106 = 1

32. A lease was not signed when tenant moved in and a lease is now in effect.

    C4 = 2 and C5 = 2

33. Lease is on a month-to-month basis while the payment of rent is not on a monthly basis.

    C6 = 1 and C8 ≠ 4

34. Number of years respondent has paid same rent.

    1973 - C20

35. Date respondent moved in is after the date he indicates he began paying his current rent.

    C20 < D1

36. Respondent indicates rent has changed while he moved in after date current rent began.

    C21 = 1 and C20 < D1

37. Current rent is less than or equal to previous rent on residence even though rent change has occurred.

    C21 = 1 and C22 ≥ C9

38. Rent was paid by different period prior to last change in rent.

    C23 ≠ C8

39. Property purchased with financing other than land contract or mortgage.

    C43 = 8

40. Residence not in rural area, yet no electricity is used.

    C1 ≠ 1 and C94A = 2

41. Residence not in rural area, yet water not supplied by utility company.

    C1 ≠ 1 and C94E = 2

42. Some other fuel other than electricity or gas is used for air conditioning.

    C97A (air conditioning) = 1

43. Residence in nonrural area without public sewerage hookup.

    C1 ≠ 1 and C94G = 2

44. Farmed acreage on property exceeds total acreage.

    C126 < C125

45. Land contract price exceeds acquisition cost for property.

    C45 > (C34 or C35 or C36)

46. Length of mortgage loan exceeds 30 years when lender is private lending institution or government agency.

    C56 (grid) > 30 and C68 (grid) = (1 or 2)

47. Length of mortgage loan exceeds 5 years when lender is previous owner.

    C56 (grid) > 5 and C68 (grid) = 3

48. Length of mortgage loan exceeds 10 years when lender is friend or relative.

    C56 (grid) > 10 and C68 (grid) = 4

49. Lender not private lending institution, government agency, previous owner or friend or relative.

    C68 (grid) = 8

50. Length of loan extension exceeds 30 years.

    C62 (grid) > 30

51. Reason for loan was to improve or repair property when lender was previous owner.

    F66 (grid) = 3 and C68 (grid) = 3

52. Mortgage is FHA or VA insured and number of units in building exceed FHA or VA limit.

    C67 = 1 and limit exceeded

53. Mortgage is FHA or VA insured when acquisition price exceeds Federal FHA or VA limits.

    C67 = 1 and (C34ror C35 or C36) > limit

54. Maker of loan outside Wisconsin.

    C69 = outside Wisconsin code

55. A balloon payment is required on a conventional loan.

    C70 = 2 and C68 = 1

56. A balloon payment is required on a government loan.

    C70 = 2 and C68 = 2

57. More than two mortgages, contracts or loans paid off in last year.

    C74 > 2

58. Property has more than three insurance policies in force.

    C86 > 3

59. Insurance policies cover flooding.

    C87C = 3

60. Flood insurance has been cancelled.

    C93C = 3

61. When renter first moved in, he did not use electricity even though residence is in nonrural area.

    D16 = 3 and D19A = 1 and C1 ≠ 1

62. When renter first moved in, he did not use water (from utility) even though residence is in nonrural area.

    16 = 3 and D19B = 2 and C1 ≠ 1

63. Electricity was not used at previous address.

    D32 (electricity) = 2

64. Electricity was not used for lighting at previous address.

    D32A (electricity) ≠ 1

65. Did not use electricity in any of prior addresses #2 - #5.

    D77 (electricity) = 1

66. Did not use water in any of prior addresses #2 - #5.

    Q.77 (water) = 1

67. Did not use electricity or water when first moved into previous address #2 - #5.

    D88 (electricity or water) = 1

68. Did not use any electricity or gas or other fuel (heat) when first moved into previous address #2 - #5.

    D88 (electricity) = 1 and D88 (gas) = 1 and D88 (other fuels) = 1

69. Did not use any electricity or gas or other fuel (heat) just before moving out of previous address #2 - #5.

    D77 (electricity) = 1 and D77 (gas) = 1 and D77 (other fuels) = 1

70. HH received AFDC when there were no children of age 14 or under.

    G14 = 2 and G18 = 1

71. HH expects income from interest on savings while having no savings.

    G16 = 0 and G17 = 0 and G18q = 1

72. Landlord does not allow pets, yet HH has some.

    B56a = 2 and G24 > 1

73. Respondent works for the landlord in a farm capacity while property not in farming area.

    C12H = 8 and C1 $\neq$ 1

Appendix C

DISTRIBUTION CHECKS INVOLVING TRANSFORMATIONS OF RESPONSES

Distribution checks for the Landlord and Tenant/Homeowner instruments that involve transformation of questions and responses are listed below. Most of these transformations are expressed as ratios or differences.

LANDLORD SURVEY

1. Ratio of owner-estimated market value to acquisition value.

$$\frac{I29}{A10}$$

2. Fraction of household income from real estate less the fraction of respondent weekly hours in real estate out of total weekly hours worked. Resulting index is positive if the relative return from real estate exceeds the fraction of hours spent on real estate negative otherwise.

$$\frac{B8}{100} - \frac{B14}{B14 + A7}$$

3. Ratio of hours respondent spends weekly in real estate of total number of commercial and residential units he owns.

$$\frac{B14}{C5 + C31 + B12}$$

4. Ratio of cash rent received to potential rent on residential portion of property.

$$\frac{C11}{12*(C22A * C23A + \ldots + C22E * C23E + C27A * C28A + C27B * C27B)}$$

5. Ratio of cash rent received to number of units for residential portion of property.

$$\frac{C11}{C5}$$

6. Ratio of residential rent revenue vacancy loss to number of residential units.

$$\frac{C12}{C5}$$

7. Ratio of residential rent revenue bad debt loss to number of residential units.

$$\frac{C13}{C5}$$

8. Ratio of residential rent revenue loss due to vacancy and bad debt to number of residential units.

$$\frac{C12 + C13}{C11}$$

9. Ratio of rent given up to reduced or free rent to numbers of residential units.

$$\frac{C17}{C5}$$

10. Ratio of rent given up due to reduced or free rent to residential cash rent revenues.

$$\frac{C17}{C11}$$

11. Ratio of additional non-rent income from residential tenants to number of residential units.

$$\frac{C18}{C5}$$

12. Ratio of additional non-rent income from residential tenants to residential cash rent revenues.

$$\frac{C18}{C11}$$

13. Ratio of residential revenue received and foregone (vacancy, reduced rent, bad debt) to potential residential revenue based upon rental rates.

$$\frac{C17 + C15 * C16 + C13 + C12 + C11}{12*(C22A * C23A + \ldots + C22E * C23E + C27A * C28A + C27B * C28B)}$$

14. Ratio of number of commercial units to number of residential units on property.

$$\frac{C31}{C5}$$

15. Potential average commercial unit rent.

$$\frac{C32}{C31}$$

16. Ratio of commercial rent received to potential commercial rent.

$$\frac{C33}{C32}$$

17. Actual average commercial unit rent.

$$\frac{C33}{C31}$$

18. Average non-rent income from commercial tenants.

$$\frac{C34}{C31}$$

19. Ratio of non-rent income to rental income from commercial tenants.

$$\frac{C34}{C33}$$

20. Ratio of mobile home rent received to potential mobile home rent.

$$\frac{C39}{C38 * C37 * 12}$$

21. Average mobile home rental revenue.

$$\frac{C39}{C37}$$

22. Average mobile home rental revenue lost due to vacancy.

$$\frac{C40}{C37}$$

23. Average mobile home rental revenue lost due to bad debt.

$$\frac{C41}{C37}$$

24. Ratio of mobile home rent foregone (live-in owner) to average monthly mobile home rent.

$$\frac{C43}{C38}$$

25. Ratio of mobile home rental revenues + rental revenue foregone due to vacancy, bad debt and reduced rent to potential mobile home rent.

$$\frac{C45 + C44 * C43 + C41 + C40 + C39}{C37 * C38 * 12}$$

26. Ratio of total mobile home rent foregone due to reduced rent to actual mobile home rental revenue.

$$\frac{C45}{C39}$$

27. Ratio of average monthly mobile home space rent to average monthly mobile home rent.

$$\frac{C47}{C38}$$

28. Ratio of mobile home space rental revenue to potential mobile home space rent.

$$\frac{C48}{C46 * C47 * 12}$$

29. Average mobile home space rental revenue received.

$$\frac{C48}{C46}$$

30. Average mobile home space revenue loss due to vacancy.

$$\frac{C49}{C46}$$

31. Average mobile home space revenue loss due to bad debt.

$$\frac{C50}{C46}$$

32. Ratio of mobile home space monthly revenue foregone (live-in owner) to average mobile home space monthly rent.

$$\frac{C52}{C47}$$

33. Ratio of mobile home space revenue + rental revenue foregone due to vacancy, bad debt and reduced rent to potential mobile home space rent.

$$\frac{C54 + C50 + C49 + C48 + C52 * C53}{C46 * C47 * 12}$$

34. Average number of managers per unit on property.

$$\frac{D11A}{C5}$$

35. Average number of custodians and maintenance men per unit on property.

$$\frac{D11B}{C5}$$

36. Average number of gardeners per unit on property.

$$\frac{D11C}{C5}$$

37. Average number of doormen and guards per unit on property.

$$\frac{D11D}{C5}$$

38. Average number of bookkeepers per unit on property.

$$\frac{D11E}{C5}$$

39. Average number of secretaries per unit on property.

$$\frac{D11F}{C5}$$

40. Average number of other office help per unit on property.

$$\frac{D11G}{C5}$$

41. Average number of other employees per unit on property.

$$\frac{D11H}{C5}$$

42. Average total number of employees per unit on property.

$$\frac{D12}{C5}$$

43. Average number of repair/improvement jobs per unit on property.

$$\frac{E1A}{C5}$$

44. Fraction of acquisition cost covered by land contract.

$$\frac{F3}{A9}$$

45. Ratio of land contract cost to purchase price (fraction down payment).

$$\frac{F6 * F5}{F3}$$

46. Ratio of total indebtedness on property to acquisition cost.

$$\frac{F11}{A9}$$

47. Length of time loan carried until extended.

F18 = F12 if F18 = 1

48. Fraction of original loan length prior to extension.

$$\frac{F18 - F12}{F14} \quad \text{if} \quad F18 = 1$$

49. Difference between respondent stated monthly payment and true financial monthly payment based upon stated interest rate.

F22 - p (interest rate, term, extension, principal, balloon) separately for F22B = 1, 2, 3, 4

(taxes, insurance included in F22)

50. Difference between respondent stated remaining principal and remaining principal computed from interest rate and term of loan.

F23 - q (interest rate, term, extension, principal, balloon)

51. Ratio of original loan principal to property acquisition cost when purpose of loan is repair or improvement.

$$\frac{F23}{A9} \quad \text{if} \quad F24 = 3$$

52. Ratio of balloon payment to original loan principal plus increases.

$$\frac{F29}{F13 + F17} \quad \text{if} \quad F28 = 2$$

53. Difference between balloon payment and loan amount less principal amortized.

F29 - (F13 + r (interest rate, term, extension, principal))

54. Ratio of special tax assessment to value of property.

$$\frac{F37}{I29}$$

55. Ratio of annual real estate taxes to value of property.

$$\frac{F38}{I29}$$

56. Ratio of other taxes and fees to value of property.

$$\frac{F39}{I29}$$

57. Ratio of total insurance policy cost to value of property.

$$\frac{F43A + F43B + F43C}{I29} \quad \text{if} \quad F44 = 1$$

or

$$\frac{F45A + F45B + F45C}{I29} \quad \text{if} \quad F44 = 2$$

58. Ratio of major racial change -- number of families of type living on block to number three years ago.

$$\frac{G17}{G16}$$

59. Ratio of major racial change -- number of families of type respondent estimates will be living on block in one year tonnumber at present.

$$\frac{G18}{G17}$$

60. Average turnover of households (excluding evictions) per unit on property.

$$\frac{H15}{C5}$$

61. Average turnover of households due to eviction per unit on property.

$$\frac{H17}{C5}$$

62. Ratio of security/cleaning deposits to average monthly rent.

$$\frac{H27}{\text{Average monthly rent (from C23)}}$$

63. Ratio of cost to put property in good condition to estimated current market value.

$$\frac{I4}{I29}$$

64. Ratio of planned capital improvements (in next year) to estimated market value.

$$\frac{I12}{I29}$$

65. Average planned additional maintenance (in next year) cost per unit on property.

$$\frac{I16}{C5}$$

66. Ratio of equalized assessed value to estimated market value.

$$\frac{EQAV}{I29}$$

67. Ratio of purchase price of property to estimated market value.

$$\frac{A9}{I29}$$

TENANT/HOMEOWNER SURVEY

1. Number of rooms in residence per person.

$$\frac{B2}{G11}$$

2. Number of bathrooms in residence per person.

$$\frac{B5 + B6}{G11}$$

3. Number of bedrooms (or rooms used for sleeping) in residence per person.

$$\frac{B4}{G11}$$

4. Household income when yard used for drying laundry.

HH income (from E14 or F14) when B15g = 7

5. Household income when residence has inexpensive main heating unit.

HH income when B19 > 3

6. Remaining length of lease when lease other than month-to-month.

C7 - date of interview when C6 ≠ 1

7. Ratio of rent paid for house and land around house to total amount of rent paid for farm households only.

$$\frac{C9A}{C9} \quad \text{when} \quad C1 = 1$$

8. Ratio of parking fees to rent.

$$\frac{C28}{C9}$$

9. Length of time household has had this property.

1974 - C30

10. Ratio of cost of house and land around house for farming household to acquisition value of whole property.

acquisition value = C34 or C35 or C36

$$\frac{C38}{\text{acquisition value}}$$

11. Ratio of cost of improvements in first year to value added to property by improvements.

$$\frac{C41}{C42}$$

12. Ratio of amount of special tax assessments to current market value of the property.

$$\frac{C79}{C82}$$

13. Ratio of real estate taxes to current market value of the property.

$$\frac{C80}{C82}$$

14. Ratio of other taxes on property to current market value of the property.

$$\frac{C81}{C82}$$

15. Ratio of rent homeowner thinks he could get to current market value of property.

Ratio of [illegible] assessed value to current market value of property.

$$\frac{C83}{C82}$$

16. Ratio of equalized assessed value to current market value of property.

$$\frac{EQAV}{C82}$$

17. Sum of hours members of HH work on repair jobs without pay.

sum C104

18. Sum of money members of HH spent on repair jobs for which no reimbursement.

sum C103

19. Ratio of cost of homeowner repairs/improvements this year to current market value.

$$\frac{C117}{C82}$$

20. Ratio of farmed acres to total acreage.

$$\frac{C125}{C126}$$

21. Fraction of acquisition cost covered by land contract.

$$\frac{C45}{(C34 \text{ or } C35 \text{ or } C36)}$$

22. Ratio of land contract cost to purchase price (fraction down payment)

$$\frac{C45 * C48}{C45}$$

23. Ratio of total indebtedness on property to acquisition cost.

$$\frac{C53}{(C34 \text{ or } C35 \text{ or } C36)}$$

24. Length of time loan carried until extended.

C61 - C54 if C60 = 1

25. Fraction of original loan length expiring prior to extension.

$$\frac{C61 - C54}{C56} \quad \text{if} \quad C60 = 1$$

26. Difference between respondent stated monthly payment and true financial monthly payment based upon stated interest rate.

C64 - p (interest rate, term, extension, principal, balloon) separately for C64B = 1, 2, 3, 4

(taxes, insurance included in C64)

27. Difference between respondent stated remaining principal and remaining principal computed from interest rate and term of loan.

C65 - q (interest rate, term, extension, principal, balloon)

28. Ratio of original loan principal to property acquisition cost when purpose of loan is repair or improvement.

$$\frac{C65}{(C34 \text{ or } C35 \text{ or } C36)} \quad \text{if} \quad C66 = 3$$

29. Ratio of balloon payment to original loan principal plus increases.

$$\frac{C71}{C55 + C59} \quad \text{if} \quad C70 = 2$$

30. Difference between balloon payment and loan amount less principal amortized.

C71 - (C55 + r (interest rate, term, extension, principal)

31. Ratio of total insurance policy cost to value of property.

$$\frac{C88A + C88B + C88C}{129} \quad \text{if} \quad C89 = 1$$

$$\frac{C89A + C89B + C89C}{129} \quad \text{if} \quad C89 > 1$$

32. Average annual rent increase for renters.

$$\frac{C9 - D17}{1974 - C1} \quad \text{when} \quad D16 = 3$$

33. Ratio of value of house and land when owner moved into acquision value of the place.

$$\frac{D20}{(C34 \text{ or } C35 \text{ or } C36)}$$

34. Ratio of rent at last address to current rent.

$$\frac{D30}{C9}$$

35. Difference between acquisition value of current residence to value of residence at last address.

(C34 or C35 or C36) - D33

36. Ratio of full and half baths at previous address to number of rooms there.

$$\frac{D36 + D37}{D34}$$ (can also be done for prior address #2 - #5

37. Average annual rent increase at previous address.

$$\frac{D30 - D61}{\text{move out date - move in date}}$$ (can also be done for prior address #2 - #5)

38. Fractional change in value of house at previous address.

$$\frac{D33 - D64}{D64}$$ (can also be done for prior address #2 - #5)

39. Average number of rooms per person at previous address.

$$\frac{D68}{D34}$$ (can also be done for prior address #2 - #5)

40. Minutes required to get to work by transportation mode.

F9 x F8 (table)
E9 x E8 (table)

41. Ratio of value of food bought with food stamps to the cost of these stamps.

$$\frac{G23}{G22} \quad \text{when} \quad G21 = 1$$

42. Ratio of rent to total income.

$$\frac{C19 * 12}{G21}$$

43. Ratio of current market value of house to total annual income.

$$\frac{C81}{G21}$$

44. Total transfer payments.

G21a + ... + G21g

45. Total pension payments.

G21j + G21k + G21ℓ

Appendix D

MULTIVARIATE OUTLIER CHECKS

Multivariate outlier checks for the landlord and tenant/homeowner instruments are listed below. A description of the variables (separated by commas) and conditional variables (read the "|" as "given" or "subject to") is followed by an equivalent SRVANL* statement (occasionally an arithmetic or logical expression is inserted into the variable list which would in practice have to be evaluated as an intermediate variable). "WT" refers to weighting variable used to include or exclude certain classes of observations.

LANDLORD SURVEY

1. Purchase price, cost of improvements given owner's reason for acquisition.

   CHK (A8 or A9 or A11), A13|A6

2. Respondent age, hours at non-real-estate job, hours at real estate job, percentage of income from real estate given owner type (private, family, or firm).

   CHK B2, B7, B14, B8|B10

3. Percentage of firm's revenues from real estate, number of years in business given principal corporate activities for corporate owners only.

   CHK B18, B19|B16 WT from B10

4. Number of buildings on property, number of residential units, number of commercial units, age of structure, current property market value.

   CHK C1, C5, C31, 1974-C6, 129

5. Residential rent revenues, vacancy loss, bad debt loss, reduced rent loss, other residential income from tenants, number of residential units, current property market value.

   CHK C11, C12, C13, C15 * C16 + C17, C18, 129

6. Efficiency rent, one bedroom rent, two bedroom rent, three bedroom rent, four or more bedroom rent, other residential rent, number of residential units, current property market value.

   ~~CHK G23A, G23B,~~ C23C, C23D, C23E, C28A, C28B, C5, 129

*Survey Analysis computer program used in performing the multivatiate outlier checks.

7. Potential commercial rent revenue, actual commercial rent revenue, other revenue from commercial tenants, number of commercial units, current property market value.

   CHK C32, C33, C34, C31, 129

8. Number of mobile homes rented, average mobile home rent, number of mobile home spaces rented, average mobile home space rent, current property market value.

   CHK C37, C38, C46, C47, 129

9. Mobile home rent revenue, vacancy loss, bad debt loss, reduced rent loss, number of mobile homes, current property market value.

   CHK C39, C40, C41, C43 * C44 + C45, C37, 129

10. Mobile home space rent revenue, vacancy loss, bad debt loss, reduced rent loss, entrance/exit fees, other revenue from mobile home spaces, number of mobile home spaces, current property market value.

    CHK C48, C49, C50, C52 * C53 + C54, C55, C56, C46, 129

11. Cost of hiring someone to do respondent's work on property, total revenue produced by property given respondent type, property classification.

    CHK D5, total revenue (module C)|DA, property classification

    Property classification scheme:

    Property owned by single individual or with co-owner
    (1) one unit
    (2) 2+ units, landlord lives on property
    (3) 2-4 units, landlord does not live on property
    (4) 4+ units, landlord does not live on property

    Property owned by family or nonfamily corporation
    (5) 1-3 units
    (6) 4+ units

12. Number of: managers, janitors, gardeners, guards, bookkeepers, secretaries, office help, others working on property, number of residential units given property classification.

    CHK D11A, D11B, D11C, D11D, D11E, D11F, D11G, D11H, C5|property classification

13. Total employee cost including rent waivers, total revenue produced by property given property classification.

    CHK employee cost, total revenue|property classification

    employee cost = D14A (grid) summed + D17 (grid) summed when D18 (grid) = 2

14. Professional management firm cost, services performed, decision-making, total revenue from property given property classification.

    CHK D20, D21, D22, total revenue|property classification

15. Expenses to do with: lawyer, court, accountant, real estate agent, rent collection agent, etc., total revenue from property given property classification.

    CHK D24 (items 1-14), total revenue|property classification

16. Utility expenses, total revenue from property|property classification.

    CHK D29 (items 1-5), D31A, D31B, total revenue|property classification

17. Total depreciable capital repair/improvement job cost, total operating repair job cost, average yearly cost of repairs last three years given property classification.

    CHK E4C (grid summed on E6 = 1 and E6 = 2), E8|property classification

18. Same as 17, using total cash revenue from property.

    CHK E4C, E8, property revenue|property classification

19. Land contract amount, contract length, monthly contract payment given insurance included in payment, taxes included in payment.

    CHK F3, F5, F6|F7, F8

20. Number of mortgages outstanding, amount of indebtedness on this property, current market value of property.

    CHK F9, F11, 129

21. Mortgage amount, total monthly payment, total balloon payment given taxes included or insurance included in payment.

    CHK F13 (summed), F22 (summed), F29 (summed)|F22B

22. Special tax assessments, real estate taxes, total insurance cost, other expenses totaled, current market value.

    CHK F37, F38, F43 (or 45) summed, F53 summed

TENANT/HOMEOWNER SURVEY

The following checks should be performed separately, as appropriate, for owners and renters:

1. Number of rooms in unit, number of bedrooms, number of sleeping rooms, number of baths and half-baths.

   B2, B3f, B4, B5, + B6

2. Number of additional rooms needed, additional baths needed, additional bedrooms needed subject to number of rooms now, number of baths now, number of bedrooms now.

   B8, B8d, B8c|B2, Bt + B6, B4

3. Land contract amount, monthly contract payment, contract length subject to inclusion of insurance and real estate taxes in payment.

   C45, C48, C47|C49, C50

4. Number of mortgages outstanding, total indebtedness on this property, current market value of property.

   C51, C53, C81

5. Amount of mortgage, monthly payment, balloon payment subject to taxes and insurance inclusion in payment.

   C55, C64, C71|C64B

6. Special tax assessments, real estate taxes, total insurance cost, other expenses, current market value.

   C79, C80, C87 (or C89) summed, C120 summed, C81

7. Acreage assessed as farmland, total acreage of property, farm rent, rent for farm residence (for farms only).

   C125, C126, C9A WT = C1

8. Total number of people in household, educational attainment, number of rooms.

   G13, G2C, B2

9. Total transfer income, pension and support income, nonwage income, wage and salary income.

   G21(a-g), G21(h-m), G21(n-r), G21(s-v)

10. Total household income, monthly rent, size of household.
    G21, C19, G13

11. Total household income, market value of house, size of household.
    G21, C81, G13

Appendix E

CROSS-SURVEY CHECKS

LANDLORD AND TENANT/HOMEOWNER SURVEYS

Because our landlord and tenant samples are linked--tenants who are administered interviews live in structures owned by landlords who are also administered interviews--the audit can corroborate some information obtained from the landlord interview against information obtained from the tenant/homeowner interview. In some cases, we will find evidence of contradiction. In other cases there may simply be differences of opinion between landlords and tenants. But in all cases we must be sensitive to circumstances that can sharply curtail the strength of comparisons we draw between a tenant/homeowner and a landlord instrument.

Consider a landlord who owns a structure with more than eight units, or a landlord who owns a structure with seven or fewer units, but some of whose tenants have either refused or not completed a tenant/homeowner interview. We may then have a complete landlord interview relating to the entire structure, but we will have missed interviewing some of the occupants of the structure. It then becomes difficult to draw analogies between the landlord instrument, which relates to the building as a whole, and the tenant/homeowner instruments, which are primarily concerned with specific units in the structure. The situation resembles assembling a jigsaw puzzle which has had some crucial pieces removed.

However, if there are statements made by the landlord that should be true for every tenant, we can check whether they actually are true for every tenant. Also, if there are statements made by an individual tenant that should be distinctly reflected in the landlord's description of the entire structure, we can check to see if the tenant's information is reflected in the landlord's statements. In both cases, all that is required is a comparison of a single tenant/homeowner record against a matched landlord record. Our initial analysis will

be restricted to these types of checks. Additional comparisons using aggregated tenant data may be developed later, should they be warranted by the initial analysis.

In addition to tenant aggregation problems, there are difficulties when tenants moved into a structure during 1973. We then have landlord information that refers to the entire year, but tenant information for only part of the year. To deal with this problem, we proceed with the checks outlined in this note and simply report that the tenant moved into his unit during 1973, along with the comparison of his responses with his landlord's.

Landlords who acquired their properties during 1973 pose much more difficult problems than do tenants who have moved into a structure during 1973. If a tenant lived in a building for all of 1973 and the landlord changed during the year, we cannot be certain whether the tenant's comments refer to the present or previous landlord. We will report that there was landlord turnover during 1973, along with the comparison of tenant and landlord responses. We suspect that the value of such comparisons will be, at best, marginal.

It is also possible that a landlord acquired a building during 1973 and subsequently experienced complete tenant turnover. Here, turnover does not seem to impede a landlord-tenant comparison. Nevertheless, the fact that turnover took place will be reported.

Many other "legitimate" reasons for discrepant responses by landlords and their tenants can be imagined. They will be kept in mind in assessing the results of the cross-questionnaire checks which follow.

CHECK 1: IS THERE AN OWNER LIVING ON THE PROPERTY?

If LL:A:16=1 or if LL:A:18=1973 and THO:B:54=2 and THO:B:55=2 then the landlord claims an owner either is now living or has during 1973 lived on the property but there exists at least one tenant who claims there is no landlord, manager or superintendent living in the building.

Note that the landlord instrument refers to the property whereas the tenant instrument refers to the building. If there is more than one building on the property then this comparison may not be strictly valid. Check the number of buildings on the property through LL:C:2.

CHECK 2: DO THE LANDLORD AND TENANT AGREE ON A DESCRIPTION OF THE TENANT'S BUILDING?

If LL:C:2=1 then there is only one building on the property and it must be of the type claimed in LL:C:11. But if THO:B:67=1 and LL:C:1 ≠ 1 or 2 then the tenant claims to be renting a single family home whereas the landlord claims the main structure is not a single family home. And if THO:B:60=2 but LL:C:1=1 or 2 then tenant claims to be renting in a multiple family dwelling but the landlord claims the main structure is a single family dwelling.

However, if LL:C:2≥ and THO:B:53 contradicts LL:C:1 then we can only state that there exists at least one tenant who claims to be living in a building which does not resemble the main building on the property.

CHECK 3: DO THE LANDLORD AND TENANT AGREE ON A DESCRIPTION OF THE TENANT'S UNIT?

From THO:B:2 and THO:B:3f we can classify the tenant's description of his unit as one of the following:

1. An efficiency or one-room unit
2. A 1 bedroom unit
3. A 2 bedroom unit
4. A 3 bedroom unit
5. A unit with 4 or more bedrooms
6. An 'other residential unit'

Then compare against LL:C:21. If unit type claimed by tenant does not show up in LL:C:21 then there exists a tenant who claims to be living in a unit which the landlord has not included in his enumeration of units.

CHECK 4: IS THE RENT THE LANDLORD CLAIMS TO RECEIVE CLOSE TO THE RENT THE TENANT CLAIMS TO BE PAYING?

We can proceed with this check only if check 3 did not result in a contradiction.

From LL:C:23 or LL:C:28 we can compute the annualized average rent corresponding to the type of unit occupied by the tenant. Call this variable LRENT.

From THO:C:8 and THO:C:9 we can compute the tenant's annualized rent payment. Call this variable TRENT.

If LRENT > 1.05 x TRENT or LRENT < .95 x TRENT then the difference between the landlord's statement of average rent for the unit occupied by the tenant differs by more than 5% from the rent the tenant claims to be paying. This result should be reported.

Since the landlord questionnaire is extremely vague as to what revenue should be included or excluded from the calculation of average rent, we should compare various measures of tenant rent payment against the average value claimed by the landlord in LRENT.

If the landlord's figure is higher than the tenant's then it is possible that the landlord is not excluding any rent reductions. From THO:C:19 we can compute TRENT1, the tenant's rent before any such reductions are made. LRENT can then be compared against TRENT1 to see if it is greater than 105% of TRENT1. If it is, this fact should be reported.

If the landlord's figure is still over 105% of TRENT1 then we can compute TRENT2 which adds the annualized value of THO:C:28, the parking charge, to TRENT1 and then compare LRENT against TRENT2. If LRENT is yet greater than 105% of TRENT2 then we have a disparity between the landlord interpretation of rent and the most generous computation of tenant rent.

If the landlord's rent figure is lower than the tenant's it may be the case that a rent increase came into effect during the course of 1973 and the landlord has based his computation on the pre-increase rents. We should therefore compute TRENT3, annualized rent as stated in THO:C:22, and compare LRENT against TRENT3. If LRENT is still under 95% of TRENT3 then we have a disparity between the landlord's interpretation of rent and the most stringent computation of tenant rent.

It is possible, though unlikely, that THO:C:22 will be greater than THO:C:8, in which case rent will have been reduced by the landlord. If this occurs we should compare LRENT against TRENT3 as another upper bound, not as a lower bound on the landlord's interpretation of rent.

CHECK 5: DO WE HAVE ANY EVIDENCE THAT THE EMPLOYEES THE LANDLORD CLAIMS TO HAVE HIRED ACTUALLY PERFORMED ANY WORK ON THE PROPERTY?

In LL:D:11 job categories A, B, C, D and H seem to correspond to the tasks about which questions are asked in THO:B:57 parts 1 through 5. If the landlord claims to have hired at least one person to fill any of positions A, B, C, D or H of LL:D:11 then that person should have

performed at least one of tasks 1 through 5 of THO:B:57. If the response of a tenant to parts 1 through 5 of THO:B:57 is 3 and the landlord claims to have hired a person for position A, B, C, D or H of LL:D:11 then there exists a tenant who claims that the work that should have been done by such an employee was not done at all. This finding casts doubt on the landlord's claim of personnel expenses.

Additionally, if any response to THO:B:57 parts 1 through 5 is 2 then a tenant claims that tenants perform some maintenance tasks and there should be an entry of 1 in at least one element of LL:D:15 -- the question that asks the landlord if any of his employees lived on a property of the landlord's during 1973. If this condition is not met then there exists a tenant who claims that tenants perform a certain task for a landlord who does not recognize that he had an employee living on his own property.

CHECK 6: DO LANDLORDS AND TENANTS AGREE ON THE EXISTENCE OF RENT DISCOUNTS FOR WORK PERFORMED?

If THO:C:11=2 or 3 but LL:D:16 parts 1 through 4 all equal 2 then a tenant claims to be receiving a rent discount for work performed for the landlord but the landlord claims not to have given any rent discounts to employees living on his property.

In the case of a single-family house occupied by only one household we can check if any of LL:D:16 parts 1 through 4 equal 1 but THO:C:11 $\neq$ 2 or 3. In that case the landlord claims to have offered a rent discount for work done but the only tenants on the property claim not to have received a rent discount.

CHECK 7: DO LANDLORDS AND TENANTS AGREE AS TO WHETHER THE LANDLORD HAS PAID A TENANT FOR WORK PERFORMED ON HIS PROPERTY?

If THO:C:11=1 or 3 but LL:D:13b $\neq$ 0 and LL:D:15=2 for parts 1 through 4 then the landlord claims to have no paid employees living on his property but there exists a tenant who claims to have been paid for work done for the landlord.

In the case of single family home rentals occupied by only one household we can check if LL:D:13b $\neq$ 0 and LL:D:15=1 for parts 1 through 4 but THO:C:11 $\neq$ 1 or 3. In that case the landlord claims to have paid a tenant for work performed but the only tenant does not claim to have been paid for work performed for the landlord.

CHECK 8: DO LANDLORD AND TENANT AGREE ON THE TYPE OF WORK PERFORMED BY THE TENANT FOR THE LANDLORD?

When a tenant claims that he has performed some work for the landlord we can compare THO:C:12 against LL:D:11 and LL:D:15.

If (LL:D:11a=0 but THO:C:12=01)
or (LL:D:11b=0 but THO:C:12=02)
or (LL:D:11c=0 but THO:C:12=03)
or (LL:D:11d=0 but THO:C:12=04)
or (LL:D:11e=0 but THO:C:12=05)
or (LL:D:11f=0 but THO:C:12=06)
or (LL:D:11g=0 but THO:C:12=07)
or (LL:D:11h=0 but THO:C:12=08 or 88)

then the landlord claims he hired no one to perform the job for which a tenant claims to have received a payment or a rent reduction.

If (LL:D:11a>0 and the corresponding LL:D:15=2 but THO:C:12=01)
or (LL:D:11b>0 and the corresponding LL:D:15=2 but THO:C:12=02)
or (LL:D:11c>0 and the corresponding LL:D:15=2 but THO:C:12=03)
or (LL:D:11d>0 and the corresponding LL:D:15=2 but THO:C:12=04)
or (LL:D:11e>0 and the corresponding LL:D:15=2 but THO:C:12=05)
or (LL:D:11f>0 and the corresponding LL:D:15=2 but THO:C:12=06)
or (LL:D:11g>0 and the corresponding LL:D:15=2 but THO:C:12=07)
or (LL:D:11h>0 and the corresponding LL:D:15=2 but THO:C:12=08 or 09)

then the landlord claims to have hired persons who did not live on his property to perform a job for which a tenant claims to have received a payment or a rent reduction.

CHECK 9: DO LANDLORD AND TENANT AGREE ON THE TYPE OF EQUIPMENT USED TO HEAT THE STRUCTURE?

If LL:D:26 $\neq$ THO:B:21 then there exists a tenant whose description of the type of equipment used to heat the structure does not agree with the landlord's description.

CHECK 10: DO TENANTS CLAIM TO BE SERVED BY SOME UTILITIES WHICH THE LANDLORD CLAIMS ARE NOT PRESENT ON THE PROPERTY?

If (LL:D:27 part 1=2 and THO:C:94 part 1=1)
or (LL:D:27 part 2=2 and THO:C:94 part 2=1)
or (LL:D:27 part 3=2 and THO:C:94 part 4=1)
or (LL:D:27 part 4=2 and THO:C:94 part 5=1)
or (LL:D:31 part 1=2 and THO:C:94 part 6=1)
or (LL:D:31 part 2=2 and THO:C:94 part 7=1)

then the tenant claims to be served by a utility which the landlord claims is not present on the property.

In the case of single family homes occupied by one household we can also check if utilities which the tenant claims are not present are also listed as not being present by the landlord.

If (LL:D:27 part 1=1 and THO:C:94 part 1=2)
or (LL:D:27 part 2=1 and THO:C:94 part 2=2)
or (LL:D:27 part 3=1 and THO:C:94 part 4=2)
or (LL:D:27 part 4=1 and THO:C:94 part 5=2)
or (LL:D:31 part 1=1 and THO:C:94 part 6=2)
or (LL:D:31 part 2=1 and THO:C:94 part 7=2)

then the only tenant on the property does not claim to be served by a utility which the landlord claims serves the property.

CHECK 11: DO TENANTS CORROBORATE ALL THE CLAIMS OF A LANDLORD CONCERNING WORK DONE ON HIS PROPERTY?

If (LL:E:1 part a>0 but THO:C:98 part a=2 or THO:C:101 part f=2)
or (LL:E:1 part b>0 but THO:C:98 part c=2 or THO:C:99 part b=2 or THO:C:101 part b=2)
or (LL:E:1 part c>0 but THO:C:98 part b=2 or THO:C:99 part a=2 or THO:C:101 part a=2)
or (LL:E:1 part d>0 but THO:C:98 part d=2 or THO:C:101 part c=2)
or (LL:E:1 part e>0 but THO:C:98 part j=2 or THO:C:101 part h=2)
or (LL:E:1 part f>0 but THO:C:98 part j=2)
or (LL:E:1 part g>0 but THO:C:98 part e=2 or THO:C:101 part g=2)
or (LL:E:1 part h>0 but THO:C:98 part f=2 or THO:C:101 part e=2)
or (LL:E:1 part i>0 but THO:C:98 part g=2 or THO:C:101 part d=2)
or (LL:E:1 part j>0 but THO:C:98 part h=2 or THO:C:101 part i=2)
or (LL:E:1 part k>0 but THO:C:98 part i=2)
or (LL:E:1 part l>0 but THO:C:99 part c=2)
or (LL:E:1 part m>0 but THO:C:99 part d=2)
or (LL:E:1 part n>0 but THO:C:99 part e=2)
or (LL:E:1 part o>0 but THO:C:99 part f=2)
or (LL:E:1 part p>0 but THO:C:99 part g=2)
or (LL:E:1 part q>0 but THO:C:98 part j=2)

then there exists a tenant who does not corroborate a landlord's claim that he performed a specific type of job on the property.

Note that the comparison involving LL:E:1 part p is weak because the landlord instrument includes fire escapes whereas the tenant instrument does not. Note also that LL:E:1 part q and THO:C:98 part j are miscellaneous categories and their comparison may be ambiguous.

If the tenant lives in a single family rental structure then we can also check to see if a landlord has overlooked a job mentioned by the tenant. This check can be carried out by replacing the 'greater than zero' condition in the anterior landlord clauses by an 'equal to zero' condition and replacing all the 2's in the posterior tenant/homeowner clauses with 1's.

CHECK 12: IS THE PROPERTY IN A BLOCKED OR AN UNBLOCKED AREA?

If (LL:G:1=1 but THO:B:70=2 or 3)
or (LL:G:1=2 but THO:B:70=1)

then there exists at least one tenant whose perception of whether the unit is situated in a blocked or unblocked area does not agree with the landlord's.

CHECK 13: DO TENANT AND LANDLORD AGREE ON THE CONDITION OF OTHER BUILDINGS IN THE VICINITY?

If LL:G:2 ≠ THO:B:72 then the landlord and tenant disagree as to the condition of buildings in the vicinity.

CHECK 14: DO LANDLORD AND TENANT AGREE ON THE CONDITION OF YARDS IN THE VICINITY?

If LL:G:3 ≠ THO:B:73 then the landlord and tenant disagree as to the condition of yards and grounds in the vicinity.

CHECK 15: DO THE LANDLORD AND TENANT AGREE ON THE CONDITION OF THE BUILDING IN RELATION TO OTHER BUILDINGS IN THE VICINITY?

If LL:6:4 ≠ THO:B:74 then the landlord and tenant disagree as to the condition of the building relative to the condition of other buildings in the vicinity.

CHECK 16: DO LANDLORD AND TENANT AGREE ON THE NUMBER OF NEW BUILDINGS PUT UP IN THE VICINITY?

If LL:G:5 ≠ THO:B:75 then the landlord and tenant disagree as to the number of new buildings constructed in the vicinity.

CHECK 17: DO LANDLORD AND TENANT AGREE ON THE NUMBER OF CONVERSIONS WHICH HAVE TAKEN PLACE IN THE VICINITY?

If LL:G:8 ≠ THO:B:78 then landlord and tenant disagree on the number of conversions which have taken place in the vicinity.

CHECK 18: DO LANDLORD AND TENANT AGREE ON THE NUMBER OF BUILDINGS WHICH HAVE BEEN ABANDONED OR BOARDED UP IN THE VICINITY?

If LL:G:9 ≠ THO:B:76 then landlord and tenant disagree on the number of buildings which have been abandoned or boarded up in the vicinity.

CHECK 19: DO LANDLORD AND TENANT AGREE ON THE NUMBER OF DEMOLITIONS WITHOUT REPLACEMENT IN THE AREA?

If LL:G:10 ≠ THO:B:69 then landlord and tenant disagree as to the number of structures which have been torn down without replacement in the vicinity.

CHECK 20: DO LANDLORD AND TENANT AGREE ON THE TREND IN AUTOMOBILE TRAFFIC?

If LL:G:11 ≠ THO:B:80 then the landlord and tenant disagree as to the trend in traffic density in the vicinity.

CHECK 21: DO LANDLORD AND TENANT AGREE ON THE NATURE OF ANY CHANGES IN THE RACIAL COMPOSITION OF PERSONS LIVING IN THE VICINITY?

If LL:G:14 ≠ THO:B: then the landlord and tenant disagree as to whether or not there has been any change in the racial composition of people living in the vicinity.

If both agree that there has been a change, LL:G:14 = 1 and THO:B:84=1, then we can compare LL:G:15a against THO:B:85a and LL:G:15b against THO:B:76b to see if the landlord and tenant agree on the racial group that is decreasing and the racial group that is increasing in the neighborhood.

If landlord and tenant agree on the racial groups that are decreasing and/or the racial groups that are increasing in the neighborhood then we can compare LL:G:16 against THO:B:86 to see if they agree on the number of families which belong to the decreasing racial group and/or LL:G:17 against THO:B:87 to see if they agree on the number of families which belong to the increasing racial group.

Furthermore, if there is agreement between landlord and tenant as to the increasing racial group, LL:G:15b - THO:B:85b then we can compare LL:G:18 against THO:B:88 to see if the landlord and tenant agree as to the potential growth of this racial group in the vicinity.

CHECK 22: DO LANDLORD AND TENANT AGREE ON SAFETY AFTER DARK?

If LL:G:21 ≠ THO:B:94 then landlord and tenant disagree on the safety of walking the streets after dark.

CHECK 23: DO LANDLORD AND TENANT AGREE AS TO WHETHER THE NEIGHBORHOOD HAS BECOME MORE OR LESS SAFE?

If LL:G:22 ≠ THO:B:96 then landlord and tenant disagree as to whether the neighborhood has become more or less safe.

CHECK 24: DO LANDLORD AND TENANT SHARE THE SAME PERCEPTIONS AS TO WHAT CONDITIONS ARE PROBLEMS IN THE NEIGHBORHOOD?

There is disagreement between landlord and tenant as to the problem caused by:

the condition of streets	if LL:G:23a ≠ THO:B:114b;
the condition of street lighting	if LL:G:23b ≠ THO:B:114a;
noise	if LL:G:23c ≠ THO:B:114c;
air pollution	if LL:G:23d ≠ THO:B:114d;
litter and trash	if LL:G:23e ≠ THO:B:114e;
juveniles	if LL:G:23f ≠ THO:B:114f;
drugs and drug users	if LL:G:23g ≠ THO:B:114g;
dangerous traffic	if LL:G:23h ≠ THO:B:114h.

CHECK 25: DO LANDLORD AND TENANT AGREE ON WHETHER THEY ARE RELATED TO ONE ANOTHER?

In multiple family units if LL:H:6=2 but THO:C:14=1, then a landlord claims not to have any relatives on the property but there exists at least one tenant who claims to be related to the landlord. If LL:H:7=1 and THO:C:14=2 then the landlord claims to be related to all tenants living on the property but there exists a tenant who claims not to be related to the landlord.

In single family rental structures, if LL:H:5 $\neq$ THO:C:14 then landlord and tenant disagree on whether they are or are not related.

CHECK 26: DOES THE TENANT'S DESCRIPTION OF HIS HOUSEHOLD CONFORM WITH THE LANDLORD'S PERCEPTION?

From Questions 4, 5, 6, 7, 8a and 21 of Module G in the Tenant/Homeowner we can categorize the tenant's household into the groups which appear in LL:H:12 (for tenants living in single family rentals), LL:H:14 (for tenants living in multiple family rentals) and LL:H:40 (for all tenants). We can name each categorization based on Module G, HTYPE1, HTYPE2, and HTYPE3 respectively.

For single family rentals if LL:H:12 and LL:H:13 do not correspond with HTYPE1 then landlord and tenant do not agree on the composition of the household.

For tenants living in multiple family rentals if HTYPE2 does not appear in LL:H:14 then the landlord has either overlooked some tenants in his listing or has described some tenants inaccurately.

For all tenants if HTYPE3 appears as response of 2 in LL:H:40 then the landlord seems to be renting to a household which he claims he would prefer not to be renting to.

CHECK 27: DOES THE LANDLORD'S DESCRIPTION OF LEASING ARRANGEMENTS AGREE WITH THE TENANT'S?

If LL:H:19=1 but THO:C:4=2 and THO:C:5=2 then the landlord claims that tenants "usually sign a lease or rental agreement" but a tenant claims that there is no lease in effect on his unit and that he did not sign a lease upon moving into his unit.

If LL:H:19=2 but THO:C:4=1 or THO:C:5=1 then the landlord claims that tenants do not "usually sign a lease or rental agreement" but a tenant claims that lease in effect on his unit on that he signed a lease upon moving into his unit.

If LL:H:19=1 and THO:C:4=1 or THO:C:5=1 then landlord and tenant agree as to the existence of a lease and we can compare LL:H:21 against THO:C:6 to see if landlord and tenant agree as to the length of leases usually issued.

And if the landlord claims that all leases expire on the same day, LL:H:23=1 then we can compare the date of expiration in LL:H:24 against the date of expiration in THO:C:7.

CHECK 28: DO LANDLORD AND TENANT AGREE AS TO THE USUAL PERIOD OF RENT PAYMENT?

If LL:H:25 ≠ THO:C:8 then the tenant claims to be paying rent at intervals which do not correspond with the landlord's statements as to the period of rent payment. Note that LL:H:25 has the categories "daily," "weekly" and "combination" which do not appear in THO:C:8.

CHECK 29: DOES THE LANDLORD'S PERCEPTION OF COMPLAINTS CORRESPOND WITH THE TENANT'S CLAIM OF COMPLAINTS?

If
(THO:B:66a=1 but LL:H:32a=1 or 2)
(THO:B:66b=1 but LL:H:32b=1 or 2) or
(THO:B:66c=1 but LL:H:32c=1 or 2) or
(THO:B:66d=1 but LL:H:32d=1 or 2) or
(THO:B:66e=1 but LL:H:32e=1 or 2) or
(THO:B:66f=1 but LL:H:32f=1 or 2) or
(THO:B:66g=1 but LL:H:32g=1 or 2) or
(THO:B:66h=1 but LL:H:32h=1 or 2) or
(THO:B:66i=1 but LL:H:32i=1 or 2) or
(THO:B:66j=1 but LL:H:32j=1 or 2)
(THO:B:66k=1 but LL:H:32k=1 or 2)
then a tenant claims not to have contacted a landlord about a problem which the landlord claims to have been contacted about. If all the anterior THO conditions are changed so that 3 replaces 1 and all the posterior LL conditions are changed so that 3 replaces 1 or 2 then the above checks will catch landlords who claim they were never contacted about a condition with which a tenant is dissatisfied and claims to have contacted the landlord.

CHECK 30: DO THE MEANS BY WHICH TENANTS CLAIM TO HAVE FOUND THEIR UNIT CORRESPOND TO THE MEANS BY WHICH LANDLORDS CLAIM TO SEARCH FOR TENANTS?

If
(LL:H:37=2 but THO:D:8=02) or
(LL:H:38≠1 but THO:D:8=01) or
(LL:H:38≠2 but THO:D:8=05, 06, 07, 08 or 09) or
(LL:H:38≠3 but THO:D:8=04) or
(LL:H:38≠4 but THO:D:8=03)

then the tenant claims to have found his unit through a medium which the landlord claims he doesn't employ.

CHECK 31: IS THE LANDLORD'S STATEMENT AS TO THE TYPES OF TENANTS HE PREFERS TO RENT TO CONTRADICTED BY THE TENANT'S PERCEPTION OF WHOM THE LANDLORD IS WILLING TO RENT TO?

If
(LL:H:40a=1 but THO:B:63a=2) or
(LL:H:40c=1 but THO:B:63b=2) or
(LL:H:40d=1 but THO:B:63c=2) or
(LL:H:40h=1 but THO:B:63f=2) or
(LL:H:40l=1 but THO:B:63d=2) or
(LL:H:40n=1 but THO:B:63e=2) or
(LL:H:40p=1 but THO:B:63g=2)

then the landlord claims he would prefer to rent to a type of tenant a present tenant claims the landlord is not willing to rent to.

If all the 1's in the anterior landlord claims are replaced by 2's and all the 2's in the posterior tenant/homeowner clauses are replaced by 1's then a tenant claims that a landlord is willing to rent to a type of tenant to whom the landlord claims he would prefer not to rent.

CHECK 32: DO LANDLORD AND TENANT AGREE ON THE CONDITION OF THE BUILDING?

If LL:I:3 $\neq$ THO:B:47 then landlord and tenant perceptions of the building's condition differ.

LANDLORD AND RESIDENTIAL BUILDING SURVEYS

There is a major complication involved in comparing a SRB with a landlord survey: we must be certain that the main building the landlord identifies in Question 1 of Module C is the one the evaluator considered in filling out the SRB. If there is some confusion on this point, many of the following checks will be difficult to interpret.

CHECK 1: IS THE NUMBER OF BUILDINGS ON THE LOT TO BE SURVEYED BY THE SRB THE SAME AS THE NUMBER OF BUILDINGS THE LANDLORD CLAIMS TO BE ON THE PROPERTY?

If the unnumbered question which corresponds to columns 23-24 of the first card image of the SRB is not equal to LL:C:2 then the landlord's statement as to the number of buildings on the property does not agree with the evaluator's statement as to the number of buildings on the lot to be surveyed.

Note that if column 25 of the first card image on the SRB is coded 3 and the corresponding Landlord instrument is not coded so that LL:C:35=1 or LL:C:1=6 then the evaluator claims to be looking at a mobile home in a mobile home park whereas the landlord claims there are no mobile home spaces on his property.

CHECK 2: DO THE SRB AND LANDLORD REINFORCE EACH OTHER WITH REGARD TO THE LANDLORD'S INTENTION TO SELL HIS PROPERTY?

If LL:I:28 part c=1 but SRB:1≠1, 3 or 4 then the landlord claims he is advertising his intentions to sell with signs on the building but the SRB claims there are no "for sale" or "sold" signs on the building.

If LL:I:28 part c=2 but SRB:1=1, 3 or 4 then the landlord claims he is not advertising his intentions to sell with signs on the building but the SRB claims there are "for sale" or "sold" signs on the property.

The above conditions should be softened by the observation that if the landlord recently acquired his structure (LL:A:1=1973 and LL:A:2>9 or LL:A:1=1974) then the fact that there is a 'sold' sign on the property (SRB:1=4) should not raise a flag even though Module I of the landlord instrument claims he has no intention of selling.

CHECK 3: DO THE SRB AND LANDLORD REINFORCE EACH OTHER WITH REGARD TO THE LANDLORD'S INTENTION TO RENT HIS PROPERTY?

If LL:H:38 ≠ 3 but SRB:1=1 or 2 then the landlord claims he does not find tenants through signs on the building but the evaluator claims "for rent" signs were posted on the structure.

CHECK 4: DO THE LANDLORD AND SRB AGREE AS TO THE OCCUPANCY STATUS OF THE STRUCTURE?

If LL:H:1=3 but SRB:2=1 then the landlord claims his structure is completely vacant but the evaluator claims the structure is fully or partially occupied.

If LL:H:1=1 or 2 but SRB:2=2 then the landlord claims his structure is fully or partially occupied but the evaluator claims it is totally vacant.

CHECK 5: DO THE EVALUATOR AND LANDLORD AGREE AS TO WHETHER THE BUILDING IS HABITABLE OR NOT?

If LL:I:2=1 but SRB:3=2 then the landlord claims the structure is unfit for occupancy but the evaluator claims the structure is not uninhabitable.

If LL:I:2 ≠ 1 but SRB:3=1 then the evaluator claims the structure is either uninhabitable, completely dilapidated, condemned or destroyed but the landlord claims that it is fit for occupancy.

If SRB:3=9 but LL:I:2≠3 or 4 then the evaluator claims the building is totally vacant and under construction but the landlord claims that plans to rebuild or remodel have nothing to do with the building being unoccupied.

CHECK 6: DO THE SRB AND LANDLORD OFFER SIMILAR DESCRIPTIONS OF THE STRUCTURE?

If SRB:4=1 or 3 but LL:C:1 ≠ 1, 2 or 5 then the evaluator claims that the structure is either a detached single family housing unit or an attached single family housing unit but the landlord claims it is not a single family home, or a mixed residential commercial structure.

If SRB:4=2 but LL:C:1 ≠ 4 or 5 then the evaluator claims the structure is a semi-detached single family housing unit (or side-by-side duplex) but the landlord claims it is not a duplex or multiple family apartment house or a mixed commercial residential structure.

If SRB:4=4 but LL:C:1 ≠ 3, 4 or 5 then the evaluator claims the structure is a multiple family apartment house whereas the landlord claims it is neither a residential hotel, roominghouse, multiple family apartment house or mixed residential commercial structure.

If SRB:4=5 but LL:C:35=2 or LL:C:1=6 then the evaluator claims he is looking at a mobile home but the landlord claims there are no mobile home spaces on his property.

CHECK 7: IS THE LANDLORD'S STATEMENT OF REPAIRS, IMPROVEMENTS OR PLANS FOR THE INTERIOR OF HIS PROPERTY AT ODDS WITH THE EVALUATOR'S OBSERVATIONS AS TO THE INTERIOR CONDITION OF THE PROPERTY?

If LL:E:1 parts a, b, c, d, g, h, i, j, k, m and q = 0 and LL:I:11 ≠ 01, 02, 03, 05, 06, 07, 08, 11, 88 but SRB:7 part j=9 then the SRB indicates that there is overall interior construction, remodelling or renovation whereas the landlord gives no indication having carried out major interior repairs or of having plans to carry out major interior repairs.

If LL:E:1 part d=0 and LL:I:11 ≠ 88 but SRB:7 part b=9 then the evaluator claims that floors are either under construction, being renovated or being remodeled but the landlord claims he did no work on flooring in 1973 and that he has no intention of performing flooring work (which should fall in LL:H:11's miscellaneous category) in the future.

If LL:E:1 part k=0 and LL:I:11 ≠ 88 but SRB:7 part d=9 then the evaluator claims work is being done on windows and skylights but the landlord claims that no work was carried out on window glass, screens, storm windows, doors or locks and that no miscellaneous major capital improvements were planned.

If LL:E:1 part k=0 and LL:I:11 ≠ 88 but SRB:7 part a=9 then the evaluator claims work is in progress on doors but the landlord does not give any indication of having performed or planned work on doors.

Note: No checks were constructed for parts c, e, f, g, h or i of Question 4 of the SRB, corresponding to walls, ceilings, lighting fixtures, mailboxes, stairways/banisters and elevators, because they did not correspond unambiguously to any categories to be found in the landlord instrument.

CHECK 8: IS THE NUMBER OF HOUSING UNITS LISTED ON THE LANDLORD AND SRB IDENTICAL?

If LL:C:5 $\neq$ SRB:17 then the number of permanent residential units listed on the landlord is not equal to the number of housing units listed in the SRB. Check is to be used only if the landlord claims there is only one structure on the property.

CHECK 9: ARE THE SRB AND LANDLORD CONSISTENT WITH REGARD TO THE EXISTENCE OF COMMERCIAL OR INDUSTRIAL SPACE IN THE BUILDING?

If LL:C:1=5 but SRB:18=2 then the landlord claims that the main building is mixed residential-commercial but the SRB claims the structure is not mixed residential-commercial.

If LL:C:1 $\neq$ 5 but SRB:18=1 then the SRB claims the structure is mixed residential-commercial but the landlord does not.

CHECK 10: IS THE NUMBER OF BUSINESSES LOCATED IN THE BUILDING (INCLUDING VACANT COMMERCIAL SPACE) AS LISTED IN THE SRB EQUAL TO THE NUMBER OF COMMERCIAL UNITS AS LISTED ON THE LANDLORD?

If LL:C:31 $\neq$ SRB:19 then there is disagreement between the number of commercial spaces noted by the landlord and the number of businesses (including vacancies) enumerated by the evaluator.

CHECK 11: IS THE LANDLORD'S STATEMENT OF REPAIRS, IMPROVEMENTS OR PLANS FOR THE EXTERIOR OF HIS PROPERTY AT ODDS WITH THE EVALUATOR'S OBSERVATIONS AS TO THE EXTERIOR CONDITION OF THE PROPERTY?

If LL:E:1 part λ=0 and LL:I:11 $\neq$ 09 but SRB:24 parts a or b=9 then the evaluator claims a roof or gutters are under construction whereas the landlord claims not to have performed any work on roofing or gutters nor does he claim to be planning major capital improvements on his roofing.

If LL:E:1 part k=0 and LL:I:11 $\neq$ 88 but SRB:24 parts e, f, g, h, i or j = 9 then the evaluator claims work is being done on windows or doors whereas the landlord gives us no reason to expect to find work being done on windows or doors.

If LL:E:1 part p=0 and LL:I:11 $\neq$ 88 but SRB:24 part l=9 then the evaluator claims work is being done on fire escapes but the landlord gives us no reason to expect to find work being done on fire escapes.

If LL:E:1 parts a and q=0 and LL:I:11 ≠ 01, 02, 03, 11 or 88 but SRB:24 part n=9 then the evaluator claims that a garage or a miscellaneous structure is under construction but the landlord gives us no reason to expect to find such work being done.

If LL:E:1 part o=0 and LL:I:11 ≠ 88 but SRB:24 part o=9 then the evaluator claims work is in progress on the sidewalk or driveway but the landlord gave no indication of having either carried out or planned any paving.

Note: No checks were constructed for parts c, d and k of Question 24 in the SRB because there was no clear correspondence to categories in the landlord survey.

CHECK 12: IS THE LANDLORD'S STATEMENT OF TENANT COMPLAINTS ABOUT LITTER AT ODDS WITH THE EVALUATOR'S OBSERVATIONS?

If LL:H:32 part c=1 or LL:G:23 part e=1 but SRB:29=1 then the landlord claims that tenants frequently complain of litter or that litter is a big problem in the vicinity but the evaluator considers the building very clean.

If LL:H:32 part c=3 or LL:G:23 part e=3 but SRB:29=3 or 4 then the evaluator claims there is a great deal of litter and trash about the structure but the landlord claims that tenants never complain or that trash and litter is not a problem in the vicinity.

CHECK 13: IS THERE A SHARP DISAGREEMENT BETWEEN THE LANDLORD AND EVALUATOR WHEN IT COMES TO ASSESSING THE OVERALL CONDITION OF THE BUILDING?

If LL:I:3=3 or 4 but SRB:30=1 or 2 then the landlord rates his building as being in poor or very bad condition whereas the evaluator sees the building's exterior as being in excellent or good condition.

If LL:I:3=1 but SRB:30=4 then the landlord rates his building as being in good condition whereas the evaluator sees the building's exterior as being in poor condition.

Note: SRB:30 includes cleanliness in evaluating the building's condition. Cleanliness is not included in SRB:28 so we may want to run these checks substituting 28 for 30. The switch would simply involve replacing 28 for 30 above and leaving the remaining conditions as they stand. A possible drawback to using 30 is that its categories are not directly comparable to LL:I:3.

CHECK 14: ARE THE LANDLORD AND SRB AT ODDS IN DESCRIBING LANDSCAPING AND THE EFFORT THAT MUST HAVE GONE INTO IT?

If LL:E:1 part n=0 and LL:D:11 part c=0 but SRB:41=1 then the landlord claims to have done no landscaping and not to have used a gardener or groundskeeper yet the evaluator rates the landscaping as extensive.

If LL:E:1 part n>0 or LL:D:11 part c>0 but SRB:41=4 then the landlord claims to have done landscaping or to have hired a gardener or groundskeeper yet the evaluator claims there is no landscaping.

CHECK 15: DO THE LANDLORD AND SRB CONTAIN INCONSISTENT OBSERVATIONS AS TO THE QUALITY OF THE GROUNDS SURROUNDING OTHER BUILDINGS IN THE NEIGHBORHOOD?

If LL:G:3=3 or 4 but SRB:46=1 then the landlord feels the condition of the grounds surrounding other buildings in the neighborhood is either poor or very bad whereas the evaluator sees them as having extensive landscaping.

CHECK 16: DO THE LANDLORD AND SRB AGREE ON THE CONDITION OF THE STRUCTURE RELATIVE TO OTHER STRUCTURES IN THE VICINITY?

If LL:G:4=1 but SRB:48=3 then the landlord sees his building as being better than others in the vicinity while the evaluator feels the building is inferior.

If LL:G:4=2 but SRB:48=1 then the landlord feels his building is worse than others in the vicinity while the evaluator sees it as superior.

CHECK 17: DO THE LANDLORD AND SRB CONTRADICT EACH OTHER AS TO THE EXISTENCE OF SOME TYPES OF STRUCTURES IN THE AREA?

If LL:G:6=1 but SRB:49 part a=0 then the landlord claims residential construction has taken place but the evaluator claims there is no residential land use in the vicinity.

If LL:G:6=2 but SRB:49 part c=0 then the evaluator claims there is no commercial land usage yet the landlord claims commercial construction has taken place.

If LL:G:6=3 but SRB:49 part d=0 then the evaluator claims there is no industrial land usage yet the landlord claims industrial construction has taken place.

If LL:G:9 part a $\neq$ 0 but SRB:50=2 then the evaluator claims there are no boarded up buildings yet the landlord claims that buildings have been boarded up within the past three years.

If LL:G:9 part a=0 but SRB:50=1 then the evaluator claims there are boarded up buildings but the landlord says that none have been boarded up within the past three years.

CHECK 18: ARE THE LANDLORD AND SRB AT ODDS IN STATEMENTS MADE CONCERNING THE CONDITION OF STREETS?

If LL:G:23 part a=3 but SRB:55=4 then the landlord claims there are no problems with the condition of streets but the evaluator notes unpaved streets or the severe incidence of chuck holes on paved streets.

CHECK 19: ARE THE LANDLORD AND SRB AT ODDS IN STATEMENTS MADE CONCERNING THE PRESENCE OF LITTER IN THE VICINITY?

If LL:G:23 part e=3 but SRB:56=3 or 4 then the landlord claims litter is not a problem but the evaluator notes the presence of considerable amounts of litter, trash and glass in the vicinity.

TENANT/HOMEOWNER AND RESIDENTIAL BUILDING SURVEYS

CHECK 1: DOES THE BUILDING DESCRIPTION OF THE SRB CORRESPOND WITH THE BUILDING DESCRIPTION OF THE TENANT/HOMEOWNER?

If columns 23-24 of the first card image of the SRB indicate there is only one building on the lot to be surveyed then if SRB Q.4=1, 2 or 3 but THO:B:50 =2 the SRB claims the only building on the lot is a single family structure whereas the Tenant/Homeowner claims it is not a single family dwelling. If SRB Q.4=4 but THO:B:50 =1 then the SRB claims the building is a multiple family apartment building whereas the Tenant/-Homeowner claims it is a single family home. If SRB Q.4=5 then the SRB claims the structure is a mobile home and there should be no corresponding Tenant/Homeowner Questionnaire.

If columns 23-24 of the first card image indicate that there is more than one building on the lot to be surveyed then the above comparisons must be considered in light of the possibility that the Tenant/Homeowner does not correspond to the SRB. This caveat should be kept in mind in all following comparisons.

CHECK 2: DO THE SRB AND TENANT/HOMEOWNER HAVE WIDELY DIVERGENT VIEWS AS TO THE CONDITION OF FLOORING IN THE BUILDING?

If SRB Q.7B=1 but THO:B:43=3 or 4 then the evaluator claims flooring in the building's interior public areas is very good but the Tenant/Homeowner claims flooring in his unit is either poor or very bad.

If SRB Q.7B=4 but THO:B:43=1 then the evaluator claims there are major defects in the flooring of the building's interior public areas but the Tenant/Homeowner claims flooring in his unit is good.

CHECK 3: DO THE SRB AND TENANT/HOMEOWNER HAVE WIDELY DIVERGENT VIEWS AS TO THE CONDITION OF WALLS AND CEILINGS IN THE BUILDING?

If SRB Q.7C=1 and SRB Q.7E=1 but THO:B:44=3 or 4 then the evaluator claims that both walls and ceilings in the building's public areas are in very good condition whereas the Tenant/Homeowner claims that walls and ceilings in his unit are either in poor or very bad condition.

If SRB Q.7C=4 and SRB Q.7E=4 but THO:B:44=1 then the evaluator claims that both walls and ceilings in the building's public areas suffer from major defects whereas the Tenant/Homeowner claims that walls and ceilings in the unit are in good condition.

CHECK 4: DO THE SRB AND THE TENANT/HOMEOWNER HAVE WIDELY DIVERGENT VIEWS AS TO THE CONDITION OF WINDOWS IN THE BUILDING?

If SRB Q.4D=1 and SRB Q.24E=1 but THO:B:35=3 or 4 then the evaluator claims that windows in the building's public areas and windows observable from outside the building are in very good condition whereas the Tenant/Homeowner claims windows in his unit are either in poor or very bad condition.

If SRB Q.4D=4 and SRB Q.24E=4 but THO:B:35=1 then the evaluator claims that windows in the building's public areas and windows observable from outside the building suffer from major defects whereas the Tenant/-Homeowner claims that windows in his unit are in good condition.

CHECK 5: DO THE SRB AND TENANT/HOMEOWNER HAVE WIDELY DIVERGENT VIEWS AS TO THE CONDITION OF THE BUILDING'S ROOF SURFACE?

If SRB Q.24A=1 but THO:B:41=1 then the evaluator claims the building's roof is in very good condition whereas the Tenant/Homeowner claims that the roof, ceiling or walls leak when it rains.

CHECK 6: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF DOOR LOCKS?

If SRB Q.12=1 but THO:B:40=2 then the evaluator claims there are door locks on all entrances to the building but the Tenant/Homeowner claims that the building does not have working locks on all outside doors and windows that need them.

If SRB Q.12=2 but THO:B:40=1 then the evaluator claims there are not door locks on all entrances to the building but the Tenant/Homeowner claims there are locks on all outside doors or windows that need them.

CHECK 7: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE NUMBER OF STORIES IN THE BUILDING?

If THO:B:51>SRB Q.14 then the lowest floor occupied by the unit, according to Tenant/Homeowner, is greater than the total number of stories in the building according to the SRB.

If THO:B:52=02 and THO:B51=SRB Q.14 then one of the unit's upper floors is, according to the Tenant/Homeowner, higher than the maximum number of stories listed in the SRB.

CHECK 8: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF GARAGES, CARPORTS OR OFF-STREET PARKING?

If SRB Q.31=000 but THO:C:26=1 then the evaluator claims there is no garage but the Tenant/Homeowner claims access to a garage.

If SRB Q.32=000 but THO:C:26=2 then the evaluator claims there are no carports but the Tenant/Homeowner claims access to a carport.

If SRB Q.33=000 but THO:C:26=3 then the evaluator claims there is no off street parking but the Tenant/Homeowner claims access to off street parking.

CHECK 9: DO THE SRB AND TENANT/HOMEOWNER MAKE MUTUALLY IMPLAUSIBLE CLAIMS AS TO THE EXTENT OF LANDSCAPING ON THE PREMISES?

If SRB Q.41=1 but THO:B:57 part 2=3 then the evaluator claims there is extensive landscaping of the property but the Tenant/Homeowner claims that "cleaning and maintaining the yards and grounds" is not done at all.

CHECK 10: IS THERE A WIDE DISCREPANCY BETWEEN THE SRB'S AND THE TENANT/HOMEOWNER'S EVALUATION OF THE BUILDING'S CONDITION RELATIVE TO OTHER BUILDINGS IN THE VICINITY?

If SRB Q.48=1 but THO:B:74=2 then the evaluator claims the building is superior to other buildings in the vicinity whereas the Tenant/Homeowner claims the building is worse than other buildings in the vicinity.

If SRB Q.48=3 but THO:B:74=1 then the evaluator claims the building is interior to other buildings in the vicinity whereas the Tenant/Homeowner claims the building is better than other buildings in the vicinity.

CHECK 11: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF RESIDENTIAL BUILDINGS IN THE VICINITY?

If THO:B:75≠0 but SRB Q.49a=2 then the SRB claims there is no residential land use in the area but the Tenant/Homeowner claims there has been residential construction in the vicinity.

CHECK 12: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF COMMERCIAL LAND USE IN THE VICINITY?

If THO:B:78≠0 but SRB Q.49b=2 and SRB Q.49c=2 then the SRB claims there is no commercial land use in the vicinity but the Tenant/Homeowner claims there has been commercial construction in the vicinity.

CHECK 13: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF UNIMPROVED OR VACANT LOTS?

If THO:B:79≠0 but SRB Q.49g=2 then the SRB claims there are no vacant lots or plots of unimproved land in the vicinity but the Tenant/Homeowner claims there have been demolitions without replacement.

CHECK 14: DO THE SRB AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF BOARDED UP OR ABANDONED BUILDINGS IN THE VICINITY?

If THO:B:76≠0 but SRB Q.50=2 then the SRB claims there are no boarded up or abandoned buildings in the vicinity but the Tenant/Homeowner claims there have been instances of buildings being boarded up or abandoned.

CHECK 15: DO THE SRB AND TENANT/HOMEOWNER MAKE MUTUALLY IMPLAUSIBLE REFERENCES AS TO THE PRESENCE OF STREET LIGHTING?

If SRB Q.53=2 but THO:B:114a=3 then the Tenant/Homeowner claims street lighting is not a problem but the SRB claims there is no street lighting in the area.

CHECK 16: DO THE SRB AND TENANT/HOMEOWNER MAKE CONTRADICTORY STATEMENTS AS TO THE CONDITION OF STREETS AND ROADS?

If SRB Q.55=1 but THO:B:114b=1 then the Tenant/Homeowner claims there are severe problems with the conditon of streets but the SRB claims streets are well paved and well maintained.

If SRB Q.55=4 or 9 but THO:B:114b=3 then the Tenant/Homeowner claims there are no problems with the condition of streets but the SRB notes there are unpaved streets, severe chuck holes or streets under construction.

CHECK 17: IS THE AMOUNT OF LITTER IN THE VICINITY DESCRIBED COMPARABLY ON THE SRB AND TENANT/HOMEOWNER?

If SRB Q.56=1 but THO:B:114e=1 then the SRB claims the vicinity is very clean but the Tenant/Homeowner claims litter and trash is a big problem.

If SRB Q.56=3 or 4 but THO:B:114e=3 then the SRB claims there is considerable litter and trash but the Tenant/Homeowner claims litter and trash is not a problem.

CHECK 18: DO THE SRB AND TENANT/HOMEOWNER HAVE DIVERGENT PERCEPTIONS OF NOISE POLLUTION?

If SRB Q.58b≠2 but THO:B:114c=1 and the Tenant/Homeowner traces the noise problem to non-residential properties then the SRB claims that non-residential properties do not have a detrimental impact due to noise pollution whereas the Tenant/Homeowner claims noise pollution emanating from non-residential properties is a big problem in the vicinity.

If SRB Q.58b=2 but THO:B:114c=3 then the SRB claims noise pollution from non-residential properties has a detrimental effect whereas the Tenant/Homeowner claims that noise pollution is not a problem in the vicinity.

CHECK 19: DO THE SRB AND TENANT/HOMEOWNER HAVE DIVERGENT PERCEPTIONS OF ODOR AND AIR POLLUTION PROBLEMS?

If SRB Q.58c≠3 but THO:B:114d=1 and the Tenant/Homeowner traces the air pollution problem to nonresidential properties then the SRB claims that non-residential properties do not have a detrimental impact due to the odors they may emanate whereas the Tenant/Homeowner claims non-residential properties are the cause of major air pollution problems.

If SRB Q.58c=3 but THO:B:114d=3 then the SRB claims that odors emanating from non-residential properties have a detrimental effect whereas the Tenant/Homeowner claims that air pollution is not a problem at all.

SCREENING AND LANDLORD SURVEYS

The comparison of the screener survey against the landlord is plagued by the same time-lag problems which hinder all other cross-questionnaire comparisons. Furthermore, the relative simplicity of the screener acts to reduce the number of checks which are possible and, in some instances, forces restructuring of classification schemes in order to achieve some degree of comparability with the landlord survey.

CHECK 1: ARE THE SCREENER AND LANDLORD IN AGREEMENT AS TO THE EXISTENCE OF MOBILE HOMES ON THE PROPERTY?

If Screener:3=1 but LL:C:1≠6 and LL:C:35=2 then the Screener was administered to a respondent who claims to be living in a mobile home whereas the landlord claims there are no mobile homes on his property.

CHECK 2: IS THE RENT FOR A MOBILE HOME SPACE, AS STATED ON THE SCREENER, COMPARABLE WITH THE RENT STATED BY THE LANDLORD?

If annualized Q.8 on the Screener is greater than 1.05 x annualized LL:C:47 or less than .95 x annualized LL:C:47 then mobile home space rent on the Screener differs from mobile home space rent on the Landlord by more than 5 percent.

If annualized Q.8 on the Screener is less than 95 percent of annualized LL:C:47 then it may be that the tenant is receiving a rent reduction and the landlord is computing average rent based on the full rental of the mobile home space. Therefore compute annualized Q.11 from the Screener and compare it against the five percent bond about LL:C:47.

If a discrepancy exists output the size of the discrepancy and note which of the Landlord or the Screener rent figures is the larger.

CHECK 3: IS THE UNIT DESCRIBED ON THE SCREENER COMPARABLE TO ANY OF THE UNITS CLAIMED BY THE LANDLORD?

From Screener:42 and Screener:44 we can classify the unit as one of the following:

A. Efficiency or one room unit
B. 1 bedroom unit
C. 2 bedroom unit

D. 3 bedroom unit
E. 4 or more bedroom unit
or, F. "Other residential unit."

This classification can then be compared against LL:C:21 and LL:C:25. If LL:C:21=2 or LL:C:25=2 for the type of unit mentioned in the Screener then the Screener respondent claims to be living in a unit which does not correspond to one claimed by his landlord.

Note that there is an amibiguity in the use of "bedrooms" in Q.44 of the Screener. Screener:44 includes "rooms used mainly for sleeping purposes" in the count of bedrooms whereas the landlord may not be using such a definition in his count.

This check is not possible for single family rentals since LL:C:21 and LL:C:25 are omitted by a skip pattern.

CHECK 4: IS THE RENT ON AN APARTMENT OR HOME, AS STATED ON THE SCREENER, COMPARABLE WITH THE RENT STATED ON THE LANDLORD?

If Check 3 did not result in a contradiction then we can compare annualized rent on the Screener, Q.15 and Q.16, against the landlord's claim of annualized rent on a unit of the type claimed on the Screener, LL:C:23 or LL:C:28. Call the Screener rent figure SRENT. Call the Landlord rent figure LRENT.

If LRENT > 1.05 x SRENT or LRENT < .95 x SRENT then the landlord's average rent claim deviates by more than five percent from the Screener's rent claim.

However, the respondent on the Screener may be receiving a rent reduction and the landlord may be making his average computation based on full rent. Therefore set SRENT1 equal to annualized rent as computed from Q.19 and compare LRENT against the five percent band about SRENT1.

It may also be the case that the landlord raised rents since the Screener was fielded. To adjust for this possibility we can compute LRENT1, rent before the rent increase by subtracting either the percentage or dollar figure stated in LL:H:28 from LRENT. LRENT1 can then be compared against the five percent band about SRENT. To adjust for the joint possibility of a rent increase and the existence of a rent discount LRENT1 can also be compared against SRENT1.

For each comparison the deviation between the two rent calculations should be output along with a statement as to whether rent was larger on the Screener or on the Landlord.

In the case of single family rentals LRENT can be computed from LL:C:11, and the rest of the procedure can proceed as in the case of a unit in a multiple family dwelling.

CHECK 5: DO THE SCREENER AND LANDLORD CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF RENT REDUCTIONS?

If Screener Q.18=2 but LL:C:17=0 then the respondent to the Screener claims to be occupying his unit at a reduced rent but the landlord claims he did not give up any revenue to rent reductions.

In the case of single family rentals if Screener Q.18=1 but LL:C:17≠0 then the respondent to the Screener claims not to have received a rent reduction, but the landlord claims to have lost revenue to rent reductions.

If Q.18=2 and LL:C:17≠0 in the case of single family homes we can compare the size of the rent reduction claimed on the Screener against the revenue loss claimed on the Landlord by subtracting annualized Q.16 from annualized Q.19 and contrasting it against LL:C:17. If the deviation is more than five percent the magnitude and direction of the deviation should be output.

CHECK 6: IS UTILITY USAGE AS REPRESENTED ON THE SCREENER CONSISTENT WITH UTILITY USAGE AS REPRESENTED ON THE LANDLORD?

If Screener:21a part u=1 but LL:D:27 part 1=2
or Screener:21b part u=1 but LL:D:31 part 1=2
or Screener:21c part u=1 but LL:D:27 part 2=2
or Screener:21d part u=1 but LL:D:27 part 3=2
or Screener:21f part u=1 but LL:D:27 part 4=2
or Screener:21e or g part u=1 but LL:D:27 part 5=2

then the respondent to the Screener claims to be using a utility which the landlord says he doesn't provide.

In single family homes we can also check

if Screener:21a part u=2 but LL:D:27 part 1=1
or Screener:21b part u=2 but LL:D:31 part 1=1
or Screener:21c part u=2 but LL:D:27 part 2=1
or Screener:21d part u=2 but LL:D:27 part 3=1
or Screener:21f part u=2 but LL:D:27 part 4=1
or Screener:21e or g part u=2 but LL:D:27 part 5=1

in which case the landlord claims to be providing a utility which the sole tenant claims he doesn't use.

CHECK 7: IS THE ESTIMATED VALUE OF THE PROPERTY ON THE SCREENER THE SAME AS THE ESTIMATED VALUE OF THE PROPERTY ON THE LANDLORD?

If Screener Q.33≠LL:I:29 then the value of the property as estimated on the screener is not the same as the value of the property as estimated on the Landlord.

CHECK 8: DO THE SCREENER AND THE LANDLORD CONTRADICT EACH OTHER WITH REGARD TO THE TYPE OF HEATING EQUIPMENT USED?

If Screener Q.51≠LL:D:26 then there is a discrepancy between the Screener and Landlord with regard to the type of heating equipment used on the property.

CHECK 9: DOES THE SCREENER'S DESCRIPTION OF THE RESPONDENT'S HOUSEHOLD CONFORM WITH STATEMENTS MADE BY THE LANDLORD?

From Questions 54, 56, 58, 59, 60, 61, 62, 63, 64, 73 and 74 on the Screener the respondent's household can be classified according to:

HOUSEHOLD CLASSIFICATION A

1. A Single Woman With Children
2. Single Person Alone or Living With Other Single Persons
3. Couple Without Children
4. Couple With Young or Teenage Children
5. Elderly People
6. Unmarried Couple
7. College Students
8. Other

For single family homes the above categorization can be compared against LL:H:12.

If LL:H:12=A but Household Classification A≠1
or LL:H:12=B or C but Household Classification A≠2
or LL:H:12=D but Household Classification A≠3
or LL:H:12=E or F but Household Classification A≠4
or LL:H:12=G but Household Classification A≠5
or LL:H:12=H but Household Classification A≠6
or LL:H:12=I but Household Classification A≠7
or LL:H:12=J but Household Classification A≠8

then the description of the household on the Landlord differs from that presented on the Screener. This check can be completed by replacing the left hand equalities with inequalities and the right hand inequalities with equalities.

Households living in multiple family dwellings can be categorized according to:

HOUSEHOLD CLASSIFICATION B

1. Elderly People
2. Couples With Young or Teenage Children
3. Families With Four or More Children
4. Single Persons Without Children
5. Couples Without Children
6. Single Women With Children
7. Unmarried Couples
8. College Students

And if LL:H:14b ≠ 1 but Household Classification B=1
or LL:H:14c and d ≠1 but Household Classification B=2
or LL:H:14e ≠ 1 but Household Classification B=3
or LL:H:14f and i ≠1 but Household Classification B=4
or LL:H:14g ≠ 1 but Household Classification B=5
or LL:H:14j ≠ 1 but Household Classification B=6
or LL:H:14k ≠ 1 but Household Classification B=7
or LL:H:14l ≠ 1 but Household Classification B=8

then the landlord claims that he does not have any tenants corresponding to the household classification of the Screener respondent.

And a further categorization of all households into:

HOUSEHOLD CLASSIFICATION C

1. Elderly People
2. Couples With Young or Teenage Children
3. Families With Four or More Children
4. Single Persons Without Children
5. White Tenants
6. Black Tenants
7. American Indian Tenants
8. Couples Without Children
9. Single Persons With Children
10. Unmarried Couples
11. College Students

allows a check to see if

LL:H:40b=2 but Household Classification C=1
or LL:H:40c and d=2 but Household Classification C=2
or LL:H:40e=2 but Household Classification C=3
or LL:H:40f and m=2 but Household Classification C=4
or LL:H:40g=2 but Household Classification C=5
or LL:H:40h=2 but Household Classification C=6
or LL:H:40i=2 but Household Classification C=7
or LL:H:40k=2 but Household Classification C=8
or LL:H:40n=2 but Household Classification C=9
or LL:H:40o=2 but Household Classification C=10
or LL:H:40p=2 but Household Classification C=11

in which case the landlord claims he would prefer not to rent to a household which, according to the Screener, closely resembles one already occupying one of his units.

CHECK 10: DO THE SCREENER AND LANDLORD AGREE ON THE EXISTENCE OF COMMERCIAL SPACE ON THE PROPERTY?

If Screener Q.75 is blank but LL:C:30=1 then the Screener claims there is no commercial space on the property whereas the Landlord claims there is commercial space on the property.

If Screener Q.75 is not blank but LL:C:30=2 then the Screener claims there is commercial space on the property whereas the Landlord claims there is no commercial space on the property.

SCREENING AND TENANT/HOMEOWNER SURVEYS

The major difficulty in comparing the screener survey against the tenant/homeowner is the possibility of changes in household composition between the date of the screener interview and the date of the tenant/homeowner interview. Modules A and G of the tenant/homeowner offer some insight into the changes that may occur, but these insights are not detailed enough to eliminate much of the ambiguity in comparing a household's composition across time.

CHECK 1: DO THE SCREENER AND TENANT/HOMEOWNER AGREE ON THE NUMBER OF UNITS IN THE BUILDING?

If Screener:4=1 but THO:B:50=8 then the Screener claims the building has only one unit but the THO claims the building is not a single family home.

If Screener:4>1 and ≠ 999 but THO:B:50=1 then the THO claims the building is a single family structure but the Screener claims it has more than one housing unit.

CHECK 2: IS TENURE ON THE SCREENER IDENTICAL TO TENURE ON THE TENANT/HOMEOWNER?

If Screener:14=1 but THO:B:1=2 or 3 then the Screener claims the unit is owned but the Tenant/Homeowner claims it is rented, or occupied rent free.

If Screener:14=2 but THO:B:1=1 or 3 then the Screener claims the unit is rented but the Tenant/Homeowner claims it is owned or occupied rent free.

If Screener:14=3 but THO:B:1=1 or 2 then the Screener claims the unit is occupied rent free but the Tenant/Homeowner claims it is owned or rented.

CHECK 3: DO THE SCREENER AND THE TENANT/HOMEOWNER AGREE ON RENTAL EXPENSE, AND THE CHRONOLOGY OF RENT PAYMENTS?

If annualized rent payment as computed from Questions 15 and 16 of the Screener is not equal to annualized rent payment as computed from THO:C:8 and THO:C:9 then the Screener and Tenant/Homeowner disagree on annual rental expense.

If annualized rent expense is identical on the Screener and Tenant/-Homeowner we can still compare the periods of rent payment, Screener:15 and THO:C:8, to see if the period of rent payment was changed since the Screener was fielded.

If annualized rent expense is not identical on the Screener and Tenant/-Homeowner we can then compare THO:C:20, the date the tenant claims to have begun paying the amount in THO:C:9, against the date of the Screener. If THO:C:20 is more recent than the date of the Screener then the discrepancy in rent payment between the Screener and the Tenant/-Homeowner may be due to a change in rent. If THO:C:20 is not more recent than the date of the Screener then there seems to be an actual discrepancy between the Tenant/Homeowner and the Screener.

And finally, if the date in THO:C:20 is not more recent than the date of the Screener we can compare THO:C:20 against Screener:17 which asks for the most recent date that rent was changed prior to the Screener. If the two are not identical then there is a disagreement between the Tenant/Homeowner and Screener as to the most recent date of a rent change.

CHECK 4: DO THE SCREENER AND TENANT/HOMEOWNER AGREE ON THE EXISTENCE OF A RENT DISCOUNT?

If Screener:18=1 but THO:C:15=1 or THO:C:17=1 or THO:C:18=1 then the Screener claims the tenant pays full rent but the THO claims he receives some kind of rent reduction.

If Screener:18=2 but THO:C:15=2 or THO:C:17=2 or THO:C:18=2 then the Screener claims the tenant receives a rent reduction but the THO claims he pays full rent.

Note: An intervening rent change, which should be discovered as part of Check 3, may be the cause of any discrepancies.

CHECK 5: DO THE SCREENER AND TENANT/HOMEOWNER AGREE ON THE FULL RENT THAT WOULD BE CHARGED IN THE ABSENCE OF A RENT REDUCTION?

If Check 4 does not result in any contradictions then we can compare annualized full rent in the Screener:19 against annualized full rent in THO:C:19. If the two differ then there is a discrepancy between the full rent claimed on the Screener and the full rent claimed on the Tenant/Homeowner.

CHECK 6: DO THE SCREENER AND TENANT/HOMEOWNER AGREE ON WHETHER THE UNIT IS RENTED AS FURNISHED?

If Screener:20=1 but THO:C:24=2 then the Screener claims the unit is rented as furnished whereas the THO claims it is rented unfurnished.

If Screener:20=2 but THO:C:24=1 then the Screener claims the unit is rented unfurnished but the Tenant/Homeowner claims it is rented as furnished.

Note that the Screener and Tenant/Homeowner questions are not directly comparable in that the Screener allows for "a stove and/or a refrigerator" whereas the Tenant/Homeowner allows for "kitchen appliances" in unfurnished units.

CHECK 7: DO THE SCREENER AND TENANT/HOMEOWNER CONCUR ON UTILITY USAGE AND PAYMENT?

If Screener:21a part u=1 but THO:C:94 part 1=2
or Screener:21b part u=1 but THO:C:94 part 6=2
or Screener:21c part u=1 but THO:C:94 part 2=2
or Screener:21d part u=1 but THO:C:94 part 4=2
or Screener:21e, f or g,part u=1 but THO:C:94 part 5=2

then the Screener claims the respondent uses a utility which the Tenant/-Homeowner claims he does not use.

If Screener:21a part u=2 but THO:C:94 part 1=1
or Screener:21b part u=2 but THO:C:94 part 6=1
or Screener:21c part u=2 but THO:C:94 part 2=1
or Screener:21d part u=2 but THO:C:94 part 4=1
or Screener:21e, f or g,part u=2 but THO:C:94 part 5=1

then the Screener claims the respondent does not use a utility which the Tenant/Homeowner claims he uses.

If a utility passes through the above checks without any contradiction we can then check:

If Screener:21a part p=1 but THO:C:96A or B part 1=1
or Screener:21b part p=1 but THO:C:96A or B part 6=1
or Screener:21c part p=1 but THO:C:96A or B part 2=1
or Screener:21d part p=1 but THO:C:96A or B part 4=1
or Screener:21e, f or g,part p=1 but THO:C:96A or B part 5=1

in which case the Screener claims the respondent pays extra for a utility for which the Tenant/Homeowner claims he does not pay extra. We can also check:

If Screener:21a part p=2 but THO:C:96A or B part 1=2
or Screener:21b part p=2 but THO:C:96A or B part 6=2
or Screener:21c part p=2 but THO:C:96A or B part 2=2
or Screener:21d part p=2 but THO:C:96A or B part 4=2
or Screener:21e, f or g,part p=2 but THO:C:96A or B part 5=2

in which case the Screener claims the respondent does not make extra payment for a utility for which the Tenant/Homeowner claims he does pay extra.

CHECK 8: IS THE ESTIMATED VALUE OF THE PROPERTY ON THE SCREENER THE SAME AS THE ESTIMATED VALUE ON THE TENANT/HOMEOWNER?

If Screener:33 ≠ THO:C:81
then the value of the property as estimated on the Screener is not the same as the estimated value reported on the Tenant/-Homeowner.

Note that the Screener asks for an estimate of the entire property's value whereas the Tenant/Homeowner asks only for an estimate of the value of the residential portion of the property.

CHECK 9: IS THE NUMBER OF BATHROOMS ENUMERATED ON THE SCREENER IDENTICAL TO THE NUMBER OF BATHROOMS ENUMERATED ON THE TENANT/HOMEOWNER?

If Screener:36 ≠ THO:B:5 then the number of full baths enumerated on the Screener is not identical to the number of full baths enumerated on the Tenant/Homeowner.

If Screener:37 ≠ THO:B:6 then the number of half-baths enumerated on the Screener is not identical to the number of half-baths enumerated on the Tenant/Homeowner. For possible clarification of a discrepancy check THO:C98a, 102 for description of an addition of a complete or half bath.

CHECK 10: DO THE SCREENER AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE EXISTENCE OF COMPLETE KITCHEN FACILITIES?

If Screener:40=1 but THO:B:16 part 2=2 or THO:B:16 part 3=2 then the Screener claims the unit has full kitchen facilities but the Tenant/-Homeowner claims that a range or cookstove, or a refrigerator is missing.

CHECK 11: IS THE NUMBER OF ROOMS ENUMERATED ON THE SCREENER THE SAME AS ON THE TENANT/HOMEOWNER?

If Screener:42 ≠ THO:B:2 then the number of rooms enumerated on the Screener is not the same as the number of rooms enumerated on the Tenant/Homeowner.

CHECK 12: IS THERE A DISCREPANCY BETWEEN THE NUMBER OF BEDROOMS ENUMERATED ON THE SCREENER AND THE NUMBER OF BEDROOMS ENUMERATED ON THE TENANT/HOMEOWNER?

If Screener:44 ≠ THO:B:2f then the number of bedrooms enumerated on the Screener is not the same as the number of bedrooms enumerated on the Tenant/Homeowner.

If this check results in a discrepancy we can then check Screener:44 against THO:B:4 to see if the number of bedrooms enumerated on the Screener is the same as the number of rooms used mainly for sleeping purposes enumerated on the Tenant/Homeowner. This check is also reasonable in light of ambiguity in the interpretation of "bedrooms" on the Screener.

CHECK 13: IS THE TYPE OF HEATING CLAIMED IN THE SCREENER IDENTICAL TO THE TYPE OF HEATING CLAIMED ON THE TENANT/HOMEOWNER?

If Screener:51 ≠ THO:B:21 then the type of heating equipment claimed on the Screener is not the same as the type of heating equipment claimed to exist on the Tenant/Homeowner.

CHECK 14: DO THE SCREENER AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE NUMBER OF PERSONS IN THE HOUSEHOLD?

If Screener:54 less Screener:57 ≠ THO:G:13 then the number of persons in the unit less the number of unrelated persons as listed on the Screener is not equal to the number of persons, excluding roomers and boarders, listed on the Tenant/Homeowner.

If the number of persons listed on the Tenant/Homeowner is greater than the number of persons listed on the Screener then we can check THO:G:6 for any persons with birthdates more recent than the date of the Screener.

CHECK 15: DO THE SCREENER AND TENANT/HOMEOWNER CONTRADICT EACH OTHER WITH REGARD TO THE PRESENCE OF UNRELATED PERSONS IN THE HOUSING UNIT?

If Screener:56=0 but THO:A:8=2 then a multi-person household which claimed to have no unrelated members on the Screener claims to have unrelated members on the Tenant/Homeowner.

If Screener:56 ≠ 0 but THO:A:8=1 then a multi-person household which claimed to have some unrelated members on the Screener claims to have no unrelated members on the Tenant/Homeowner.

CHECK 16: IS THE NUMBER OF PERSONS WHO LIVE IN THE UNIT AND PAY RENT TO THE PRIMARY RESPONDENT THE SAME ON THE SCREENER AND THE TENANT/HOMEOWNER?

If Screener:57 ≠ THO:A:9 then the number of persons who live in the unit and pay rent to the primary respondent is not the same on the Screener and the Tenant/Homeowner.

CHECK 17: IS THE NUMBER OF PERSONS UNDER 18 YEARS OF AGE CLAIMED ON THE SCREENER THE SAME AS THE NUMBER OF PERSONS UNDER 18 YEARS OF AGE CLAIMED ON THE TENANT/HOMEOWNER?

If Screener:59 ≠ the number of persons below age 18 when THO:G:6 is backdated by the time elapsed between the Screener and the Tenant/Homeowner, then there is a discrepancy between the Screener and Tenant/-Homeowner with regard to the number of persons below age 18 in the household.

CHECK 18: IS THE RESPONDENT ON THE SCREENER STILL A MEMBER OF THE HOUSEHOLD AS IT IS DESCRIBED IN THE TENANT/HOMEOWNER?

If the Tenant/Homeowner does not describe a person whose age (THO:G:6) and sex (THO:G:6) corresponds with age (Q.64) and sex (Q.73) on the Screener then the respondent, as described in the Screener, does not seem to be a member of the household described in the Tenant/Homeowner.

Also check THO:A:1 for changes in the male and/or female heads of household as a possible source of contradiction between the Screener and the Tenant/Homeowner. This check should also be incorporated into Checks 15, 16 and 17.

CHECK 19: HOW DOES THE INCOME CLAIMED ON THE SCREENER COMPARE TO THE INCOME CLAIMED ON THE TENANT/HOMEOWNER?

The measure of total income on the Tenant/Homeowner most comparable to Q.65, total income on the Screener, can be obtained by adding THO:G:21a through v, THO:G:22 and the difference between THO:G:25 and THO:G:24. This figure can then be classified in ranges identical to the ones used in Q.65 of the Screener. If the two income ranges differ then output the fact that they differ and the difference between them in terms of the categories used in Q.65. Whether the Screener or the Tenant/Homeowner income figure is the greater of the two should be included as part of the output.

The measure of transfer income on the Tenant/Homeowner most comparable to Q.66, transfer income on the Screener, can be obtained by adding THO:G:21a through o and the difference between THO:G:25 and THO:G:24. After a classification identical to the one described above, transfer income on the Screener can be compared against transfer income on the Tenant/Homeowner and any discrepancies can be output in a manner also similar to the one described above.

CHECK 20: IS THE SEX OF THE RESPONDENT TO MODULES B AND C THE SAME AS THE SEX OF THE RESPONDENT ON THE SCREENER?

If THO:B:137=02 but Screener:73=2 then the male head predominated on Module B but the Screener respondent was female.

If THO:C:129=02 but Screener:73=2 then the male head predominated on Module C but the Screener respondent was female.

If THO:B:137=03 but Screener:73=1 then the female head predominated on Module B but the Screener respondent was male.

If THO:C:129=03 but Screener:73=1 then the female head predominated on Module C but the Screener respondent was male.

CHECK 21: IS THE RACE-ETHNICITY OF THE HOUSEHOLD HEAD OF THE SAME SEX AS THE SCREENER RESPONDENT ON THE TENANT/HOMEOWNER IDENTICAL TO THE RACE-ETHNICITY OF THE SCREENER RESPONDENT?

If the Screener respondent was male (Q.73=1) then if THO:G:37 ≠ Screener Q.72 then the race-ethnicity of the male head on the Tenant/-Homeowner is not the same as the race-ethnicity of the male Screener respondent.

If the Screener respondent was female (Q.73=2) then if THO:G:38 ≠ Screener Q.72 then the race-ethnicity of the female head on the Tenant/-Homeowner is not the same as the race-ethnicity of the female Screener respondent.

SCREENING AND RESIDENTIAL BUILDING SURVEYS

Though the screener and the survey of residential buildings are composed to serve different purposes, there are five cross-questionnaire checks that are nevertheless possible:

CHECK 1: DO THE SRB AND SCREENER AGREE AS TO THE NUMBER OF HOUSING UNITS IN THE BUILDING?
If Screener:4 ≠ SRB:17 then the number of housing units stated on the Screener is not the same as the number stated on the SRB.

CHECK 2: ARE THE SRB AND SCREENER CONSISTENT WITH REGARD TO THE EXISTENCE OF FIRE EXITS?
If SRB:24 part C ≠ 4, 5, 6, 7 or 9 and Screener:50=2 then according to the SRB there exists a fire escape without any major defects but according to the Screener the unit lacks two or more safe fire exits.

CHECK 3: ARE THE SRB AND SCREENER CONSISTENT WITH REGARD TO THE EXISTENCE OF CHIMNEYS, FLUES AND/OR VENTS?
If SRB:24 part c=6 or 7 and Screener:53=1 then the Screener claims there is a working chimney or vent attached to the unit but the SRB exterior survey claims that chimneys and/or flues are either not applicable, or not observable.

If SRB:24 part c=1, 2 or 3 and Screener:53=2 then the Screener claims there is no working chimney or vent attached to the unit but the SRB exterior survey claims that there are chimneys and/or flues attached to the building and they seem to be in working condition.

CHECK 4: ARE THE SRB AND SCREENER CONSISTENT WITH REGARD TO THE EXISTENCE OF COMMERCIAL SPACE IN THE BUILDING?
If SRB:18=2 but Screener:75 is not blank then the SRB claims that there is no commercial or industrial usage of the building but the Screener claims there is some commercial or industrial usage.

If SRB:18=1 but Screener:75 is blank then the Screener claims there is no industrial or commercial usage whereas the SRB claims there is some commercial or industrial usage.

CHECK 5: DOES THE DESCRIPTION OF THE BUILDING ON THE SCREENER CONFORM WITH THE DESCRIPTION OF THE BUILDING ON THE SRB?

If SRB:4=1, 2 or 3 then Screener:30=1. If this condition is not met then there is a contradiction between the Screener and the SRB as to whether or not the building is a single family dwelling.

If SRB:4=4 then Screener:30=2. If this condition is not met then there is a contradiction between the Screener and the SRB as to whether or not the building is a multiple family dwelling.

If SRB:4=5 then Screener:3=1. If this condition is not met then there is a contradiction between the Screener and the SRB as to whether or not the building is a mobile home or trailer.

CHECK 6: ARE THE SRB AND SCREENER CONSISTENT WITH REGARD TO THE NUMBER OF UNITS IN THE BUILDING?

If SRB:17 $\neq$ S4 then the SRB and Screener are not consistent with regard to the total number of units in the building.

Appendix F

ANALYSIS OF LINEAR RELATIONSHIPS

STATISTICAL ANALYSIS OF LINEAR RELATIONSHIPS

HASE surveys will generate thousands of observations on hundreds of variables. Some of these data will occur in systematic patterns--one response on a questionnaire being correlated with another response on the same questionnaire. The presence or absence of such systematic patterns can be tested in many cases through statistical analyses of linear relationships. This appendix describes procedures for performing this phase of the audit.

A linear relationship between a pair of variables can be characterized as a simple formula which expresses one variable in terms of the other. The formula need not hold exactly for each observation. Random fluctuations can cause imprecision in the formula relating the two variables. When there is substantial imprecision in the formula, the variables are said to be weakly correlated. When the formula is relatively precise, and random fluctuations are comparatively minor, the variables are said to be strongly correlated.

It is also possible to examine linear relationships involving more than two variables. Given a set of variables, we can construct a formula relating any one variable to all the remaining variables. When the formula relating one variable to a set of variables is relatively precise, it is said that there is a good fit between the variables. However, if the formula relating the variables is relatively imprecise, having a substantial amount of random fluctuation, then it is said that there is a poor fit between the variables.

Our analysis of linear relationships will focus on the degree of interdependence among responses to different questions, as measured by the R^2 of each response regressed on all the others; on pairwise simple and partial correlations; and on full-scale regression analysis as a device for testing relationships.

PURPOSE OF ANALYSIS

The proposed analysis will be valuable for at least two reasons: first, because linear relationships are useful to know about in their own right for future investigations; and second, because they can be used as diagnostic devices to locate problems in the data. If, for example, we found a relationship that contradicted previous research findings or one which seemed anomalous in the context of the rest of our data, then that result would be subjected to closer scrutiny, to see if, perhaps, the survey responses are somehow misleading.

In the process of analyzing linear relationships, the audit will be gathering much information which will form a useful foundation for the overall analysis of the experiment. Analysts must often expend a great deal of effort in exploratory data analysis building experience and familiarity with their data base--learning its strengths, weaknesses, and idiosyncrasies. The audit, by systematically sifting through the data, will help analysts avoid unexpected pitfalls and will also reduce the energy that will have to be expended later in the experiment on such exploratory activity.

The analysis of linear relationships will also be useful in monitoring the impact of missing or incomplete data. Results of the analysis can help pinpoint those areas most sensitive to problems with missing data, and in some cases estimated relationships can be used to project missing values should this be required.

SPECIFYING LINEAR RELATIONSHIPS

There are over 300 variables generated by the landlord questionnaire alone. That means there are more than 45,000 possible pairwise combinations of variables which can be computed for an analysis of linear relationships. Furthermore, when we add the possibility of simultaneously analyzing more than two variables at a time, we quickly run into hundreds of thousands of linear relationships that could be generated as part of the audit of the landlord questionnaire. And, if we take into consideration the fact that the Tenant/Homeowner questionnaire is larger still than the Landlord questionnaire, and that it is

also possible to construct linear relationships spanning both the Landlord and Tenant/Homeowner questionnaires, then it becomes evident that there are literally millions of linear relationships which are candidates for examination by the audit.

As a practical matter, therefore, some restrictions must be initially placed on the number of variables used in the analysis. At first we will limit ourselves to those variables thought to be most important to the experiment. Later as results are obtained this group may be redefined or increased. These initial variables are classified by "audit variable groups" which cluster variables supplying common information. There are sixteen audit variable groups for the Landlord instrument and another sixteen for the Tenant/Homeowner instrument. A listing of audit variable groups is presented in Table 1. The variables constituting each audit variable group are listed in Table 2 along with their location in the instruments.

INTRA-GROUP CORRELATIONS

For each audit variable group an intra-group correlation matrix will be constructed which will indicate the strength of the linear relationship existing between each pair of variables in the group. These matrices are designed to present both the simple and partial correlations between variables. Simple correlation measures the precision of the linear relationship between two variables without controlling for the influence of any other variables. Partial correlation measures the precision of the linear relationships between two variables only after the effects of other variables have been excluded.

Table 3 is a pro-forma intra-group correlation matrix composed for audit variable group L2. The upper triangle of the matrix contains simple correlations between all variables in L2 whereas the lower triangle contains partial correlation between all variables in L2.

INTER-GROUP CORRELATIONS

Analysis of correlations between variables not in the same audit variable group will also be performed. In order to be able to examine

Table 1

A LISTING OF AUDIT VARIABLE GROUPS FOR THE LANDLORD AND TENANT/HOMEOWNER INSTRUMENTS

Identifying Code	Audit Variable Groups
Landlord Instrument	
L 1	Acquisition of the property--history and intent
L 2	Costs of acquisition
L 3	Involvement in non-real estate ventures
L 4	Extent of real estate involvement
L 5	Physical description of property
L 6	Revenues generated by property
L 7	Labor inputs to property
L 8	Service inputs to property
L 9	Utility inputs to property
L10	Repair inputs to property
L11	Claims against property
L12	Tax on property
L13	Insurance on property
L14	Neighborhood characteristics
L15	Landlord-Tenant relations
L16	Plans for property
Tenant/Homeowner Instrument	
T 1	Description and evaluation of residence
T 2	Description and evaluation of neighborhood
T 3	Costs of rental housing
T 4	Purchase and evaluation of homeowner properties
T 5	Claims against homeowners
T 6	Tax liability of homeowners
T 7	Insurance
T 8	Utility usage and cost
T 9	Repair expense
T10	Intent to move and cost of moving
T11	Cost and financing of previous residence
T12	Description of previous residence
T13	Household characteristics and composition
T14	Employment of male head
T15	Employment of female head
T16	Household income and assets

Table 2

KEY AUDIT VARIABLES BY AUDIT VARIABLE GROUP

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
L 1	Acquisition of the property-history and intent		
	1. Year of acquisition	A	1
	2. Means of acquisition	A	4
	3. Intent of acquisition	A	6
L 2	Costs of acquisition		
	1. Value of property upon completion of main building	A	8
	2. Purchase price of property	A	9
	3. Estimated value of property upon acquisition	A	10
	4. Cost of major improvements within a year of acquisition	A	13
	5. Value added by major improvements within a year of acquisition	A	14
L 3	Involvement in non-real estate ventures		
	1. Sources of non-real estate income	B	3
	2. Hours spent on non-real estate related work	B	7
L 4	Extent of real estate involvement		
	1. Percentage of household earnings derived from real estate	B	8
	2. Total number of properties owned in site area	B	11
	3. Total number of residential units in site area	B	12
	4. Hours spent on real estate related work	B	14
	5. Percentage of firm revenue derived from real estate	B	18
	6. Membership in real estate organizations	B	20
	7. Presence of ownership or management on property	A	15
L 5	Physical description of property		
	1. Number of residential units on property	C	5
	2. Age of main building	C	6
	3. Description of residential units on property	C	21
	4. Number of each unit, mentioned in Mod C-Q21, on property	C	22
	5. Number of commercial units on property	C	31
	6. Number of rental mobile home units on property	C	37
	7. Number of mobile home spaces on property	C	46

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
	8. Condition of building	I	3
	9. Whether building meets housing code	I	7
L 6	Revenues generated by property		
	1. Total cash rent from residential units	C	11
	2. Vacancy loss on residential units	C	12
	3. Bad debt loss on residential units	C	13
	4. Imputed rent of owner/occupant in residential units	C	15
	5. Rent forgiveness in residential units	C	17
	6. Other rental income from residential	C	18
	7. Average monthly rent of each unit, mentioned in Mod C-Q21	C	23
	8. Total full occupancy income from commercial units	C	32
	9. Actual income from commercial units	C	33
	10. Other commercial income	C	34
	11. Average rent for mobile homes	C	38
	12. Total cash revenue from mobile homes	C	39
	13. Vacancy loss on mobile homes	C	40
	14. Bad debt loss on mobile homes	C	41
	15. Imputed rent of owner/occupant in mobile home	C	43
	16. Rent forgiveness on mobile home	C	45
	17. Average rent for mobile home spaces	C	47
	18. Total cash revenue from mobile home spaces	C	48
	19. Vacancy loss on mobile home spaces	C	49
	20. Bad debt loss on mobile home spaces	C	50
	21. Imputed rent of owner/occupant mobile home spaces	C	52
	22. Rent forgiveness on mobile home spaces	C	54
	23. Income from mobile home entrace and/or exit fees	C	55
	24. Other mobile home income	C	56
	25. Total revenue from property in 1970	C	58
	26. Number of vacant units	H	1
	27. Number of households that moved out in 1973	H	15
	28. Number of units covered by lease	H	20
	29. Length of typical lease	H	21
	30. Size of security deposit	H	27
	31. Size of recent rent increase	H	28
	32. Cost of putting building in good condition	I	4
	33. Availability of adequate financing	I	8

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
L 7	Labor inputs to property		
	1. Hours respondent worked on property	D	1
	2. Imputed value of respondent's labor	D	2
	3. Hours co-owners worked on property	D	4
	4. Imputed value of co-owners labor	D	5
	5. Hours of free labor from outside sources	D	7
	6. Imputed value of free labor	D	9
	7. Number of employees, and their function	D	11
	8. Employee expenses (for each employee)	D	13
	9. Value of rent discounts and waivers (for each employee)	D	17
	10. Value of free labor for each job	E	5
L 8	Service inputs to property		
	1. Cost of management firm	D	20
	2. Use of professional or maintenance services	D	23
	3. Cost of professional or maintenance services	D	24
L 9	Utility inputs to property		
	1. Use of utilities of property	D	27
	2. Cost of utility usage	D	29
L10	Repair inputs to property		
	1. Number of jobs performed	E	1
	2. Cost of each job	E	4
	3. Average yearly cost of repairs and improvements	E	8
L11	Claims against property		
	1. Type of claim on property	F	1
	2. Size of land installment contract	F	3
	3. Length of land installment contract	F	5
	4. Size of monthly payment on installment contract	F	6
	5. Number of mortgages on property	F	9
	6. Present size of mortgage	F	11
	7. Length of original mortgage	F	14
	8. Present interest on loan	F	21
	9. Size of monthly payments on mortgage	F	22
	10. Amount yet outstanding on the mortgage	F	23
	11. Size of balloon payment	F	29
	12. Number of payments in arrears	F	31
L12	Tax on property		
	1. Special tax assessments	F	37
	2. Real estate tax liability	F	38
	3. Non-real estate tax liabilities	F	39

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
L13	Insurance on property		
	1. Numbering of insurance policies covering the property	F	41
	2. Type of insurance policy (for each policy)	F	42
	3. Cost of insurance policy (for each policy)	F	43
L14	Neighborhood characteristics		
	1. Condition of buildings in vicinity	G	2
	2. Condition of building, relative to neighborhood	G	4
	3. Assessment of desirability of owning property in the vicinity	G	12
	4. Assessment of the incomes of new persons in neighborhood	G	13
	5. Trend of property values in recent past	G	20
L15	Landlord-tenant relations		
	1. Difficulty in finding suitable tenants	H	8
	2. Description of tenants (single family structure)	H	12
	3. Description of tenants (multiple family structure)	H	14
	4. Number of evictions in 1973	H	17
	5. Evaluation of tenants' maintenance of their own units	H	33
	6. Means of searching for tenants	H	38
L16	Plans for property		
	1. Cost of planned improvements	I	12
	2. Cost of planned additional maintenance	I	16
	3. Average planned rent increase	I	18
	4. Plans to sell	I	21
	5. Estimated market value	I	29
T 1	Description and evaluation of residence		
	1. Number of rooms in unit	B	2
	2. Type of rooms in unit	B	3
	3. Number of complete baths	B	5
	4. Number of half baths	B	6
	5. Occupants satisfaction with unit	B	49
	6. Whether unit is furnished	C	24
	7. Date property was acquired	C	30
	8. Means of acquisition	C	32

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
T 2	Description and evaluation of neighborhood		
	1. Length of residence in neighborhood	B	71
	2. Condition of buildings in neighborhood	B	72
	3. Condition of building relative to other buildings in neighborhood	B	74
	4. Income to respondent relative to other residents in neighborhood	B	81
T 3	Costs of rental housing		
	1. Existence of lease on unit	C	5
	2. Length of lease	C	6
	3. Rent expense for unit	C	9
	4. Full rent for unit	C	19
	5. Additional parking expense	C	28
	6. Total rent reduction	C	111
T 4	Purchase evaluation of homeowner properties		
	1. Value of property upon completion of construction	C	34
	2. Purchase price of property	C	35
	3. Value of property upon acquisition	C	36
	4. Cost of improvements to property	C	41
	5. Value of improvements to property	C	42
	6. Estimated market value of property	C	81
	7. Imputed rental value for homeowner occupied structure	C	82
T 5	Claims against homeowners		
	1. Size of land installment contract	C	45
	2. Length of land installment contract	C	47
	3. Monthly payment for land installment contract	C	48
	4. Size of mortgage on property	C	53
	5. Original length of mortgage	C	56
	6. Present rate of interest	C	63
	7. Monthly payments on mortgage	C	64
	8. Amount outstanding on mortgages	C	65
	9. Size of balloon payment	C	70
T 6	Tax liability of homeowners		
	1. Special tax assessments on property	C	79
	2. Real estate taxes on property	C	80
T 7	Insurance		
	1. Number of insurance policies on structure	C	85
	2. Type of insurance policies	C	86
	3. Cost of insurance policies	C	87

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
T 8	Utility usage and cost		
	1. Utility usage	C	94
	2. Utility cost	C	97
T 9	Repair expense		
	1. Cost of repairs to unit	C	103
	2. Hours of unpaid labor done, on repair work	C	104
	3. Planned major repairs	C	114
	4. Cost of planned repairs	C	117
T10	Intent to move and cost of moving		
	1. Intentions to move and date of most recent move	D	1
	2. Number of potential residences examined before moving	D	9
	3. Length of time spent searching for residences	D	12
	4. Cost of moving	D	13
T11	Cost and financing of previous residence		
	1. Rent upon moving in	D	17
	2. Value of property upon moving in	D	20
	3. Cost of building structure	D	21
	4. Rent or mortgage at previous residence	D	27
	5. Value of previous residence upon departure	D	33
	6. Value of previous residence upon acquisition	D	64
	7. Value of previous residence upon completing construction	D	65
T12	Description of previous residence		
	1. Number of rooms in previous residence	D	34
	2. Number of bedrooms in previous residence	D	35
	3. Number of complete baths in previous residence	D	36
	4. Number of half-baths in previous residence	D	37
T13	Household characteristics and composition		
	1. Number of children under 18	D	23
	2. Number of people living in unit as of move in	D	24
	3. Age of household members	G	6
	4. Education of household members	G	7
	5. Number of persons in household	G	13

Table 2 (continued)

Audit Variable Group Code	Audit Variable Group and Description of Key Audit Variables	Location of Key Audit Variables on Field Instruments	
		Module	Question
T14	Employment of male head		
	1. Wage of male head	E	14
	2. Hours worked by male head	E	15
	3. Business income of male head	E	16
T15	Employment of female head		
	1. Wage of female head	F	14
	2. Hours worked by female head	F	15
	3. Business income of female head	F	16
T16	Household income and assets		
	1. Cost of child care	G	16
	2. Value of securities	G	18
	3. Value of bank deposits and cash on hand	G	19
	4. Income and source	G	21
	5. Rental income	G	22
	6. Cost of food stamps	G	24
	7. Value of food stamps	G	25

Table 3

PRO FORMA INTRA-GROUP CORRELATION MATRIX
FOR AUDIT VARIABLE GROUP L2

		Variable					
		1	2	3	4	5	
	1		.9046	.8512	.2110	.6284	Simple Correlation
	2	.8942		.9238	.1641	.1275	
Variable	3	.8071	.7650		.3419	.2908	
	4	.0953	.0396	.1756		.9482	
Partial Correlation	5	.1844	.0107	.1327	.8976		

NOTE: This table is presented for illustrative purposes only. Its format is typical of the format to be used in constructing intra-group correlation matrices. The contents of this table are not drawn from HASE data or research.

these linear relationships, a series of inter-group correlation matrices will be constructed. A pro-forma inter-group correlation matrix for audit variable groups L1 and L2 is presented in Table 4. The matrix is constructed according to a format which retains the symmetric nature of the intra-group correlation matrix. Here, however, the upper right-hand corner contains simple correlations and the lower left-hand corner contains partial correlations.

There are close to 500 possible intergroup correlation matrices, and some of these matrices may contain over 200 entries. The size of this task makes use of a set of priorities necessary: those inter-group correlation matrices which are likely to generate important information should receive more immediate attention than matrices which are likely to produce information of only peripheral interest. Tables 5, 6, and 7 define those inter-group correlation matrices which have first, second, and third priority. The remaining inter-group correlation matrices are implicitly assigned to a fourth priority group. This classification of inter-group tests is preliminary and may be changed during the course of the analysis.

SPECIFYING REGRESSION RELATIONSHIPS

In addition to correlation analysis, we also plan to use a full-scale regression analysis as a device for testing and identifying relationships within the data. An initial set of interesting groupings is presented in Table 8. In Table 8, the left-hand column defines the audit variable group from which the dependent variable is drawn, and the right-hand column defines the audit variable groups from which the independent variables are drawn. Note that in every case, the audit variable group of the dependent variable also appears as one of the audit variable groups used as independent variables -- therefore, any variable used as a dependent variable could have all other variables in its audit variable group used as independent variables.

In addition to the specifications of Table 8, we will also test where possible for relationships suggested by the standard literature

Table 4

PRO FORMA INTER-GROUP CORRELATION MATRIX
FOR AUDIT VARIABLE GROUPS L1 AND L2

		Audit Variable Group L1			Audit Variable Group L2				
		1	2	3	1	2	3	4	5
Audit Variable Group L1	1				.2158	.1390	.1247	.0026	.0704
	2				.3762	.4851	.4092	.0180	.0061
	3				.3457	.4020	.3210	.0175	.0083
Audit Variable Group L2	1	.1891	.2271	.2930			↑		
	2	.1347	.3569	.3162			Simple Correlation		
	3	.0968	.3118	.2840					
	4	.0024	.0093	.0116	←	Partial Correlation			
	5	.0496	.0048	.0074					

NOTE: This table is presented for illustrative purposes only. Its format is typical of the format to be used in constructing inter-group correlation matrices. The contents of this table are not drawn from HASE data or research.

Table 5

FIRST PRIORITY INTER-GROUP
CORRELATION MATRICES

Inter-group Correlation Matrices Drawn From		
The Landlord Instrument	The Tenant/Homeowner Instrument	The Landlord and Tenant/ Homeowner Instruments
L5 - L 6	T 1 - T 3	L 5 - T 1
L5 - L 7	T 1 - T 4	L 5 - T13
L5 - L 8	T 1 - T 5	L 5 - T16
L5 - L10	T 1 - T 9	L 6 - T 1
L5 - L11	T 1 - T13	L 6 - T13
L6 - L 7	T 1 - T16	L 6 - T16
L6 - L 8	T 3 - T 9	L15 - T 2
L6 - L10	T 3 - T13	
L6 - L11	T 3 - T16	
L7 - L 8	T 4 - T 5	
L7 - L10	T 4 - T 9	
L8 - L10	T 4 - T13	
	T 4 - T16	
	T 5 - T 9	
	T 5 - T13	
	T 5 - T16	
	T 9 - T13	
	T 9 - T16	
	T13 - T16	

Table 6

SECOND PRIORITY INTER-GROUP
CORRELATION MATRICES

Inter-group Correlation Matrices Drawn From		
The Landlord Instrument	The Tenant/Homeowner Instrument	The Landlord and Tenant/ Homeowner Instruments
L 1 - L16	T 1 - T 6	L 6 - T 1
L 5 - L 2	T 1 - T10	L 6 - T 3
L 5 - L12	T 1 - T12	L 6 - T13
L 5 - L13	T 2 - T13	L 6 - T16
L 5 - L16	T 2 - T 4	L 7 - T 1
L 6 - L 2	T 2 - T12	L 7 - T 3
L 6 - L12	T 2 - T16	L 8 - T 1
L 6 - L13	T 4 - T 6	L 8 - T 3
L 6 - L16	T 5 - T 6	L10 - T 1
L 8 - L16	T 6 - T16	L10 - T 3
L10 - L16	T11 - T12	L15 - T13
L14 - L16	T13 - T14	L15 - T16
	T13 - T15	
	T14 - T15	
	T14 - T16	
	T15 - T16	

Table 7

THIRD PRIORITY INTER-GROUP
CORRELATION MATRICES

Inter-group Correlation Matrices Drawn From		
The Landlord Instrument	The Tenant/Homeowner Instrument	The Landlord and Tenant/ Homeowner Instruments
L 1 - L 2	T1 - T 7	L 7 - T 9
L 1 - L 3	T1 - T 8	L 8 - T 9
L 1 - L 4	T2 - T 5	L 9 - T 8
L 5 - L 9	T2 - T 6	L10 - T 9
L 6 - L 9	T2 - T 7	L13 - T 2
L11 - L14	T2 - T 8	L14 - T 7
L11 - L16	T2 - T10	L14 - T13
L12 - L13	T2 - T13	L14 - T16
L12 - L16	T2 - T16	L15 - T10
L13 - L14	T3 - T 7	
L14 - L16	T3 - T 8	
L15 - L16	T4 - T 7	
	T7 - T 8	
	T7 - T13	
	T7 - T16	

Table 8

SPECIFICATION OF DEPENDENT AND INDEPENDENT VARIABLES FOR REGRESSIONS IN THE ANALYSIS OF LINEAR RELATIONSHIPS. BY AUDIT VARIABLE GROUP

For Dependent Variables Drawn From Audit Variable Group	Explanatory Variables are Drawn From Audit Variable Groups
L 1	L1, L2, L4, L11, L16
L 2	L2, L1, L5, L6, L11
L 3	L3, L1, L4, L16
L 4	L4, L1, L3, L5, L6, L16
L 5	L5, L6, L7, L8, L10, L11, L14
L 6	L6, L5, L7, L8, L10, L11, L14, L16
L 7	L7, L5, L6, L8, L10, L11
L 8	L8, L5, L6, L7, L10, L11
L 9	L9, L5, L6
L10	L10, L5, L6, L7, L8, L11
L11	L11, L5, L6, L7, L8, L10
L12	L12, L5, L6, L11
L13	L13, L5, L6, L11, L12
L14	L14, L2, L5, L6
L15	L15, L4, L5, L6, L7, L8, L10
L16	L16, L1, L2, L4, L5, L6, L10
T 1	T1, T2, T3, T4
T 2	T2, T1, T13, T16
T 3	T3, T1, T2, T13, T16
T 4	T4, T1, T2, T13, T16
T 5	T5, T1, T2, T13, T16
T 6	T6, T1, T2, T13, T16
T 7	T7, T1, T2, T13, T16
T 8	T8, T1, T3, T4, T16
T 9	T9, T1, T3, T4, T5
T10	T10, T1, T2, T3, T4, T11, T12, T13, T16
T11	T11, T1, T2, T3, T4, T10, T12, T13, T16
T12	T12, T1, T2, T3, T4, T10, T11, T13, T16
T13	T13, T1, T2, T3, T4, T14, T15, T16
T14	T14, T1, T2, T3, T4, T13, T15, T16
T15	T15, T1, T2, T3, T4, T13, T14, T16
T16	T16, T1, T2, T3, T4, T13, T14, T15

in relevant areas--i.e., housing economics, urban development, regional planning, et cetera.

DOCUMENTATION

All correlation matrices and regression findings will be compiled and made readily available to researchers working on the experiment. Most of this documentation will take the form of computer output.

In order to aid researchers in using audit findings, we will also document interpretations of the results of the analysis of linear relationships, referencing any suspicious patterns among regressions or correlations and outlining potential pitfalls in the statistical application of baseline survey data.

By using both types of documentation, analysts will be able to benefit from the experience gained by the audit in examining linear relationships and will also be able to examine the linear relationships themselves and extend or modify the audit's findings to suit their particular circumstances.

Appendix G

COMPARISONS WITH EXTERNAL DATA

Below, we describe our current plan for comparing data from the landlord and tenant/homeowner surveys with fourth count data from the 1970 census. This information is presented largely in tabular form and as figures. Following these, we present a list of publications and other sources that may contain data useful for comparison with survey results and for adjusting census data.

COMPARISON WITH THE CENSUS

Drawing upon the survey of landlords and the survey of tenants and the homeowners as necessary, approximately 90 tables will be constructed after applying appropriate sampling weights, to allow comparisons (with as few definitional problems as possible) with selected fourth count tabulations from the 1970 Census of Population and Housing. The objective will be to generate tables which, after adjustment for changes that are known to have occurred over the intervening time period, should correspond closely to the tables from the census. The adjustment for the time lapse between the pairs of tables will be necessary in almost every case and will generally have to be done on two levels.

The first level of adjustment will be for changes over time which affect the data uniformly. Examples of this form of adjustment might include housing value, rent, and income increases due to inflation and family and household count totals that have increased with population growth.

The second level of adjustment will be for those changes which modify the relative size of subsets of the data such as school enrollment by grade and families by classes of income. Both time and migration affect school enrollment by grade differentially. Some income groups respond more quickly and in closer proportion to inflation than do other income groups. Local data will be relied upon heavily in adjusting for changes which occur differentially. Examples of local sources which are expected to prove valuable in this procedure are annual

reports of school enrollment by school districts and surveys of wage rates in selected occupations. For making comparisons, consideration must also be given to possible problems in the census itself. Known problems exist, for example, in data on low income and minority groups. Whenever possible, additional local sources will be used, as in the case of adjustments, to cross-check both the survey results and the census tabulations.

CENSUS TABLES FOR USE IN COMPARISONS

Initial data comparisons which will be made with the census are listed below. Table 9 presents tabulations which can be constructed from the landlord survey from comparisons with data from the 1970 Fourth Count Census of Housing. Tables 10 to 18 indicate comparisons to be generated from the tenant/homeowner survey, and Table 19 indicates tabulations to be constructed from both the landlord and tenant/homeowner surveys.

Tables constructed from the survey of tenant/homeowners are organized as follows:

Housing Census Comparisons
- Rental Values
- Housing Characteristics
- Household Characteristics
- Income Values
- Value for Owner-Occupied Unit

Population Census Comparisons
- Demographic Characteristics
- Income Values
- Value for Owner-Occupied Units
- Educational Characteristics

All of the large tables are followed by a schematic display depicting the organization of comparisons by count and cross-tabulation. These are presented in Figures 6 to 12. In the figures, numbers in parenthesis following the most disaggregated level of cross-tabulation refer to the census tabulation being compared.

Table 9

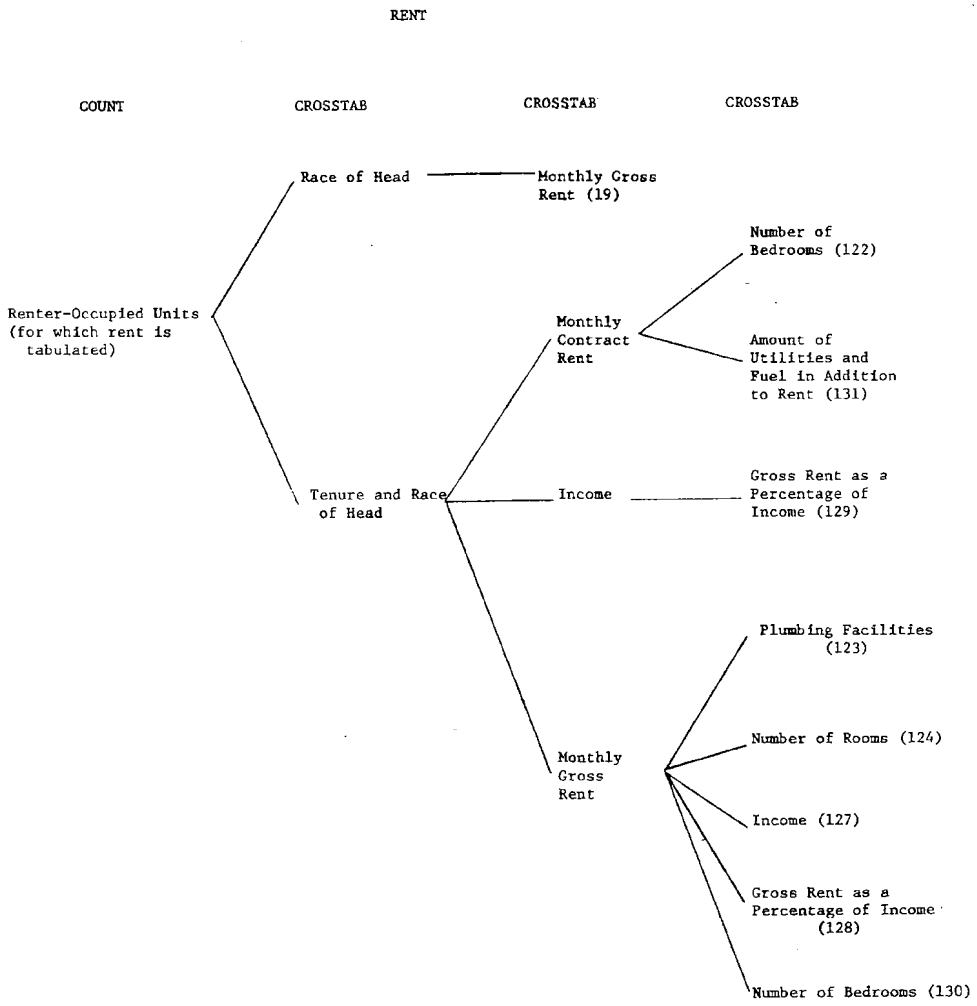
HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF LANDLORDS

Census Tabulation Number	Contents
3	Aggregate dollars monthly contract rent for units for which rent is tabulated: by occupancy status & race of head
6	Aggregate dollars asking rent for vacant year-round units for which rent is tabulated
8	Count of occupied and vacant year-round housing units: by tenure & race of head, by year structure built
9	Count of occupied and vacant year-round housing units: by tenure & race of head, by units in structure
11	Count of occupied and vacant year-round housing units: by tenure & race of head, by heating equipment
20	Count of vacant year-round units for which rent is tabulated: by inclusion of utilities, by monthly contract rent
27	Count of occupied & vacant year-round housing units: by tenure & race of head, by number of bedrooms
35	Count of occupied and vacant year-round housing units: by occupancy/vacancy status
36	Count of occupied units by tenure
54	Count of units for which rent is tabulated: by occupancy status and race of head, by monthly contract rent
122	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly contract rent by number of bedrooms
125	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly gross rent, by units in structure
126	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly gross rent, by year structure built
130	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly gross rent, by number of bedrooms
135	Count of occupied units: by units in structure, by plumbing facilities
144	Count of occupied and year-round vacant-for-rent units: by occupancy status and race of head, by plumbing facilities, by number of bedrooms
148	Count of year-round vacant-for-rent units for which rent is tabulated: by monthly contract rent, by year structure built
149	Count of year-round vacant-for-rent units for which rent is tabulated: by monthly contract rent, by units in structure
151	Count of year-round vacant-for-rent units for which rent is tabulated: by monthly contract rent, by number of bedrooms

Table 10

HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
RENTAL VALUES

Census Tabulation Number	Contents
5	Aggregate gross rent for renter-occupied units
19	Count of renter-occupied units (rent tabulated): by race of head, by monthly gross rent
54	Count of units (rent tabulated): by occupancy status by race of head by monthly contract rent
55	Count of units with all plumbing facilities (rent): by occupancy status by race of head by monthly contract rent
122	Count of renter-occupied units (rent tabulated): by tenure by race of head by monthly contract rent by number of bedrooms
123	Count of renter-occupied (rent tabulated): by tenure by race of head by monthly gross rent by plumbing facilities
124	Count of renter-occupied units (rent tabulated): by tenure by race of head by monthly gross rent by number of rooms
127	Count of renter-occupied units (rent tabulated): by tenure by race of head by monthly gross rent by income
128	Count of renter-occupied units (rent tabulated): by tenure by race of head by monthly gross rent by gross rent as percent of income
129	Count of renter-occupied units (rent tabulated): by tenure by race of head by income by gross rent as percent of income
130	Count of renter-occupied units (rent tabulated): by tenure and race of head by income by gross rent as percent of income
131	Count of renter-occupied units (rent tabulated): by tenure by race of head by monthly contract rent by amount of utilities and fuel paid in addition to rent.



Aggregate Gross Rent for Renter Occupied Units (5)

Units (for which Rent is Tabulated)	Occupancy Status and Race of Head	Monthly Contract Rent (54)
Units with all Plumbing Facilities (for which Rent is Tabulated)	Occupancy Status and Race of Head	Monthly Contract Rent (55)

Fig. 6--Organization of rental data for housing census comparisons.

Table 11

HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
HOUSING CHARACTERISTICS

Census Tabulation Number	Contents
11	Count of year round dwelling units (occupied and vacant) by tenure, by race of head, by heating equipment
12	Count of year round dwelling units (occupied and vacant) With all plumbing facilities by tenure, by race of head, by heating equipment
16	Count of year round dwelling units (occupied and vacant) by tenure, by race of heat, by number of bathrooms
27	Count of year round dwelling units (occupied and vacant) by tenure, by race of head, by number of bedrooms
28	Count of occupied units by tenure, by race of head, by clothes washing machines
29	Count of occupied units by tenure, by race of head, by clothes dryer
30	Count of occupied units by tenure, by tenure of head, by dishwasher
43	Count of year round dwelling units (occupied and vacant) by tenure by race of head by complete kitchen facilities

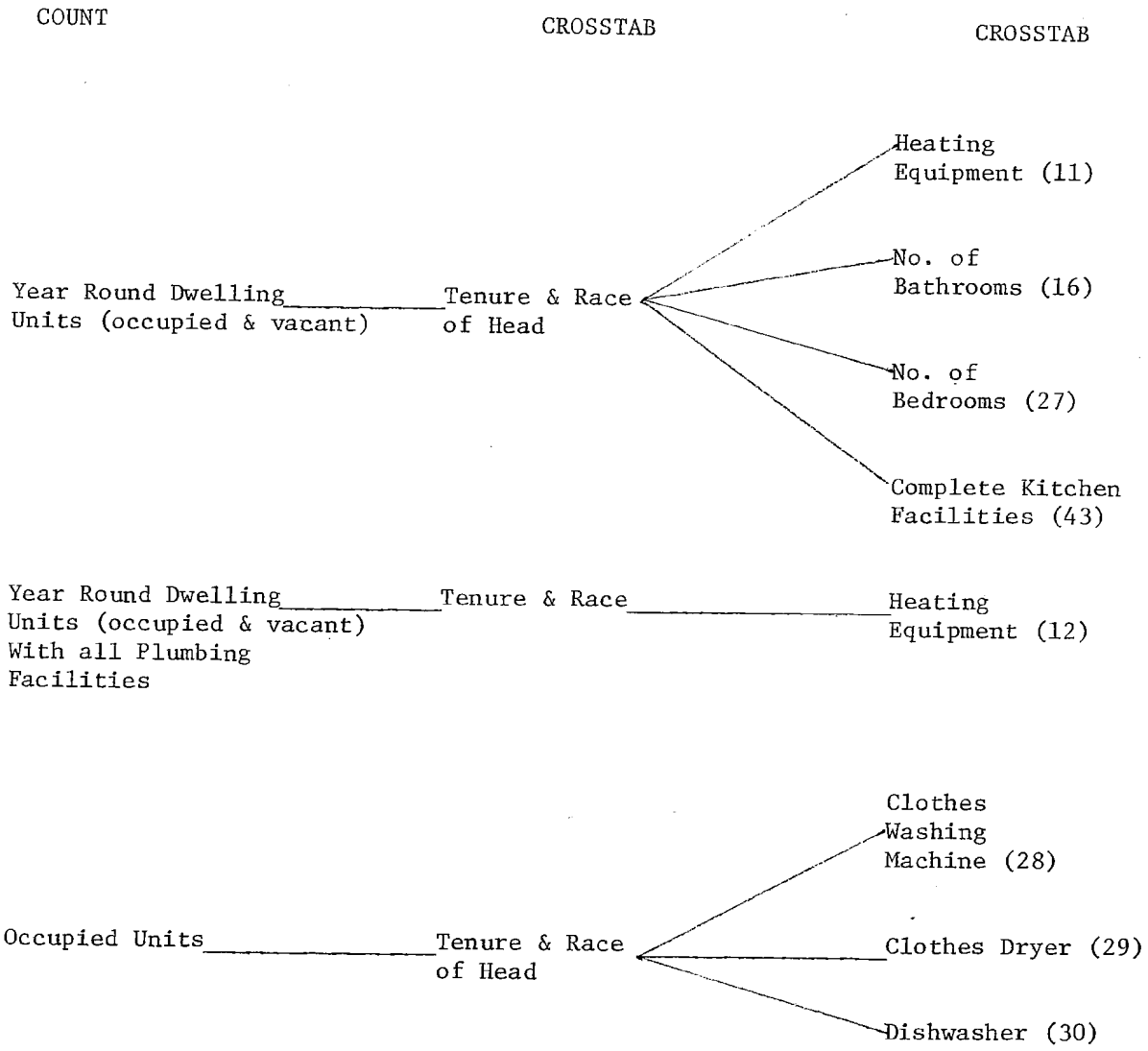


Fig. 7--Organization of housing characteristics data for housing census comparisons.

Table 12

HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
HOUSEHOLD CHARACTERISTICS

Census Tabulation Number	Contents
10	Count of occupied units: by tenure and race of head, by year head moved into unit
36	Count of occupied units: by tenure
37	Count of occupied units (and count of persons): by tenure and race of head, by number of persons in unit
38	Count of occupied units: by tenure and race of head, by household type, by age of head
39	Count of occupied units with head 62+ years: by tenure and race of head, by household type
40	Count of occupied units for one person households: by tenure and race of head, by sex MF, by age
41	Count of households with nonrelatives: by tenure and race of head, by household type
42	Count of occupied units: by tenure and race of head, by persons per room
60	Count of occupied units: by tenure and race of head, by plumbing facilities, by person per room
109	Count of occupied units: by tenure and race of head, by household type and age for 11-W, by year head moved into unit
116	Count of occupied units: by tenure and race of head, by number of persons, by year head moved into unit

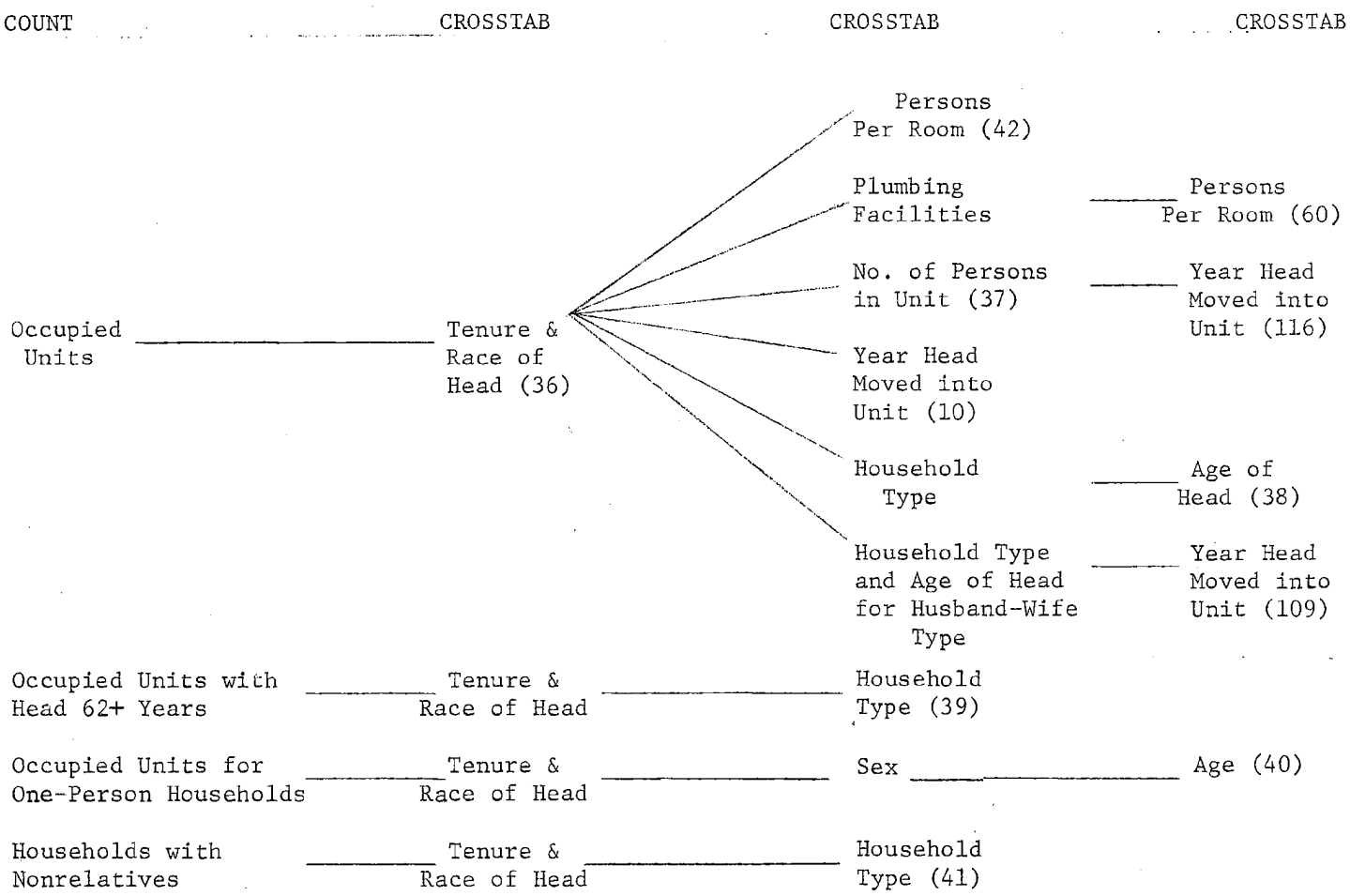


Fig. 8--Organization of household characteristics data for housing census comparisons.

Table 13

HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
INCOME VALUES

Census Tabulation Number	Contents
110	Count of occupied dwelling units: by race (total and Negro), by tenure, by three household types, by four classes of age of head, by eight income classes
142	Count of occupied dwelling units: by plumbing facilities, by eight classes of income, by tenure, by race of head (total and Negro)

Table 14

HOUSING CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
VALUE FOR OWNER-OCCUPIED UNITS

Census Tabulation Number	Contents
1	Aggregate $ value for units for which value is tabulated: by occupancy status and race of head
2	Aggregate $ value for units with all plumbing facilities for which value is tabulated: by occupancy status and race of head
52	Count of units for which value is tabulated: by occupancy status and race of head, by value
53	Count of units with all plumbing facilities for which value is tabulated: by occupancy status and race of head, by value
118	Count of owner occupied units for which value is tabulated: by tenure and race of head, by value, by income
119	Count of owner-occupied units for which value is tabulated: by tenure and race of head, by value, by value/income
120	Count of owner-occupied units for which value is tabulated: by tenure and race of head, by value, by year structure built
121	Count of owner-occupied units for which value is tabulated: by tenure and race of head, by value, by number of bedrooms

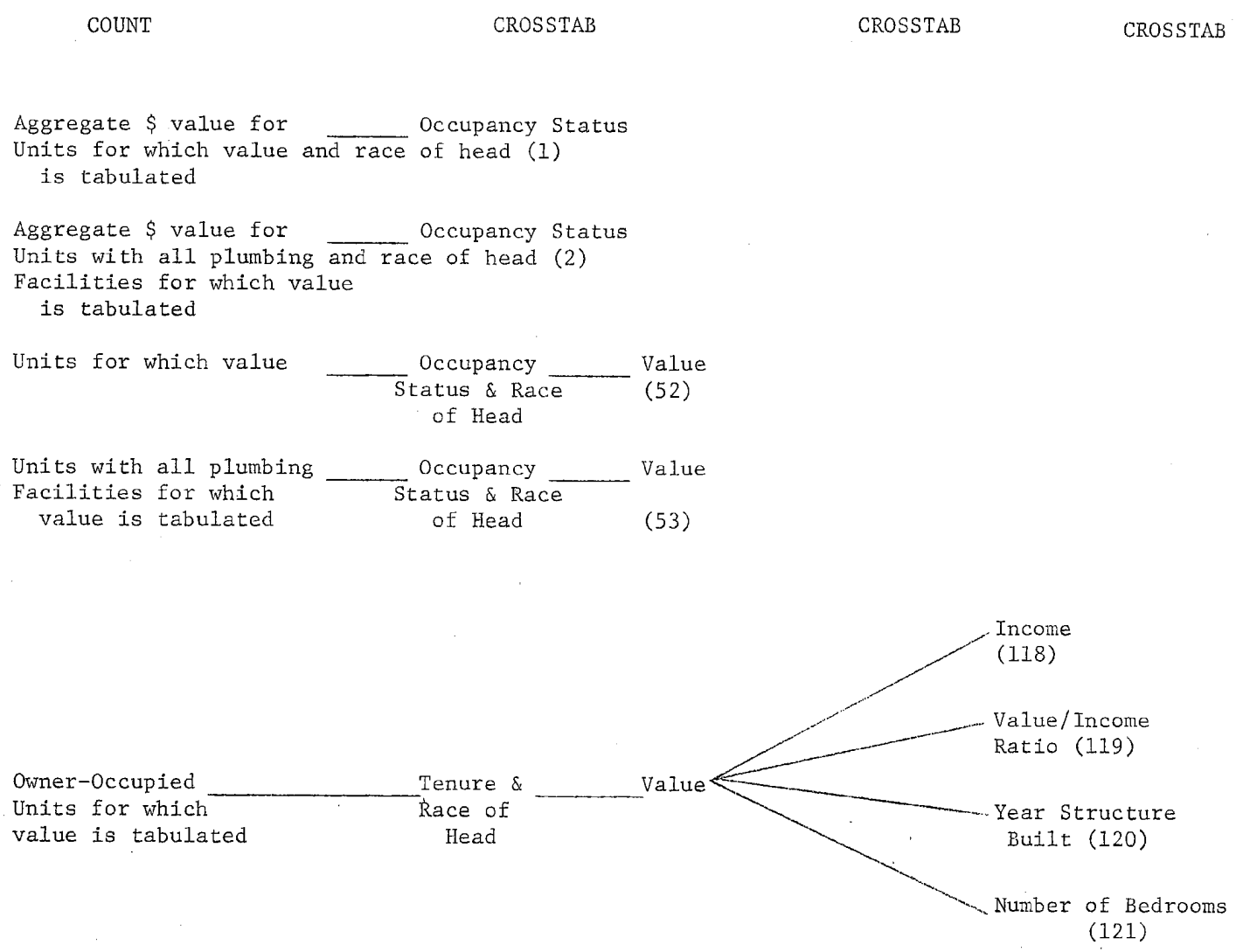


Fig. 9--Organization of data on value for owner-occupied units for housing census comparisons.

Table 15

POPULATION CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
DEMOGRAPHIC CHARACTERISTICS

Census Tabulation Number	Contents
17	Count of persons: by sex (M,F), by 27 classes of age
18	Count of persons: by 12 classes of household relationship and sex (mingled)
19	Count of families: by three classes of family type, by presence and age of children
20	Count of persons 14+: by sex (M,F), by six classes of matital status
45	Count of families with scns/daughters present: by presence of children in five age classes
48	Count of married couples with own children present: by presence of own children under 6, by presence of own children under 18, by husband under 45

COUNT	CROSSTAB	CROSSTAB	CROSSTAB
	Relationship 12 Classes Including Sex Types (Tab 18)		
Persons	27 Classes of Age (Tab 17)		
Persons 14+	Sex MF	6 Classes of Marital Status (Tab 20)	
Families	3 Classes of Family Type	Presence and age of children (Tab 19)	
Families with Sons/Daughters Present	Presence of Children in 5 Age Classes (Tab 45)		
Married Couples with own Children Present	Presence of own Children under 6, under 18, and Husband under 45, (Tab 48)		

Fig. 10--Organization of data on demographic characteristics for population census comparisons.

Table 16

POPULATION CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
INCOME VALUES

Census Tabulation Number	Contents
1-4	Aggregate $
15	Count of Families: by 15 income classes
8	Aggregate $ by type
80	Count of families and unrelated individuals: by family status, by 6 classes of type of income
76	Count of unrelated individuals: by 15 income classes
10-11	Aggregate $ income deficit
12-13	Aggregate $ income
82	Count of families: by 8 classes of ratio of income to poverty level
83	Aggregate number of persons in families below poverty level
86	Count of family heads 65+: by above or below poverty level
89	Count of 14+ unrelated individuals: by above or below poverty level, by under 65 or not
90	Count of 65+ persons: by above and below poverty level
94	Count of families below poverty level: by 3 classes of income
95	Count of 14+ unrelated individuals below poverty level: by 3 classes of income
15	Aggregage $ gross rent or renter-occupied units: by poverty status
96	Count of families and primary individuals: by poverty status, by tenure
16	Aggregate $ income deficit: by below 75 and 125% of poverty level, by family or unrelated individuals
97	Count of families and primary individuals in housing lacking plumbing: by family status
98	Count family members and unrelated individuals 14+: by less than 75 and 125% of poverty level, by sex of head, by 3 classes of family status
99	Count of family members and unrelated individuals 14+: by less than 25 and 75% of poverty level, by below poverty level

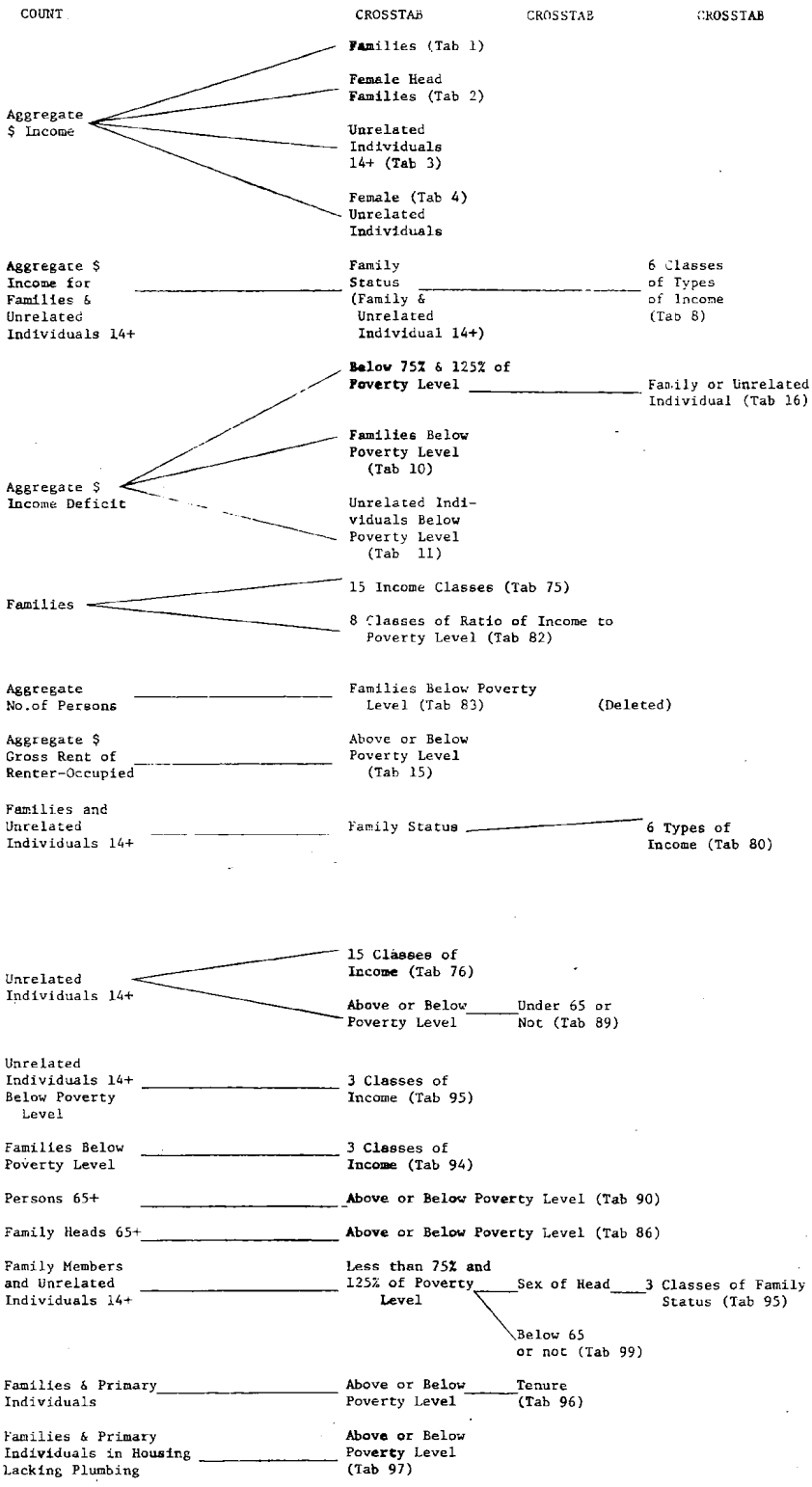


Fig. 11--Organization of data on income values for population census comparisons.

Table 17

POPULATION CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
VALUE FOR OWNER-OCCUPIED UNITS

Census Tabulation Number	Contents
14	Aggregate $ value of owner-occupied units for family or primary individual: by above or below poverty level

Table 18

POPULATION CENSUS - 4TH COUNT COMPARISONS
CONSTRUCTED FROM SURVEY OF TENANT/HOMEOWNERS
EDUCATIONAL CHARACTERISTICS

Census Tabulation Number	Contents
38	Count of 3+ persons in school: by under 35 or not by level of school, by type of school
39	Count of persons 3-34 yrs, in school: by age
40	Count of persons 18-24 yrs: by four or more years of high school and four or more years of college
42	Count of persons 25+ yrs: by sex (MF), by years of school completed
53	Count of males 20-49 and females 15-44 yrs: by years of school completed

COUNT	CROSSTAB	CROSSTAB	CROSSTAB
Persons 3+ in School	Under 35 or not	Level of School	Type of School (Tab 38)
Persons 3-34 In School	9 Classes of Age (Tab 39)		
Persons 18-24	Years of High School or College Completed (Tab 40)		
Persons 25+	Sex (MF)	10 Classes of Years of School Completed (Tab 42)	
Males 20-49 & Females 15-44	4 Classes of years of School Completed (Tab 53)		

Fig. 12--Organization of data on educational characteristics for population census comparisons.

Table 19

HOUSING CENSUS - 4TH COUNT COMPARISONS
TABLES BASED ON DATA FROM BOTH THE LANDLORD SURVEY
AND THE TENANT/HOMEOWNER SURVEY

Census Tabulation Number	Contents
8	Count of occupied and vacant year-round housing units: by tenure and race of head, by year structure built
9	Count of occupied and vacant year-round housing units: by tenure and race of head, by units in structure
108	Count of occupied units: by tenure and race of head, by household type and age of head, by year structure built
111	Count of owner-occupied units: by household type and age of head, by units in structure
112	Count of occupied units: by tenure and race of head, by household type and age of head, by units in structure
113	Count of occupied units: by tenure and race of head, by number of persons, by year structure built
114	Count of owner-occupied units: by number of persons, by units in structure
115	Count of occupied units: by race and tenure of head, by number of persons, by units in structure
125	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly gross rent, by units in structure
126	Count of renter-occupied units for which rent is tabulated: by tenure and race of head, by monthly gross rent, by year structure built
132	Count of owner-occupied units: by units in structure by heating equipment
133	Count of occupied units: by tenure and race of head, by units in structure, by heating equipment
134	Count of owner-occupied units: by units in structure, by plumbing facilities
135	Count of occupied units: by tenure and race of head, by units in structure by plumbing facilities
137	Count of occupied units: by tenure and race of head, by units in structure, by year structure built
138	Count of owner-occupied units: by units in structure by year head of household moved into unit
139	Count of occupied units: by tenure and race of head, by units in structure, by year head of household moved into unit
144	Count of occupied and year-round vacant-for rent units: by occupancy status and race of head, by plumbing facilities, by number of bedrooms
152	Count of occupied and vacant year-round housing units with all plumbing facilities and no complete bathrooms: by tenure and race of head

COMPARISON WITH OTHER LOCAL SOURCES OF DATA

The following is a list of sources of data that may prove useful for making additional comparisons with survey results and for adjusting census data. The list is not exhaustive, but is fairly representative of what is available. A preliminary analysis is now underway to determine the usefulness of each source.

Publications

Wisconsin Statistical Abstract, Department of Administration, Madison, Wisconsin, May 1972.

Wisconsin Socio-Economic Series, Vol. 1, Nos. 1-5, Department of Administration, Madison, Wisconsin.

New Industries and Plant Expansions Reported in Wisconsin, 1972, Department of Business Development, Madison, Wisconsin, January 1973.

New Industries Dot Wisconsin's Landscape, Department of Business and Development, Madison, Wisconsin, June 1973.

Employment Security Review, Department of Industry, Labor and Human Relations, Madison, Wisconsin, July 1973.

Wisconsin Work Force, Vol. 13, No. 5, Department of Industry, Labor and Human Relations, Madison, Wisconsin, June 15, 1973.

Employment and Wages Covered by Wisconsin's Unemployment Compensation Law, No. 64, Department of Industry, Labor and Human Relations, Madison, Wisconsin, February 5, 1972.

Wisconsin Employment, Earnings, and Labor Turnover, 1963-1967, Department of Industry, Labor and Human Relations, Madison, Wisconsin, July 1969.

Survey of Wage Rates in Selected Occupations, Department of Industry, Labor and Human Relations, Madison, Wisconsin, May 1971.

Taxes, Aids and Shared Taxes in Wisconsin Municipalities, Department of Revenue, Madison, Wisconsin, January 1973.

Economic Profile, Brown County Department of Business Development, Madison, Wisconsin, 1967, 1969, and 1970.

Procedure for Processing Population Estimates and Projections for State Tax Sharing in Wisconsin, Department of Administration, Madison, Wisconsin, July 1973.

Population Estimates, Department of Administration, Madison, Wisconsin, August 1, 1973.

Outside Plant History and Background, Wisconsin Telephone Co., Appleton, Wisconsin, June 1973.

Changes of Address, Credit Bureau of Green Bay, Green Bay, Wisconsin.

Newcomer Bulletin, Credit Bureau of Green Bay, Green Bay, Wisconsin.

Annual Report of School Enrollment, Department of Public Instruction, Madison, Wisconsin.

Annual School District Census of Persons under Twenty Years, Department of Public Instruction, Madison, Wisconsin.

Live Births and Deaths by Minor Civil Division Since 1970, Department of Health and Social Services, Bureau of Health Statistics, Madison, Wisconsin.

Estimates of the Population of Wisconsin Counties, July 1, 1971 and July 1, 1972, Series P-26, No. 26, Department of Commerce, Washington, D.C., May 1973.

Other Sources

State income tax data from the Department of Revenue, Madison, Wisconsin.

Vital statistics from the County Registrar of Deeds, Green Bay, Wisconsin.

List of registered voters from the County Clerk's Office, Green Bay, Wisconsin.

Appendix H

INCOME AND EXPENSE COMPARISONS

In the case of the landlord survey, it may prove useful to compare our data on landlord income and expenses to those for other regions. Such comparisons may indicate the similarities and differences between our experimental site and these regions. One source for such comparisons is data in the *Apartment Building Income/Expense Analysis Report* (IEA).* Below, we present average figures derived from this report for eight northern and midwestern cities.** These values will be used in our comparisons. Comparisons also may be made with similar data from other sources.

HOUSING INCOME AND EXPENSES

In the IEA, average figures are presented by region, age of structure, and size of building. As a starting point, we took the figures for the northern section of the country and for the building size of 12 to 24 units, which was the lowest size reported.

The estimates in the IEA are for 1971 and must be adjusted for inflation. Average rates of increase in the various income and expense categories were estimated. Since most of the rates were between 6 and 8 percent, it was decided to use a 7-percent rate over all categories. The average income and expenses as adjusted are shown in Table 20.

Estimates of the range for each category were made by inspection. The IEA presents data by city, reviewing eight northern and midwestern cities. Ranges of value were established that encompassed about six out of eight values for that category. It was assumed that the ranges grew proportionately with inflation.

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*Institute of Real Estate Management, Chicago, 1972.

**These were: Pittsburgh, Cincinnati, Omaha, Boston, Minneapolis-St. Paul, Chicago, Kansas City, and Milwaukee.

Table 20

INCOME AND EXPENSE STANDARDS (1973)

Category	Standards		Range	
	$ per Room per Annum	Percent of Gross Possible Revenue	$ per Room per Annum	Percent of Gross Possible Revenue
1. Gross income	480.89	100.0	±110	0
2. Less vacancies and delinquencies	11.72	2.4	11.72 to +40	-2.4 to +7.6
3. Actual collections	469.17	97.5	±110	-7.5 to +3.5
4. Total payroll	35.48	7.3	±8	2
5. Electricity	11.33	2.4	±5	-1 to +3
6. Gas	4.55	0.9	±11	-0.9 to +2
7. Water	8.48	1.8	±5	-0.8 to +2
8. Heating fuel	37.87	7.8	±11	-2 to +3
9. Management	24.89	5.2	±5	±3
10. Other administrative expenses	5.77	1.2	±3	-1.2 to +2
11. Paint and decoration	13.59	2.8	±5	±2
12. Maintenance and repairs	28.94	6.0	±11	±3
13. Supplies	3.33	0.7	±3	-7 to +0.5
14. Services	6.28	1.3	±5	±1
15. Miscellaneous operating expenses	4.22	0.9	±4	-0.9 to +1
16. Insurance	16.09	3.3	±5	±1
17. Real estate taxes	101.57	21.1	±22	±5
18. Other taxes	3.31	0.7	±3	-0.7 to +2
19. Total expenses	289.94	60.3	±55	±5
20. Net operating income	179.23	37.3	±55	±5

As noted earlier, estimates of standard revenue and cost were derived from a sample of buildings that are much larger than most of the buildings in Green Bay. Two checks imply that these estimates may still hold for smaller units. First, there is not much difference between estimates for buildings with less than 24 units and those with more than 24 units. If there is a scale factor, it is not evident in this range. Second, what data we do have on smaller units seem to check with these estimates. It has been estimated that the average expenditure for maintenance and repair and construction in the north-central section of the country for a renter-occupied, one-unit residence was $287 in 1971.*

Approximately one-half of those expenditures, or $143,** goes for maintenance and repair. Using the IEA estimates for 1971, it is estimated that painting, decorating, maintenance, and repair costs for a three-bedroom house would be approximately $186.*** The average house costs $28.6 per room for maintenance and repair, while our standard is $37. Therefore, the $28.6 figure would not be considered on outlier within the ranges previously defined.

Owner-occupied housing presents somewhat of a problem, however. Approximately the same amount is spent on this type of housing, but only 25 percent goes to maintenance and repair. This would yield an expenditure less than the lower bound of our range. However, the Department of Commerce survey does not include landlord labor as a cost. When this is included, the two estimates could possibly be in line.

Income and expense estimates are made for both average cost per square foot and average cost per room. Neither of these normalizing variables are included in our survey. We can approximate the number of rooms by adding two rooms to each unit that has a bedroom. These two rooms would be the kitchen and the living room. If this yields

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*_Residential Alteration and Repair_, U.S. Department of Commerce, Washington, D.C., 1972, p. 11.

**Ibid, p. 8

***Painting and decorating are probably considered as maintenance and repair expenditures in the other study.

consistently high or low results, the number of rooms added can be adjusted accordingly.

Various differences between IEA data and our survey results must be taken into account when making comparisons. Below, we list a few areas of possible differences where adjustments might be possible.

COMPARISON WITH SURVEY RESULTS

1. Age of Structure. Old structures tend to cost more (as a percentage of building revenue) for items such as maintenance and repair. A building constructed after 1961 cost on the average 4.4% of total revenue on maintenance and repair, while a building constructed before 1921 cost 9.3%. Different estimates could be constructed for various age groups to adjust for this age phenomenon. Most of the categories do not show such a trend, however, so age-related estimates will not be developed unless examination of the data shows that outliers are strongly correlated with the age of the building.

2. Different Handling of Utilities. The IEA format asks the landlord to include all the utility bills he pays even if he is reimbursed by the tenant. The landlord survey asks only for the reimbursed cost of utilities. Therefore, survey data will tend to underestimate the IEA cost category.

3. Mobile Home. The estimates were made for apartments and cannot be expected to hold for mobile homes.

4. Variation by Type of Neighborhood. There should be a large variation in the size of expenditures and revenues due to differences in the quality of housing services provided. A variation of 4:1 in the rent of one-bedroom apartments would not be reasonable. Expense statements could be expected to vary also, though perhaps not as radically. Therefore, one might want to construct standards for different classes of housing or restrict the comparison to the standards based upon the percentage distribution of revenue among expense categories.

Appendix

HASE WORKING NOTES REISSUED AS RAND NOTES

HASE WORKING NOTES REISSUED AS RAND NOTES

Most HASE publications that originally appeared as working notes (WN-series) are now being reissued as Rand notes (N-series) to make them available to a wider audience. Except as noted in the preface of each reissued document, its text and pagination are identical with the preceding WN. Rather than alter text citations of other reissued documents to reflect their current publication numbers, we provide the following list of corresponding numbers. Interested readers may order publications in the N-series from The Rand Corporation's Publications Department.

Former	Current
WN-7711-UI	N-1025-HUD
WN-7833-HUD	N-1026-HUD
WN-7866-HUD	N-1027-HUD
WN-7883-HUD	N-1028-HUD
WN-7885-HUD	N-1029-HUD
WN-7888-HUD	N-1030-HUD
WN-7895-HUD	N-1031-HUD
WN-7901-HUD	N-1032-HUD
WN-7907-HUD	N-1033-HUD
WN-7953-HUD	N-1034-HUD
WN-7974-HUD	N-1035-HUD
WN-7980-HUD	N-1036-HUD
WN-7982-HUD	N-1037-HUD
WN-8025-HUD	N-1038-HUD
WN-8029-HUD	N-1040-HUD
WN-8034-HUD	N-1041-HUD
WN-8054-HUD	N-1042-HUD
WN-8101-HUD	N-1043-HUD
WN-8167-HUD	N-1044-HUD
WN-8174-HUD	N-1045-HUD
WN-8198-HUD	R-2630-HUD
WN-8201-HUD	N-1047-HUD
WN-8209-HUD	N-1048-HUD
WN-8218-HUD	N-1049-HUD
WN-8268-HUD	N-1050-HUD
WN-8350-HUD	N-1051-HUD
WN-8364-HUD	N-1052-HUD
WN-8396-HUD	N-1053-HUD
WN-8439-HUD	N-1054-HUD
WN-8468-HUD	N-1055-HUD
WN-8489-HUD	N-1056-HUD
WN-8547-HUD	N-1057-HUD
WN-8574-HUD	N-1058-HUD
WN-8576-HUD	N-1059-HUD
WN-8577-HUD	N-1060-HUD
WN-8588-HUD	N-1061-HUD
WN-8611-HUD	N-1062-HUD
WN-8612-HUD	N-1063-HUD
WN-8623-HUD	N-1064-HUD
WN-8640-HUD	N-1065-HUD
WN-8645-HUD	N-1066-HUD
WN-8682-HUD	N-1067-HUD
WN-8684-HUD	N-1068-HUD
WN-8686-HUD	N-1069-HUD
WN-8687-HUD	N-1070-HUD
WN-8688-HUD	N-1071-HUD
WN-8689-HUD	N-1072-HUD
WN-8715-HUD	N-1073-HUD
WN-8809-HUD	N-1074-HUD
WN-8810-HUD	N-1075-HUD
WN-8811-HUD	N-1076-HUD
WN-8819-HUD	N-1077-HUD
WN-8973-HUD	N-1078-HUD
WN-8974-HUD	N-1079-HUD
WN-8976-HUD	N-1080-HUD
WN-8977-HUD	N-1081-HUD
WN-8978-HUD	N-1082-HUD
WN-8980-HUD	N-1083-HUD
WN-8999-HUD	N-1084-HUD
WN-9015-HUD	N-1085-HUD
WN-9016-HUD	N-1086-HUD
WN-9020-HUD	N-1087-HUD
WN-9022-HUD	N-1088-HUD
WN-9026-HUD	N-1089-HUD
WN-9027-HUD	N-1090-HUD
WN-9029-HUD	N-1091-HUD
WN-9051-HUD	R-2630-HUD
WN-9070-HUD	R-2630-HUD
WN-9079-HUD	N-1094-HUD
WN-9098-HUD	R-2630-HUD
WN-9211-HUD	N-1096-HUD
WN-9229-HUD	N-1097-HUD
WN-9292-HUD	N-1098-HUD
WN-9307-HUD	N-1099-HUD
WN-9390-HUD	N-1100-HUD
WN-9400-HUD	N-1101-HUD
WN-9430-HUD	N-1102-HUD
WN-9444-HUD	N-1104-HUD
WN-9541-HUD	N-1106-HUD
WN-9575-HUD	N-1107-HUD
WN-9576-HUD	N-1108-HUD
WN-9577-HUD	N-1109-HUD
WN-9651-HUD	N-1112-HUD
WN-9709-HUD	N-1113-HUD
WN-9723-HUD	N-1220-HUD
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WN-9734-HUD	N-1116-HUD
WN-9735-HUD	N-1117-HUD
WN-9736-HUD	N-1118-HUD
WN-9737-HUD	N-1119-HUD
WN-9738-HUD	N-1120-HUD
WN-9739-HUD	N-1121-HUD
WN-9801-HUD	N-1122-HUD
WN-9802-HUD	N-1123-HUD
WN-9814-HUD	N-1124-HUD
WN-9816-HUD	N-1125-HUD
WN-9895-HUD	N-1126-HUD
WN-9901-HUD	N-1127-HUD
WN-9949-HUD	N-1128-HUD
WN-9979-HUD	N-1129-HUD
WN-9980-HUD	N-1130-HUD
WN-10029-HUD	N-1131-HUD
WN-10039-HUD	N-1132-HUD
WN-10057-HUD	N-1133-HUD
WN-10073-HUD	N-1134-HUD
WN-10074-HUD	N-1135-HUD
WN-10086-HUD	N-1226-HUD
WN-10095-HUD	N-1136-HUD
WN-10139-HUD	N-1227-HUD
WN-10200-HUD	N-1137-HUD
WN-10223-HUD	N-1138-HUD
WN-10293-HUD	N-1139-HUD
WN-10294-HUD	N-1140-HUD
WN-10422-HUD	N-1142-HUD
WN-10432-HUD	N-1143-HUD