WELFARE CASELOAD ESTIMATING TECHNIQUES: A SURVEY AND EVALUATION

PREPARED FOR THE CALIFORNIA DEPARTMENT OF BENEFIT PAYMENTS

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PREFACE

The research in this report was performed between July 1 and October 31, 1975, under contract with the California Department of Benefit Payments. The study's primary objective was to assist the Department in assessing welfare caseload forecasting methods developed by other states and private research groups. The analysis should also be useful to other states, certain federal agencies, and those generally interested in welfare research.
SUMMARY

This report presents findings from a survey and evaluation of welfare caseload forecasting techniques, with emphasis on the desirability and suitability of such techniques for use by the Department of Benefit Payments (DBP) of the State of California. The findings reflect (1) a mail survey (with telephone follow-ups and cross-verification with HEW sources) of all state welfare agencies, (2) site visits to selected state and private groups active in this field, (3) an extensive literature search, and (4) subsequent analysis of the 25 most promising methodologies.

Highlights of our conclusions and recommendations follow. We discuss the conclusions first, following a question-and-answer format in which the questions represent the specific points we think DBP should ask itself about other techniques, and the answers are derived from our findings.

CONCLUSIONS

Are other states using methods or special kinds of data substantially different from what DBP knows about or uses? No. Although our review of DBP's procedures was necessarily brief, we satisfied ourselves beyond doubt that DBP had nothing to learn from other states—as far as currently operational procedures are concerned—that it did not know about already.

Does a technique exist somewhere that (1) could be applied to California with little or no start-up cost (in time, effort, and inconvenience as well as money) and (2) would constitute a significant improvement over current DBP procedures? No. Techniques purported to offer quick and easy solutions are oversold.

Can DBP benefit at all from other techniques, regardless of start-up costs? Almost certainly yes. The greatest gains would come, our findings

* For more extended discussion of the content of this Summary, turn directly to Sec. 5.
** We had not been asked to examine what DBP is doing now—only other techniques.
suggest, in the areas of (1) anticipating caseload movement induced by changes in the state of the economy, (2) anticipating abrupt departures from past trends, caused by various demographic, behavioral, or economic shifts, and (3) tracing the reasons for recent caseload movement and explaining these during budget preparation.

*Is there some single, specific technique that is best?* We think not. Many of the studies in our review contain good ideas—sometimes very, very good (see text, especially our discussion of work by the Boston College group, Holmer, Lochrie, and the NYCRI group); but no technique emerges as so outstandingly better than the rest that DBP should concentrate on that one alone, to the exclusion of all others.

*Are there techniques that DBP should be sure not to draw upon?* Yes. See text for details. Among other points, we particularly urge DBP to be especially wary of techniques that require input data not obtainable either from direct sources (e.g., published data series) or from estimating relationships provided along with the rest of the forecasting procedure. In other words, do not fall into the following trap:

A welfare administrator, plagued by his inability to predict caseload well, commissions a researcher on his staff to devise a forecasting model. Some time later, the researcher returns with model in hand and proceeds to demonstrate beyond all doubt that it is incredibly accurate. Pleased as punch, the administrator is lavish with praise. A month or so later, when he actually sets out to produce his first forecast with the new model, the administrator discovers that in order to derive an estimate of caseload a year from then, he must first know the number of unemployed tea-tasters a year in advance. Hastily he calls his researcher and asks where he can get a good estimate of future tea-taster unemployment, but in reply receives only: (1) "that is not part of the model"; or (2) "your top-of-the-head estimate is best, because you are in a position to know"; or (3) a simple projection from today’s value will do." Disillusioned, the administrator ruefully reflects that instead of the difficult problem of predicting caseload, he now faces the even more difficult problem of predicting conditions in the tea-tasting industry.
What about the suitability of other techniques for California?

There are two problems here: (1) Are California's problems in the welfare field enough like those elsewhere to warrant adopting the same conceptual approach as other states? and (2) Does the right data exist in California? On both, the answer is a clearcut yes.

**RECOMMENDATIONS**

Our recommendations, based on the conclusions presented above, are as follows:

1. Promising methods exist which with high probability would substantially enhance DBP's caseload and expenditure forecasting capability, particularly with regard to (a) anticipating the impact of changes in economic conditions, demographic trends, and behavioral patterns, and (b) explaining caseload movement during budget preparation. DBP should take advantage of these methods. Specifically, it should undertake a program (as outlined here) to select, test, and implement techniques especially appropriate for periods of rapid change, as enrichment for its presently strong capability during relatively stable periods. Techniques known from previous studies to have a high potential of enduring effectiveness should be considered first, but DBP should also explore new approaches extending beyond—but built upon—past efforts.

2. Many good ideas have been tried, but no single technique has yet been demonstrated as clearly best. Accordingly, the first step of DBP's enrichment program should be to test on current California data the most promising techniques from other studies (we believe there are less than half a dozen worth trying). These preliminary tests should adhere as closely as possible to the original work on all conceptual and theoretical matters, but should use recalibrated parameters and should correct weaknesses in statistical procedure wherever possible. This will insure that each "pure" technique is examined in the most favorable light for comparison and evaluation in terms of California's special circumstances.
3. Many other good ideas either have not been tried at all, have not been pushed far enough, or ought to be brought together in a single framework instead of treated as mutually exclusive. The second step of DBP's program should therefore be to synthesize and extend promising features of past studies, in effect forming new or hybrid approaches from the "pure" methods previously tested. Care must be taken at this step to avoid attempting too many possibilities with too little forethought, and thereby losing the thread of the effort's logical development.

4. As useful as these multiple investigations may be for exploratory purposes, the end result must be one procedure (or at most one principal and a very few back-up procedures), workable and complete in all respects, which can produce reliable forecasts on a routine basis. The third and final step must hence be narrowing the field of candidates down to the finalists. Many considerations should enter this process, but we think two are particularly important:

- DBP should be sure that all input data needed to compute caseload forecasts are either directly available (i.e., can be obtained from regularly updated sources at its disposal) or, if not available, can be reasonably well estimated by methods incorporated in the procedure selected.
- Those who will exercise the procedure must understand it and have confidence in it. They must know how to amend or fix it, should the need arise. Any technique, however laudable in the abstract, will be worthless if it does not meet this elementary requirement.

5. Lastly, we suggest that DBP consider searching for new kinds of data to use as explanatory variables. Since governmental
sources have already been thoroughly mined for this purpose, the principal thrust of this search would be toward finding data items in nongovernmental sources which nonetheless are reasonably comprehensive in coverage, timely in availability, and regularly accessible to DBP. Our personal view is that a search along these lines would be extremely valuable; even if nothing were found and the only payoff was knowledge that every avenue had been investigated. However, we also recognize that DBP might justifiably feel that this step should be undertaken only after the potential of currently known data is first exhausted.
ACKNOWLEDGMENTS

This study would not have been possible without the cooperation and assistance of a great many people in state and federal welfare agencies and in private research organizations. These people, by responding to our mail survey and telephone contacts and by meeting with us during our site visits, provided crucial information which we could not have obtained otherwise. They are too numerous to mention here, but a complete list is given in App. B. For extra help in various ways, we are also grateful to James Baxter, Barry Bluestone, Keith Bolte, Wayne Epperson, David Fairweather, Manual Helzner, Richard Lochrie, Ralph Meuller, C. Peter Rydell, Howard Thompson, John Townsend, Henry Townsend, and Ray Uhalde.

Special thanks are due to Anthony Moss, Chief of the Estimates Bureau, who as the Department of Benefit Payments Project Monitor, helped to guide our research. Mr. Moss and Mr. Robert Hotchkiss, Chief of the Program Support Branch, read and provided constructive comments on an earlier draft of this report. We also want to thank Joy Gee and other staff of the Estimates Bureau who aided us in developing a better understanding of California's Caseload estimation procedures.

At Rand, the survey would not have been completed successfully and on time without the design advice of Deborah Hensler and Nancy Hope and the follow-up efforts of Barbara Woodfill and Abby Robyn. C. Lance Barnett and David Weinschrott reviewed the text, suggesting many useful improvements. Finally, we wish to express deep appreciation for the secretarial assistance of Ann Hurley and Ethel Sniderman.
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1. INTRODUCTION

Early in 1975, the Department of Benefit Payments (DBP) of the state of California became increasingly aware of

a need for studies to determine the interrelationship between general economic conditions, unemployment, and the growth and decline of the welfare caseload . . . . This need was first identified by the Department Director from staff correspondence, and subsequently by the Legislative Analyst in his 1975 Budget Report to the Legislature.*

Besides the Legislative Analyst, the regional office of the U.S. Department of Health, Education, and Welfare also expressed interest in this area:

HEW has shown considerable concern over the accuracy of State budgetary projections which are used to request Federal funds as input to the Federal budget process . . . . Since it is believed that AFDC expenditures are a function of the economy, an improved understanding of these relationships would permit greater accuracy in budget projections.

By late spring, DBP was ready to take a first step toward satisfying these concerns, and accordingly invited bids for "a survey and analysis of methods of welfare caseload projection either currently used by states or developed in the relevant literature." More specifically, it wanted

research into what has been accomplished or is in process in other states, with a state of the art— review of the subject by educational or social institutions, along with an analysis of this research applied to California's current operating environment.

* All quotations in this Introduction are from the Invitation for Bid which initiated this study.
In response, we proposed a work plan involving: (1) an initial survey of all 49 states other than California; (2) in-depth data collection, including field visits, for the five states with the greatest technical expertise; (3) an analysis of the suitability of other states' methods for California; (4) a review of published methodologies; and (5) preparation of a final report including discussion of the study approach, the findings, conclusions, and recommendations.

Although the time allotted was extremely short for this program, we were able to meet—and in many cases exceed—all of our objectives within the given time and resource constraints. We received a higher response rate on our survey than expected, completed more telephone verifications, visited six (rather than five) states plus several private groups as well, analyzed 25 different studies, and produced a final report (the present document) considerably more extensive than anticipated in our contract. Inevitably, not everything went exactly according to plan. We had expected to spend the major portion of our time on techniques used by other states, and relatively little on those developed outside welfare agencies. However, our preliminary information-gathering clearly indicated that few states had much to offer that DBP did not already know about, but that private groups did. With the consent of the DBP project monitor, we adjusted the allocation of our efforts correspondingly.

Throughout, we kept in mind DBP's stated intention of subsequently proceeding to a second step in this research, which would cause to be developed and implemented several techniques to estimate caseloads based upon economic factors.

This consideration influenced both the nature of the recommendations included herein and our self-education—or storing up of "human capital"—on DBP's current procedures and problems.

Subsequent sections report our findings. Section 2 explains the methodology of our survey. Section 3 describes the results of our site visits. Section 4 presents our reviews and analysis of the most promising techniques. Section 5 discusses our conclusions and recommendations. Finally, the appendixes present detailed, supporting material including the survey package, summaries of state contracts and appropriate literature, and an extensive bibliography.
2. A SURVEY OF STATE WELFARE DEPARTMENTS

This section describes our mail and telephone survey of all state welfare departments (exclusive of California). Successive subsections explain the methodology of the survey, summarize its results, and compare our findings with those of an independent survey conducted previously by Mathematica, Inc.

METHODOLOGY

Our survey was designed to fulfill certain very specific and limited objectives rather than to be a catch-all for information on many issues. Both DBP and we felt that a broader survey, besides not helping the study in any respect, could well have hurt us by obscuring our essential data needs and absorbing too much of our limited budget.

The objectives may be simply summarized. The survey was supposed to inquire about methods of caseload projection as applied to four aid categories: Aid to Families with Dependent Children (AFDC), State Supplemental Payments (SSP), Food Stamps, and state general assistance programs. It was to focus on caseload and aid disbursement, rather than on administrative costs and caseworker staffing. It was to stress the (statistical or other) methods used to prepare basic projections prior to high-level review, and was not to concern itself with adjustments of these projections (e.g., for political reasons) during budget negotiations. It was to contact all 49 states other than California. Finally, it was to be basically a coarse screening device, not our final source of information.

The survey's role as a screening device is crucial. Neither DBP nor we thought that a survey of any kind, however thorough, could elicit enough useful evidence on caseload forecasting techniques to permit us to reach a final conclusion on their suitability for California. The most that could be hoped for from the survey responses, in our view, would be some guide as to which states are worth investigating further, plus general information on the rest. Therefore, the main thrust of the survey effort would be simply to identify candidate states for more
extensive study later, via site visits. If we had expected to find a
large number of promising techniques of generally distinct types, our
course might have been somewhat different. However, our and DBP's pre-
vious experience suggested (correctly as it turned out) that the number
of states meriting a visit would be quite small—e.g., the Invitation for
Bid (IFB) anticipated five. The survey thus served as a relatively quick
and inexpensive way of sifting out the numerous uninteresting techniques
which our study was not concerned with.

For the delivery of the survey, we chose a mail-out, mail-back
procedure, with telephone follow-up. We decided to use the mails ini-
tially in order to save time and effort where states were willing to be
immediately cooperative; and to use telephone contacts where some pro-
dding was needed. The questions in our mailed questionnaires were
short, specific, and required only brief answers. Brevity and absence
of complications, we thought, would encourage a quicker reply and a
higher final response rate. Furthermore, detailed technical questions
at this stage would have been irrelevant for most states, and a possible
source of misunderstanding (given the wide range of techniques that
sometimes go by the same label) for others.

The telephone follow-ups served several purposes. Besides prodding
states that had not responded, we also called those that had, and veri-
fied and refined the information they had sent us. Occasionally, too,
one source provided a cross-check on another. In a few cases where no
contact of any kind could be made with state representatives, we con-
sulted by telephone with the appropriate HEW regional representatives.
Regional and national HEW sources also provided a wealth of other infor-
mation—about states we had already heard from, about private research
efforts, and about their own modeling activities. Finally, the telephone
interviews enabled us to learn of any ambiguities or misunderstandings in
the mailed questionnaires. We found, for example, that the term "eco-
metric forecasting" was interpreted by many states to mean including eco-
nomic factors in their caseload estimation, whether subjectively or in
some quantitative way. Because of this problem, which we discovered
early in our follow-up procedure, we revised the format of the telephone
interview, making a particular effort to quiz in detail any state that responded positively to "econometric forecasting."

A complete copy of the mailed survey package, including the cover letters from Rand and the Department of Benefit Payments, appears in App. A. Because the four programs of interest to us (AFDC, SSP, Food Stamps, and general assistance) are not necessarily handled by the same office within a welfare department, we devised four separate questionnaires, one for each program. The survey package also included a fifth form which was to be completed by the welfare commissioner or his designee and which asked for the names and departments responsible for case-load estimation in each program. This fifth form was meant to aid us in record-keeping and in securing names of appropriate contacts in the event that the program questionnaires were not returned. When following up by telephone, we concentrated exclusively on one program—AFDC. Calls on all four programs, we reasoned (from respondent data), were not necessary because (1) states often use the same technique for all four and (2) if they have more than one technique, the most complete one is almost invariably reserved for AFDC—the largest and most controversial of the four programs.

The survey package was in most cases directed to the welfare commissioner, whose address we had found from the 1973 Public Welfare Directory. Attached to each of the five questionnaires was a stamped, self-addressed return envelope. In addition to all 49 states other than California, we also sent survey packages, containing a revised Rand cover letter, to the largest welfare department (county or city) in the ten largest metropolitan areas in the United States. Although neither DBP nor we anticipated much payoff from the city and county contacts (this expectation was correct), we went ahead with them anyway because the additional cost was so small.

Survey forms for the states were mailed July 3, 1975, and responses began coming in as early as July 15. The work schedule of the project required that selection of candidate states for site visits be completed by early August. With time so short, we had to begin the telephone follow-ups during the week of July 21. The bulk of the follow-ups were finished during the week of August 4; calls to a few late respondents continued into early September.
A complete record of the names and addresses of all the people we
spoke to or corresponded with during the survey appears in App. B, along
with a brief description of the caseload estimating technique of each
state.

As a further method of acquiring information and arranging meetings,
we attended the 15th Annual Conference on Welfare Research and Sta-
tistics held in San Francisco August 2 and 3, 1975. Discussions with
state personnel present from all over the country added considerably to
our growing store of information and helped us make our final choice of
states for site visits.

RESULTS

A summary of all our contacts with each state--by mail, by tele-
phone, and via a HEW regional representative--is given in Table 1. As
this table shows, we were in some way able to survey every state.

Thirty-two states returned the mail survey, and in every case,
they sent us back all of the relevant forms.* Fourteen of the remain-
ing states were reached either by telephone or in person. Thus, we
contacted 46 states directly, and relied on indirect sources (i.e., HEW
representatives) for only 3 states. In 27 states, we obtained informa-
tion in two or more of the four ways indicated in the table.

The responses demonstrate, perhaps not unexpectedly, that vir-
tually all states employ one variation or another of trend analysis.
To the extent that other techniques are utilized, it is always in sup-
port of trend analysis. A few states reported using regression analysis,
but only as an aid in selecting the appropriate trend line.** Several
states claimed to have an econometric forecasting method, but further
inquiry revealed that they had misinterpreted our reference to this
method.

We found several distinct types of trend analysis in use. First,
many states which obviously devote little time and effort to caseload

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* For states without any general assistance program, that form is
not relevant.
** See the discussion of Texas in Sec. 4.
Table 1

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<td>Wisconsin</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Wyoming</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>
projection rely on simple extrapolation of cases and recipients from past trends, without consulting other variables. A second group of states adjusts their trend extrapolations on the basis of usually qualitative assessments of the impacts of economic variables such as the Consumer Price Index, the absolute amount of unemployment, or the rate of unemployment. A third group of states has—or is acquiring—a model to "backup" trend selection.

THE MATHEMATICA SURVEY

As a final check on our survey results, we compared them with the findings of a similar but independent study conducted by Mathematica, Inc., in 1974 for the Congressional Research Service of the U.S. Library of Congress. Mathematica contacted a total of 17 states, all by telephone. This sample included the 10 states that spent the most federal welfare funds in fiscal 1973 and the 3 states with the highest rate of overpayment according to HEW quality control reports for the period July–December 1971. The balance of the sample was chosen by expert judgment. Since the study was concerned as much with costs as with caseloads, the interviews in general were with budget analysts—unlike our study which dealt mostly with the statistical staff responsible for deriving the initial estimates.*

* The Library of Congress did not agree to release Mathematica's final report publicly until after our study was completed. Not surprisingly, therefore, few people have heard of the study, apart from those directly involved. We only became aware of it midway through our own effort. Fortunately, Ray Uhalde of Mathematica, to whom we are very much indebted, gave us a full description and some useful documentation (not the embargoed part).

Some readers will be tempted to ask: could we have used Mathematica's results (if they had been totally available and if we had known of them soon enough) in lieu of conducting a survey of our own? The answer is no: Mathematica's survey does not meet our needs completely. To see this, compare the contents of the paragraph to which this paragraph refers with the contents of the earlier subsection on "Methodology."
State by state comparisons reveal almost total agreement between our and Mathematica's findings. In addition, Mathematica's overall conclusions correspond closely to ours, particularly their classification of states into three categories. Their categories are: (1) states that use simple trend analysis, making few if any adjustments; (2) so-called "judgmental trend line" states—i.e., states that first estimate a trend line and then adjust it subjectively based on a variety of economic factors; and (3) states that have formal models or some formal procedure for adjusting the trend line. The Mathematica study also observed—as we did—that the initial estimates are often revised as they progress through the budget process, with the most changes being made by the welfare department's budget division, the Governor's office, or the state legislature. Another of their conclusions is that the accuracy of estimates depends more on the perspicacity of assumptions about political, judicial, and legislative developments than on the technical sophistication of the prediction technique employed.

That two studies, conducted at different times, using different approaches, and focusing on different sections within welfare departments, should agree so thoroughly is encouraging. Such agreement significantly reinforces our central conclusion that most estimating techniques currently in use at the state level are rather conventional applications of well-known procedures.

*The one exception is Michigan. Since we were not able to reach state personnel there directly, and had to rely on HEW contacts instead, our information is less complete than Mathematica's.
3. SITE VISITS

This section describes our visits to six state welfare departments. The first subsection explains how we chose these six rather than some others. Each visit is then discussed in turn in succeeding subsections.

Prior to and during the state visits, we also had discussions, by telephone or via further site visits, with several individuals at federal agencies or in private research organizations. Although DBP and we had anticipated that the chosen states would provide our most important data, these other sources often were more useful. A few of them, such as Barry Bluestone of Boston College, Richard J. Lochrie of Lochrie Associates, and Henry Townsend of National Planning Associates, are now actively engaged in their own caseload modeling programs. Others, such as Manuel Heizner of the Office of Information Systems at HEW and Ray Uhalde of Mathematica, are extremely well informed on the current state of the art and the latest efforts of its practitioners.

Counting both state and other sources, we made 11 site visits. However, in this section, we confine our attention to the state visits. A complete list of other contacts is given in App. B, and their forecasting techniques are examined in Sec. 4 and App. C.

SELECTION OF STATES FOR SITE VISITS

To select a final list of states for personal interview, we first prepared a list of 16 candidates on the basis of a review of (1) the survey results and (2) supplementary intelligence obtained from the San Francisco research conference, HEW regional representatives, and published literature. Several criteria guided our initial choice of candidates. First, we excluded all states that devote very little staff effort to forecasting (e.g., one person week per year per program) since it would be extremely unlikely that they would have a promising technique. Second, the number and type of data elements
they use told us a considerable amount about the potential of a technique. Some states access only two variables—usually number of cases and cost per caseload in previous months. Others look at as many as a dozen or more variables. Third, we studied carefully a state's response to our questions about the nature of the technique employed. On this, our telephone follow-ups were of crucial importance.

The 16 candidate states are given in Table 2, along with some summary data relevant to the final selection. If, by the above criteria, several states qualified with similar techniques, we consulted the information in the table to assure a broad mix both geographically and in terms of actual and potential caseload size. On August 11, the DBP project monitor and Rand staff discussed each candidate in detail. By that time, we had already visited two states: New York and Wyoming. Although neither state's technique was especially outstanding, both had been in the path of other Rand trips, and so had been easy to visit in passing.

With these two states removed from the competition, the final choices to emerge from the August 11 meeting were: Illinois, Maine, Massachusetts, South Dakota, Texas, and Wisconsin. We subsequently met with our contacts in all of these states except Maine and Wisconsin. Maine was dropped because the technique we had initially heard was being developed by the welfare staff there turned out actually to be under development for them—and by Barry Bluestone, whom we were already going to see anyway. Wisconsin was not visited because our contacts there insisted that their methods were unexceptional and discouraged a meeting. While their survey responses indicated a combination of trend analysis and regression analysis, they told us in telephone conversation that it really is all trend analysis. We persisted in trying to set up a meeting but were unsuccessful.

We turn now to the site visits.

ILLINOIS

In Illinois we met with Wayne Epperson, head of Research and Statistics for the Illinois Department of Public Aid. Illinois is one of many states which at the moment relies on trend analysis but has a modeling effort under way. Funded July 1, 1975, by HEW as a three-year study,
Table 2
STATE DATA

<table>
<thead>
<tr>
<th>State</th>
<th>Region (^a)</th>
<th>Total AFDC Recipients, Feb. 1974(^b) (thousands)</th>
<th>Population, 1973(^c) (thousands)</th>
<th>Percent Persons Poverty(^d)</th>
<th>Percent Urban(^e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>9</td>
<td>72</td>
<td>2,058</td>
<td>15</td>
<td>80</td>
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<td>California</td>
<td>9</td>
<td>1,338</td>
<td>20,601</td>
<td>11</td>
<td>91</td>
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<tr>
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<td>5</td>
<td>776</td>
<td>11,236</td>
<td>10</td>
<td>83</td>
</tr>
<tr>
<td>Kentucky</td>
<td>4</td>
<td>149</td>
<td>3,342</td>
<td>23</td>
<td>52</td>
</tr>
<tr>
<td>Maine</td>
<td>1</td>
<td>73</td>
<td>1,028</td>
<td>14</td>
<td>51</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1</td>
<td>312</td>
<td>5,818</td>
<td>9</td>
<td>85</td>
</tr>
<tr>
<td>Minnesota</td>
<td>5</td>
<td>125</td>
<td>3,897</td>
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<td>66</td>
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<tr>
<td>Nebraska</td>
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<td>13</td>
<td>62</td>
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<tr>
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<td>18,265</td>
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<tr>
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<td>Pennsylvania</td>
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<td>11</td>
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<tr>
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<td>Wisconsin</td>
<td>5</td>
<td>145</td>
<td>4,569</td>
<td>10</td>
<td>66</td>
</tr>
</tbody>
</table>

\(^a\) Department of Health, Education and Welfare regions.

\(^b\) Recipients of Public Assistance Money Payments and Amounts of Such Payments, by Program, State and County, February 1974, DHEW Publication (SRS) 74-03105, June 1974.


\(^d\) Ibid., Table 634, p. 391.

\(^e\) Ibid., Table 18, p. 19.
this effort is being performed by Dr. Thomas Prince of Northwestern University.

Currently, Illinois' forecasts are based primarily on past program activity, with the most important variable being the number of applications received per month. Other measures of program activity taken into account are openings, closures, and denials. In addition, for background purposes only, economic and social factors such as the number of female-headed households, the trend in the unemployment rate, cost of living, food stamp applications, number of medical-only applications, as well as caseload and grant level in other states, are monitored. This last item is of some interest. Those responsible for preparing caseload estimates feel that economic impacts first appear in other states, in particular California and New York. These states are looked at to see what can be expected in Illinois a few months hence. In addition, states "similar" to Illinois are monitored. These include Michigan, Pennsylvania, New Jersey, and Massachusetts. Ohio, while economically similar, has a strict and low-paying welfare program, so that welfare activity in that state is not monitored. Future caseload estimates are developed from three-month, six-month, and nine-month activity averages and then adjusted up or down based on judgment.

In Illinois and probably other states as well, the decisionmaking process is not very conducive to the use of technically sophisticated techniques. Illinois has a history of underbudgeting. Department requests for federal funds typically show a true caseload for the first two quarters of a fiscal year. By the third and fourth quarters, they must show a sharply decreased caseload if they are to keep within the state budget. (Fortunately, the regional office of HEW makes its own estimates of the department's needs and credits the state accordingly.) The department must then go to the legislature and seek additional funds--apparently a well-accepted annual practice. Current estimates for this year's additional appropriation stand at $115 million.

MASSACHUSETTS

In Massachusetts we met with Ralph Meuller of the finance section in the Department of Public Welfare. Caseload forecasting, prior to
recent departmental reorganization, used to be the responsibility of the research and planning section, which relied on a model developed by Bluestone at Boston College. Mueller, however, is currently seeking the assistance of another research group to develop a new model. Details of the Boston College model and Mueller's views are discussed in Sec. 4.

NEW YORK

New York state has one of the largest welfare caseloads in the country and therefore we expected, before the survey started, that it would have one of the best forecasting techniques. On the questionnaires returned by the state's welfare department, their Chief Economist, Miles Storfer, indicated that caseload estimates are based on a variety of techniques, including econometric forecasting, and make use of a number of data elements from a variety of sources. Repeated efforts to arrange a meeting resulted in reluctant agreement to our visit. When the time came, Storfer could not see us after all, but discussions with members of the department responsible for preparing caseload estimates, the Program Forecasting and Economic Analysis Section, told us that the procedure is largely ad hoc, varying with the policy question at issue at the time of budget preparation. Later conversations with the Region II HEW representative confirmed these findings, with the added note that caseload estimating in New York, as in other places, is a "one man show." The state at one time approached the Boston College group to develop a model, but the project was never funded. Instead, New York is now one of the five states being used as a demonstration site by the Boston College group under contract to HEW.

SOUTH DAKOTA

South Dakota's Office of Assistance Payments is under the division of social welfare within the social services department. Our contact was Keith Bolte, Assistance Program Administrator. The welfare program is state administered, and through a system developed by the department program support group, payments and records are maintained on an online computer system. The emphasis is on using the computer to store data, not to do payment determinations.
The key to the department caseload-estimating process is something called program analysis, which produces caseload estimates by county. Counties are characterized according to the degree of urbanization, the incidence of Indians in the population, and the incidence of past protest demonstrations (a two-way distinction is made on each of these dimensions). Based on the results of a departmental time study, the caseload estimates are translated into estimates of caseload per social worker and, ultimately, of program administrative cost. The initial caseload estimates are a function of number of illegitimate births, percentage of female heads of households below the poverty level, and the divorce rate. All of the figures for this program are maintained by the state, including those on poverty.

While of only peripheral interest to this study, the departmental time study is noteworthy. Concerned that the legislature always cuts the welfare budget on the administrative (not the payment) side, departmental managers realized they needed to justify its administrative costs. To do this on a per case basis, they carried out a three-month study of 1000 cases, stratified by the characteristics noted before—urban, Indian, and past protests.

Every time a file was pulled, they noted the activity and the time spent in that activity. From this, they developed estimates of their administrative costs per case by the above characteristics. From these estimates they derive their manpower needs.

TEXAS

Mr. John Townsend, Assistant Commissioner for Coordination, arranged our visit. Howard Thompson, manager of the Research and Evaluation Section, is the individual responsible for caseload forecasting and the one who provided all of the information for this case study.

The Texas legislature meets only every two years, so caseload, recipients, and dollars of aid are estimated biennially for the state budget process. The Research and Evaluation Section is relatively new, having been formally created July 1, 1974. Before this group came into existence, estimates both for federal and state purposes were prepared by the Reports and Statistics Group. The estimating method of this
latter group was simple trend analysis. The current method used by the Research and Evaluation Section is trend analysis supported by regression analysis. Details of the current method are discussed in Sec. 4.

WYOMING

Wyoming is typical of that group of states which, by checking econometric forecasting on our questionnaires, meant to indicate that they look at variables when preparing caseload estimates. Dan Brown, the department's statistician, explained that with such a small caseload—only 2300 cases—the department can really "just about guess" the caseload. However, they do try to take account of what they call impact areas—i.e., areas in the state which because of oil, gas and coal resources are presently experiencing tremendous changes in economic activity.
4. DISCUSSION OF SELECTED TECHNIQUES

This section reviews the most interesting or important caseload forecasting techniques we found. An initial subsection explains how we selected and organized the techniques for analysis. Following that, another subsection defines a few specialized terms useful for expository clarity. Seven succeeding subsections then present the reviews themselves.

SELECTION AND ORGANIZATION OF TECHNIQUES FOR REVIEW

We first amassed a master list of all the references we had found from: (1) the mail-and-telephone survey, (2) the site visits, (3) our literature search, and (4) bibliographies in other references. This master list (given in App. D) included over 100 papers, but not all of these turned out to be truly relevant to caseload prediction. To select the relevant ones, we applied a twofold test to each paper. We first asked "Is there any empirical content at all?" and then "If so, can the dependent variable(s) be related to caseload via some simple arithmetic transformation?" Papers receiving a "yes" on both questions qualified for our final review list (Part I of App. D).* By adopting this test, we were able to keep our review as broad as possible without devoting scarce time and resources to papers obviously beyond the scope of the study. The test in effect operationalizes the maxim "when in doubt, review it."

The final list, after allowance for multiple references to the same piece of work, is comprised of 25 distinct papers. Our next step was to prepare brief summaries of all these papers. These summaries appear in App. C. Each identifies: the author(s), title, publication information, date of the study, the study's sponsor and intended audience, type of model, welfare categories analyzed, dependent variables,

* Among other papers, the entire labor supply literature was screened out at this stage, on the basis of our second criterion.
independent variables, functional form, description of calibration data, method of calibration, statistics on the model's performance, and the author's principal conclusions. After further analysis of each paper individually and of the group as a whole, we selected 11 for more extended review. These 11 papers are discussed at length in the present section. On the other 14, shorter evaluations are included with the literature summaries in App. C.

When selecting papers for extended review, we first confined our attention to those directly applicable to caseload forecasting. Among that group, we choose the leading examples (on the basis of overall quality) of each different type of technique. It must be stressed that several of the papers not extensively discussed below are of absolutely first-rate caliber, but just did not happen to be as pertinent to this study's purposes as others, or were too much like another paper to require detailed independent treatment.

We begin, in the immediately following subsection, with a few definitions of terms. Subsequent subsections discuss, in turn, the work of Hudson, Lochrie, Texas' Department of Public Welfare, a sequence of studies on choice between welfare and work (by Brehm and Saving, Albin and Stein, Kasper, Durbin, and Honig), a group at Boston College, a group at the New York City-Rand Institute, and Holmer. Readers may find it helpful to refer to App. C from time to time for additional details.

SOME DEFINITIONS

We considered several possible ways of classifying caseload forecasting techniques. A distinction can be made, first of all, between models that forecast for the entire nation and those at the subnational (i.e., state or city) level. Second, some models are macro (because their dependent variable is about individuals in aggregate—e.g., caseload and others are micro (because their dependent variable is about individuals by themselves—e.g., the probability that a given individual will be a welfare recipient). Third, some concentrate on total caseload and others on components of caseload changes.

In the end, we decided neither these nor any other taxonomies were absolutely necessary to make our points. However, a few general comments
may be helpful here at the outset about a useful fourth distinction—

between *predictive* and *descriptive* models.

In some of the studies on our list, the main objective is to pre-

dict well, but in others it is to describe (i.e., elucidate some as-

pect of the structural relationships believed to underlie what is ob-

served). The resulting models tend to differ markedly, depending on

which of these two goals dominates. For example, the Hudson model,

conceived solely as a predictive tool, has almost no descriptive prop-

erties, whereas the model of Greenston and MacRae, devised to test a

certain hypothesis about welfare participation rates, would not be

suitable for predictive purposes. There is no clear dividing line, of

course: some models fall closer to the center than to either end of

the predictive-descriptive spectrum (e.g., the Boston College model).

In trying to understand what it is that accounts for the essential

differences between the two model types, we noted first that the

author's affiliation (university or nonuniversity) and source of fund-

ing for the study (contract or "no strings" grant) foretell much about

the final product. But since we also wanted a more fundamental expla-

nation, we then went on to take a more theoretical look at the dif-

ferences. This led us to the following conclusions:

- In a predictive model, *all* of the independent variables *must*
  pertain to (or be defined in terms of other variables which
  pertain to) time periods *preceding* that of the dependent vari-
  able. For if the two sides of the equation are contemporaneous,
  the only way a future value of the dependent variable could be
  predicted would be by first predicting future values of the in-
  dependent variables; and that would mean the model had not
  really fulfilled its intended purpose of providing a bridge
  from current and past evidence to future estimates. A useful
  predictive model therefore should be of the form

  \[ y_t = f(x_{t-1}, x_{t-2}, x_{t-3}, \ldots) \]
where \( y_t \) might be welfare caseload at time \( t \) and the \( x_{t-1} \) are independent variables at previous time periods. The primary aim in such models is to minimize the predictive error, 
\[ |y_t - f(x_{t-1}, x_{t-2}, x_{t-3}, \ldots)|, \]
and the exact form and interpretation of the function \( f \) is less important.

- In a descriptive model, there is no similar constraint. These models may be of the form

\[ y = f(x) \]

where, since time is not critical, it has been omitted. In this case, the function \( f \) must express something "true" about the nature of the dependence of \( y \) on \( x \), and the only reason for being interested in the estimation error \( |y - f(x)| \) is as verification of the "truth" of \( f \).

When we applied these conventions to the models on our list, we immediately discovered that very few models intended for predictive purposes are structurally complete. To see this, consider the following simple model:

\[ y_t = f(x_t) \quad (4-1) \]

\[ x_t = \alpha_0 + \alpha_1 x_{t-1}. \quad (4-2) \]

This is a true predictive model, since when the two structural equations are combined, the model has a reduced form of

\[ y_t = f(\alpha_0 + \alpha_1 x_{t-1}). \]

Many of the supposedly predictive models we encountered only discuss the more glamorous structural components—e.g., Eq. (4-1)—and presume that users will somehow come up with the less glamorous parts—Eq. (4-2)—on their own. Components like Eq. (4-2) become "hidden" equations, presumed but not formally acknowledged.
We use the term *calibration* to refer to the process by which parameters associated with a particular functional form are estimated, using a data base of observations on the dependent and independent variables. We use *validation* to refer to analysis of prediction errors from an already-calibrated model. Validation should have different goals, depending on whether the model is predictive or descriptive. With a descriptive model, the central concerns are usually the statistical significance of the parameter estimates and the overall fit (as measured, say, by the $R^2$) on the calibration data. With a predictive model, on the other hand, greater importance should be attached to the model's predictive accuracy on new data, *not used in calibration*.

While the distinction between predictive and descriptive models should not be made too strictly, we feel that the fact that the distinction is sometimes not made at all has led to some misdirection of efforts, failure to communicate, and poor workmanship. The problem exhibits itself in several ways:

- In attempts to use a sophisticated descriptive model for predictive purposes, when the model has not been properly validated.
- In failure to validate predictive models, as a consequence of following too closely the methodology suitable to descriptive models.
- In narrowness of technical approach (e.g., using regression when factor analysis or cluster analysis would be more appropriate) as a result of stressing predictive issues in descriptive endeavors.
- In overemphasis when deriving conclusions from a descriptive model, on the strength of its predictive properties, at the expense of careful examination of statistical significance (e.g., asserting that a high $R^2$ proves the worth of a descriptive model).

We turn, now, to the extended reviews.
HUDSON

The Hudson (1973) paper* is an excellent example of the simplest of all forecasting techniques—pure extrapolation—carried to its logical extreme. Competently executed and concisely discussed, this study provides a natural jumping-off place for those considering more complicated techniques—and a good place, too, to start our review.

Hudson's basic model is

\[ C_t = \alpha_0 + \alpha_1 t + \alpha_2 t^2 + \alpha_3 t^3 + \ldots \]  

(4.3)

where \( C_t \) is caseload (the exact definition for his particular data is AFDC-FG cases under care at the end of the month in Cook County, Illinois) and \( t \) is time (with \( t = 0 \) for June 1971, \( t = 1 \) for July 1971, and so on by months). When all but the first two terms are dropped, this model reduces to linear trend fitting, the familiar ruler-and-chart method. By adding the higher order terms, Hudson is able to take into account some of the nonlinear components of past trends (i.e., he in effect gets to bend his ruler to fit his data better).

Wisely setting aside the last six of his 24 months of data for validation, he uses the remaining 18 months to derive estimates of the \( \alpha \) coefficients via a step-wise least squares regression procedure which includes successively higher order terms one at a time until the highest term reached is no longer statistically significant. His results are

\[ C_t = 96825 + 2083t - 18t^2. \]

He then compares predicted values from this equation with actual values for the six months set aside, and finds a maximum percentage error of a remarkably low 0.6 percent. In a minor variation on the same theme, he repeats these steps using a three-month running average of caseload as the dependent variable; and obtains essentially similar results.

Hudson next tries another method in which caseload is first decomposed into ten components through the accounting identity:

*See Part I of Bibliography for full citation.
\[ \text{EMC} = \text{BF} + \text{NO} + \text{RI} + \text{RE} + \text{NG} + \text{TI} - \text{CL} - \text{SU} - \text{DFG} - \text{TOTS} \] (4-4)

where

\text{EMS} is the number of cases on the public assistance rolls at the end of the month
\text{BF} is the number of cases on the rolls at the beginning of each month\n\text{NO} is the number of cases opened for the first time\n\text{RI} is the number of cases opened for each month for which the department had a prior closed record\n\text{RE} is the number of cases whose assistance payments were resumed during the month\n\text{NG} is the number of cases where the person serving as the grantee was changed\n\text{TI} is the number of cases that were transferred onto the county rolls from other jurisdictions\n\text{CL} is closings during the month\n\text{SU} is the number of cases whose assistance payments were stopped, but the case was not closed\n\text{DFG} is the number of cases deleted from the record merely to reflect the name change to a new grantee\n\text{TOTS} is the number of cases transferred out of the county to another jurisdiction
For each component separately, he fits an equation of the form (4-3), in the same way as before. Each equation is then evaluated for the six validation months, and the resulting predictions are aggregated to obtain estimates of total caseload. Comparing these estimates to actual data, he discovers that he has done much worse than before. The minimum error is 1.2 percent, twice the maximum error of his first method. And the second method's maximum error is nearly 10 percent.

This seemingly paradoxical result—that disaggregating can reduce accuracy—underscores a fundamentally important point: namely, that if the independent variables of a predictive model have to be estimated by trends, then the final predictions, containing two sources of error ((1) the error inherent in the model and (2) the error in estimating the independent variables), may be of poorer quality than direct trend projections of the dependent variable by itself. Few models could be better suited to demonstrate this point than Hudson's, for his core equation (4-4) is just an identity, and therefore does not have the additional complication of a third kind of error—error in estimating the model's coefficients. In more complex models, the potential for compounded difficulties can be many times greater. This apparently has disturbed several of the users of the techniques we reviewed (e.g., Massachusetts with regard to the Boston College model) and, we suspect, lies behind many other half-formulated complaints as well. Beyond the specific issue of aggregation vs. disaggregation, there is a more general point here, too, which will come up again and again in these pages: much that goes wrong with forecasting methods stems from excessive complexity when simpler approaches would serve equally well.

LOCHRIE

The logical next step beyond pure extrapolation is a generalized autoregressive model of the form

\[ C_t = f(C_{t-1}, C_{t-2}, \ldots, \varepsilon_{t-1}, \varepsilon_{t-2}, \ldots) \]  

(4-5)
where \( C_{t-1} \) is caseload \( i \) periods (e.g., months) ago, the \( \varepsilon \) terms are the errors in predicted caseload in the indicated periods, and \( f \) is some functional form which may here remain unspecified. Like Hudson's model, this one relies solely on past patterns of caseload movement and uses no outside information. But unlike Hudson's, Eq. (4-5) focuses on caseload itself, instead of time, and implicitly references (through the error terms) actual as well as predicted values of lagged caseload. These differences mean that Eq. (4-5) can be sensitive to more types of movements—particularly those of a cyclical nature—and can to some degree "learn" from its past mistakes. As a result, the generalized autoregressive model can be regarded conceptually as a large family of techniques of which pure extrapolation is a special case. Calibration and analysis of these techniques have been extensively studied by many authors at least as far back as the early part of the century, but the most recent systematic investigation, now being widely applied, is by Box and Jenkins.

None of the studies on our list rely solely on a generalized autoregressive model; but one author, Richard Lochrie, uses this sort of model as the first step of a multiple-step procedure. As he described his approach to us during our visit with him, Lochrie first develops a benchmark forecasting equation using the univariate Box-Jenkins methodology, which he argues is the best possible estimation technique for this purpose. He then puts these results "away in a desk drawer" and begins building a separate "econometric model." His econometric model uses outside data for independent variables (never, he stresses, lagged values of the dependent variables), chosen to achieve the best possible fit. Next, he applies recursive adaptive least squares to see how well the resulting model will forecast. Retrieving the benchmark equation, he compares the two different techniques' predictive capability. If

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*George E.P. Box and Gwilym M. Jenkins, *Time Series Analysis: Forecasting and Control*, Holden-Day, San Francisco, 1970. We use the word "generalized" in front of "autoregressive model," because the latter, unqualified term is usually reserved in other studies for models with no lagged error term.
the econometric model does not perform better than the simpler benchmark approach, he rejects the former in favor of the latter.

Since Lochrie was unable to give us extended documentation on any application of his technique, we still have several unanswered questions (e.g., How good are his choices for independent variables? Has he conducted validation tests like Hudson's? And how well have his models performed after delivery to his clients?) Nevertheless, a few general points of an evaluative nature seem clear. First, the initial step of developing a basic equation dependent only on past caseload data makes good sense in our view. So, too, does putting both models "at risk" against each other subsequently. On the other hand, most of Lochrie's applications of his approach so far have been in industrial contexts. Whether his method can be as easily and effectively adapted to welfare caseload forecasting as Lochrie believes remains to be seen.

The merits of Lochrie's approach can only be decided by experience, of which too little exists as yet (specifically on caseload predicting) to tell. The outcome, however, is well worth watching. According to one observer we talked with, Lochrie's work typifies a basically "engineering" approach, as distinct from the "behavioral" approach espoused by many others. Which performs best? Perhaps some of the work now being done with Lochrie's methodology in the Region X HEW office (Seattle, Washington) help answer this question.
TEXAS

Another, entirely different but still essentially simple approach to caseload forecasting is what we call "trend analysis supported by regression analysis." Within this broad rubric, we place a wide variety of techniques involving (1) careful inspection of numerous time series on caseload and economic indicators (this is the "trend analysis" part) and (2) some kind of back-up investigations, usually in the form of a very simple regression.

Most state welfare agencies that do anything at all beyond pure extrapolation, according to our survey, proceed along the general lines above. Details, of course, vary greatly from state to state (e.g., the trend analysis may be merely a visual check or may draw on curve-fitting methods like Hudson's or Lochrie's, and different trend indicators and regression variables may be used); but the underlying logic remains much the same. As an example of this type of approach, we discuss here the procedure followed by Howard Thompson's Research and Evaluation Section at Texas' Department of Public Welfare.

Briefly, the Texas procedure consists of the following steps:

- Plot cases, recipients, and average payments per recipient over time. Look for aberrations from trends and try to identify the causes (e.g., certain months may be atypical because of policy changes implemented then). If the causes cannot be found at the policy level, look for changes in recipient characteristics.

- Perform a regression of caseload on a standard set of explanatory variables, taking into account the aberrational factors previously identified. The exact form of this regression may differ each time, but one possibility is

\[ C = \alpha_0 + \alpha_1 \text{POV} + \alpha_2 \text{UN} + \alpha_3 \text{FS} + \alpha_4 \text{APL} + \alpha_5 X \]

where \( C \) is caseload, \( \text{POV} \) is the percentage of the state population below the poverty line (or, in some variants, 75 or 125 percent of the poverty line), \( \text{UN} \) is unemployment, \( \text{FS} \) is average family size, \( \text{APL} \) is average payment level, and \( X \) stands for variables expressing the causes behind the aberrations. All variables are contemporaneous.
Compare the regression results with those derived in the previous forecasting cycle. Look for signs of underlying changes.

Return to the time-series charts and fit several trend lines under alternative assumptions. Derive the final caseload forecast by selecting one of these lines, using the findings of the comparative regression analysis as one of the criteria influencing the choice.

Since some of the regression variables are not directly observable on a current basis, surrogates must be constructed. The chief problem in this regard is the poverty variable, which Thompson finds is one of the most important contributors to the regression results. \((R^2\text{'s for regressions with only that variable and a constant term routinely run about } .8\text{.})\) He estimates this variable from annual updates of population by counties and an assumption that the percentage in poverty in each county is the same as at the last decennial census.

The Texas procedure has two central advantages: it is easy to carry out and there is never any doubt about what is being decided or why. Since July 1, 1974, when it was first implemented, Thompson reports that the error in his predictions has been less than 2 percent and recently has hovered about 0.8 percent. He consequently sees no reason to search for more complicated schemes which, besides being more difficult to exercise and comprehend properly, might—he thinks—turn out to be less accurate due to large errors of measurement in the independent variables.

All this is on the plus side. On the minus side, we feel that the price of such a simple and sensible approach may be limited capability to anticipate abrupt departures from past trends, caused by economic, demographic, or behavioral shifts not very well captured in the back-up regression. This, naturally, could be remedied by expending greater effort on the regression specifications—which leads inevitably toward some of the more complicated techniques discussed below.

First, however, two final notes about the states' use of trend analysis supported by regression analysis. One is a point about other data items utilized. For the most part, the same kinds of independent
variables appear again and again across states, but in different combinations and with fewer at once than in the case of Texas. A sampling of other states' variables includes: total state population, total state employment, case applications, female population aged 15 to 55, number of illegitimate births, divorce rate, the welfare need standard, consumer price index, percentage of female-headed households below the poverty level, number of UIB recipients, auto employment and national domestic auto sales (these are from Michigan), building permits, median personal income, quality control validation, total state labor force, tax rates, age distribution, and educational level.*

The other point concerns disaggregation by geographic areas (e.g., counties) within a state. A few states find that their statewide estimates are better if they make smaller area estimates first, and then aggregate. The benefits of disaggregation presumably lie in making more effective use of information on different circumstances across areas. One state that proceeds along these lines is South Dakota, which classifies counties according to whether they (1) are predominantly urban or rural, (2) include a large or small percentage of Indian families (for those who may not know, South Dakota has extensive reservation lands), and—most interesting of all—(3) have experienced a high or low incidence of protest demonstrations in the past.

EARLY THEORETICAL MODELS BASED ON "WORK-WELFARE CHOICE"

Many current ideas about determinants of welfare caseloads are either extensions of or reactions to theoretically oriented models developed at several universities over the past two decades. Although none of these models, we think, should be seriously considered for forecasting purposes, some understanding of their general features and the history

* For further details on individual states, see App. B.
surrounding them is needed to appreciate where caseload predicting has come from and where it might be going next.*

The central question at issue in this literature is what we will here call the theory of "work-welfare choice." This theory, nominally derived from work during the 1930s by John Hicks (1932) and Lionel Robbins (1930) on choice between work and leisure, essentially reduces to the two assertions: (1) that going on welfare is the result of a choice, and (2) that the key determinants of the choice are the relative pecuniary advantages of working vs. being dependent on welfare. Proponents of the theory, in order to demonstrate its empirical validity, have sought to show that a statistically significant relationship exists between caseload levels and a measure of grant levels compared to wage rates. Critics, on the other hand, have argued that there is no such relationship and that instead, caseload movement can be traced mostly to fluctuations in unemployment. Interestingly, however, critics have not always objected strongly to the idea that there is a good deal of individual choice involved in going on welfare. (We examine this in our discussion of the Boston College model below.)

Both sides have used the same general model, of which the two most widely analyzed variants are

\[ C = \alpha_0 + \alpha_1(G/W) + \alpha_2U + \alpha_3X \]

and

\[ C = \alpha_0 + \alpha_1G + \alpha_2W + \alpha_3U + \alpha_4X \]

where \( C \) is caseload, \( G \) is the average grant level, \( W \) is the average manufacturing wage, \( U \) is unemployment, and \( X \) stands for demographic or other control factors.

*More extended discussions of the papers reviewed in this subsection are available in most doctoral dissertations on the subject. See, for example, Holmer's work (Holmer, 1975).
The first important analysis of this model was by Brehm and Saving, whose 1964 paper provides the first formal discussion of the theory and some pertinent regression results. Using pooled cross-sectional and time-series data on the 48 continental United States, Brehm and Saving calibrated several variations of the model for the general assistance caseload. Their principal findings were: (1) that allowance levels are the most important single factor affecting enrollment; (2) that unemployment is not a major factor; and (3) that enrollment is positively related to degree of urbanization, which the authors interpreted as a positive response to more liberal administrative policies. Additional computations admittedly based on "a few heroic assumptions" led Brehm and Saving to conclude that "... nearly one-half of all assistance recipients are not on assistance due to zero wage alternatives."** Apparently, they mean by this that half of the recipients have consciously withdrawn from the labor market in order to make themselves eligible for welfare. They drew no policy implications from this obviously explosive assertion, but others have seen it as a charge that welfare is a haven for "slackers."

In a sharply critical comment on Brehm and Saving's work, Albin and Stein (1967) claimed that these results are wrong because Brehm and Saving confused welfare cases with persons. Making this correction, Albin and Stein found that allowance levels are not an important determinant of enrollment. Brehm and Saving, in their reply, held to the contrary view. Kasper (1968), attempting to unravel these mysteries, observed that the two teams had used different functional forms for estimation purposes. Testing both forms, he found both teams correct in their own terms. He then went on to discover further findings differing with both, which he summarizes as follows:

* However, see also the Collins (1967) study which, although primarily concerned with other issues, includes some of the earliest empirical findings relevant to "work-welfare" choice theory.

** Brehm and Saving (1964), p. 1017.
We find that labor market conditions, i.e., unemployment, are a substantial determinant of the proportion of the people in a state who are receiving GAP [General Assistance Payments] and that the average level of GAP is of much less importance. The difference of our results from earlier studies stems primarily from somewhat more appropriate measures of unemployment. Whereas the earlier models implied that GAP rates each month were determined, in part by the current rate of insured unemployment, our model (1) allows for the fact that labor market conditions in the past may determine current GAP rates, and (2) uses an unemployment rate which more closely approximates the labor market conditions faced by workers with low wage opportunities.

Kasper further concluded that the "slackers" argument is a myth. Rather, he argued, the facts show "that few workers are receiving GAP because they prefer this kind of welfare assistance to earning a living."*

All of this exchange was based on general assistance data by states. Separate studies by Durbin (1971) and Honig (1973) pointed out that such data may be inadequate to resolve the issues at hand. General assistance programs are far from uniform across states. Many state's programs are more restrictive in the conditions, duration, and levels of assistance they offer than the Federal programs. For instance, in 12 states aid is usually granted for short periods only; and in 14, aid is available only for special situations (e.g., chronic illness). Furthermore, general assistance programs are a very minor part of welfare nationwide. In 1966, these programs accounted for only 6 percent of the aid disbursed and 8 percent of the persons assisted in all Federal, state, and local programs.**

As Honig clearly perceived, the considerable variation in types of general assistance programs may mean that the results of Brehm and Saving, Albin and Stein, and Kasper are all spurious. Instead of

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* This and the indented quotations are from Kasper [1968], p. 88.
reflecting behavioral patterns, those results may be driven by another factor which has not been controlled for in their analysis: the size of a state's eligible population. States with broad coverage and hence a large eligible population relative to their total population usually have a comparatively high incidence of enrollment, for the simple reason that there are more people, in percentage terms, who can apply. Complicating matters further, the same states also often have high allowance levels, since historically they have been disposed to adopt liberal welfare policies.

In their own studies, Durbin and Honig both used AFDC data. Durbin estimated the relationship between the incidence of AFDC recipients and the incidence of persons below income levels commensurate with average AFDC allowance levels, controlling for several other factors. A statistically significant positive relationship was found, from which Durbin inferred that allowance levels are an important determinant of the size of the recipient population. She therefore falls in the camp of Brehm and Saving, with Albin and Stein in the opposite camp and Kasper somewhere off on his own (but nearer Albin and Stein). Durbin did not test the effect of unemployment, though, so she is in only half of the battle.

There is a problem, however, with Durbin's analysis. Although she escaped the difficulties associated with general assistance data, her AFDC data have severe shortcomings of their own. Her sample consists of 350 observations on districts of New York City known as "health" areas; the year is 1960. The principal difficulty with this kind of sample is that effects attributable to socioeconomic and demographic differences between districts may obscure behavioral factors. Thus, the observed relationship between incidence of welfare recipients and incidence of persons below average allowance levels may signify nothing more than the fact that neighborhoods with many welfare recipients also have many poor ones—which is not a very informative result, since many aid recipients are ipso facto poor. In fact, Durbin's results cannot mean more than that, for a very simple reason: allowance levels are uniform throughout New York City except for negligible aberrations due to administrative irregularity. Absent those aberrations, variations in the incidence of
persons below average welfare payments in her sample must therefore be due entirely to differences in the compositions of the populations of the
"health areas."

Honig proceeded along other lines. In her study, the units of observation are SMSAs. AFDC data on the 44 largest SMSAs provide three cross-sectional samples for 1950, 1960, and 1970.* Her model is more like Brehm and Saving's than Durbin's in that the independent variables include allowance levels (instead of persons below those levels) and the unemployment rate. Honig found that the former has a significant effect on the incidence of welfare recipiency and that the latter is in some cases significant and in others insignificant.

Honig too, then, like Durbin, appears to be in Brehm and Saving's camp, although without the latter's strong rejection of the unemployment rate as an influence on enrollment. However, if one considers the differing natures of AFDC and general assistance, Honig's place might be closer to Kasper than to Brehm and Saving. AFDC is likely to be much less sensitive, in terms of fluctuations in enrollment, to the unemployment rate than general assistance because AFDC mostly serves families with no potential earners whereas general assistance often aids employables. Honig's finding that the unemployment rate is marginally significant for AFDC could easily be consistent with Kasper's finding that it is of major significance for general assistance; but the case for both Honig's and Brehm and Saving's being right is less plausible.

Honig's data are not subject to precisely the same problems as Durbin's, but it still may be questioned whether Honig's results reflect family decisionmaking or simply differences between SMSAs. Her independent variables control for many differences: in average wage rates, unemployment rates, average income levels, size and composition of families, and the incidence of blacks in the total population. However, there is still the possibility that differences in SMSA populations on other dimensions, not controlled for in her analysis (e.g., industrial mix), may be more important as determinants of her findings than the presumed behavioral response of families to welfare allowance levels.

* Her dissertation uses 1950 and 1960 data. Her later paper uses 1960 and 1970 data. Various constraints dissuaded her from attempting to pool the data.
What does all this work by so many different authors add up to? A very inconclusive story, it would seem, with very few direct benefits for caseload forecasting. But indirectly, these studies may have had a much more positive impact than first meets the eye. For they may have had salutary influences on the development of more practicable efforts, to which we now turn.

THE BOSTON COLLEGE MODEL

In conscious departure from the theory of work-welfare choice, a radically different approach, focusing on "employment structure," has recently been put forward by a group at Boston College led by Professor Barry Bluestone. Their work is on several grounds among the best we reviewed and is now being massively extended in a large effort to construct state-specific AFDC forecasting procedures for all six New England States plus five other states from around the nation. Moreover, to a far greater extent than most of our other studies, their model aims to be strong in both predictive and descriptive capability. Since, for all these reasons, it is one of the most important endeavors in the field, we shall discuss it in greater depth than other studies.

The Boston College group's "employment structure" theory starts from the proposition that there is really very little "choice" involved in most decisions to apply for welfare. Welfare applicants simply cannot find work. The problem, in other words, is not whether they prefer work to welfare, but rather whether the job market has no room for them. That this proposition is, at the very least, a sensible hypothesis to test—especially for AFDC female-headed families—seems to the Boston College group self-evident; and they consequently are surprised others have not done more with it before them, and find the "choice" theorists' work, in retrospect, correspondingly narrow. All of which we are inclined to agree with.

Given, then, that the key question is whether there are enough of the right kinds of jobs available, the obvious concern of a caseload prediction model, the Boston College group reasons, should be the condition of relevant job-providing industrial sectors. Hence, their term "employment structure." The rest of their theory derives from detailed
examination of the Massachusetts economy, and therefore may not turn out to be applicable elsewhere. However, a few general principles about their approach are worth noting. First, they devote considerable attention to identifying the particular sectors that are most likely to include welfare-prone individuals. Second, they also try to guess which sectors are the most subject to fluctuations or internal changes that cause an above average incidence of layoffs periodically. Third, they look for underlying dynamic shifts in the sectoral composition of employment that might lead to recurring mismatches between jobs and job-seekers' skills, even though the overall number of jobs available is sufficient. (For example, they refer to "twists" in the job market stemming from certain combinations of sectoral growth and decline.) Fourth, throughout all this, they are careful to keep in mind the type of workers they are dealing with—e.g., women with child care needs in the case of AFDC. In the end, they emerge with a few (so far, only two) agglomerations of S.I.C.* three-digit industries and some basically heuristic arguments why these sectors should have a strong effect on the welfare caseload while the many excluded industries do not. The gist of the arguments can be gleaned from their short-hand labels for the sectors: "low training" and "high turnover."

That, very briefly, is what the theory is about. Now what is their forecasting model? Consider first their core equation, which we choose to write as

\[
C = \alpha_0 + \alpha_1 LF + \alpha_2 EMPNM + \alpha_3 EMPSR + \alpha_4 (EMPNM \times EMPSR) + \alpha_5 UN + \alpha_6 UN \times UN + \alpha_7 (UN \times UND6) + \alpha_8 DADMIN + \alpha_9 DACCT + \alpha_{10} DXMAS + \alpha_{11} DSUM
\]  

(4-6)

*Standard Industrial Classification.

**Since they have yet to publish their results, we refrain, as a courtesy, from presenting the empirical findings. The equation shown is from the Venti (1975) paper, pp. 45-46, with some notational changes for expository purposes. The core equation of the earlier paper by Bluestone, Venti, and Ware is only slightly different. The equations they will come up with in their current 11-state effort may, of course, be very different, but we infer that the same principles will be followed.
where
C is monthly AFDC caseload (excluding the UP segment)
LF is size of the total labor force, including both males and
females (six months moving average)
EMPNM is employment in 19 nondurable manufacturing industries
believed to be "low training, predominantly female"
(six months moving average)
EMPSS is employment in 9 service and retail trade industries
(six months moving average, lagged three months)
UN is estimated female unemployment rate (six months moving
average)
UND6 is a dummy variable: 1 when UN is greater than six per-
cent and zero otherwise
DADMIN is a dummy variable proxying the introduction of WIN and
state takeover from local welfare agencies
DACCT is a dummy variable: 1 during months coinciding with a
change in the state's accounting procedures that oc-
curred in 1973, and zero otherwise.
DXMAS is a dummy variable: equal to EMPSS during December of
each year and zero otherwise
DSUM is a dummy variable: equal to LF during June, July, and
August of each year and zero otherwise.

This long and recondite formula can be thought of as a linear sum of
four sub-models, plus a constant term. The four sub-models, specified
separately but calibrated altogether, pertain to the following pre-
sumed determinants of AFDC caseload: (1) population size, (2) the
kinds of jobs available for women, (3) the number of jobs available
for women, and (4) administrative policy. Let us look at each sub-
model in turn.

Population. On the premise that population increase or decline
is a significant factor in caseload movement, the Boston College group
would like to include monthly population counts in their model. How-
ever, since they believe such data are not available by states, they
resort to counts of the total labor force instead, which are routinely prepared by most state employment departments according to standardized U.S. Department of Labor procedures.

In fact, we think the number of potential welfare cases (which after all is the reason for worrying about population) is more affected by changes in the composition of the population than its size, considering the short time-frames of most caseload predictions. (Witness, for example, New York City, where the size of the population has remained nearly constant for 25 years while the composition has changed drastically.) Therefore, the Boston College group is better off with labor force (because it focuses more on the right age group) regardless of data availability on population; and we suggest they argue accordingly.

Since they evidently have not concerned themselves much with population composition, they do not attempt to control for demographic variables. Nevertheless, they do try to allow for changes in the labor force in summer months due to school vacations, through a dummy variable. The final form of the population sub-model, as expressed in Eq. (4-6), is therefore

\[ \alpha LF + \alpha DSUM. \]

Kinds of jobs. This sub-model is the vehicle for the "employment structure" theory. Based on their analysis of developments in Massachusetts' economy, the Boston College group concluded that the crucial sectors, according to their criteria, could be aggregated into "nondurable manufacturing" and "service and retail trade." Their model uses monthly employment in each of these industry classes individually (sectoral unemployment is unavailable, or we presume they would have used that instead) and also the product of the two, on the (arguable, we think) grounds that they then would be capturing the dynamic "twist" in employment composition. Finally, to remove the biasing effects of temporary Christmas retail trade employment, they have a dummy variable for December of every year. Thus, the sub-model is
\[ a_2 \text{EMPNM} + a_3 \text{EMPSSR} + a_4 (\text{EMPNM} * \text{EMPSSR}) + a_{10} \text{DXMAS}. \]

**Number of jobs.** Ideally, the group want the female unemployment rate here, but that variable is not available on a monthly basis by states. It *is*, though, for the nation as a whole, and so they regressed national female unemployment rate on national total unemployment and seasonal dummies, using a monthly sample. The regression equation thus obtained is then used to impute Massachusetts's female unemployment rate from its total unemployment rate.

Further investigations also convinced the group that unemployment has a substantially greater impact on caseload when above six percent than when below. Expressing this through a step function specification, they arrive at the following reasonable result:

\[ a_5 \text{UN} + a_6 \text{UND6} + a_7 (\text{UN} * \text{UND6}) \]

**Administrative policy.** The group believes very strongly that administrative changes are a major determinant of caseload movement. Extensive investigations led them, in the Massachusetts model, to concentrate on three particular changes: the effect of introducing WIN, the take-over by the state of local administration, and the impact of a new accounting procedure. The first two are supposedly reflected in a variable (DADMN) that is zero prior to WIN, rises rapidly for 20 months, and increases more slowly thereafter. The result is

\[ a_8 \text{DADMIN} + a_9 \text{DACCT}. \]

This, then, is the Boston College model. How good is it? Consider, first, the conventional statistical measures. $R^2$ is .9985. All the coefficients are statistically significant—some very much so—and the F-statistics are 10 and 120, with 11 and 160 degrees of freedom. In sum, a remarkably good fit on the calibration data. As a test of the model's performance on data not used in calibration, the group prepared conditional forecasts (with actual data for the independent variables) for the 15 months following the most recent of their calibration observations,
which was December 1973; and then compared these forecasts with actual
caseload counts. The average monthly error was 2.23 percent and the
error in the 15th month was 1.58 percent. These results, too, are im-
pressive, although not noticeably more so than tests of simple trend
models like Hudson's.

For further information on performance, we spoke with Ralph
Meuller, who recently joined Massachusetts' Department of Public
Welfare. Meuller has decided to abandon the Boston College model*
and contract with Data Resources, Inc., to build a new one. His
principal reservations about the Boston College work, as he ex-
plained them to us are:

- the model is too complicated; he would like to be able to trace
  the effects, by simple calculations, of various potential de-
  velopments, but cannot with equations so abstruse;
- the input data needed must be predicted; no methods are pro-
  vided to make these predictions, so simple trend projections
  are used by default; that is very crude and implausible—no
  better, in fact, than dispensing with the model entirely and
  simply trend-projecting caseload in the first place;
- the model has not stood the test of time; every few months it
  had to be revised to incorporate some new "structural" change.

Regardless of where one's sympathies ultimately lie, Meuller's re-
marks cannot be ignored. Take, for instance, the point about having to
make predictions of the input data. That is incontrovertibly true:
the model can only predict caseload a year in advance if first provided
with an estimate of labor force a year in advance (among other things).
And where will that estimate come from? The model does not 'say'. In
response, the Boston College group note that they never intended the
model to be self-contained. Rather it would always need exogenous
estimates from a macro-economic state or regional forecasting model.

* More precisely, a model essentially similar to the one described
here, which the group prepared for the Department a few years ago to
forecast the state's general relief caseload.
This, however, is small consolation for someone in Meuller's position, who is likely to conclude that the model has "hidden" additional equations, needed to project forward current data on the independent variables.

Or consider, also, the point about excessive complexity. Reduced to essentials, the model rests on only five simple data elements: employment in nondurable manufacturing, employment in services and retail trade, total size of the labor force, the total unemployment rate, and indicators of time. On these foundations, an intricate structure is erected. That an effective structure can be found for a single given body of data is, though commendable, not surprising. But will the same structure perform just as well—or even nearly as well—on totally new data? Is it really likely that with only these five elementary data items to work with, any model can consistently explain more the 99 percent of the variation in caseload?

It is apparent that the Boston College group placed a high value on achieving a model that demonstrates a close fit to the data. A good deal of effort is visible, which required, we are sure, a good many iterations. Among the aspects of the model that show evidence of this work are: the six-month moving averages applied to some of the variables, and the lag applied to one of the moving averages; the interaction terms; the special time-variant function modeling administrative changes; the weighted dummy terms. Such richness of structure has not been found in any of the other models we have reviewed in this study. These features are not all exactly predicted by any of the theories described by the available documentation on the model—for example, there is no hypothesis in the theory that demand for AFDC should lag one of the independent variables by exactly three months. We do not wish to imply that we think these features are arbitrary; they are, ex post facto, reasonable ones, but they are clearly guided and suggested by the data, and insofar as the data contain unobserved variables, or are generally subject to observational error, some aspects of these features may be partly accidental.
Unfortunately, statistical theory has no precise way to account for loss of significance when complex aspects of the model are suggested by the data. We would be curious to see what degree of fit could be achieved by a simple linear regression containing, say, three seasonal dummies, the four observational data elements, and a fourth order polynomial in the ordinal of the month of observation. Whether the Boston College model is statistically more significant than this other formulation is subject to a rigorous statistical test. Whatever the outcome of such a test, it would neither conclusively reject or confirm the Boston College group's work, but it would give some evidence of the extent to which their success may or may not be accounted for by the effects of trend and accident.

**THE NYCRI MODEL**

The NYCRI (New York City–Rand Institute) model, originally developed by C. Peter Rydell and later revised by David Lyon and Mark Menchik, represents the earliest major effort we encountered which approaches welfare caseload forecasting through extensive analysis of the components of caseload change. Beginning from the identity

\[
\begin{align*}
\text{Change in AFDC-FG caseload during any given month} &= \text{AFDC-FG openings that month} - \text{AFDC-FG closings that month} + \text{Net transfers to AFDC-FG from other aid categories that month}
\end{align*}
\]

and similar identities for AFDC-UP and general assistance, this model provides relationships that predict the three components on the right-hand side.

Like the Boston College group's product, NYCRI's was created in the context of a consulting arrangement with a local welfare agency; but though both therefore reflect greater concern with predictive accuracy than most of the other studies on our list, there is an important difference in emphasis. NYCRI, to satisfy New York City's paramount need for better welfare budget projections, chose to concentrate more of its resources on prediction and much less on theoretical foundations than the Boston College group. The two approaches, incidentally, evolved roughly contemporaneously, but—strangely enough (considering the short distance between Boston and New York)—neither was very aware of the other until the later stages.
For its relationships to explain openings and closings, the NYCRI model relies on the simple core formulas:

\[
\text{Openings in any given month} = \left( \text{Average openings over the past year plus estimated "extra" reopenings that month} \right) \times \left( \text{Multiplicative adjustment factors} \right) (4-7)
\]

\[
\text{Closings in any given month} = \left( \text{Estimated long run closing rate times } \frac{\text{Estimated short run caseload the previous month}}{\text{recent openings}} \right) \times \left( \text{Multiplicative adjustment factors} \right) (4-8)
\]

Written out in full, the final equations are

\[
0 = \bar{O} \times \text{DAYS}^{a_1} \times \text{ACCR}^{a_2} \times \text{GRANT}^{a_3} \times \text{UNEMP}^{a_4} \times \text{BIRTHS}^{a_5}
\]

\[
\text{CL} = \bar{CL} \times \text{DAYS}^{a_1} \times \text{GRANT}^{a_2} \times \text{UNEMP}^{a_3}
\]

where \(\bar{O}\) (for "normal" openings) stands for the first term in brackets in Eq. (4-7), \(\bar{CL}\) (for "normal" closings) stands for the corresponding term in Eq. (4-8), DAYS is welfare center workdays per month, ACCR is the acceptance rate (openings divided by applications), GRANT is the average grant level, UNEMP is the total unemployment rate, and BIRTHS is general service births. DAYS, ACCR, GRANT, UNEMP, and BIRTHS enter as 12-month moving averages. Additional parameters, needed to compute \(\bar{O}\) and \(\bar{CL}\), are fixed exogenously on the basis of extensive side analysis of openings and closings trends.

For the remaining component—net transfers—a similar approach proved unsuccessful. Instead, therefore, current transfers are obtained from past transfer rates that have been estimated directly from sample data proportions.

Now: what are this model's strengths and weaknesses? Of all the ones we examined, the NYCRI model is by far the best documented. From Rydell's massive report (1974), we had no trouble learning exactly what he did but also why. More to the point, perhaps, we could tell, too, exactly how well the model performed, since the report includes one of

*Births that occur in hospital wards.
the most comprehensive and well-conceived programs of validation testing of any study on our list.

The chief results of these tests are as follows. For the data on which it was originally fitted, the NYCRI model accounts at best for 91 percent of the variation in total monthly case openings and 84 percent of case closings. Since the difference between two uncertain numbers is even more uncertain, the model explains at best only 52 percent of the net change in monthly caseload. However, since aggregates are easier to predict well than month-to-month changes, we computed that its accuracy for total caseload must be above 95 percent. Corroborating this, an independent test by Rydell, in which he predicted caseload six months ahead (from January to June 1972, using actual data for the independent variables), showed at the end of that period a total error of only 1.3 percent. In other tests, it was found that the predictions are quite sensitive to variations in certain of the explanatory variables; and the error by December 1973 in a series of predictions begun in July 1972 was only 3.5 percent. Finally, regarding statistical significance of the coefficients: mixed results and only average robustness with respect to specification changes.

In short, as far as can be determined from tests on calibration data and tests that require knowledge of the true values of the explanatory variables, the NYCRI model registers a highly commendable, but not perfect, performance. What, though, of other considerations? To begin with, all of the reservations raised above about the Boston College group's model also obviously apply here as well. As in that case so here, too, the equations call for data that do not exist--future values of the independent variables. Model users must consequently resort to simple projections of current values or their own best guesses, either of which mean the model has "hidden" equations of very crude quality. Also, the NYCRI model, no less than the Boston College group's, seems excessively complex. The core idea--deriving current openings and closings from relatively minor adjustments of their own past values--and the use of 12-month moving averages make good sense, but raise the question: with that much implicit reliance on "smoothing" past data, how much better is the final model than sophisticated time trending (e.g., via Box-Jenkins techniques)?
In addition, there seems to us to be another problem with the NYCRI model, not shared by the Boston College group. The absence of any underlying theory comparable to the latter's "employment structure" idea makes the NYCRI model much less easy to interpret and reason from, and much more open to criticism (as some told us) for "putting-in-anything-including-the kitchen-sink." The meaning, for example, of the acceptance rate in the openings equation is unclear. A rise in acceptance rate could increase openings either in a direct accounting sense or by inducing nonrecipients to apply because they think their chances are better—or both. Unless ACCR is treated as endogenous, and an additional equation is included, there is no way to sort out its real role, due to the probable presence of simultaneous equation bias. (However, Rydell feels differently. See his report.)

HOLMER

Martin Holmer's model, first presented in his 1975 doctoral dissertation in Economics at M.I.T. and later extended by him at the Office of Income Security Policy of HEW, also focuses on components of caseload change, but from a different perspective than the NYCRI model. Where the NYCRI model (which, incidentally, Holmer studied carefully when formulating his own) stresses prediction more than theory and pertains to a single city, the Holmer model has a high theoretic content and is nationwide. And instead of concentrating on openings and closings as such, the Holmer model has as its dependent variables: the applications rate, the acceptance rate, and the closings rate.

The model is more complex than any other we encountered and will be only briefly outlined here. The basic caseload change equation is

\[(C/P)_t = (C/P)_{t-1} + \text{APPR}_t \times \text{ACCR}_t \times (1 - (C/P)_{t-1}) + \text{CLR}_{t-1} \times (C/P)_{t-1}\]

where C is caseload, P is total population, APPR is the applications rate (applications divided by nonrecipients), ACCR is the acceptance rate (openings divided by applications), and CLR is the closings rate (closings
divided by caseload). Holmer first derives impressively complete theoretical equations for the three dependent variables, but then, because many of the required variables are not observable even on a current basis, he must go on to specify a second entire set of more tractable equations. The final equations are as follows: the applications rate is predicted from average monthly per capita earnings in low-wage jobs, the job offer rate (which, as estimated by Holmer, is highly correlated with the unemployment rate), another unemployment construct, average monthly AFDC grant, average monthly food stamp benefit, average monthly medicaid benefit, and the long-run trend in the acceptance rate; the closings rate is predicted from the same variables but excluding the long-run trend in the acceptance rate and including an indicator of seasonal variations in the closing rate; and the acceptance rate is predicted from the last two mentioned variables. All told, over 40 equations are required in the computerized version of the model.

Holmer's calibration methods are of the highest quality, and the resulting caseload estimates, when compared with actual values from the 20-year monthly data series used in calibration, exhibit an average error of 1.6 percent and a maximum error of 5.5 percent.

Although very sound theoretically and statistically, the real strengths of the Holmer model in regular forecasting have yet to be tested. Will this model, like some others, fall victim of excessive complexity (when simpler methods would do just as well) and of unavailability of required input data? Or has Holmer found some secret that others have missed? Until his current efforts advance further, we cannot tell.
5. CONCLUSIONS AND RECOMMENDATIONS

This section presents (1) our conclusions regarding the desirability and suitability of other caseload forecasting techniques for California; and (2) our recommendations on what steps DBP should take toward enhancing its present projection capabilities in light of experiences elsewhere. We discuss the conclusions first, following a question-and-answer format in which the questions represent the specific points we think DBP should ask itself about other techniques, and the answers reflect our findings based on the survey and evaluations reported above. The questions begin with points that implicitly concern California's capabilities in relation to all other techniques, regardless of type or origin; later questions narrow the focus to California in relation to other state welfare agencies. A second and final subsection, drawing together the implications of the conclusions, sets forth our recommendations.

CONCLUSIONS

Naturally, if a simple (but effective) solution to its projection problem already exists somewhere, DBP would want to know about this first, before contemplating further investigations. Thus an obvious initial question to ask is: Does a technique exist somewhere that (1) could be applied to California with little or no start-up cost (in time, effort, and inconvenience as well as money) and (2) would constitute a significant improvement over current DBP procedures?

We believe not—very definitely not. Quite apart from the matter of how good other techniques are, there is the basic fact that none of them could be properly implemented in California without a substantial amount of work either "in house" or using outside resources—(and probably both). All would require recalibration at the very least, in our judgment, and even then would be of doubtful usefulness unless backed by new exploratory data analysis, reassessment of functional forms, and thorough understanding of California's special circumstances—all of which take time. In short, the myth of a magical "black box," instantly transportable, is just that: a myth.
Judging by what the developers and users of the techniques we reviewed have to say about forecasting generally and their approach to it in particular, the overwhelming majority of them would agree with this conclusion. However, a few are far more sanguine about transportability than the rest, and feel they can begin producing projections in a new state in a matter of a month or two at comparatively little expense. While some of the ideas these individuals employ make good sense, our analysis convinces us strongly that adopting in toto any of their packaged models would lead to forecasts no better—and probably considerably worse—than DBP's present performance.

Given, then, that other techniques offer no simple panacea, we think the next question DBP should ask, before embarking on the sizable effort that would be required to adapt any of them to California, is whether—even then—it would be better off. In other words, can DBP benefit at all from other techniques, regardless of start-up costs?

Almost certainly yes. The greatest gains would come, our findings suggest, in the areas of (1) anticipating caseload movement induced by changes in the state of the economy, (2) allowing for abrupt departures from past trends, caused by various demographic, behavioral, or economic shifts, and (3) tracing the reasons for recent caseload movement and explaining these during budget preparation. Regarding the first of these points, over ten studies on our list reported statistically significant relationships among caseload and one or another economic variable. There is too much strong evidence and too much agreement among these studies to doubt that real progress in this regard is within close reach. Particularly the works of the Boston College group, Holmer, Kasper, and the NYCRI group clearly demonstrate that measurable economic indicators can be effectively applied to caseload projection. On the second point—anticipating abrupt departures from past trends—we found two studies (the Boston College group and the NYCRI group) with documented examples showing marked improvement over simpler methods in the prediction of turning points. And many of the other studies would clearly also out-perform trend forecasts on this score if put to the test, in our view. Lastly, explaining the reasons for variations in the caseload is naturally easier if one can look at relevant and reliable
quantitative relationships. Most of the techniques we examined had one or more that would represent a large advance over trend methods.

Another way to think of these potential gains is that they would enable DBP to cope better with periods of rapid structural change or instability. Whether, in addition, they would lead to significantly improved forecasts for periods of little underlying change is less clear. Those periods, however, are not the major problem: DBP can already achieve high accuracy from its present techniques. In unsettled times, on the other hand, DBP sorely lacks adequate capabilities—and recognizes this fully.

Having decided that other techniques would help in general, DBP next would want to know which techniques. Here our findings are not conclusive, as is indicated by the following discussion of: Is there some single, specific technique that is best?

We think not. Many of the studies in our review contain good ideas—sometimes very, very good; but no technique emerges as so outstandingly better than the rest that DBP should concentrate on that one alone, to the exclusion of all others. Nor do we believe that even after additional investigation would one clearly dominate, because all—as good as they are—have at least a few faults. Instead of treating each as a separate alternative, then, the next logical step would be to synthesize. Good ideas now in isolation from one another should be brought together in a single framework.

Consider, for instance, these possibilities. The Boston College group's disaggregation of employment sectors has enormous potential, but is not as meaningful when total caseload is the dependent variable as it might be in a model of caseload changes (e.g., applications, approvals, discontinuances, etc.). The techniques of Holmer and the NYCRI group could help there. That union, in turn, could profit from the residuals modeling that Lochrie practices; and something about the role of interaction between welfare and female-headed family formation might be lifted from Durbin and Honig. Hudson's time trend tests would serve as good benchmarks. Indirectly, the competent work of Barr and Hall (1974) on the degree of dependence on welfare, or Kasper (1968) on the importance of grant levels and unemployment, of Greenston and MacRae (1974) on diffusion of
welfare information, and of Jackson and Johnson (1973) on welfare rights organizations might also prove instructive.

Now what about those faults: Are there techniques that DBP should be sure not to draw upon?

Yes. Our reservations about several individual techniques among those we examined are itemized in the literature summaries in App. C; but a few overall cautions deserve mention here. To begin with, we urge DBP to be especially wary of techniques that require input data not obtainable either from direct sources (e.g., published data series) or from estimating relationships provided along with the rest of the forecasting procedure. Many of the techniques we reviewed have this shortcoming. They can be patched up, of course, by adding supplemental equations; but the time to make these amendments is before not after presenting the finished product.

Another mistake to avoid is opting for a highly complex technique when a simpler one would perform just as well. Many refinements that appear absolutely critical in theory turn out not to have practical impact. These superfluous adornments can impede understanding of a technique's essential features. Since a few of our techniques are guilty on this score, we feel DBP should always ask of every complication: does it really help?

Still another problem: "overfitting." A technique can sometimes be calibrated so finely to the unique attributes of its calibration data that it is not very useful for other data—especially the future data to which it is meant to be applied. Usually, this problem arises only when those developing the technique spend so long working on a single body of data—and trying every imaginable variation—that they forget that no data base is ever exactly representative of the universe from which it has been drawn. Overfitting causes some techniques to look much better (from their test data) than they really are. DBP should therefore be suspicious of studies that clearly have "tried everything."

In this vein, we note that very few studies have truly put their method "at risk" in rigorous validation tests. One natural test is to compare predicted and actual caseload for some periods not included in the calibration data base. Many of the better studies we looked at did this if they could, but few went far enough in the direction of the following further test:
o Fit a simple autoregressive or "pure" time dependent (e.g., Hudson) model to the data; carry out a test of the first kind on recent data;

o Repeat for the technique at risk;

o Then compute how much better—if at all—the technique at risk performed than the simple-minded temporally determined model.

This sort of test will help identify when a given technique really has strong predictive power in its own right or has simply benefited from smoothly monotonic trends in the calibration data. We advise DBP to be suspicious of strong claims of accuracy unless thorough validation test findings are in evidence.

**What about the suitability of other techniques for California?**

Previous remarks have already implicitly indicated that at least the most promising of the techniques we reviewed would, in fact, be suitable for California; but some further points still need mentioning.

In essence, there are two issues to resolve concerning suitability:

1. Are California's problems in the welfare field enough like those elsewhere to warrant adopting the same conceptual approach as other states? and
2. Does the right data exist in California? On both, the answer is a clearcut yes. Regarding the first, the key point is that although no two states face exactly the same problems, the degree of differences between them is far too small—relative to the level of generality of the techniques being discussed here—to matter. In other words, every state can benefit, in its own particular way, from these techniques as much as any other state.* True, California may have a unique geographic situation (a large southern metropolis—Los Angeles—subject to separate stimuli from a distant but also large northern center—the San Francisco Bay area), Michigan may have its auto industry, New York may have the turmoil of New York City, the southwest may have its migrant problem, and so on; but the same principles, although not perhaps the same variables, can be used in all these cases.

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*Well, almost any. Alaska, Hawaii, and some states with very small populations may be rather special.
Regarding data, California is as well—or better—endowed in the kinds of data required for these techniques as other states. Its employment-related data are in the standard mold fostered by the U.S. Department of Labor; its demographic data derive largely from uniform Census sources; and the miscellaneous items that the state collect are generally commensurate with other states' offerings. As a result, virtually every technique that could be widely employed elsewhere could also be implemented in California.

Consider next a very different question. So far, this section has been exclusively concerned with whether ideas that have been tried before would work in California. But are there ideas that have not been tried which ought to be?

In general, not many, we think—at least not with presently available data. However, a few suggestions come to mind. First, it was noted above that much might be gained by synthesizing in one framework ideas until now treated as mutually exclusive alternative strategies. That would be one new idea worth trying. Second, a few ideas could possibly be pushed considerably further than they have to date. For instance, the disaggregation of employment sectors could be carried beyond just two allegedly welfare-prone sectors; and something might be done, too, with disaggregation of case types (e.g., isolate female-headed households whose head has a high school diploma from those with subnormal educational attainment). Also, the role of changes in the incidence of female-headed households due to family separations and illegitimacy still could be brought into the forecasting process more thoroughly and effectively than Durbin's and Honig's good beginnings permit.

Third, and perhaps most important, new data sources should be sought. Governmental sources at both the federal and state levels have already been extensively explored. However, no one has tried nongovernmental data. A few of the sources that might be tapped are: financial institutions, utilities, retail sales organizations, collection agencies, churches, other charitable institutions. Ferreting out truly useful, timely data from these and other nongovernmental sources would of course take considerable work; and there is no guarantee that such data would yield any major advance over present knowledge. But there may also be
some enormously powerful predictor buried somewhere (the incidence of bad debts at supermarkets? arrears on telephone or electricity bills?), which will remain undiscovered until someone takes the chance.

Since DBP particularly wanted to know how other states handle case-load forecasting, the next three questions focus on comparing California with other states.

Are other states using methods or special kinds of data substantially different from what DBP knows about or uses? No. Most states, according to our original mail survey and telephone follow-ups, rely entirely on data collected by local welfare offices for administrative purposes, which, when aggregated statewide, usually amount to nothing more than caseload, average case size, total aid payments, and average payment per case—in other words, the very items which they then want to estimate for future months. Forecasting in these states is done either by extrapolation (e.g., a simple procedure) or—as one state put it with admirable honesty—by "seat of the pants" guessing. Those states who go beyond this, we discovered in our site visits, generally have a relatively straightforward regression equation to back up trend analysis. Explanatory variables vary from state to state, but rarely include any variable that has not at one time or another been tried for California. Though our review of DBP's procedures necessarily was brief, we satisfied ourselves beyond all doubt that DBP had nothing to learn—as far as currently operational procedures are concerned—from other states that it did not know about already.

Are other states able to predict more accurately? We cannot say for sure, since our efforts to collect data on accuracy mainly met with failure, due to the simple fact that most states either do not retain systematic records comparing actual and predicted caseloads or are loath to share them with outsiders. A sizable number can give approximate estimates (e.g., "Within five percent most of the time"), but that.

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* We had not been asked to examine what DBP is doing now—only other techniques.
obviously, is not enough for rigorous comparisons. This said, however, we strongly suspect that DBP has a better track record than most states, and at least during periods of stable conditions—and possibly at other times too—is among the top five states in the nation in predictive accuracy. We base this supposition on the fact that few states gave rough estimates as good as the true performance data we ourselves computed for California.* Considering (1) that the rough estimates would—if anything—probably overstate rather than understate other states' true performance, (2) that many states apparently are under much less pressure at the state level to forecast accurately, and (3) that many states' efforts suffer severely from high turnover in staff and organizational structure—there seems to us little room for doubt.

Are other states able to explain caseload movement better and anticipate the impact of economic dislocations better? Again—and for the same reasons—we cannot be certain. However, sundry intelligence acquired from our numerous interviews and telephone conversations suggests that virtually all states are equally lacking in this area. Whether California is at the top or bottom of the pack is therefore much less important than the fact that the pack as a whole is far below the standard that some (DBP included, we found) believe imperative.

RECOMMENDATIONS

Our recommendations, based on the conclusions presented above, are as follows:

1. Promising methods exist which with high probability would substantially enhance DBP's caseload and expenditure forecasting capability, particularly with regard to (a) anticipating the impact of changes in economic conditions, demographic trends, and behavioral patterns, and (b) explaining caseload movement during budget preparation. DBP should take advantage of

*Small states, with caseloads that change very little, may again be an exception.
these methods. Specifically, it should undertake a program (as outlined below) to select, test, and implement techniques especially appropriate for unsettled times, as enrichment for its presently strong capability during relatively stable periods. Techniques known from previous studies to have a high potential of enduring effectiveness should be considered first, but DBP should also explore new approaches extending beyond—but built upon—past efforts.

2. Many good ideas have been tried, but no single technique has yet been demonstrated as clearly best. Accordingly, the first step of DBP's enrichment program should be to test on current California data the most promising techniques from other studies (we believe there are less than half a dozen worth trying). These preliminary tests should adhere as closely as possible to the original work on all conceptual and theoretical matters, but should use recalibrated parameters and should correct weaknesses in statistical procedure wherever possible (especially those mentioned above—e.g., overfitting or poor validation). This will insure that each "pure" technique is examined in the most favorable light for comparison and evaluation in terms of California's special circumstances.

3. Many other good ideas either have not been tried at all, have not been pushed far enough, or ought to be brought together in a single framework instead of treated as mutually exclusive. The second step of DBP's program should therefore be to synthesize and extend promising features of past studies, in effect forming new or hybrid approaches from the "pure" methods previously tested. Care must be taken at this step to avoid attempting too many possibilities with too little forethought, and thereby losing the thread of the effort's logical development. Consequently, we recommend that DBP proceed according to the following natural—but still noteworthy—principles:

- Start with the simplest possible methods;
- Add complications incrementally rather than all at once; and
Test each additional refinement exhaustively; unless it improves matters noticeably, delete it and revert to the next simplest approach.

4. As useful as these multiple investigations may be for exploratory purposes, the end result must be one procedure (or at most one principal and a very few back-up procedures), workable and complete in all respects, which can produce reliable forecasts on a routine basis. The third and final step must hence be narrowing the field of candidates down to the finalists. Many considerations should enter this process, but we think two particularly important:

DBP should be sure that all input data needed to compute caseload forecasts are either directly available (i.e., can be obtained from regularly updated sources at its disposal) or, if not available, can be reasonably well estimated by methods incorporated in the procedure selected. Candidate models that rely on future data and do not provide a way of projecting that data should be rejected.

Those who will exercise the procedure must understand it and have confidence in it. They must know how to amend or fix it, should the need arise. Any technique, however laudable in the abstract, will be worthless if it does not meet this elementary requirement.

5. Lastly, we suggest that DBP consider searching for new kinds of data to use as explanatory variables. Since governmental sources have already been thoroughly mined for this purpose, the principal thrust of this search would be toward finding data items in nongovernmental sources which nonetheless are reasonably comprehensive in coverage, timely in availability, and regularly accessible to DBP. Our personal
view is that a search along these lines would be extremely valuable; even if nothing were found and the only payoff was knowledge that every avenue had been investigated. However, we also recognize that DBP might justifiably feel that this step should be undertaken only after the potential of currently known data is exhausted first.
Appendix A

SURVEY PACKAGE
The Department of Benefit Payments of the State of California, assisted by the RAND Corporation, is conducting a survey and analysis of methods of projecting welfare caseloads. We consider this study an important step toward improving welfare caseload projections in California. Other states may also be interested in the study results.

The primary objective of the study is to determine the extent to which quantitative relationships between economic variables and caseload movement are, or can be, effectively used to improve the administration of public assistance programs.

The RAND Corporation is contacting you for specific information to help us attain this objective, which we think of importance to both our agency and yours. A copy of their final report will be sent to you. Your cooperation would be greatly appreciated. Thank you.

Sincerely,

JEROLD A. PROD
Acting Director
Dear

The Rand Corporation is assisting the Department of Benefit Payments of the State of California in a study of existing methods for projecting welfare caseloads and expenditures. This four-month study will collect and analyze information, both from state and local agencies as well as the published literature, on quantitative techniques for estimating future caseloads and grant expenditures in such programs as AFDC, Food Stamps, General Assistance, and State Supplemental Payments. One of the primary aims of the study is to assess how well models which quantitatively associate movement in such economic variables as unemployment with caseload movement are, or can be, effectively used for caseload projection.

To carry out this study, we need your assistance in providing us with information about quantitative methods of caseload projection used in your metropolitan area. These may be methods used by your agency or other agencies also involved in the administration or budgeting of public assistance programs. We hope that you will direct the attached material to the appropriate people, filling in those portions of the questionnaire which pertain to you.

The enclosed questionnaires, originally sent to the directors of welfare agencies in all states, are also being sent to welfare agencies in the ten largest metropolitan areas in the United States. The completed analysis should be of considerable interest and benefit to administrators, at the state and local level, who are concerned with the problems of planning and budgeting public assistance programs. A copy of the final report will be sent to all recipients of this letter.

Due to the short duration of the study, we ask that you return the information requested as soon as possible. After your response has been received, a member of our staff may telephone your office to discuss the subject of the study further.

Thank you for your cooperation.

Sincerely,

Patricia D. Fleischauer

PDF:ah
Attachments as noted
INSTRUCTIONS FOR COMPLETING QUESTIONNAIRES

The attached set of materials includes several forms. The white form is to be filled out by the agency director or his designee. Please complete this form first and return to Rand in the enclosed self-addressed envelope.

The other forms included in the package contain questions to be answered by the individual(s) directly responsible for preparing program estimates for the four programs we are studying. Four forms are included:

- the yellow form is for information about Aid to Families with Dependent Children
- the green form is for information about the Food Stamp program
- the pink form is for information about State Supplemental Payments
- the blue form is for information about the State General Assistance program

Please direct each of these forms with a self-addressed return envelope to the appropriate department or section of your department for completion.
THIS FORM SHOULD BE COMPLETED BY THE AGENCY DIRECTOR OR HIS DESIGNEE.

1. For which of the following programs is your department responsible for preparing estimates of the amount of aid disbursed and/or the number of aid recipients?
   - Aid to Families with Dependent Children (AFDC) [ ]
   - State Supplemental Payments (SSP) [ ]
   - Food Stamps (FS) [ ]
   - State General Assistance (GA) [ ]

2. For each of the programs checked above, please identify the departmental section and section chief responsible for preparing the estimates.

   **AID TO FAMILIES WITH DEPENDENT CHILDREN**
   
   Section Name: ____________________________
   Section Chief's Name: _____________________ Title: ___________________
   Business mailing address: ____________________________
   Phone number: ____________________________

   **STATE SUPPLEMENTAL PAYMENTS**
   
   Section Name: ____________________________
   Section Chief's Name: _____________________ Title: ___________________
   Business mailing address: ____________________________
   Phone number: ____________________________

   **FOOD STAMPS**
   
   Section Name: ____________________________
   Section Chief's Name: _____________________ Title: ___________________
   Business mailing address: ____________________________
   Phone number: ____________________________

   **STATE GENERAL ASSISTANCE**
   
   Section Name: ____________________________
   Section Chief's Name: _____________________ Title: ___________________
   Business mailing address: ____________________________
   Phone number: ____________________________
3. Do any other departments of the state government prepare estimates for these programs (in addition to or in lieu of yours)?
   Yes ☐ No ☐

   If yes, please indicate the department(s), the program, and the appropriate individual for us to contact for further information.

   PROGRAM: ____________________________ DEPT: ____________________________ INDIVIDUAL TO CONTACT: ____________________________

   ____________________________ ____________________________ ____________________________

4. Do any city or county governments in your state prepare such estimates?
   Yes ☐ No ☐

   If yes, please indicate the jurisdiction, the department, and the appropriate individual for us to contact for further information.

   JURISDICTION: ____________________________ DEPT: ____________________________ INDIVIDUAL TO CONTACT: ____________________________

   ____________________________ ____________________________ ____________________________

5. Do any non-governmental institutions in your state which have done work in this area (i.e. universities, research organizations) prepare such estimates?
   Yes ☐ No ☐

   If yes, please indicate the institution and the appropriate individual for us to contact for further information.

   INSTITUTION: ____________________________ INDIVIDUAL TO CONTACT: ____________________________

   ____________________________ ____________________________

If you have any additional suggestions about individuals we should contact for further information about estimates please indicate their names and affiliations on a separate sheet of paper.

In order to be sure that our records are complete and accurate we would appreciate it if you could fill in the following:

   YOUR NAME: ____________________________
   TITLE: ____________________________ DEPARTMENT: ____________________________
   MAILING ADDRESS: ____________________________
   TELEPHONE: ____________________________

UPON COMPLETION, PLEASE RETURN THIS FORM TO RAND IN THE ENCLOSED SELF-ADDRESSED ENVELOPE.

PLEASE SEND ANY PRINTED MATTER THAT DESCRIBES YOUR QUANTITATIVE ESTIMATION TECHNIQUES.
FOR INFORMATION ABOUT AID TO FAMILIES WITH DEPENDENT CHILDREN

The Department of Benefit Payments of the State of California, assisted by the Rand Corporation is conducting a survey and analysis of methods of projecting welfare caseloads. The director of your state welfare agency has indicated that your department or departmental section is responsible for preparing such estimates and has directed this questionnaire to you for completion. The questionnaire should be answered by the individual directly responsible for preparing program estimates. The information you provide will be most helpful in carrying-out this important study. We appreciate your taking the time to fill-out the questionnaire.

1. Which of the following estimates are made by your department? (Check all that apply)
   Number of Cases  ☐
   Number of Recipients  ☐
   Dollars of Maintenance Payments Disbursed  ☐
   Income Maintenance Administration Costs  ☐

2. How often are the annual budget estimates prepared each year?

3. How many person-months of effort are required?

4. How far in the future are estimates made?
5. In many cases good estimates can be obtained by extrapolation of past amounts and/or expert judgement. Does your department use any of the following quantitative techniques:

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<td>Trend analysis?</td>
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If yes, please describe: ____________________________________________________________

6. List the data elements and check the sources you use in preparing estimates.

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*Please describe the sources.

7. Has your department found it useful to analyze the differences between past estimates and actual data?

Yes [ ] No [ ]

8. Are the department's estimates used:

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9. Do any other departments of the state government prepare estimates for these programs (in addition to or in lieu of yours)?
   
   Yes ☐  No ☐

   If yes, please indicate the department(s), the program, and the appropriate individual for us to contact for further information.

   PROGRAM: ____________________________________________
   DEPT: ____________________________________________
   INDIVIDUAL TO CONTACT: ________________________________

10. Do any city or county governments in your state prepare such estimates?

   Yes ☐  No ☐

   If yes, please indicate the jurisdiction, the department, and the appropriate individual for us to contact for further information.

   JURISDICTION: ________________________________________
   DEPT: ____________________________________________
   INDIVIDUAL TO CONTACT: ________________________________

11. Do any non-governmental institutions in your state which have done work in this area (i.e. universities, research organizations) prepare such estimates?

   Yes ☐  No ☐

   If yes, please indicate the institution and the appropriate individual for us to contact for further information.

   INSTITUTION: ________________________________________
   INDIVIDUAL TO CONTACT: ________________________________

If you have any additional suggestions about individuals we should contact for further information about estimates please indicate their names and affiliations on a separate sheet of paper.

In order to be sure that our records are complete and accurate we would appreciate it if you could fill in the following:

   YOUR NAME: ________________________________________
   TITLE: ___________________________  DEPARTMENT: ______________
   MAILING ADDRESS: ________________________________________
   TELEPHONE: ____________________________________________

UPON COMPLETION, PLEASE RETURN THIS FORM TO RAND IN THE ENCLOSED SELF-ADDRESSED ENVELOPE. PLEASE SEND ANY PRINTED MATTER THAT DESCRIBES YOUR QUANTITATIVE ESTIMATION TECHNIQUES.
FOR INFORMATION ABOUT FOOD STAMPS

The Department of Benefit Payments of the State of California, assisted by the Rand Corporation, is conducting a survey and analysis of methods of projecting welfare caseloads. The director of your state welfare agency has indicated that your department or departmental section is responsible for preparing such estimates and has directed this questionnaire to you for completion. The questionnaire should be answered by the individual directly responsible for preparing program estimates. The information you provide will be most helpful in carrying-out this important study. We appreciate your taking the time to fill-out the questionnaire.

1. Which of the following estimates are made by your department? (Check all that apply)
   - Number of Cases □
   - Number of Recipients □
   - Bonus Value of Food Stamps Disbursed □
   - Food Stamp Maintenance Administration Costs □

2. How often are the annual budget estimates prepared each year?

3. How many person-months of effort are required?

4. How far in the future are estimates made?
5. In many cases good estimates can be obtained by extrapolation of past amounts and/or expert judgement. Does your department use any of the following quantitative techniques:

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<th>Question</th>
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If yes, please describe: ________________________________________________

6. List the data elements and check the sources you use in preparing estimates.

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7. Has your department found it useful to analyze the differences between past estimates and actual data?

Yes ☐ No ☐

8. Are the department's estimates used:

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9. Do any other departments of the state government prepare estimates for these programs (in addition to or in lieu of yours)?

   Yes [ ]  No [ ]

   If yes, please indicate the department(s), the program, and the appropriate individual for us to contact for further information.

   PROGRAM: ___________________________  DEPT: ___________________________  INDIVIDUAL TO CONTACT: ___________________________

   ___________________________  ___________________________  ___________________________

10. Do any city or county governments in your state prepare such estimates?

   Yes [ ]  No [ ]

   If yes, please indicate the jurisdiction, the department, and the appropriate individual for us to contact for further information.

   JURISDICTION: ___________________________  DEPT: ___________________________  INDIVIDUAL TO CONTACT: ___________________________

   ___________________________  ___________________________  ___________________________

11. Do any non-governmental institutions in your state which have done work in this area (i.e. universities, research organizations) prepare such estimates?

   Yes [ ]  No [ ]

   If yes, please indicate the institution and the appropriate individual for us to contact for further information.

   INSTITUTION: ___________________________  INDIVIDUAL TO CONTACT: ___________________________

   ___________________________  ___________________________

If you have any additional suggestions about individuals we should contact for further information about estimates please indicate their names and affiliations on a separate sheet of paper.

In order to be sure that our records are complete and accurate we would appreciate it if you could fill in the following:

 YOUR NAME: ___________________________
 TITLE: ___________________________  DEPARTMENT: ___________________________
 MAILING ADDRESS: ___________________________
 TELEPHONE: ___________________________

UPON COMPLETION, PLEASE RETURN THIS FORM TO RAND IN THE ENCLOSED SELF-ADDRESSED ENVELOPE.
PLEASE SEND ANY PRINTED MATTER THAT DESCRIBES YOUR QUANTITATIVE ESTIMATION TECHNIQUES.
FOR INFORMATION ABOUT STATE SUPPLEMENTAL PAYMENTS

The Department of Benefit Payments of the State of California, assisted by the Rand Corporation, is conducting a survey and analysis of methods of projecting welfare caseloads. The director of your state welfare agency has indicated that your department or departmental section is responsible for preparing such estimates and has directed this questionnaire to you for completion. The questionnaire should be answered by the individual directly responsible for preparing program estimates. The information you provide will be most helpful in carrying-out this important study. We appreciate your taking the time to fill-out the questionnaire.

1. Which of the following estimates are made by your department? (Check all that apply)

   Number of Cases

   Number of Recipients

   Dollars of Maintenance Payments Disbursed

   Income Maintenance Administration Costs

2. How often are the annual budget estimates prepared each year?

3. How many person-months of effort are required?

4. How far in the future are estimates made?
5. In many cases good estimates can be obtained by extrapolation of past amounts and/or expert judgement. Does your department use any of the following quantitative techniques:

- Trend analysis?  Yes ☐  No ☐
- Econometric forecasting? Yes ☐  No ☐
- Probabilistic model? Yes ☐  No ☐
- Other quantitative technique? Yes ☐  No ☐

If yes, please describe: ____________________________________________

6. List the data elements and check the sources you use in preparing estimates.

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*Please describe the sources. ____________________________________________

7. Has your department found it useful to analyze the differences between past estimates and actual data? Yes ☐  No ☐

8. Are the department's estimates used:

- in the state budget process? Yes ☐  No ☐
- in the federal budget process? Yes ☐  No ☐
- for general planning purposes? Yes ☐  No ☐
9. Do any other departments of the state government prepare estimates for these programs (in addition to or in lieu of yours)?
   Yes ☐ No ☐
   If yes, please indicate the department(s), the program, and the appropriate individual for us to contact for further information.

   PROGRAM: ____________________________  DEPT: ____________________________  INDIVIDUAL TO CONTACT: ____________________________


10. Do any city or county governments in your state prepare such estimates?
    Yes ☐ No ☐
    If yes, please indicate the jurisdiction, the department, and the appropriate individual for us to contact for further information.

    JURISDICTION: ____________________________  DEPT: ____________________________  INDIVIDUAL TO CONTACT: ____________________________


11. Do any non-governmental institutions in your state which have done work in this area (i.e. universities, research organizations) prepare such estimates?
    Yes ☐ No ☐
    If yes, please indicate the institution and the appropriate individual for us to contact for further information.

    INSTITUTION: ____________________________  INDIVIDUAL TO CONTACT: ____________________________

If you have any additional suggestions about individuals we should contact for further information about estimates please indicate their names and affiliations on a separate sheet of paper.

In order to be sure that our records are complete and accurate we would appreciate it if you could fill in the following:

YOUR NAME: ____________________________

TITLE: ____________________________  DEPARTMENT: ____________________________

MAILING ADDRESS: ____________________________

TELEPHONE: ____________________________

UPON COMPLETION, PLEASE RETURN THIS FORM TO RAND IN THE ENCLOSED SELF-ADDRESSED ENVELOPE. PLEASE SEND ANY PRINTED MATTER THAT DESCRIBES YOUR QUANTITATIVE ESTIMATION TECHNIQUES.
FOR INFORMATION ABOUT STATE GENERAL ASSISTANCE

The Department of Benefit Payments of the State of California, assisted by the Rand Corporation, is conducting a survey and analysis of methods of projecting welfare caseloads. The director of your state welfare agency has indicated that your department or departmental section is responsible for preparing such estimates and has directed this questionnaire to you for completion. The questionnaire should be answered by the individual directly responsible for preparing program estimates. The information you provide will be most helpful in carrying-out this important study. We appreciate your taking the time to fill-out the questionnaire.

1. Which of the following estimates are made by your department? (Check all that apply)
   - Number of Cases
   - Number of Recipients
   - Dollars of Maintenance Payments Disbursed
   - Income Maintenance Administration Costs

2. How often are the annual budget estimates prepared each year?

3. How many person-months of effort are required?

4. How far in the future are estimates made?

   -
5. In many cases good estimates can be obtained by extrapolation of past amounts and/or expert judgement. Does your department use any of the following quantitative techniques:

Yes ☐  No ☐

Trend analysis?

Econometric forecasting?

Probabilistic model?

Other quantitative technique?

If yes, please describe: ________________________________

6. List the data elements and check the sources you use in preparing estimates.

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*Please describe the sources.

7. Has your department found it useful to analyze the differences between past estimates and actual data?

Yes ☐  No ☐

8. Are the department's estimates used:

Yes ☐  No ☐

in the state budget process?

in the federal budget process?

for general planning purposes?
9. Do any other departments of the state government prepare estimates for these programs (in addition to or in lieu of yours)?
   If yes, please indicate the department(s), the program, and the appropriate individual for us to contact for further information.

   Yes [ ]
   No [ ]

   PROGRAM: ____________________________
   DEPT: ____________________________
   INDIVIDUAL TO CONTACT: ____________________________

10. Do any city or county governments in your state prepare such estimates?
   If yes, please indicate the jurisdiction, the department, and the appropriate individual for us to contact for further information.

   Yes [ ]
   No [ ]

   JURISDICTION: ____________________________
   DEPT: ____________________________
   INDIVIDUAL TO CONTACT: ____________________________

11. Do any non-governmental institutions in your state which have done work in this area (i.e. universities, research organizations) prepare such estimates?
   If yes, please indicate the institution and the appropriate individual for us to contact for further information.

   Yes [ ]
   No [ ]

   INSTITUTION: ____________________________
   INDIVIDUAL TO CONTACT: ____________________________

If you have any additional suggestions about individuals we should contact for further information about estimates please indicate their names and affiliations on a separate sheet of paper.

In order to be sure that our records are complete and accurate we would appreciate it if you could fill in the following:

   YOUR NAME: ____________________________
   TITLE: ____________________________
   DEPARTMENT: ____________________________
   MAILING ADDRESS: ____________________________
   TELEPHONE: ____________________________

UPON COMPLETION, PLEASE RETURN THIS FORM TO RAND IN THE ENCLOSED SELF-ADDRESSED ENVELOPE.
PLEASE SEND ANY PRINTED MATTER THAT DESCRIBES YOUR QUANTITATIVE ESTIMATION TECHNIQUES.
Appendix B

SUMMARY OF CONTACTS

This appendix is divided into three sections: state contacts, local contacts and other. In the first group we list for each state the names of the individuals who received the survey packages, the names of those who responded to the individual program questionnaires, who we talked with on the phone or visited in person, and finally, a summary of the estimating techniques used for each program sponsored in a state. The same information is given in the section on local contacts for those cities which received survey forms. The section on other contacts contains the names and affiliations of persons outside state or local government who were contacted as additional sources of information on welfare caseload estimating techniques.
Contacts

Letter: Ruben K. King, Commissioner
       State Department of Pensions & Security
       64 North Union Street
       Montgomery, Alabama 36104

Responses:
AFDC  Ralph A. Logan, Director
       Bureau of Financial Management
FS    State Department of Pensions & Security
       64 North Union Street
       Montgomery, Alabama 36130
       205-832-6160
SSP   Mrs. Burke McConigal, Administrator
       Office of Internal Administration
       State Department of Pensions & Security
       64 North Union Street
       Montgomery, Alabama 36104
       205-832-6222

Phone: Mrs. Burke McConigal, Administrator
       Office of Internal Administration
       State Department of Pensions & Security
       64 North Union Street
       Montgomery, Alabama 36104
       205-832-6222

Summary of estimating methods

AFDC: Estimates are completed quarterly for number of cases, number or recipients, dollars of maintenance payments disbursed and program administration costs. The estimates are made for three years in the future using trend analysis. Based on administrative records, the three data elements used in the estimating process are caseload, average payment level and administrative cost.

FS: Estimates of cases, recipients, administration cost and bonus value of food stamps disbursed are computed annually and revised as needed. The projections are 15 months in the future using trend analysis. The basic data elements in the estimating process are caseload, bonus value and administration cost.

SSP: Annual estimates, projecting three years into the future, are made for cases, recipients, dollars of aid disbursed and program administration cost. The method used is trend analysis and the basic data elements are caseload, payment level and administration cost.
ALASKA

Contacts:

Letter: Mr. Frederick McGinnis, Commissioner
State Department of Health and Social Services
Pouch H
Juneau, Alaska 99801
907-586-5401

Responses: None received

Phone: Contacted HEW regional representative

Summary of estimating methods

Method was described as primitive, straight line extrapolation.
**Summary of estimating methods**

**AFDC:** Estimates of cases, recipients, dollars of aid and program administration costs are computed annually but revised quarterly. Eighteen person months of effort are required. Annual estimates are projected five years into the future; quarterly revisions are projected two years into the future. Based on administrative records and federal statistics of cases, recipients and expenditures, the estimation process is said to use both trend analysis and econometric forecasting. Other quantitative techniques are used to estimate the effects of program changes on caseload.

**SSP:** Estimates of cases, recipients and dollars of aid were completed once each year and are projected five years into the future. The effort requires approximately one person month of effort. Based on administrative records of cases and expenditures as well as some federal statistics, estimates are made using trend analysis and econometric forecasting. Other quantitative techniques are used to estimate the effects of program changes.

**GA:** Requiring two person months of effort, annual estimates projecting five years into the future are computed for cases, recipients and dollars of aid. Based on administrative records of cases and expenditures and some federal statistics, the estimating methods used are trend analysis and econometric forecasting. Other quantitative techniques are used to estimate the effects of program changes.
ARIZONA cont'd.

FS: Estimates of cases, recipients and the bonus value of food stamps disbursed are computed once each year. Two person months of effort are required and the estimates are projected five years into the future. The data elements used are cases, recipients and bonus value of food stamps and the estimates are made using trend analysis and econometric forecasting.

Note: In all cases, the econometric forecasting, or really regression analysis is used in support of the trend analysis. It is the latter process which actually produces the caseload estimates.
Contacts

Letter: Mr. Dalton Jennings, Commissioner
Department of Social and Rehabilitative Services
406 National Old Line Building
Little Rock, Arkansas 72201

Responses: None received

Phone: Mrs. Maude Russell, Supervisor
Research and Statistics
Division of Social Services
Department of Social and Rehabilitative Services
Blue Cross-Blue Shield Building
7th and Gaines Streets
P. O. Box 1437
Little Rock, Arkansas 72203
501-371-2521

Summary of estimating methods

AFDC: Estimates of cases, recipients, dollars of aid and program administration costs are normally computed annually, but more often if it is found that the estimates are in error. One person month of effort is required for the estimates which are projected two years into the future. Before this year, estimates were done in individual departments but are now done by the Research and Statistics group. The projection method used is trend analysis modified by subjective evaluation of various economic factors. The data elements used in projecting caseload are the number of one parent families, the percent of two parent families with one disabled parent, the preceding year's caseload and income.
Contacts

Letter: Ms. Charline J. Birkins, Director
       Public Welfare Division
       State Department of Social Services
       1575 Sherman Street
       Denver, Colorado 80203

Responses: James Corlett
           AFDC  Assistant Director of the Budget
           FS    State Department of Social Services
           SSP   1575 Sherman Street
                   Denver, Colorado 80203
                   303-892-3141

Phone: James Corlett

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients and dollars of maintenance payments are prepared twice each year. The method of estimation used is trend analysis based on cases, recipients, number of adults, number of children, recipients per case, average cost per case and average cost per recipient.

FS: Estimates of cases, recipients, bonus value of food stamps disbursed and program administration cost are prepared twice each year. One quarter of a person month is devoted to the effort which uses trend analysis as the projection technique. The data elements used in preparing the estimates are the number of households on public assistance, the number of households not on public assistance, the bonus value of food stamps, eligibility staff, sales staff, operating costs and travel costs.

SSP: Twice each year annual budget estimates of cases, recipients and dollars of aid are prepared. One half of a person month is required. The estimation technique is trend analysis using as data elements the number of supplement cases, the number of state only cases, cases with deemed income, the amount of deemed income, spouses and average cost.
CONTACTS

Letter: Mr. Nicholas Norton, Commissioner
State Welfare Department
1000 Asylum Avenue
Hartford, Connecticut 06115

Responses:
AFDC  Diane Smith, Assistant Chief
      Research and Statistics
FS      110 Bartholomew Avenue
SSP     Hartford, Connecticut 06115
GA      203-566-2445

Phone:  Diane Smith

SUMMARY OF ESTIMATING METHODS

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year. The estimates are projected one to four years into the future. The estimating process is said to require forty to sixty person months of effort divided between twenty people working on the annual effort and then four people working throughout the year part-time. The estimating technique is trend analysis using number of cases, new programs, cost per case, number of persons and the number of unemployed fathers as data elements.

FS:  Annual estimates of cases, recipients and program administration costs are prepared once each year. The estimates are carried one to four years in the future and require between thirty and fifty person months of effort. The estimation technique is a combination of trend analysis and econometric forecasting using caseload size and number of persons as data elements.

GA:  Once each year annual budget estimates are prepared of cases, recipients and dollars of maintenance payments disbursed. Estimates are made one to four years in the future and require from thirty to fifty person months of effort. Trend analysis and econometric forecasting based on caseload and cost per case are the estimating techniques used.

SSP:  Estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and are projected one to four years into the future. The basic estimating technique is trend analysis but there is much in the way of subjective judgement as the program is said to still be too new to yield useful data for trend analysis on its own. The data elements used are caseload size and cost per case. The amount of effort devoted to the estimation process is between thirty and fifty person months.
Contacts

Letter: Mr. Miklos T. Lazar, Acting Director
State Department of Health and Social Services
3000 Newport Gap Pike
Wilmington, Delaware 19808

Responses: Barbara Olivere, Planner
AFDC Research and Statistics
GA Division of Planning, Research and Evaluation
SSP Department of Health and Social Services
Room 228
Delaware State Hospital
New Castle, Delaware 19720
302-421-6717

Phone: Barbara Olivere

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared quarterly requiring one quarter of a person month each time. The estimates are projected 24 months into the future using trend analysis. The data elements used in preparing the estimates are the number of cases and number of recipients, dollars of aid and previous administration costs.

GA: Estimates of cases, recipients, dollars of aid and program costs are prepared quarterly requiring .05 person months of effort each time. Estimates are made twelve months into the future using trend analysis of cases, recipients, dollars of aid and administration costs.

SSP: Estimates of cases, recipients, dollars of aid and program costs are prepared quarterly using trend analysis. .05 person months of effort are required and the estimates are projected twelve months into the future.

Note: The University of Delaware is said to be working on econometric model for the state but it was not known if this is related to welfare projections or not.
FLORIDA

Contacts

Letter: Mr. E. Douglas Endsley, Director  
Division of Family Services  
State Department of Health and Rehabilitative Services  
660 Apalachee Parkway  
IBM Branch Office Building  
Tallahassee, Florida 32304

Responses: Ted R. Lewis, Director  
AFDC Office of Planning, Research and Quality Control  
SSP Division of Family Services  
FS State Department of Health and Rehabilitative Services  
P.O. Box 2050  
Jacksonville, Florida 32203  
904-725-3080 ext. 372

Phone: John G. Beville, Administrator  
Research and Statistics Section  
Office of Planning, Research and Quality Control  
Division of Family Services  
State Department of Health and Rehabilitative Services  
P.O. Box 2050  
Jacksonville, Florida 32203  
904-725-3080 ext. 251

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program costs are prepared at least twice a year. Four person months of effort are required for a method which is trend analysis modified by various estimates of economic factors. The data elements used in preparing caseload estimates are previous caseload, recipients and average payment, number of applications, population, cost of living, the rise in unemployment and the payment standard. Estimates are projected at least eighteen months into the future.

FS: Food stamp estimates are prepared at least twice a year for number of cases, recipients and program administration costs. One and one half person months are devoted to the estimating process which is said to involve trend analysis and the use of a probabilistic model. The data elements used are caseload, applications, population, employment and "economy." Again the estimates are projected eighteen months into the future.

SSP: At least twice a year annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared. Two person months are devoted to the estimation process which is based on a combination of trend analysis and the use of a probabilistic model. Data elements used in preparing the estimates are caseload, average payment level, population, and "economy."
Contacts

Letter: Mr. Richard M. Harden, Commissioner
State Department of Human Resources
620 State Office Building
Atlanta, Georgia 30334

Responses: None received

Phone: Charles N. Wagner, Management Analyst
Georgia Department of Human Resources
47 Trinity Avenue, S.W.
Atlanta, Georgia 30334
404-656-7070

Summary of estimating methods

Caseload estimating technique was described as "seat of the pants." They use neither models nor formulas and devote only one person month of effort to making caseload projections. As inputs to the estimates they look at census data, the consumer price index, case histories and the growth rate in both population and caseload.
Contacts

Letter: Edwin B.L. Tam
Public Welfare Administrator
Department of Social Services and Housing
P.O. Box 339
Honolulu, Hawaii 96809

Responses: Jack T. Wakayama, Chief
AFDC Research and Statistics Office
GA Department of Social Services and Housing
FS P.O. Box 339
SSP Honolulu, Hawaii 96809
808-548-5753

Summary of estimating methods

AFDC: Annual estimates of cases, recipients, and dollars of aid are usually prepared twice a year and are projected six years into the future. Using one person month of effort the technique used is trend analysis. Data elements which go into the estimating process include population and the ratio of women aged 15 to 55 to total AFDC caseload.

FS: Estimates of cases, recipients, the bonus value of food stamps disbursed and program administration costs are prepared once each year, projected five years into the future. The method used to produce estimates is trend analysis based on population, the income distribution of families and the ratio of unmarried persons to recipient population.

GA: Annual budget estimates of cases, recipients, and dollars of aid disbursed are prepared twice a year and require two weeks of effort. Trend analysis is the basic estimation technique based on migration by age group, the single population, income distribution, family population and an income distribution ratio.

SSP: Once each year estimates are prepared of the number of cases, recipients and the dollars of aid. The effort requires about fifty hours of work and estimates are projected six years into the future. The method of estimation is trend analysis based on population and age distribution, income distribution and the ratio of disability rate to population by income distribution.
Contacts

Letter: James A Bax, Administrator
State Department of Environmental and Community Services
Box 1189
Boise, Idaho 83701

Responses: Richard V. Atwood, Chief
AFDC
State Department of Research and Statistics
Statehouse
Boise, Idaho 83720
208-384-3820

SSP
State Department of Environmental and Community Services
Statehouse
Boise, Idaho 83720
208-384-3820

Phone: Ruth Pefley
Bureau of Research and Statistics
State Department of Environmental and Community Services
Statehouse
Boise, Idaho 83720
208-384-3820

Summary of estimating methods

AFDC: Annual estimates of cases, recipients, dollars of aid and program administrative costs are prepared five times each year. Estimates, which are projected up to 27 months into the future, take about three weeks to prepare each time. The basis of the estimates is a least squares regression which is then extrapolated. The data elements used in preparing estimates are the need standard, the ratable reduction, the payment standard, total income, available income, grant amount, the ratio of recipients to cases, the number per household and the consumer price index.

SSP: Annual estimates of cases, recipients, dollars of aid and program administrative costs are prepared five times and require in total about one person month of effort. The estimation technique is extrapolation of a least squares regression line. The data elements used are the payment standard, total income, available income, grant amount and the ratio of recipients to cases.

Note: Dr. Richard Kaiser at Boise State University is doing a modeling project for the state. Kaiser will be working for the state full time after August 15, 1975 and can be reached at the above number.
ILLINOIS

Contacts

Letter: Mr. Joel Edelman, Acting Director
Illinois Department of Public Aid
222 South College Street
Springfield, Illinois 62762

Responses: Wayne Epperson, Chief
AFDC Bureau of Research and Statistics
216 E. Monroe Street
Springfield, Illinois 62762
217-782-1128

Site visit

Wayne Epperson

Summary of estimating methods

AFDC: The estimating process begins in the fall, around September and continues until the end of January. Estimates are computed for number of cases, recipients and dollars of maintenance payments disbursed and require the efforts of five people for the five month effort. The estimating technique used is trend analysis based on case openings, case closings, application volume, denials, and changes in caseload.

Note: For a more complete description of the Illinois process, see the site visit report in section 3 of this report.
Contacts

Letter: Wayne A. Stanton, Commissioner  
State Department of Public Welfare  
100 North Senate Avenue, Room 701  
Indianapolis, Indiana 46204

Responses: None received

Phone: James L. John, Assistant Administrator  
State Department of Public Welfare  
100 North Senate Avenue, Room 701  
Indianapolis, Indiana 46204  
317-633-6509

Summary of estimating methods

AFDC: Estimates of cases, recipients and dollars of aid are prepared annually using trend analysis. Subjective reevaluations are made based on population, unemployment, etc.

Note: John not really the one prepared to discuss the estimating process. The chief statistician, Thomas Quarto, or his assistant, David Webster would have been more appropriate but we were unable to reach either of them.
IOWA

Contacts

Letter: Mr. Kevin J. Burns, Acting Commissioner
       Iowa Department of Social Services
       Lucas State Office Building
       Des Moines, Iowa 50319

Responses: None received

Phone: Robert R. Miller, Director
       Statistics Section
       Department of Social Services
       Lucas State Office Building
       Des Moines, Iowa 50319
       515-281-5783

Summary of estimating methods

The estimating process was said to require only a few days per year
and was based on extrapolation of previous caseload growth.
Contacts

Letter: Robert C. Harder, Secretary
Department of Social and Rehabilitation Services
State Office Building
Topeka, Kansas 66612

Responses: Gary Sullivan, Director
AFDC Research and Statistics Section
SSP Department of Social and Rehabilitation Services
GA State Office Building
Topeka, Kansas 66612
913-296-3877

FS Rick Burr, Director
Food Programs Section
Department of Social and Rehabilitation Services
State Office Building
Topeka, Kansas 66612
913-296-3348

Phone: Contacted HEW regional representative

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year but updated monthly. The estimating process requires one man month of effort and estimates are projected eleven months into the future. The data elements used in a combination of trend analysis and econometric forecasting are caseload, average grant, employment data and policy changes. Department estimates are used only in the state budgeting process and not in the federal process or for planning purposes.

SSP: Estimates of cases, recipients, and dollars of aid are prepared once and require one day of effort. The technique used is trend analysis based on caseload and size of average payment. These estimates which are projected eleven months into the future are used only in the state budget process.

GA: Estimates of cases, recipients, dollars of aid disbursed and program administration costs are prepared once but updated monthly. The task requires one man month of effort. The estimation method used is a combination of trend-analysis and econometric forecasting based on previous caseload size, average payment level, employment and policy changes. The estimates which are projected eleven months into the future are used only in the state budget process.

FS: Estimates of food stamp maintenance administrations costs only are prepared once each year. One man month of effort is devoted to the task which uses none of the estimating techniques of interest.
Contacts

Letter: Gail S. Huecker, Commissioner
State Department of Economic Security
Capitol Annex Office Building
Frankfort, Kentucky 406-1

Responses: Roy Butler, Executive Director
AFDC Bureau for Social Insurance
SSP Center for Program Development
FS Department for Human Resources
Room 251 Capitol Annex
Frankfort, Kentucky 40601
502-564-3556

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared quarterly and require the full time efforts of three persons per year. The basic estimation technique is trend analysis modified where appropriate by such non-quantitative factors as economic conditions, program expansion, policy changes and changes in Federal laws and regulations. The data elements used in preparing caseload estimates are number of cases, number of recipients, average payment per case, the average payment per recipient, the administrative cost per case month, family size, growth rates and proposed program elements. The estimates are projected two years into the future and are the basis for the state budget process as well as the estimates which are submitted to the federal government.

FS: Estimates are prepared quarterly for number of cases, recipients, bonus value of food stamps disbursed and program administration costs and require the equivalent of two full-time persons per year. The estimation technique is trend analysis based on cases, recipients, purchase price, bonus value, family size, growth rates and administrative cost per case month. Estimates are projected two years into the future.

SSP: Cases, recipients, dollars of aid and program administration costs are prepared quarterly and require the effort of one person per year. The estimation technique used is trend analysis based on number of cases, recipients, average payment, growth rate, administrative cost per case month and proposed program expansions. The estimates which are projected two years into the future are used strictly in the state budget process and for general planning purposes.
LOUISIANA

Contacts

Letter: Garland L. Bonin, Director
Division of Income Maintenance
Louisiana Health and Social and Rehabilitation Services
Administration
655 North Fifth Street
P.O. Box 44065
Baton Rouge, Louisiana 70804

Responses: Alvis D. Roberts, Assistant Director for Operations
Division of Family Services
Louisiana Health and Human Resources Administration
755 Riverside North
P.O. Box 44065
Baton Rouge, Louisiana 70804

Phone: Mr. Guillory, Administrator
Public Assistance Programs
Louisiana Health and Human Resources Administration
755 Riverside North
P.O. Box 44065
Baton Rouge, Louisiana 70804
504-389-6592

Billy LaFontaine, Administrator
Statistics Department
Louisiana Health and Human Resources Administration
755 Riverside North
P.O. Box 44065
Baton Rouge, Louisiana 70804
504-389-6671

Summary of estimating methods

Future caseload estimates are based on previous rates of caseload growth.
MAINE

Contacts

Letter: Robert O. Wyllie, Director
Bureau of Social Welfare
State Department of Health and Welfare
State House
Augusta, Maine 04330

Responses: None received

Phone: Paul Le Vecque, Manager
Income Maintenance Unit
Bureau of Social Welfare
Maine Department of Health and Welfare
State House
Augusta, Maine 04333
207-289-2826

Contacted HEW regional representative

Summary of estimating methods

Note: Unable to reach people at the state level and the HEW representatives were not knowledgeable about the state projection methods. The most informed group is at Boston College where Dr. Barry Bluestone is working on a state model which it is anticipated will be applicable to Maine.
MARYLAND

Contacts

Letter: David T. Mason, Secretary
Department of Employment and Social Services
1100 N. Eutaw Street
Baltimore, Maryland 21201

Responses: None received

Phone: Charlie Plantholt, Chief
Budget and Finance
Department of Employment and Social Services
1100 N. Eutaw Street
Baltimore, Maryland 21201
301-383-5635

Summary of estimating methods

Estimates are based largely on past experience. The total amount of
time expended in the estimation process was said to be no more than 48 hours
for all programs.
MASSACHUSETTS

Contacts

Letter:  Steven A. Minter, Commissioner
         Department of Public Welfare
         Executive Office of Human Services
         100 Cambridge Street
         Boston, Massachusetts 02202

Responses: None received

Phone:  Ralph Mueller
         Department of Finance
         Department of Public Welfare
         Executive Office of Human Services
         100 Cambridge Street
         Boston, Massachusetts 02202
         617-727-4617

         Dr. Bitman, Head
         Statistical Section
         Research and Planning
         Department of Public Welfare
         Executive Office of Human Services
         100 Cambridge Street
         Boston, Massachusetts 02002
         617-727-6057

Summary of estimating methods

The state used to use a model developed by Dr. Barry Bluestone at Boston College. The estimating process has recently been transferred to the Department of Finance and they are not using the Bluestone model but trying to develop one of their own. For a more detailed description see section 3 of this report.
Contacts

Letter: R. Bernard Houston, Director
       State Department of Social Services
       300 South Capitol Avenue
       Lansing, Michigan 48926

Responses: Robert W. Swanson, Acting Director
          AFDC Income Maintenance Analysis Section
          GA Michigan Department of Social Services
          FS 300 S. Capitol Avenue
              Lansing, Michigan 48926
              517-373-6830

Philip Michel
SSI Coordinator
Michigan Department of Social Services
300 S. Capitol Avenue
Lansing, Michigan 48926
517-373-9530

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients and dollars of maintenance payments disbursed are prepared monthly. Three person months of effort are required and the estimates are projected two fiscal years into the future. The estimating technique used is a combination of trend analysis and econometric forecasting based on monthly caseload, total number employed, number unemployed receiving UCB, auto employment, Detroit CPI, domestic U.S. auto sales, Michigan Building permits and a time variable.

GA: Annual budget estimates which are projected two fiscal years into the future are prepared monthly for cases, recipients and dollars of aid. Three person months of effort are required for the estimation process which is a combination of trend analysis and econometric forecasting. The data elements used in preparing the caseload estimates are monthly caseload, wage and salary employment, auto employment, domestic U.S. auto sales, Michigan building permits, the total number employed and four time variables.

FS: One person month of effort is required for the monthly preparation of annual budget estimates of cases, recipients, and bonus value of food stamps disbursed. The estimation process is largely trend analysis although there have been attempts to develop an econometric model which so far have proved unsuccessful.

SSP: Annual estimates of cases, recipients, dollars of aid and program administration costs are prepared twice a year and require one-half person month of effort. The estimates which are projected two years into the future use none of the quantitative methods of interest but are based on number of cases, the ratio of the yearly increase to yearly decrease, breakdown by supplement amount, expected releases from mental institutions and the number of disabled children.
MINNESOTA

Contacts

Letter: Vera J. Likins, Commissioner
State Department of Public Welfare
Centennial Office Building
St. Paul, Minnesota 55155

Responses: Richard W. Neuman, Director
AFDC Research and Statistics
SSP State Department of Public Welfare
GA Minnesota Centennial Building
St. Paul, Minnesota 55155
612-296-6154

Phone: Richard W. Neuman

Summary of estimating methods

AFDC: Annual estimates of cases, recipients and dollars of aid are prepared once each year and projected two to three years into the future. The estimating effort requires one person month of effort and is based on trend analysis and the use of a computerized system from Tymshare, Inc. of Cupertino, California. Usually used in sales forecasting, the Tymshare system combines season and long term variables into one formula but is more sensitive to short term economic variables. The data elements used to prepare the caseload estimates are persons by basis of eligibility, average grant by basis of eligibility and child population.

SSP: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and require one person month of effort. Using strictly trend analysis the estimates are projected two to three years into the future. The data elements used in preparing the estimates are caseload, both mandatory and optional and size of the average grant.

GA: The GA activity is relatively new, having started within the past year. The estimates, which are prepared once each year for cases, recipients and dollars of aid, are based on trend analysis of persons, both family and single, average both family and single and the number of persons unemployed. One person month of effort is devoted to the estimating task and estimates are projected two to three years into the future.
MISSISSIPPI

Contacts

Letter:  Robert L. Robinson, Commissioner
         State Department of Public Welfare
         P.O. Box 4321 Fondren Station
         Jackson, Mississippi 39216

Responses:  James Donald Smith, Administrator
            Research and Statistics Section
            State Department of Public Welfare
            P.O. Box 4321 Fondren Station
            Jackson, Mississippi 39216
            601-982-6657

Phone:  James Donald Smith

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, and dollars of
      maintenance payments disbursed are prepared once each year and
      projected eighteen months into the future. Between three and four
      person months of effort are required for the process which is a
      combination of trend analysis and econometric forecasting. The data
      elements used to prepare the estimates are case counts, recipient
      counts, payments, child counts, adult counts, recipient
      characteristics, population and application closures. The estimates
      are used in the state budget process and for general planning
      purposes but not for the federal budget process.

FS: Once each year annual budget estimates are prepared for cases
only. One person in the Research and Statistics Section works on these
and projects the estimates eighteen months into the future. The estimates
are based on households, persons and technical eligibles using trend
analysis. The estimates are used only in the state budget process.

SSP: Estimates of cases and dollars of maintenance payments disbursed
are prepared once each year and require three person months of effort.
Projecting eighteen months ahead, the estimates are based on trend analysis
of cases and money payments.
MISSOURI

Contacts

Letter: Bert Shulimson, Director
Division of Welfare
State Department of Public Health and Welfare
Broadway State Office Building
Jefferson City, Missouri 65101

Responses: None received

Phone: Joseph Stokes
Statistics Department
Division of Family Services
Department of Social Services
Broadway State Office Building
Jefferson City, Missouri 65101
314-751-4285

Summary of estimating methods

Estimates of caseload are prepared once each year and require approximately four person months of effort. The technique used is trend analysis. Data elements which come from census data, department records and special studies are average family size, number of persons, amount of payment, and number of applications.
Contacts

Letter: Theodore Carkulis, Director
Department of Social and Rehabilitation Services
Box 1723
Helena, Montana 59601

Responses: None received

Phone: Doug Eagen, Chief
Statistics and Research Bureau
Centralized Services Division
Department of Social and Rehabilitation Services
Box 1723
Helena, Montana 59601
406-449-3424

Summary of estimating methods

The HEW regional representative described their estimating procedure as straight line estimates based on past percent increases in caseload.
Contacts

**Letter:** Lawrence L. Graham, Director
State Department of Public Welfare
1526 K Street, Fourth Floor
Lincoln, Nebraska 68508

**Responses:**

**AFDC**
Don Leuenberger
Assistant State Budget Administrator
Room 1322 State Capitol
Lincoln, Nebraska
402-471-2526

**FS**
Donald Gerber, Chief
Division of Finance and Accounting
Department of Public Welfare
1526 K Street
Lincoln, Nebraska 68508
402-471-2278

**SSP**
Jerry L. Bahr, Chief
Division of Research and Statistics
Department of Public Welfare
1526 K Street
Lincoln, Nebraska 68508
402-471-2512

**GA**
James R. Hanlon
Legislative Analyst
Legislative Fiscal Office
P.O. Box 94727
Lincoln, Nebraska
402-471-2263

Summary of estimating methods

**AFDC:** Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared as needed for the budgetary process. One person month of effort is required for the estimates which are projected 18 to 24 months into the future. The technique used is trend analysis based on monthly cases added, monthly case cancellation, monthly case average cost, monthly average case size and monthly program expenditure. The estimates are used only in the state budget process and for general planning purposes.

**FS:** Annual budget estimates of cases, recipients, bonus value of food stamps disbursed and program administration cost are prepared between two and four years each year. Four person months of effort are required for the effort which is trend analysis of general medical, social services, ADC, supplement and food stamps. The estimates are projected twelve to eighteen months into the future and are used for state budget and planning purposes as well as in the federal budget process.
NEBRASKA cont'd.

SSP: Between two and three times each year annual budget estimates are prepared for cases, recipients and dollars of maintenance payments disbursed. Two person months are devoted to the process which uses trend or regression analysis of cases, persons, dollars per case and dollars per person using a reasonable time period. In addition there is analysis of and projection of unit size and payments by size of unit.

GA: Each November with frequent adjustment through the following March annual budget estimates are prepared of the number of cases, number of recipients and dollars of maintenance payments disbursed. Two and one half person months of effort are required. The estimates are projected only for the next fiscal year as changes in federal regulations make any estimate tenuous. Estimates are based on trend analysis of ADC, SSI, Title XIX and Title XX cases.
Summary of estimating methods

AFDC: Annual estimates which require six person months of effort are prepared every two years for number of cases, number of recipients, dollars of aid and program administration costs. The technique used is trend analysis based on cases, recipients, population projections provided by Nevada Bell Telephone Co., average income in the state, unemployment, percent of population on ADC and various economic factors which are entered judgmentally. The estimates are projected two and one half years into the future and are used in the state budget process, federal budget process and for general planning purposes.

SSP: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared on a biennial basis and require three person months of effort. The estimates are projected two and one half years into the future and are the result of trend analysis of cases, recipients, income, percent of the population on SSI and population.

FS: Estimates of cases, recipients, bonus value of food stamps disbursed and program administration costs are prepared biennially and require four person months of effort. Using as data elements cases, recipients, income, unemployment, population and percent population on food stamps, the technique of estimation is trend analysis.
Contacts

Letter: Thomas L. Hooker, Director  
State Department of Health and Welfare  
8 Loudon Road  
Concord, New Hampshire 03301

Responses: Leslie G. Hammond, Chief  
Bureau of Financial Planning and Accounting  
Division of Welfare  
State Department of Health and Welfare  
8 Loudon Road  
Concord, New Hampshire 03301  
603-271-2106

Phone: Leslie G. Hammond

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and require one half of a full-time budget analyst's time. Based on trend analysis the data elements used are the CPI, the unemployment rate, past caseload, median income, population estimates and policy changes. Projected two years into the future the estimates are used for state budget and planning purposes as well as for the federal budget process.

SSP: Estimates of cases, recipients, dollars of aid and program administration costs are prepared annually and require about 5% of one budget analyst's time. The estimates, derived from trend analysis of CPI, unemployment rate, past caseload, median income, population estimates and policy changes, are projected two years into the future.

FS: Annual budget estimates of cases, recipients, bonus value of food stamps disbursed and program administration costs are prepared annually. The estimates are projected two years into the future and require approximately ten percent of a full-time budget analyst's time. The technique used is trend analysis based on CPI, unemployment rate, past caseload, median income, population estimates and policy changes.

Note: The University of New Hampshire is working on a modeling project. The project is still in the developmental stages. A first pass, using thirteen independent variables, was not found to be too effective.
NEW JERSEY

Contacts

Letter: Robert L. Clifford, Commissioner
State Department of Institutions and Agencies
P.O. Box 1237
Trenton, New Jersey 08625

Responses:

AFDC: Allen Twer, Chief
Bureau of Management Services
Division of Public Welfare
Department of Institutions and Agencies
P.O. Box 1627
3525 Quakerbridge Road
Trenton, New Jersey
609-890-9500 ext. 272

FS: Robert W. Kendall, Fiscal Supervisor
Food Stamp Program
Division of Public Welfare
Department of Institutions and Agencies
1478 Prospect Street
Trenton, New Jersey 08625
609-292-6484

GA: Michael P. Hritz, Fiscal Supervisor
General Assistance Program
Division of Public Welfare
Department of Institutions and Agencies
P.O. Box 1627
3525 Quakerbridge Road
Trenton, New Jersey
609-890-9500 ext. 347

SSP: Charles J. Cifelli, Chief
Bureau of Business Services
Division of Public Welfare
Department of Institutions and Agencies
P.O. Box 1627
3525 Quakerbridge Road
Trenton, New Jersey
609-890-9500 ext. 323

Phone: Mr. Lindsay

Summary of estimating methods

AFDC: Three times each year annual budget estimates are prepared for cases, recipients, dollars of aid and program administration costs. One person month is devoted to the task which uses trend analysis of persons aided and average monthly grant per person. Estimates are projected twelve to eighteen months into the future.
NEW JERSEY cont'd.

FS: Annual budget estimates requiring 0.5 person months are prepared once each year for cases, recipients, bonus value of food stamps disbursed and program administration costs. The estimation technique used is trend analysis based on households, bonus value and purchase requirement.

GA: Annual budget estimates of cases, recipients, and dollars of aid are prepared three times each year and require 0.5 person months of effort. Trend analysis based on average monthly recipient persons and average monthly grant per person is the estimation technique. Estimates are projected as far as one year after the current fiscal year.

SSP: Estimates of cases, recipients and dollars of maintenance payments disbursed are prepared three times each year and require one person month of effort. The estimates are based on trend analysis of average monthly recipients taking into account living arrangements and the state standard. Estimates are projected one year past the current fiscal year.
NEW MEXICO

Contacts

Letter:  Mr. Richard W. Heim, Executive Director
State of New Mexico Health and Social Services Department
P.O. Box 2348
Santa Fe, New Mexico 87501

Responses: None received

Phone:  Charles Lopez, Director
Public Welfare Agency
State of New Mexico Health and Social Services Department
P.O. Box 2348
Santa Fe, New Mexico 87501
505-827-2188

Summary of estimating methods

No system description offered. Staff size small.
NEW YORK

Contacts

Letter: Abe Lavine, Commissioner
New York State Department of Social Services
1450 Western Avenue
Albany, New York 12203

Responses: Miles Storfer, Chief Economist
AFDC Program Forecasting and Economic Analysis
SSP New York State Department of Social Services
GA 1450 Western Avenue
FS Albany, New York 12203
518-457-2559

Phone: Miles Storfer
Mr. Churchman, HEW Region II representative

Site Visit: Miles Storfer

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid
and program administration costs are prepared four times each year and require
18 person months of effort. Depending on the season, estimates are projected
18 to 24 months into the future. Based on trend analysis, the data elements
used in preparing the estimates are births to people on public assistance,
migration trends, family size of cases, graphic view of recessionary impact on
recipients, expected paternity and support trends, judicial rulings, ADC
foster care trends as a percent of total foster care, and ineligibility rate
projections. The department's estimates are used in the state and federal
budget processes as well as for general planning purposes but the department
has not found it useful to analyze the differences between past estimates
and actual data.

SSP: Annual budget estimates of cases, recipients and dollars of aid
are prepared each quarter and require two person months of effort. The
estimating technique is a combination of trend analysis and econometric
forecasting based on the ratio of debt to credit per case, APL, the impact
of economic conditions on disability applications, the liquid resources of
the aged, and curvilinear growth patterns.

FS: Number of cases, recipients, bonus value of food stamps disbursed
and program administration costs are estimated quarterly and require one person
month to complete. The technique used is trend analysis based on public
assistance caseload projections, unemployment rate projections, inflation
projections, administrative costs of local DSS agencies, bank charges, and
current trends.

GA: Cases, recipients, dollars of aid and program administration
costs are estimated quarterly. The task requires five person months of
effort and uses trend analysis. The data elements used in preparing the
estimates are economic conditions, ADC quality control efforts, non-durable
goods manufacturing outlook for New York State, New York City work relief
employment program, and the impact of more stringent disability definitions.
Contacts

Letter: Renee Westcott, Commissioner
Department of Human Resources
325 North Salisbury Street
Raleigh, North Carolina 27611

Responses: Renee P. Hill, Director
Division of Social Services
Department of Human Resources
325 North Salisbury Street
Raleigh, North Carolina 27611

AFDC Jemma S. Penney, Statistical Analyst
FS Division of Social Services
SSP 325 North Salisbury Street
Raleigh, North Carolina 27611
919-829-4532

Phone: No contact

Summary of estimating methods

AFDC: Annual estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year for the state budget and quarterly for the Federal government. The task requires one person month of effort and estimates are projected two years into the future. The estimating technique is a combination of trend analysis and econometric forecasting using as data elements the number of recipients, average payment and total payments. Projections are based on economic factors related to the U.S. as a whole as well as to North Carolina.

FS: Annual budget estimates of cases, recipients and bonus value of food stamps disbursed are prepared once each year. Based on trend analysis of number of cases, number of recipients and bonus value the task requires one half person month of effort. Estimates are projected one year into the future.

SSP: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year for the state budget. The task requires one person month of effort and estimates are projected two years into the future. The technique used is trend analysis of number of cases, average payment and total payments.
Contacts

Letter: Donald K. Johnson, Director
Public Assistance
Department of Social Services
Capitol Building
Bismarck, North Dakota 58501

Responses: LeRoy Bollinger, Administrator
Research and Statistics
Social Service Board of North Dakota
State Capitol
Bismarck, North Dakota 58505

Phone: LeRoy Bollinger
701-224-2330

Summary of estimating methods

Estimates are based on a straight line trend in caseload growth taking into account such factors as new programs and new factors such as increased interest in coal. They have tried to use some universities studies which relate caseload to economic variables but have not been very successful.
Contacts

Letter: Mr. Charles W. Bates, Director
State Department of Public Welfare
Executive Offices
408 East Town Street
Columbus, Ohio 43215

Responses: None received

Phone: Contacted HEW regional representative

Summary of estimating methods

Caseload estimates are made using trend analysis. The basic data elements are unemployment, caseload growth and the use of some demographic information.
Contacts

Letter: L.E. Rader, Director
State Department of Institutions, Social and Rehabilitative
Services
P.O. Box 25352
Oklahoma City, Oklahoma 73125

Responses: Dale L. Mitchell, Supervisor
AFDC Division of Research and Statistics
FS State of Oklahoma Department of Institutions, Social and
GA Rehabilitative Services
SSP P.O. Box 25352
Oklahoma City, Oklahoma 73125
405-521-3551

Phone: Contacted HEW regional representative

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid
and program administration costs are prepared once each year requiring one
person month of effort. The estimates which are projected one year into the
future are derived from trend analysis and econometric forecasting using
recipient rates, population and quality control validation as data elements.
The department's estimates are used only for general planning purposes;
the estimates produced by the finance unit are used in the state and federal
budget processes.

FS: For its own planning purposes, the department once each year
produces annual estimates of cases, recipients, bonus value of food
stamps disbursed and program administration costs. The effort requires
one person month. The estimating technique is a combination of trend
analysis and econometric forecasting using as data elements recipient rates,
population and quality control validation.

GA: Annual budget estimates of cases, recipients, dollars of aid and
program administration costs are prepared once each year. These estimates
are projected one year into the future and require one person month to develop.
The estimating technique is a combination of trend analysis and econometric
forecasting based on recipient rates, population and quality control validation.

SSP: Same as the other estimating processes.

Note: Oklahoma was said by other states, in particular Connecticut, to
use fairly quantitatively sophisticated methods of estimation. Nothing in
their survey response or in our discussions with the HEW regional representa-
tive would support this view.
Contacts

Letter: Jacob Tanzer, Director
Department of Human Resources
Room 318 Public Service Building
Salem, Oregon 97310

Responses: Keith Putman, Assistant Administrator
Assistance Section
Department of Human Resources
400 Public Service Building
Salem, Oregon 97310
503-378-3190

Phone: Never got through

Summary of estimating methods

AFDC: Number of cases, recipients and dollars of aid disbursed are monitored continually but there are no annual budget estimates per se. The monitoring activity requires 23 person months of effort. What estimates are prepared are projected three years into the future from an estimating technique which combines trend analysis, econometric forecasting and correlation analysis. The data elements used in preparing the estimates are cases (families), recipients, CPI, labor force and unemployment, population, components of need and income offsets.

GA: As in the case of AFDC, there is no formal preparation of annual budget estimates. Three person months are devoted to the estimate which is done using trend analysis and econometric forecasting. The data elements on which this work is based are historical caseloads, case costs, unemployment forecasts, and increases in the CPI.

FS: Three person months are devoted to monitoring and preparing estimates of cases and recipients. Projected three years into the future, these estimates are developed from trend analysis, econometric forecasting and correlation analysis. The data elements used are the number of participating persons, the number of participating households, the number of public assistance cases, CPI and population.

SSP: Three person months of effort are devoted to estimating cases, recipients and dollars of aid. Based on trend analysis of historical caseload and case costs the estimates are projected three years into the future.
Contacts

Letter: Helene Wohlgemuth
Secretary of Public Welfare
State Department of Public Welfare
Harrisburg, Pennsylvania 17120

Responses: None received

Phone: Charles Passmore, Chief
Statistics
State Department of Public Welfare
Harrisburg, Pennsylvania 17120
717-783-8477

Summary of estimating methods

AFDC and GA caseload are plotted on a monthly basis with the trend line maintained for the past 15 to 20 years. Projections are made using a 12 month moving average with adjustments made for the peak period in January and the low in July. Charts are reviewed every one or two months and then a free hand estimate is made for the next year. For the past five years there has been a very good correlation between the percent of the population receiving public assistance and the percent unemployment.

Note: About three years Peat, Marwick, and Mitchell Inc. computerized the estimation process but because they could not adjust for seasonal variations they found the estimates poor and hence did not implement the system.
RHODE ISLAND

Contacts

Letter: John J. Affleck, Director
State Department of Social and Rehabilitative Services
600 New London Avenue
Cranston, Rhode Island 02920

Responses: Joseph F. Murray, Administrator
AFDC Assistance Payments
FS Division of Management Services
GA Department of Social and Rehabilitative Services
SSP 600 New London Avenue
     Cranston, Rhode Island 02920
     401-464-2371

Phone: Lewis Goff, Business Manager
Assistance Payments
Division of Management Services
Department of Social and Rehabilitative Services
600 New London Avenue
Cranston, Rhode Island 02920
401-464-3375

Summary of estimating methods

AFDC: Annual budget estimates are prepared once each year for the
expected number of cases, recipients, dollars of aid and program administra-
tion costs. The method of estimation is trend analysis based on previous
number of cases, cost per case and program changes. The estimates are used
mainly in the state budget process and for planning purposes. To get
estimates for the federal government they update their basic state estimates
quarterly.

FS: Annual budget estimates of the number of cases, number of recipients,
bonus value of food stamps disbursed and program administration cost are prepared
once each year and projected one fiscal year into the future. The technique
used is trend analysis.

GA: Same as FS.

SSP: Same as FS.
Contacts

Letter: R. Archie Ellis, Commissioner
State Department of Social Services
P.O. Box 1520
Columbia, South Carolina 29202

Responses: R. Archie Ellis

Phone: Bruce Bondo
State Department of Social Services
P.O. Box 1520
Columbia, South Carolina 29202
803-758-3244 ext. 8041

Sam Griswold
State Department of Social Services
P.O. Box 1520
Columbia, South Carolina 29202
803-758-3470

Summary of estimating methods

Annual budget estimates are made once each year and then refigured as necessary. Trend analysis based on rate of caseload growth is the method used. Some work has been done using regression analysis. The result has been a three variable formula using time, the square of time and the number of people on caseloads in the past month.
Contacts

Letter: John E. Madigan, Director
Division of Social Welfare
Department of Social Services
Pierre, South Dakota 57501

Responses: Keith A. Bolte, Assistant Program Administrator
APDC Office of Assistance Payments
SSP Division of Social Welfare
Department of Social Services
Sigurd Anderson Building
Pierre, South Dakota 57501
605-224-3493

Phone: Keith A. Bolte

Site Visit: Keith A. Bolte

Summary of estimating methods

APDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared twice each year; once for the requested budget and again for the operational budget. Two people work one and one half months on the estimates which are projected one year into the future. Based on median income, per capita income, poverty level increase, the number of state assistance cases and the rate of increase in the CPI, the estimates are developed from a combination of trend analysis, econometric forecasting, a probabilistic model and the use of time studies and systems analysis.

SSP: Once each year annual budget estimates of cases, recipients, dollars of aid and program maintenance costs are prepared. The effort requires 0.5 person months. The technique used is trend analysis. Projected one year into the future the estimates are used for the state and federal budget processes but not for planning purposes.

Note: For a more detailed description see the site visit report in section 3.
TENNESSEE

Contacts

Letter:  Fred E. Friend, Commissioner
         State Department of Public Welfare
         410 State Office Building
         Nashville, Tennessee 37219

Responses: None received

Phone:  Josephine Akins, Director
         Research and Statistics
         Administrative and Fiscal Services
         State Department of Public Welfare
         410 State Office Building
         Nashville, Tennessee 37219
         615-741-3356

         Lewis Harris, Director
         Fiscal Services
         Administrative and Fiscal Services
         State Department of Public Welfare
         410 State Office Building
         Nashville, Tennessee 37219
         615-741-1021

Summary of estimating methods

Caseload estimates are based on historical data and financial reports.
TEXAS

Contacts

Letter: Raymond W. Vowell, Commissioner
State Department of Public Welfare
John H. Reagan Building
Austin, Texas 78701

Responses: John D. Townsend, Assistant Commissioner for Coordination
State Department of Public Welfare
John H. Reagan Building
Austin, Texas 78701
512-475-355

AFDC Howard Thompson, Director
FS Quantitative Analysis Section
Research and Evaluation Division
State Department of Public Welfare
John H. Reagan Building
Austin, Texas 78701
512-475-3896

Site Visit: Howard Thompson
John D. Townsend

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year for the operating budget. Ten to twenty person months of effort are required for the estimates which are projected one to five years into the future. The final estimates are based on trend analysis but this is after regression analysis has established that the underlying determinants of welfare have not changed. The data elements used in preparing the estimates are the number of cases and recipients, payments, population projected by age, income estimates, case transactions, unemployment data and family composition.

FS: Once each year when the department operating budget is prepared estimates are made of cases, recipients, bonus value of food stamps disbursed and program administration costs. The estimates are projected one to five years into the future and require ten to twenty person months of effort to complete. The technique used is a combination of trend analysis, econometric forecasting and the use of a probabilistic model based on caseloads by type, payment dates, caseload transactions, unemployment dates, ethnic characteristics, and welfare status.

Note: For a more detailed description of this state's caseload estimating techniques see the site visit report under section 4.
Contacts

Letter: Paul S. Rose, Executive Director
State Department of Social Services
221 State Capitol
Salt Lake City, Utah 84114

Responses: Irvin H. Ratcliffe, Director
AFDC Bureau of Statistical Services
FS Office of Administrative Services
GA Department of Social Services
231 East 4th Street
Salt Lake City, Utah 84111
801-328-5075

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of the number of cases are prepared once each year and require less than one man month of effort. Citing too many program changes to allow use of a statistical method, estimates are developed via trend analysis based on past caseload history and considering known changes in such things as the program and the economy. The estimates are projected two years into the future.

FS: Requiring less than one man month of effort, annual budget estimates of the number of cases are prepared once each year. The estimates are developed using trend analysis considering households, the economy and the advertising of food stamps.

GA: Only the number of cases is estimated and this is done once each year. The effort requires less than one person month of effort and the estimates are projected two years into the future. Again the estimation technique is trend analysis.
Contacts

Letter: Paul R. Philbrook, Commissioner
State Department of Social Welfare
Agency of Human Services
Montpelier, Vermont 05602

Responses: Paul R. Philbrook

Phone: Paul R. Philbrook #802-828-3421

Summary of estimating methods

AFDC: Annual budget estimates are prepared once each year for number of recipients, dollars of aid and program maintenance. The process is said to require less than 5 to 10 percent of one full-time person. Using very simple trend analysis, the estimates are projected 18 to 24 months into the future.

FS, SSP, GA: Same as above.
Contacts

Letter: William L. Lukhard, Director
State Department of Welfare and Institutions
429 S. Belvidere Street
Richmond, Virginia 23220

Responses: Richard E. Odette, Reporting Supervisor
AFDC Bureau of Research and Data Systems
SSP Division of Administration
FS Department of Welfare
GA Box K-176 Blair Building
8007 Discovery Drive
Richmond, Virginia 23288
804-770-8603

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of the number of cases, recipients, dollars of aid and program administration costs are prepared once each year and require approximately three person months of efforts for all welfare programs. The current method of estimation is a combination of trend analysis and econometric forecasting but the state is about to change to a programmed regression model. The data elements used in preparing the estimates are previous number of cases, family size, economic analysis and cost of living. The estimates are projected two years into the future.

SSP, FA, GA: Same as AFDC.
Contacts

Letter: Sidney E. Smith, Secretary
Department of Social and Health Services
P.O. Box 1788
Olympia, Washington 98504

Responses:
AFDC
Edward Ryan, Acting Supervisor
Program Analysis Section

FS
Department of Social and Health Services

SSP
P.O. Box 1788

GA
Olympia, Washington 98504
206-753-7042

Phone:
Tried many times without success to talk with people in
the department. Did discuss at length the estimating
procedures with Allen Zendell in the HEW Region X office.

Summary of estimating methods

AFDC: Estimates of cases, recipients and dollars of maintenance payments
disbursed are prepared twice a year by the program analysis section; estimates
of program administration costs are prepared by the Office of Budget Services.
The estimates, based largely on trend analysis, are projected up to 36 months
into the future and require two person months of effort to prepare. The data
elements used are case counts, recipient counts and size of average grant.

FS: Number of cases are estimated twice a year by the program analysis
section and administration costs are estimated with the same frequency by the
Office of Budget Services. Using cases and certifications and recertifications
as data elements the estimation method is least squares.

SSP: The program analysis section twice yearly prepares estimates of
cases, recipients, and dollars of maintenance payments disbursed while the
Office of Budget Services prepares estimates of program administration costs.
The method of estimation is largely trend analysis supplemented with least
squares projections. The data elements used are cases, recipients and
expenditures. The source for these data elements is the Social Security
Administration whose tapes are used to generate tabulations showing cases,
persons and expenditures.

GA: Again the program analysis section is responsible for estimating
cases, recipients and amount of aid while the Office of Budget Services is
responsible for estimating program administration costs. Based on cases,
recipients and average grants the estimation method used is trend analysis
with occasional use of link-relative and least squares projections.
WEST VIRGINIA

Contacts

Letter: Edwin F. Flowers, Commissioner
State Department of Welfare
State Office Building
1900 Washington St., East
Charleston, West Virginia 25305

Responses: David W. Forinash, Assistant Commissioner
AFDC Economic Services
GA Department of Welfare
SSP 1900 Washington Street, East
State Office Building B
Charleston, West Virginia 25305
304-348-8810

Donald Roberts, Director
Operations Unit
Department of Welfare
1900 Washington Street, East
State Office Building B
Charleston, West Virginia 25305
304-348-2437

Phone: Larry White

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and require six person months of effort. Based on caseload, dollars per case, cost per person, current expense and personnel the technique used is said to be a combination of trend analysis, econometric forecasting, a probabilistic model and other quantitative techniques. The estimates which are projected 21 months into the future prior to the beginning of the fiscal year are used in the state budget process and for general planning purposes.

SSP: One time each year annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared. The task requires six person months of effort and is based on a combination of trend analysis, econometric forecasting, probabilistic model and other quantitative techniques. The data elements used are caseload, cost per case, cost per person, current expense and personnel.

GA: Same as SSP.

FS: Same as SSP.

Note: The state is trying to develop a new system based on Hudson's work. In conversation with White it was said that the main means of estimating is linear regression from past caseload over the past three to five months.
Contacts
Letter: Wilbur J. Schmidt, Secretary
State Department of Health and Social Services
State Office Building
Madison, Wisconsin 53702

Responses: George Rowland, Director
AFDC Bureau of Audits and Accounts
Division of Family Services
Department of Health and Social Services
Room 385, 1 West Wilson Street
Madison, Wisconsin 53702
608-266-3605

FS Joseph C. Gale, Chief
Research and Analysis Section
Division of Family Services
Department of Health and Social Services
Room 385, 1 West Wilson Street
Madison, Wisconsin 53702
608-266-7046

SSP Carl Martin, Jr
SSI Coordinator
Division of Family Services
Department of Health and Social Services
Room 300, 1 West Wilson Street
Madison, Wisconsin 53702
608-266-8760

Phone: Peter Gehrke
608-266-3606

Summary of estimating methods

AFDC: Each quarter annual budget estimates are prepared for cases, recipients, dollars of aid and program administration costs. The task requires four person months of effort. At the beginning of the estimating cycle, estimates are projected ahead one quarter; one year at the end of the second quarter; two years at the end of the third quarter of the first year of the biennium and six months at the end of the second quarter of the second year of the biennium. The technique used is a combination of trend analysis and econometric forecasting. Data elements which are drawn from agency records, other state department records, federal sources, and Sales Management Inc., University Research Facilities and Wisconsin Taxpayer's Alliance include population, family needs, employment, income, age, housing, taxes and education.
WISCONSIN cont'd.

FS: Annual budget estimates of cases, recipients, bonus value of food stamps disbursed and program administration costs are prepared semi-annually. One half person month of effort is required and the estimates are projected one to two years into the future. Based on population, SSI caseloads, income, participants and certifications, the method of estimation is a combination of trend analysis and the use of a probabilistic model.

SSP: Each year annual budget estimates of cases, recipients and dollars of aid disbursed are prepared and then updated quarterly. One person month of effort is required. Trend analysis, econometric forecasting and a probabilistic model are used where participation rate trends are applied to projected growth for the estimating model. Three data elements, population, participants and medical, are used. Estimates are projected quarterly to one year in the future depending where they are in the budget cycle.

Note: When discussing their system on the phone they implied that it was really all just trend analysis and would not be of interest to this project. This was confirmed with HEW. In addition, we discussed their system with Irwin Garfinkel, Director of the Institute for Poverty Research at the University of Wisconsin. He did not comment on the state but suggested that we contact Martin Holmer at HEW in Washington, D.C.
Wyoming

Contacts

Letter: Terrence R. Hanley, Coordinator
State Department of Health and Social Services
State Office Building
Cheyenne, Wyoming 82001

Responses: Elizabeth M. Meyer, Supervisor
AFDC Assistance Payments
GA State Department of Health and Social Services
State Office Building
Cheyenne, Wyoming 82001
307-777-7561

FS Ole Galgerud, Manager
Food Stamp Program
Division of Public Assistance and Social Services
State Office Building West
Cheyenne, Wyoming 82002
307-777-7561

Phone: No contact

Site Visit: Elizabeth M. Meyer
Nick Angel
Don Brown

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared four times each year and require one person month of effort. The estimates are projected three years into the future and are based on a combination of trend analysis and econometric forecasting. The data elements used are cases, number of adults, number of children, payments, impact areas and federal regulations.

GA: Budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and projected three years into the future. The task requires three person months and is a combination of trend analysis and econometric forecasting. The data elements used are experience and impact.

FS: Annual budget estimates of cases, recipients, bonus value of food stamps disbursed and program administration costs are prepared twice a year and projected one year into the future. One quarter of a person month of effort is required. The estimating technique is a combination of trend analysis and econometric forecasting using the number of non public assistance households, the number of public assistance households, the number of non public assistance persons, the number of public assistance persons, client payment, bonus payment, issuance cost and certification cost as data elements.

Note: For a more detailed description of the estimating process see the site visit report in section 3.
Local Contacts
Contacts

Letter: Bernice Rosenbaum, Director
Department of Public Welfare
Church Street Welfare Service Office
20 Church Street
Boston, Massachusetts 02116

Responses: None received
CHICAGO

Contacts

Letter: John W. Ballew, Superintendent
Illinois Department of Public Aid
Public Assistance Division
318 W. Adams Street
Chicago, Illinois 60606

Responses: None received
DETROIT

Contacts

Letter:  R.B. Shelton, Director
         Wayne County Department of Social Services
         640 Temple Street
         Detroit, Michigan 48201

Responses: None received
Contacts

Letter: Ellis P. Murphy, Director
Los Angeles County Department of Welfare
P.O. Box 368
El Monte, California 91734

Responses: None received
NEW YORK

Contacts

Letter:  Jule M. Sugarman, Commissioner
         Department of Social Services
         250 Church Street
         New York, New York 10013

Responses:  None received
PHILADELPHIA

Contacts

Letter: Don J. Stovall, Executive Director
       Department of Public Welfare
       1400 Spring Garden Street
       Philadelphia, Pennsylvania 19130

Responses:

AFDC  Leon Cerullo, Statistician
      Research and Statistics

GA    Philadelphia County Board of Assistance

FS    Broad and Spring Garden Streets
      Philadelphia, Pennsylvania 19130
      215-238-7134

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and
       program administration costs are prepared once each year and require approxi-
       mately two person months of effort. The estimating technique used is trend
       analysis based on caseload, personload, grant allowances, unemployment,
       population, and population shifts. The estimates are projected three years
       into the future.

GA:  Same as AFDC.

FS:  Same as AFDC.
Contact:

Letter: Edward H. Kalberer, Executive Director
County Board of Assistance
State Office Building
300 Liberty Avenue
Pittsburgh, Pennsylvania 15222

Responses: None received
ST. LOUIS

Contacts

Letter: Paul R. Nelson, Director
Missouri Division of Welfare
4255 West Pine Street
St. Louis, Missouri 63108

Responses: None received
Contacts

Letter: Ronald H. Born, General Manager
San Francisco County Department of Welfare
585 Bush Street
San Francisco, California 94108

 Responses: M. Kakebe, Director
AFDC Administrative Services
City and County of San Francisco Department of Social Services
P.O. Box 7988
San Francisco, California 94120
415-558-5411

FS J.P. Dowdall, Assistant General Manager
San Francisco Department of Social Services
P.O. Box 7988
San Francisco, California 94120
415-558-5913

SSP Jerry Fishman, Division Supervisor
Department of Social Services
P.O. Box 7988
San Francisco, California 94120
415-558-2416

GA Rod Smilo, Assistant Director
Adult Services
San Francisco Department of Social Services
P.O. Box 7988
San Francisco, California 94120
415-558-2581

Phone: No contact

Summary of estimating methods

AFDC: Annual budget estimates of cases, recipients, dollars of aid and program administration costs are prepared once each year and require one person month of effort. The estimates are projected 14 to 16 months into the future. The technique used is a combination of trend analysis and econometric forecasting based on monthly caseload and legislative changes.

FS: Annual budget estimates of cases, recipients, bonus value of food stamps and program administrative costs are prepared once each year in December for the fiscal year starting the following July. No quantitative technique is used, rather estimates are developed from looking at past expenditures and augmenting these with educated guesses. The data elements taken into account are caseload, households, persons, discontinuances, purchase per bonus, participation and aid type.
SAN FRANCISCO cont'd.

SSP: Annual budget estimates are prepared once each year for number of cases, number of recipients, dollars of aid and program administrative costs. The process requires one person month of effort and estimates are projected 16 months into the future. Combining trend analysis and econometric forecasting the estimates are based on applications, caseload, discontinuances, number of cases pending, denials and inquiries.

GA: Once each year annual budget estimates are prepared for number of cases, number of recipients, dollars of aid and program administration costs. Five person months of effort are required and the estimates are projected one and one half years into the future. The technique used is a combination of trend analysis and econometric forecasting based on number of applications, case count, discontinuances, new cases added, cost per case per fiscal year and staffing needs.
Contacts

Letter: Joseph P. Yeldell, Director
District of Columbia Department of Human Resources
Room 420 District Building
1350 E. Street, N.W.
Washington, D.C. 20004

Responses: William H. Whitehurst, Jr.
Associate Director for Planning and State Agency Affairs
Department of Human Resources
Washington, D.C. 20001

AFDC
Joseph P. Yeldell, Director

SSP
Department of Human Resources

GA
District Building

FS
1350 E. Street, N.W.
Washington, D.C. 20004
202-629-5443

Phone: No contact

Summary of estimating methods

AFDC: Once each year annual budget estimates are prepared for number of cases, recipients, dollars of aid and program administration costs. Twelve person months of effort are required for the task which combines trend analysis, econometric forecasting, extrapolation, and curve fitting using endogenous and exogenous variables. The data elements used are number of cases, number of persons, persons per case, consumer price index, D.C. unemployment rate and case cost. The estimates are projected five years into the future.

SSP: Same as AFDC.

GA: Same as AFDC.

FA: Once each year annual budget estimates are prepared for the number of recipients and the bonus value of food stamps disbursed. The task requires three person months of effort and estimates are projected five years into the future. Based on number of eligibles and number of transactions the technique used is trend analysis.
Who was contacted: John Berry
Management Systems Office
Social and Rehabilitation Service
1114 Commerce Street
Dallas, Texas 75202
214-749-7103

How: Telephone

Why: In talking with people in the welfare department in Louisiana they indicated that Berry had done a study on caseload projection and manpower needs. We called to see if we could obtain a copy of the report from this study and to learn of any other work that this group was doing on caseload projections.
Who was contacted: Barry Bluestone, Assistant Director
Social Welfare Regional Research Institute
Boston College
Chestnut Hill, Massachusetts 02167
617-969-0100

How: In person

Why: Barry Bluestone is the Assistant Director of Boston College's Social Welfare Regional Research Institute and is in charge of their welfare forecasting effort. SWRRI was founded in 1969-1970, under the aegis of SRS of HEW, to do research on welfare in the New England region. Of interest to this study is the work which this group has done in developing a model for predicting General Relief caseloads and expenditures. Building on the experience gained in that effort, the group has recently begun two year-long studies. In one they are building models on AFDC in all six New England states. In the other, they are doing the same thing for five other states which have yet to be selected.
Who was contacted: George Brauchler
Social and Rehabilitation Service
Federal Building
1961 Stout Street
Denver, Colorado 80202
303-837-2121

How: Telephone

Why: Contacted as representative of HEW region VIII to discuss the estimating techniques used by Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.
Who was contacted: Horace Churchman
Associate Regional Commissioner, Management
Social and Rehabilitation Service
26 Federal Plaza
New York, New York 10007
212-264-4021

How: Telephone

Why: Contacted Churchman as HEW representative in region II to discuss the caseload estimating techniques used in New York.
Who was contacted: David Fairweather
Social and Rehabilitation Service
Federal Office Building
50 Fulton Street
San Francisco, Calif. 94102
415-556-1856

How: In person

Why: Talked with Fairweather as representative of HEW region IX about the estimating techniques used by states in his or other regions.
Who was contacted: Gerald Fisher  
University of Texas at Austin  
School of Social Welfare  
Austin, Texas 78712  
512-471-1937  

How: Telephone  

Why: Fisher's name was given to us as someone who would know if there was anyone at the Institute on Poverty at the University of Wisconsin who was working on welfare modeling. In addition to answering some questions on welfare work at the Institute, Fisher was also able to discuss the state of welfare forecasting in the state of Wisconsin and to suggest some people who we should talk with in Texas.
Who was contacted: Irwin Garfinkel, Director
Institute for Research on Poverty
University of Wisconsin
Madison, Wisconsin
608-262-6358

How: Telephone

Why: The state of Wisconsin on its questionnaire indicated that the Institute had done work in the area of welfare caseload estimating. We were calling to follow up on this.
| Who was contacted: | Dudley S. Hall  
Associate Regional Commissioner, Assistance Payments  
Social and Rehabilitation Service  
1114 Commerce Street  
Dallas, Texas 75202  
214-749-3917 |
<table>
<thead>
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<tbody>
<tr>
<td>How:</td>
<td>Telephone</td>
</tr>
<tr>
<td>Why:</td>
<td>Spoke with Hall as HEW representative for region VI to discuss the caseload estimating methods used by Texas, Oklahoma, and Louisiana.</td>
</tr>
</tbody>
</table>
Who was contacted: Dorothea Harrington
Associate Regional Commissioner, Assistance Payments
Social and Rehabilitation Service
300 S. Wacker Drive
Chicago, Illinois 60606
312-393-5180

How: Telephone

Why: As representative of HEW region V we called to discuss the estimating techniques used by Ohio and Michigan
Who was contacted: Manuel Helzner
Social and Rehabilitation Service
Office of Information Systems
330 C Street, S.W.
Washington, D.C. 20201
202-245-9263

How: In person

Why: Mr. Helzner is with the Office of Information Sciences in SRS and was one of the speakers at the forecasting session at the welfare research and statistics meeting in San Francisco. Our purpose in meeting with him was to discuss our study and to see if in our survey we had missed getting information on states with estimating methods of interest.
Who was contacted: Dwight High  
Social and Rehabilitation Service  
Federal Building  
601 E. 12th Street  
Kansas City, Missouri  
816-374-5975

How: Telephone

Why: Called him as EHW representative for region VII to discuss the estimating techniques used by Nebraska and Kansas.
Who was contacted: Arnold T. Lepisto
Associate Regional Commissioner, Assistance Payments
Social and Rehabilitation Service
John F. Kennedy Office Building
Boston, Massachusetts 02203
617-223-6839

How: Phone

Why: Contacted Lepisto as representative of HEW region I to discuss caseload estimating techniques in Maine and Massachusetts.
Who was contacted: Richard J. Lochrie, President
Lochrie & Associates, Inc.
8128 W. Wisconsin Avenue
Milwaukee, Wisconsin 53213
414-258-6613

How: In person

Why: Richard Lochrie is president of Lochrie and Associates, a management consulting firm specializing in econometric forecasting. The firm deals largely with industrial clients making sales forecasts. Having teamed up with GE MAP, the econometric arm of GE, Lochrie offers technical assistance in building forecasting models using Box-Jenkins solution techniques via a time shared computer. The first one to try using Lochrie's package in welfare forecasting is Zendell who is working at the regional level in Washington. At the federal level, Steve Bravy has approached Lochrie. Lochrie has also received inquiries for assistance from Kaiser in Idaho.
Who was contacted:
Edith Ponder, Research Analyst
Research, Reports and Fiscal Administration
Social and Rehabilitation Service
50 7th Street N.E.
Atlanta, Georgia 30323
404-526-5038

How:
In person at the 15th Annual Conference on Welfare
Research and Statistics, San Francisco, August 2, 3, 1975

Why:
Talked with Mrs. Ponder as the representative from HEW region IV to confirm our information on the estimating techniques used by Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee.
Who was contacted: Mr. Shrumberger
Social and Rehabilitation Service
3535 Market Street
Philadelphia, Pennsylvania 19101
215-596-1300

How: Telephone

Why: Contacted Mr. Shrumberger as representative of HEW region III to discuss the estimating techniques used by Pennsylvania
Who was contacted: Tom Steinberg  
American Data Systems, Inc.  
Consulting Division  
915 Asylum Avenue  
Hartford, Connecticut  
203-247-5258

How: Telephone

Why: Keith Bolte from South Dakota suggested that we contact American Data Systems, and Steinberg in particular, saying that they had done work for a number of welfare departments and might be knowledgeable about caseload estimating techniques.
Who was contacted: Henry Townsend, Senior Economist
National Planning Associates
1666 Connecticut Avenue, N.W.
Washington, D.C. 20009
202-483-2260

How: In person

Why: Henry Townsend, now with National Planning Associates, was formerly with the Office of Information Sciences at SRS. While at SRS he developed a model for forecasting AFDC caseloads and total payments which is documented in a paper titled "A Forecasting Model for AFDC Caseloads and Total Payments" and dated June 30, 1974.
Who was contacted: Ray Uhalde, Research Associate
Policy Studies Group
Mathematica, Inc.
2021 L Street, N.W.
Washington, D.C. 20036
202-833-9510

How: In person

Why: Ray was one of the principals in the study which Mathematica did for the Library of Congress Congressional Research Service on state methods of forecasting welfare caseloads and costs. The publication rights for the final report from this study were signed over to the Library of Congress and they have never made the report public. The report is titled "Estimating Costs and Caseloads for Federal Transfer Programs" and was published in November 1974.
Who was contacted: Ed Weaver, Executive Director
American Public Welfare Association
1155 16th Street, N.W.
Washington, D.C.
202-833-9250

How: Telephone

Why: Ed Weaver, now Executive Director of the APWA, was formerly commissioner of public aid in Illinois. We called him to make sure that we were contacting the right people in Illinois, to learn from him what we could about the caseload estimating techniques used in Illinois, and also to see if there were any people or organizations which Weaver thought we should visit as part of our survey.
Who was contacted: Allen Zendell
Social and Rehabilitation Service
Arcade Plaza Building
1321-2nd. Avenue
Seattle, Washington 98101
206-442-0533 or in Olympia 206-753-1077

How: Telephone

Why: Contacted Zendell as representative of HEW region X to discuss the estimating techniques used in Alaska, Idaho, Oregon, and Washington. In addition to being most knowledgeable about the work in the states, Zendell indicated that he was working on a model of his own using the Box-Jenkins methodology as packaged by Lochrie and Associates.
Appendix C

LITERATURE SUMMARIES

This appendix summarizes the essential features of the 25 studies on our final review list.* For brevity and convenience, we follow a standard format which covers: author(s), title, publication information, sponsor and intended audience, sections relevant for our purposes, type of model (predictive or descriptive, according to the definitions of these terms given in Chap. 4), welfare categories analyzed, dependent variables, independent variables, functional form, description of calibration data, method of calibration, fit on calibration data, performance on other data, author's principal conclusions, and our comments.

*With one exception: we omit the Texas methodology since there is no written documentation of it. See Chap. 4 and App. B for our findings from interviews with Texas personnel.
1. ALBIN AND STEIN

Author: Peter S. Albin and Bruno Stein

Title: "Unemployment and Welfare Expenditures: Demand For and Supply of Public Assistance"

Publication information: Undated, draft mimeograph from New York University

Sponsor and intended This paper is one of a series of studies conducted by the Public Assistance Project of the Institute of Labor Relations at New York University. The intended audience is primarily the welfare research community, and secondarily economists and econometricians. Because of its attention to macroeconomic policy the paper is also of interest to welfare policymakers and administrators.

Sections relevant: The entire paper (36 pages)

Type of model: Descriptive

Welfare categories: AFDC

Dependent variables: In the final form of the expenditure equation, the dependent variable is the ratio of the change in expenditures at time t to the benefit rate in the preceding period.

Independent variables: Entered either singly or as ratios, there are six independent variables: number of persons unemployed in the civilian labor force, U; the unemployment rate expressed as a percentage of the civilian labor force, UR; the ratio of average monthly AFDC benefits to the consumer price index, B; total AFDC payments, E; the ratio of federal to total AFDC expenditures, P; and the female population fifteen years of age and over, F.

* These authors are also known for (1) their criticism of Brehm and Saving's work (see Item 6) and (2) their paper on "Determinants of Relief Policy at the Sub-Federal Level" (which we have not reviewed here because it essentially is about governments'--rather than welfare eligibles'--decisionmaking).
Functional form:

\[
\frac{\Delta E_t}{(B_{t-1})} = A + \alpha_0 \left(1/B_{t-1}\right) + \sum_{j=0}^{m} (\alpha_1 \gamma_{1j}) U_{t-j} + \sum_{j=0}^{m} (\alpha_1 \gamma_{2j}) U_{t-j} + \sum_{j=0}^{m} (\alpha_1 \gamma_{3j}) B_{t-j} + \sum_{j=0}^{m} (\alpha_1 \gamma_{4j}) \Delta F_{t-j} - \alpha_1 (E_{t-1}/B_{t-1}) + \alpha_2 \frac{P_t}{B_{t-1}} + \alpha_3 \frac{UR_{t-2}}{B_{t-1}} + \alpha_4 \frac{UR_{t-3}}{B_{t-1}} + \alpha_5 \frac{\Delta E_{t-1}}{B_{t-1}} + Q_t
\]

where \(Q_t\) is the disturbance term and \(A = \gamma_0 \alpha_1 + A_1\) where \(A_1\) is a constant term.

Data used for calibration: The period of estimation for the equation was 1959Q1 to 1971Q2. Unemployment data was from the Bureau of Labor Statistics; AFDC benefits and total expenditures were based on U.S., HEW Social Security Bulletin, 1951-1971; the ratio of federal to total AFDC expenditures were from SRS Publication No. 55; and data on female population came from the United Nations Demographic Yearbook 1970.

Method of calibration: Ordinary least-squares regression.

Fit on calibration data: Reported \(R^2\) of .9099.

Performance on other data: Not tested

Author's principal conclusions: "...variations in the unemployment rate can trigger substantial reactions within the welfare system. These reactions, which are associated both with the demand for relief and the level of available funds, effectively add additional dimensions to the "unemployment problem"--the simple two-dimensional trade-off between price wage changes and the rate of unemployment vanishes. In addition, our analysis has identified significant lags in the various unemployment effects; this means that the path to any particular unemployment position must be considered in policy evaluation..."
Our comments: An innovative and valuable addition to the series of studies we discuss under the heading of "Early Theoretical Models Based on 'Work-Welfare Choice'" in Chap. 4. However, further analysis is needed: the ideas and findings in the current paper are tentative and experimental, as the authors themselves acknowledge. The paper is marred slightly by unsupported inferences about general welfare issues. The approach would need to be much simplified, and related more to the constraints of ongoing forecasting efforts, before it could benefit DBP directly.
2. BARR AND HALL

Author: Nicholas A. Barr and Robert E. Hall
Title: The Probability of Dependence on Public Assistance
Publication Information: Working paper number 131, Department of Economics, Massachusetts Institute of Technology, May 1974
Sponsor and intended audience: The research for the report was supported by the Ford Foundation. Study intended for peer group.
Sections relevant: All (41 pages)
Type of model: Descriptive
Welfare categories: AFDC
Dependent variable: There are four dependent variables: the probability of not being on welfare, the probability of partial dependence, the probability of substantial dependence and the probability of essentially total dependence.
Independent variables: Wage rate, unearned income, maximum benefits, tax rate on earnings, residency, race, age, health, education, children and adults other than mother.
Functional form: Logit
Data used for calibration: Data were obtained from two sources: SRS survey of three percent of all recipients carried out in the fall of 1967 and the Survey of Economic Opportunity conducted by the Bureau of the Census in March 1967. The sample includes 11,839 families.
Method of calibration: Maximum likelihood
Fit on calibration data: Not given

*The other article cited in App. D by these authors ("The Taxation of Earnings under Public Assistance") is about the effective—as opposed to statutory—tax rate implicit in welfare grant calculations.
Performance on other data:

Not tested

Author's principal conclusions:
The AFDC program is (1) reasonably successful in bringing about a redistribution of income; (2) an important minority of dependent families supplement welfare benefits with earnings; (3) the higher fraction of dependent black families compared to white families derives from the higher fraction of fatherless black families and the adverse education, wages, and other characteristics of blacks and not from any differences in attitudes about welfare.

Our comments:
The authors address four questions: (1) How effective is AFDC in selecting the very poorest for the largest benefits? (2) To what extent do recipients take advantage of the opportunity to supplement benefits with earnings . . . ? (3) How does caseload depend on generosity of benefits . . . ? and (4) Does the disproportionate share of blacks among recipients reflect a difference in attitudes about work and welfare . . . ?

This study is not (and was not intended to be) directly relevant to caseload forecasting. Considered in its own right, however, it is one of the best studies on our list. The mathematics is exceptionally competent and clearly explained. The analysis is rigorous, the results are interesting, the exposition is clear and understandable, and the technique is validly applied.
3. BAXTER

Author: James Baxter

Title: Summary of the Projection Techniques Used in the Formulation of the DPSS Budget Request for Fiscal Year 1975-76

Publication information: Undated manuscript

Sponsor and intended audience: Sponsor and intended audience are both the Budget Services Section of the Los Angeles County Department of Public Social Services

Sections relevant: Section II, Public Dependency, Labor Market Simulation, Projection Model

Type of Model: Predictive

Welfare categories: AFDC

Dependent variable: Applications registered and discontinuance rate

Independent variable: Unemployment rate

Functional form: Both equations are linear and of the form $y(t) = ax(t+c)e^{dt}$

Data used for calibration: Data was for the period 1968 to 1974 from the State Department of Employment Development

Method of calibration: Trial and error

Fit on calibration data: No measure of goodness of fit given

Performance on other data: Not tested

Author's principal conclusions: Simulations of actual caseload movement are possible given the functional relationship between caseload levels and unemployment rates.
Our comments: A creditable effort obviously based on first-hand knowledge of Los Angeles' caseload. The makings are evident of a good alliance between theory and empiricism, but more development is needed.
4. BOLAND

Author: Barbara Boland

Title: Participation in the Aid to Families with Dependent Children Program (AFDC).

Publication information: This is one paper in the series "The Family, Poverty, and Welfare Programs: Factors Influencing Family Instability" prepared for the Subcommittee on Fiscal Policy of the Joint Economic Committee of the U.S. Congress.

Sponsor and intended audience: The sponsor and intended audience for this study was the Subcommittee of Fiscal Policy of the Joint Economic Committee of the 93d Congress, 1st session.

Sections relevant: All

Type of model: Predictive

Welfare categories: AFDC

Dependent variables: The number of families eligible for AFDC.

Independent variables: The independent variables are: total amount of unearned income, total amount of earned income, monthly work related expenses, monthly child care expenses, and the state's full standard of need for a family of a given size.

Functional form: If S is greater than or equal to $Y^u + \max (0, Y^e - WRE - CCE)$ the unit passes the full standard test and is eligible for AFDC. S is the state full standard of need; $Y^u$ the amount of unearned income for the assistance unit; $Y^e$ the amount of earned income; WRE is work related expenses; CCE is child care expenses.

<table>
<thead>
<tr>
<th>Method of calibration:</th>
<th>Application of welfare regulations to the data base.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit on calibration data:</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Performance on other data:</td>
<td>Not tested.</td>
</tr>
<tr>
<td>Author's principal conclusions:</td>
<td>Poor female-headed families are an inadequate measure of potential eligibles for AFDC. The estimates of eligibles generated by the methodology presented in this paper indicate that more families are eligible for AFDC than are now participating; this is in contrast to the relationship of eligibles to participants based on number of poor female-headed households.</td>
</tr>
<tr>
<td>Our comments:</td>
<td>A sensible treatment of an oft-neglected question. Not, however, directly relevant to caseload forecasting.</td>
</tr>
</tbody>
</table>
5. BOSKIN AND NOLD

Author: Michael J. Boskin and Frederick C. Nold

Title: A Markov Model of Turnover in Aid to Families with Dependent Children*

Publication information: Updated manuscript

Sponsor and intended audience: The authors were supported, respectively by Manpower Administration Grant No. 51-06-73-06 and NSF Grant GS-39906. Paper intended for peer group at the National Bureau of Economic Research, Stanford Research Institute, Stanford University and the University of Santa Clara.

Sections relevant: All (20 pages)

Type of model: Descriptive

Welfare categories: AFDC

Dependent variable: There are two dependent variables: families, all of whom came on welfare during the first month of the survey, the probability that individual s moves from "on welfare" at time t to "off welfare" at time t+1 and b_s, the probability that individual s moves from "off welfare" at time t to "on welfare" at time t+1.

Independent variables: Independent variables include the expected hourly market wage facing the household head, the expected duration of unemployment facing the head of the household, non-wage income, and three dummy variables accounting for age, health and ages of children in the household.

Functional form: A two-state temporally homogeneous Markov chain model. Transition probabilities are estimated via a logistic function.

*For a related study, see the reference in App. D on Takeshi Amemiya and Michael J. Boskin, "Regression Analysis When the Dependent Variable is Truncated Lognormal, with an Application to the Determinants of the Duration of Welfare Dependency."
Data used for calibration: Data used are from the State of California AFDC five year survey which follows individual households over the period 1965-1970. Sample consists of 440 families, all of whom came on welfare during the first month of the survey.

Method of calibration: Maximum likelihood

Fit on calibration data: Not given

Performance on other data: Not tested

Author's principal conclusions: "We have presented new data that confirms that the notion of the welfare population as more or less permanently entrenched on welfare is erroneous; an enormous amount of turnover occurs in the welfare population and the average duration of time on welfare once on welfare is relatively modest."

Our comments: The question addressed is interesting and the model is sensible. However, we have serious doubts about the data. While the data are acceptable for estimating the transition probability from the "on" state to the "off" state, the estimate of the transition in the opposite direction is probably invalid. All of the families in the "off" state used to estimate this probability, by virtue of being in the given sample, were at least once before in the "on" state. One can easily hypothesize that such families are more likely to appear in the "on" state than families who have never been there. The data used are incapable of rejecting that hypothesis. One indication of the problem is evident from the author's estimate of .31 as the probability that a randomly chosen white family facing an hourly wage exceeding $1.60 will be in AFDC. Clearly 31 percent of such families in California are not on AFDC. (The formula used to derive the 31 percent estimate, by the way, is more generally true than under the assumptions made by the authors.)

The authors' main point (that there is no evidence to support the belief "that the population of recipients is more or less permanently entrench in a welfare dependency state") is not contradicted by the difficulties mentioned above with the Markovian model. However, it should be noted that since the 440 families all entered the AFDC program in the first month of the study, the probability that the sample would contain families who have been entrenched for a long time is somewhat diminished. In this regard, we
mention the observation in the Rydell paper that the closing rate appears to decrease and the case age increases. Such an observation is not inconsistent with a Markovian model, but is unlikely to be apparent in the Boskin-Nold data base.

This paper is not directly relevant to caseload forecasting.
6. BREHM AND SAVING (I-THE ORIGINAL PAPER)

Author: C. T. Brehm and T. R. Saving

Title: "The Demand for General Assistance Payments"


Sponsor and intended audience: No specific sponsor. Intended primarily for peer group. Authors were associate professors of economics at Kenyon College and Michigan State University, respectively, at the time.

Sections relevant: Section I is a standard statement of the Hicks-Robbins (two economists) theory of leisure as applied to welfare, and can be skipped. Sections II through V are the most relevant.

Type of model: Purely descriptive.

Welfare categories analyzed: General assistance only.

Dependent variable: Persons receiving general assistance (monthly average per calendar year) by states, as a percentage of the total state population (N).

Independent variables: (1) Average monthly general assistance payment, \( P \); (2) average monthly manufacturing wage, \( W \); (3) the ratio of (1) to (2), \( W/P \); (4) the annual unemployment rate, \( U \); and (5) annual nonagricultural employment is a percentage of the total state population (used as a measure of degree of urbanization in the state, which in turn is interpreted as a proxy for ease of getting on welfare rolls), NA.

Functional form: Four different models are calibrated:

\[
(1) \quad N = \alpha_0 + \alpha_1(P/W) + \alpha_2U \\
(2) \quad N = \alpha_0 + \alpha_1(P/W) + \alpha_2U + \alpha_3NA \\
(3) \quad N = \alpha_0 + \alpha_1U + \alpha_2P + \alpha_3W \\
(4) \quad N = \alpha_0 + \alpha_1U + \alpha_2P + \alpha_3W + \alpha_4NA
\]
Data used for calibration: Unit of analysis is states. Sample is pooled cross-section (48 states) and time series (9 years), for total of 432 observations. Years are 1951-1959. General assistance enrollment and average payments data are from HEW compilations of state administrative records. Other data are from Bureau of the Census.

Method of calibration: A total of 36 equations are calibrated—one for each of the four functional forms in each of the nine years. For each functional form, separate regressions were performed with the nine years pooled. Technique was Zellner's application of Aitken's generalized least squares for seemingly unrelated regressions.

Fit on calibration data: Prediction error not measured. However, most of the coefficient estimates are of plausible sign and many are statistically significant at the 10 percent level or better. Several variables were significant at the 1 percent level.

Performance on other data: Not tested.

Authors' principal conclusions: (1) General assistance enrollment is strongly positively related to the average payment level; (2) the effect in (1) is not only highly statistically significant but also more important than any other determinant of enrollment; (3) enrollment is also positively related to degree of urbanization, which the authors interpret to mean that liberal welfare policies increase enrollment. Making "a few heroic assumptions," the authors also go on to speculate about the effect of welfare on labor force participation; but that is not relevant here.

Our comments: See Chap. 4.
6. Brehm and SAVING (II-Comments by Stein and Albin)

Author: B. Stein and P. S. Albin
Title: "The Demand for General Assistance Payments: Comment"
Publication information: Journal article, published in American Economic Review, V. 57, #3, June 1967
Sponsor and intended audience: Article is a ten-page comment on the 1964 article by Brehm and Saving. No specific sponsor. Intended for peer group. Authors were associate and assistant professor of economics at New York
Sections relevant: Much of the paper is a detailed criticism of Brehm and Saving's study and presumes that the reader already has a working knowledge of that study. However, pp. 581-584 contain some new results.
Type of model: Purely descriptive
Welfare categories analyzed: General assistance only
Dependent variable: There are two: (1) persons and (2) cases receiving general assistance monthly by states, as a percentage of the total state population. The former is the same as Brehm and Saving's.
Independent variables: Same as in Brehm and Saving
Functional form: Same as in Brehm and Saving
Data used for calibration: Same sources as—but differently interpreted than—in Brehm and Saving. The authors' main point is that Brehm and Saving did not pay enough attention to the distinction in their data between cases and persons on welfare. To document this charge, the authors calibrated the Brehm and Saving model once with cases as the dependent variable and a second time with a "corrected" estimate of persons.
Method of calibration: Same as in Brehm and Saving, but with ordinary least squares regression instead of Zellner's generalized least squares.
Fit on calibration data: Best $R^2$ in over 100 equations was under .7. Typical values were in the range .3 to .45. Unlike Brehm and Saving, the authors found no statistical significance for the average welfare payment variables.

Performance on other data: Not tested

Authors' principal conclusions: Brehm and Saving's conclusions are wrong. There is no evidence supporting the view that enrollment depends positively on the enrollment level.

Our comments: See Chap. 4
6. BREHM AND SAVING (III-THE REPLY)

Authors: C. T. Brehm and T. R. Saving

Title: "The Demand for General Assistance Payments: A Reply"

Publication information: Journal article, published in American Economic Review, V. 57, #3, June 1967

Sponsored intended audience: A reply to Stein and Albin's comment (1967) on Brehm and Saving's 1964 article. No specific sponsor. Intended for peer group. Authors were associate professor of economics at Kenyon College and Michigan State University, respectively, at the time.

Sections relevant: Entire paper is only four pages long.

Type of model: Purely descriptive.

Welfare categories analyzed: General assistance only.

Dependent variable: Persons receiving general assistance in December 1959 by states, as a percent of the total state population.

Independent variables: Mostly as in the authors' 1964 paper, with a few inessential changes.

Functional form: Very like the 1964 paper, but simpler.

Date used for calibration: Some as in 1964 paper, but with more precise HEW figures on aid recipients. Also, for one point in time only, and for 34 states instead of the full 48 as before.

Method of calibration: Ordinary least squares regression.

Fit on calibration data: Best $R^2$ is .23.
Performance on other data: Not tested.

Author's principal conclusions: Their 1964 conclusions are still valid, contrary to Stein and Albin's view.

Our comments: See Chap. 4.
Author: Lora S. Collins
Title: "Public Assistance Expenditures in the United States"
Publication information: This is a chapter in Studies in the Economics of Income Maintenance edited by Otto Eckstein and published by The Brookings Institution in 1967.
Sponsor and intended audience: The study was originally prepared as a doctoral dissertation at Harvard University. It was part of a special program of research and education on taxation and public expenditures, supervised by the National Committee on Government Finance and financed by a special grant from the Ford Foundation.
Sections relevant: All
Type of model: Descriptive
Welfare categories: Old Age Assistance (OAA), Aid to Dependent Children (ADC), Aid to the Blind (AB), and Aid to the Permanently and Totally Disabled (APTD). General Assistance is considered briefly.
Dependent variables: The dependent variables of the regression analyses are: total, federal, and state-local expenditures per capita for each public assistance program and for the four combined; the recipient rate for each program and for the four combined; the average monthly payment per recipient in each program; the average monthly administrative expenditure per case in each public assistance program; and for general assistance, per capita state-local expenditure, the recipient rate and the average payment.
Independent variables: The independent variables are income level, degree of urbanization, unemployment rate, racial composition, age composition, variables relating to social insurance coverage, and rate of population growth.
Functional form: Each dependent variable was regressed linearly on the independent variables.
Data used for calibration: The analysis is cross-sectional and uses each state as an observation. The data is for the year 1960.
Method of calibration: Ordinary least squares regression.

Fit on calibration data: For each program and for each dependent variable the best results achieved were the following:

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>OAA</th>
<th>ADC</th>
<th>AB</th>
<th>APTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.64</td>
<td>.50</td>
<td>.34</td>
<td>.28</td>
</tr>
<tr>
<td>Federal</td>
<td>.76</td>
<td>.46</td>
<td>.55</td>
<td>.44</td>
</tr>
<tr>
<td>State-Local</td>
<td>.47</td>
<td>.58</td>
<td>.23</td>
<td>.32</td>
</tr>
<tr>
<td>Recipient Rate</td>
<td>.79</td>
<td>.64</td>
<td>.52</td>
<td>.66</td>
</tr>
<tr>
<td>Average Monthly</td>
<td>.72</td>
<td>.64</td>
<td>.59</td>
<td>.61</td>
</tr>
<tr>
<td>Payment</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Performance on other data: Not tested.

Author's principal conclusions: "The most important feature of the empirical results is perhaps the 'qualitative' finding that, despite states' substantial control over important policy matters, significant relationships in fact exist between the dependent and determinant variables tested." In addition, the study concludes that" . . . expenditures are influenced not just by objective economic variables, but by the subjective attitudes of the electorate, of state and local governments, and of the federal government."

Our comments: Possibly the first major study of the quantitative relationship between caseload variables and their determinants. Has been superseded by more recent studies.
Author: E. Durbin

Title: "Family Instability, Labor Supply and the Incidence of Aid to Families with Dependent Children"


Sponsor and intended audience: No specific sponsor. Intended partly for peer group and partly for more general audience.

Sections relevant: Pages 156-164 for results and 136-152 for description of variables. Other sections can be skipped.

Type of model: Purely descriptive.

Welfare categories analyzed: AFDC.

Dependent variables: There are two: (1) persons on AFDC in a single month (W), and (2) female-headed households (F), both by New York City "health areas" and expressed as a percentage of the total "health area" population.

Independent variables: Rejection rate for AFDC applicants; population under 18 years of age, divided by the population 18-64; median family income; proportion of families with incomes under $2,000; proportion of unskilled males in total male employment; proportion of unskilled females in total female employment; population over 64 years of age, divided by population 18-64; proportion of female-headed households; and control variables (not explicitly defined) for nonwhite and migration.

Functional form: A semi-simultaneous model is specified:
\[ F = f(X) \]
\[ W = f(X,F) \]
where X stands for the independent variables and f is linear.

Data used for calibration: Unit of analysis is New York City "health areas." Sample is intended to be cross-sectional (350 observations) but some of the data is for March 1962 while the rest is for 1960. Sources are City welfare files and 1960 Census.

Method of calibration: Ordinary least squares regression, with simultaneity removed by substitution to eliminate F from the second equation.

Fit on calibration data: Not tested.

Performance on other data: Not tested.

Authors principal conclusions: AFDC incidence rises with the incidence of children, the poverty incidence, the nonwhite incidence, the migration incidence, and the incidence of unskilled female employment; and decreases with the rejection rate and the incidence of unskilled male employment.

Our comments: See Chap. 4.
9. GREENSTON AND MACRAE

Author: Peter M. Greenston and C. Duncan MacRae

Title: A Diffusion Analysis of Participation in the Aid to Families with Dependent Children (AFDC) Program by States


Sponsor and intended audience: Study was supported by Grant No. 18-P-56665/03-01, from the Social and Rehabilitation Service, Department of Health, Education and Welfare, Washington, D. C.

Sections relevant: All

Type of model: Descriptive

Welfare categories: AFDC

Dependent variable: Welfare participation rate (P)

Independent variables: Number of female-headed families, number of unemployed people, state standard of need, average expenditure per AFDC family and average manufacturing wage rate

Functional form: The final form of the estimating equation is

\[ \frac{P_t}{P_{t-1}} = bP_{t-1} + c_0 + c_1FHF_t + c_2D_{FHF} + c_3U_t + c_4B/W_t + c_5S_t + c_6D_{I,t} + c_7D_{II,t} + c_8D_{III,t} + c_9D_{IV,t} + e_t \]

where FHF = number of female-headed families
D = "man in the house" families
U = number of unemployed people
S = state standard of need
B = average expenditure per AFDC family
W = average manufacturing wage rate
D_I = seasonal dummy

Method of calibration: Ordinary least squares regression

Fit on calibration data: $R^2$ at most .86; typically between .34 and .75

Performance on other data: Not validated

Author's principal conclusions: Participation is shown "... to be the result of the diffusion of information regarding the existence of the program from those participating to those who are not but who are eligible for the program."

Our comments: The authors' central hypothesis is that "... at a particular time not all eligible families are participating [in AFDC] because not all of them know about the program, and that it is the diffusion of information which has increased the rate of participation over time." The authors "implicitly assume that once sufficient information is available, the eligible family does participate in the program."

We briefly summarize the approach. Let $E(t)$ be the number of eligibles at the beginning of time period $t$, and let $P(t)$ be the number of participants at the end of time period $t$. The authors relate $E(t)$ to $P(t)$ and $P(t-1)$ with an equation containing a single parameter $B$ measuring "the proportion of possible contact which leads to new participants." An equation relating $E$ to demographic variables is introduced, and a single equation relating $P$ to demographic variables and the parameter $B$ is derived. Parameters are estimated separately for 20 states. The existence of a number of states for which the estimate of $B$ is significantly different from zero is taken as evidence supporting the hypothesis quoted above.

The paper is of high quality and very interesting. The model is clearly not a predictive one, but rather one that focuses on one particular aspect of welfare caseload dynamics.
10. HOLMER

Author: Martin R. Holmer

Title: The Economic and Political Causes of the "Welfare Crisis"

Publication information: Thesis submitted to the Massachusetts Institute of Technology, June 1975

Sponsor and intended audience: Research was supported in part by Grant No. 91-25-13-17 from Manpower Administration, U.S. Department of Labor under the authority of Title I of the Manpower Development and Training Act of 1962, as amended.

Sections relevant: Chapter VIII, Structure of the Caseload Model; Chapter IX, Specification of the Caseload Model, Chapter X, Estimation of the Caseload Model, Chapter XI, Simulation of the Caseload Model: The Immediate Causes of the AFDC Expansion

Type of Model: Descriptive

Welfare categories: AFDC

Dependent variables: Caseload/population in the preceding time period, applications rate, acceptance rate, and the closing rate in the preceding time period

Independent variables: Employment variables and program variables as noted below.

Functional form:

\[ (C/P)_t = (C/P)_{t-1} + APPR_t \cdot ACCR_t \cdot (1 - (C/P)_{t-1}) \]

\[ - CLR_{t-1} \cdot (C/P)_{t-1} \]

where

- C - Caseload
- P - Population
- APPR - Applications rate
- ACCR - Acceptance rate
- CLR - Closings rate

*The author plans to publish a briefer, more user-oriented discussion paper in the near future, under the aegis of SRS at HEW. We had a draft in hand during our review, kindness of the author.*
Also

\[ \text{APPR} = f (\text{EARNs, ORT, UNEMPL, CHBEN, FDBEN, MDBEN, IPC, ACCR}) \]
\[ \text{ACCR} = f (\text{IPS, UNEMPL}) \]
\[ \text{CLR} = f (\text{EARNs, ORT, UNEMPL, CHBEN, FDBEN, MDBEN, IPC, SEAS}) \]

where

- **EARNs** - Average monthly per capita earnings in low wage jobs
- **ORT** - Job offer rate
- **UNEMPL** - A variable highly correlated with the unemployment rate
- **CHBEN** - Average monthly AFDC grant
- **FDBEN** - Average monthly food stamps benefit
- **MDBEN** - Average monthly medicaid benefit
- **IPC** - Long run trend in the acceptance rate
- **SEAS** - Seasonal variations in the closings rate


**Method of calibration:** The caseload model includes a relief rate difference equation, three benefit equations, and the acceptance, application and closing rate equations. All equations except the applications rate equation were estimated using ordinary least squares and Cochrane Orcutt; the applications rate equation was estimated using two-stage least squares.

**Fit on calibration data:** For the five equations estimated using ordinary least squares the \( R^2 \) ranged from .74 to .99.

**Performance on other data:** Not tested.

**Author's principal conclusions:** "The caseload model . . . explains over 99 percent of the actual historical variation in the AFDC caseload. It reveals that fully four-fifths of the 1952-1972 caseload expansion can be attributed to an increase in AFDC accessibility and less stigmatizing treatment of applicants and recipients by caseworkers."

**Our comments:** See Chap. 4.
ll. HONIG

Author: M. H. Honig

Title: "The Impact of Welfare Payment Levels on Family Stability"


Sponsor and intended audience: Sponsor was Sen. Martha Griffith's Subcommittee on Fiscal Policy of the Joint Economic Committee. Intended for members of Congress and their staffs.

Sections relevant: Entire paper (17 pages).

Type of model: Purely descriptive.

Welfare categories: AFDC.

Dependent variables: There are two: (1) female-headed families (F) with children under 18, divided by all families; and (2) AFDC cases (C), divided by all families. Both are by SMSAs (standard metropolitan statistical areas) and for a full calendar year.

Independent variables: Average AFDC grant level, estimated earnings of females employed full time, estimated earnings of males employed full time, the male unemployment rate, the female unemployment rate, female income from nonwelfare sources, and measures of eligibility limitations.

<table>
<thead>
<tr>
<th><strong>Functional form:</strong></th>
<th>Double logarithmic regressions were run on various combinations of the independent variables.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data used for calibration:</strong></td>
<td>Unit of analysis is SMSA. Two cross-sectional samples (44 observations each) are drawn from the 66 largest SMSAs for 1960 and 1970. Welfare data are from HEW reports; other data are from Bureau of the Census.</td>
</tr>
<tr>
<td><strong>Method of calibration:</strong></td>
<td>Ordinary least squares regression on each sample separately.</td>
</tr>
<tr>
<td><strong>Fit on calibration data:</strong></td>
<td>$R^2$ between .63 and .77. Several variables statistically significant.</td>
</tr>
<tr>
<td><strong>Performance on other data:</strong></td>
<td>Not tested.</td>
</tr>
<tr>
<td><strong>Author's principal conclusions:</strong></td>
<td>&quot;High welfare payments do help to cause family splitting and do influence women heading families to become welfare recipients.&quot;</td>
</tr>
<tr>
<td><strong>Our comments:</strong></td>
<td>See Chap. 4.</td>
</tr>
</tbody>
</table>
Author: Walter W. Hudson

Title: Projecting Public Assistance Caseloads

Public information: Published in the proceedings of the 13th Annual Workshop on Welfare Research and Statistics, 1973

Sponsor and intended audience: Sponsored by the George Warren Brown School of Social Work, Washington University, St. Louis, Missouri, the paper is intended for both academics working in welfare research as well as public welfare research and statistics directors.

Sections relevant: All (13 pages of text plus 9 pages of graphs and 3 pages of SPSS programs)

Type of model: Predictive

Welfare categories: AFDC

Dependent variable: End of the month caseload

Independent variable: Ordinals corresponding to the month, i.e., 1 for June 1971, 2 for July 1971, etc.

Functional form: \[ Y = a + b_1 X_1 + b_2 X^2 + b_3 X^3 + \ldots + b_n X^n + e \] where \( X \) is the month of record

Data used for calibration: Caseloads for 18 months from June 1971 to November 1972 for Cook County, Illinois.

Method of calibration: Three methods:
1) stepwise regression of independent variable against powers of ordinal;
2) stepwise regression of three month central moving average against powers of ordinal;
3) caseload expressed as algebraic sum of 11 accounting variables (openings, closings, etc.). Each of the 11 regressed as in step 1 and resulting polynomials combined algebraically.

Fit on calibration data: Not given
<table>
<thead>
<tr>
<th>Performance on other data:</th>
<th>Errors estimated using six months of data, December 1972 to May 1973. Maximum estimation error for methods 1 and 2 about .6 percent and for methods 3 about 10 percent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author's principal conclusions:</td>
<td>Methods 1 and 2 are superior to method 3.</td>
</tr>
<tr>
<td>Our comments:</td>
<td>See Chap. 4.</td>
</tr>
</tbody>
</table>
Author: L. R. Jackson and W. A. Johnson

Title: "Protest by the Poor: The Welfare Rights Movement in New York City"

Publication information: Report published by the New York City-Rand Institute, R-791-NYC, August 1973

Sponsor and intended audience: Sponsored and funded by the New York City-Rand Institute. The authors were associated with the Institute and Columbia University at the time. Intended partly for welfare policy analysts (not economists, in general), partly for New York City officials and commentators, and partly for a general audience.

Sections relevant: Readers are advised to read Appendix A first and then Sections XVI, XIII, XIV, XV, and XVII in that order. Other sections are not relevant.

Type of model: Purely descriptive.

Welfare categories analyzed: AFDC-FG primarily. Also AFDC-U and general assistance.

Dependent variables: The acceptance rate (monthly case openings divided by applications processed that month), r; the applications divided by an estimate of the nonrecipient eligible population, a; the closings rate (monthly case closing divided by cases on the rolls that month), k; and the average grant level, G. All variables are by aid category and by City welfare district.

Independent variables: Membership, M, in welfare rights organizations, as a percentage of welfare caseload; welfare demonstrations, D; a proxy for the relative stringency, S, of welfare centers' policies (the proxy is either the rejection rate—i.e., one minus the acceptance rate—or the percentage of closings due to failure to comply with departmental policy); average family size, F, and a dummy variable, I, for districts where
welfare rights organization membership is known to have been underestimated. Again, all variables are by aid category, City welfare district, and—where possible—month.

**Functional form:**

The authors propose a simultaneous system involving four structural equations:

\[
\begin{align*}
\sigma &= \delta_0 + \delta_1 M + \delta_2 D + \delta_3 S \\
a &= \gamma_0 + \gamma_1 M + \gamma_2 D + \gamma_3 r + \gamma_4 G \\
k &= \phi_0 + \phi_1 M + \phi_2 D + \phi_3 S + \phi_4 G \\
G &= \beta_0 + \beta_1 M + \beta_2 D + \beta_3 S + \beta_4 F + \beta_5 I
\end{align*}
\]

By substitution they eliminate identification problems and are able to recover all the parameters shown from "reduced form" estimates. The following identity is also discussed:

\[
\hat{c} = r \alpha N - kc
\]

where \( c \) is cases receiving assistance, \( \hat{c} \) is the change in \( c \) from one month to the next, and \( N \) is the nonrecipient eligible population.

**Data used for calibration:**

Unit of analysis is New York City welfare district. Monthly data are used for 1967–68, but as 24 separate cross-sectional samples rather than pooled temporally. Although the City had over 40 districts then, most samples include only 10 to 25, due to data unavailability on the others. The analysis concentrated mostly on AFDC in the seven months from February through August 1968. Data are from City welfare agency records and welfare rights organization sources.

**Method of calibration:**

Ordinary least squares regression, with numerous sensitivity analyses.

**Fit on calibration data:**

Two of the equations—for the average grant level and the applications rate—had several significant variables and corrected \( R^2 \) mostly between .25 and .6. The equation for the closings rate was somewhat weaker and the equation for the acceptance rate showed no significant relationships for any of its independent variables.

**Performance on other data:**

Not tested.

**Authors' principal conclusions:**

Those relevant here are: (1) welfare rights organizations significantly influenced average grant levels; (2) and applications; (3) but not the acceptance rate or closings rate.
Our comments: A thoughtful attempt to tackle a very difficult issue. The authors extract maximum benefit from a few simple (and eminently sensible) ideas. However, their data are poor—poorer even than their caveats admit. The findings should consequently be regarded as much more tentative than those of other studies.

The model is one of the earliest—and still one of the best—efforts to take explicit account of the simultaneity between key caseload variables from the supply and demand sides of welfare decisions.
<table>
<thead>
<tr>
<th><strong>Author:</strong></th>
<th>H. Kasper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong></td>
<td>&quot;Welfare Payments and Work Incentive: Some Determinants of the Rates of General Assistance Payments&quot;</td>
</tr>
<tr>
<td><strong>Publication information:</strong></td>
<td>Journal article, published in <em>Journal of Human Resources</em>, V. 111, #1, Winter 1968</td>
</tr>
<tr>
<td><strong>Sponsor and intended audience:</strong></td>
<td>The study was performed while the author held a Brookings Research Professorship. He was Associate Professor of Economics at Oberlin College at the time. Intended for peer group.</td>
</tr>
<tr>
<td><strong>Sections relevant:</strong></td>
<td>Entire paper (23 pages).</td>
</tr>
<tr>
<td><strong>Type of model:</strong></td>
<td>Purely descriptive.</td>
</tr>
<tr>
<td><strong>Welfare categories analyzed:</strong></td>
<td>General assistance only.</td>
</tr>
<tr>
<td><strong>Dependent variables:</strong></td>
<td>There are two, the same as in Stein and Albin (1967): (1) persons and (2) cases receiving general assistance in December 1964 by states, divided by the total state population.</td>
</tr>
<tr>
<td><strong>Independent variables:</strong></td>
<td>(1) state population; (2) geographic region; (3) percent of state financial support to program; (4) percent of population on payrolls of nonagricultural employment; (5) and (6) median earnings and family income of male service workers, excluding private household workers, 1959; (7) and (8) average December 1964 general assistance payment per recipient and per case; (9) average weekly earnings of production workers in manufacturing; (10) total unemployment rate, 1964; (11) insured unemployment rate, 1964; (12) arithmetic difference between total and insured unemployment rate; (13) percent change in total unemployment rate, 1964-65; (14) percent change in insured unemployment rate, 1964-65; and (15) percent change in total aid payments under general assistance, December 1963-64.</td>
</tr>
</tbody>
</table>
Each of recipients and cases is regressed linearly on some 20 or more combinations of various independent variables. Two of the regressions are intended as explicit tests of the formulations of Brehm and Saving (1964) and Stein and Albin (1967). The others are presented as extensions.

Unit of analysis is states. Sample includes 41 cross-sectional observations (7 states were dropped due to data unavailability) for December 1964. Data are from same sources as Stein and Albin used (i.e., HEW documents for welfare-related data and Census reports for other data) but supplemented with some unpublished data supplied by HEW.

Ordinary least squares regression on full sample.

Best $R^2$ is .72. Typical values are in the range .55 to .7. A sufficient number of coefficient estimates are statistically significant—and remain so despite numerous changes in functional form—to suggest that the model explains fairly well part of the variation in its dependent variables. A plot of predicted vs. actual values of the dependent variable shows that the model badly overestimates enrollment in New Jersey, West Virginia, Alaska, and Connecticut and badly underestimates in Louisiana, Minnesota, Maine, and particularly California.

Not tested.

As summarized on p. 88: "We find that labor market conditions, i.e., unemployment, are a substantial determinant of the proportion of the people in a state who are receiving GAP [General Assistance Payments] and that the average level of GAP is of much less importance. The difference of our results from earlier studies stems primarily from somewhat more appropriate measures of unemployment. Whereas the earlier models implied that GAP rates each month were determined, in part by the current rate of insured unemployment, our model (1) allows for the fact that labor market conditions in the past may determine current GAP rates, and (2) uses an unemployment rate which more closely approximates the labor market conditions faced by workers with low wage opportunities."

See Chap. 4.
15. LOCHRIE

<table>
<thead>
<tr>
<th>Author:</th>
<th>Lochrie &amp; Associates, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>The MAPBJ System</td>
</tr>
<tr>
<td>Publication</td>
<td>The MAPBJ System, January 1975, booklet published by the Information Services Business Division of General Electric</td>
</tr>
<tr>
<td>information:</td>
<td></td>
</tr>
<tr>
<td>Sponsor and</td>
<td>General Electric and Lochrie &amp; Associates, Inc. sponsored the publication which is intended to acquaint potential users with the MAPBJ system.</td>
</tr>
<tr>
<td>intended</td>
<td></td>
</tr>
<tr>
<td>audience:</td>
<td></td>
</tr>
<tr>
<td>Sections</td>
<td>Section 1, Introduction to MAPBJ</td>
</tr>
<tr>
<td>relevant:</td>
<td></td>
</tr>
<tr>
<td>Type of model:</td>
<td>Predictive</td>
</tr>
<tr>
<td>Our comments:</td>
<td>This paper is the only documentation Lochrie could give us on his forecasting approach. It is not very useful, and we urge interested readers to talk directly with Lochrie instead. See Chap. 4 for more information on his methodology.</td>
</tr>
<tr>
<td><strong>Author:</strong></td>
<td>Miland Patil</td>
</tr>
<tr>
<td>-------------</td>
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<tr>
<td><strong>Title:</strong></td>
<td>SMART (Simulation Model as a Research Technique) Forecasting</td>
</tr>
<tr>
<td><strong>Publication information:</strong></td>
<td>Memo from the State of Texas, Department of Public Welfare, Budget Office dated April 24, 1974.</td>
</tr>
<tr>
<td><strong>Sponsor and intended audience:</strong></td>
<td>Memo is addressed to &quot;Present and Potential SMART Users;&quot; in particular people in state budget and public welfare departments.</td>
</tr>
<tr>
<td><strong>Sections relevant:</strong></td>
<td>All (eight pages)</td>
</tr>
<tr>
<td><strong>Type of model:</strong></td>
<td>Predictive</td>
</tr>
<tr>
<td><strong>Welfare categories:</strong></td>
<td>AFDC, Food Stamps, Nursing Home, and Vendor Drug caseloads</td>
</tr>
<tr>
<td><strong>Dependent variable:</strong></td>
<td>County welfare caseload</td>
</tr>
<tr>
<td><strong>Independent variable:</strong></td>
<td>AFDC caseload = f(per capita personal income, percent of workforce unemployed, total population, percent of females 15 years old, percent of population white, percent of population black, percent of population other races, percent of population in single headed families, percent of population in low income families, percent of population 65 years and older, percent of females 14 to 45 years old)</td>
</tr>
<tr>
<td><strong>Functional form:</strong></td>
<td>Food Stamp caseload, Nursing Home caseload and Vendor Drug caseload all expressed as a function of the above set of independent variables.</td>
</tr>
<tr>
<td><strong>Data used for calibration:</strong></td>
<td>Single linear equation for each welfare category.</td>
</tr>
<tr>
<td>**Observations of variables for 254 Texas counties in 1970 from such sources as the U.S. Department of Commerce, Social and Behavioral Administration, Bureau of Economic Analysis; Texas Employment Commission; U.S. Bureau of the Census.</td>
<td></td>
</tr>
<tr>
<td><strong>Method of calibration:</strong></td>
<td>Stepwise regression with variables selected from an initial set of 26.</td>
</tr>
</tbody>
</table>
Fit on calibration data:

- AFDC: $R^2 = 0.91$
- Food Stamp: $R^2 = 0.90$
- Nursing Home: $R^2 = 0.90$
- Vendor Drug: $R^2 = 0.90$

Performance on other data: Not tested

Author’s principal conclusions:
"SMART is far superior to trend forecasting or averaging because it does not entirely depend on its own historical data in isolation from any societal changes. SMART is a system of mathematical equations capable of exploiting computer’s ability to assimilate huge quantities of data and to perform complex, statistical operations on data."

Our comments: A standard regression study. Needs more explanation of statistical procedures used. For example, the model as specified has perfect collinearity among the independent variables, and hence a singular covariance matrix. How has the author handled this problem? The paper does not say.
17. THE NYCRI MODEL

Author: C. Peter Rydell, Thelma Palmerio, Gerard Blais, Dan Brown

Title: Welfare Caseload Dynamics in New York City

Publication information: R-1441-NYC, The New York City Rand Institute, New York, New York, October 1974

Sponsor and intended audience: Prepared for the New York City Human Resources Administration. The study was the combined efforts of the Office of Policy Research in the HRA and the New York City Rand Institute. Support came from the Bureau of the Budget of the city of New York and the Ford Foundation.

Sections relevant: Section VI, Modeling Caseload Change: Overview; Section VIII, Components of the DSS Caseload Model, and Section IX, Using the DSS Caseload Model.

Type of Model: Descriptive and predictive

Welfare categories: Aid to Dependent Children, Aid to Dependent Children with Unemployed Fathers, Aid to the Disabled, Old Age Assistance, Aid to the Blind and Home Relief.

Dependent Variable: New caseload change in month t

Independent Variables: Openings, closings and net transfers

Functional form: \[ \Delta C_t = O_t - C_{1t} + NT_t \]

where

\[ \Delta C_t = \text{New Caseload change in month } t \]

\[ O_t = \text{Openings} \]

\[ C_{1t} = \text{Closings} \]

\[ NT_t = \text{Net Transfers} \]

\[ O = [AO + ERO] \ast \theta_1 \ast ACCR \ast \theta_2 \ast \text{ALL} \ast \theta_3 \ast \text{UNEMP} \ast \theta_4 \ast B \theta_5 \]

\[ C1 = [LCL \ast C + SCL \ast RO] \ast \theta_1 \ast \text{ALL} \ast \theta_2 \ast \text{UNEMP} \ast \theta_3 \]

*An unpublished memorandum ("Predictions of the Size and Cost of the New York City Welfare Caseload in 1975") by David W. Lyon, Mark D. Menchik, and Gerard Blais reports new estimates from a revised version of the NYCRI model. But we have not reviewed that later work separately because the revisions were not major.
where

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO</td>
<td>Average openings during previous 12 months</td>
</tr>
<tr>
<td>ERO</td>
<td>Expected extra reopenings</td>
</tr>
<tr>
<td>D</td>
<td>Workdays per month</td>
</tr>
<tr>
<td>ACCR</td>
<td>Acceptance rate</td>
</tr>
<tr>
<td>ALL</td>
<td>Allowance rate</td>
</tr>
<tr>
<td>UNEMP</td>
<td>Recent unemployment</td>
</tr>
<tr>
<td>B</td>
<td>Births</td>
</tr>
<tr>
<td>LCL</td>
<td>Long-run closing rate</td>
</tr>
<tr>
<td>SCL</td>
<td>Short-run closing fractions</td>
</tr>
<tr>
<td>RO</td>
<td>Recent openings</td>
</tr>
<tr>
<td>NT</td>
<td>Estimated from exogeneously determined transfer rates</td>
</tr>
</tbody>
</table>

Data used for calibration: Data used was for the period 1962-1973 from the Cumulative Ledger Analysis File and the Historical File of Daily Records of Actions Taken for the Department of Social Service, New York City.

Method of calibration: Multiple regression analysis

Fit on calibration data: The $R^2$ for the openings model ranged from .44 to .96; from .22 to .93 for the closings model and from -4 to .60 for the net transfers model.

Performance on other data: Error averaged 1.3% for a seven month prediction period in 1972.

Author's principal conclusions: "At the current state of knowledge about welfare dependency, chance events play a large part in determining whether a welfare case is a short-term or long-term one...Approximately one-half of closed cases eventually reopen and...in each month's flow of case openings, approximately one-half are cases that received welfare previously."

Our comments: See Chap. 4.
Author: D. H. Saks

Title: "Economic Analysis of an Urban Public Assistance Program: Aid to New York City Families of Dependent Children in the Sixties"

Public Information: Unpublished Ph.D. dissertation from the Department of Economics of Princeton University

Sponsor and intended audience: No specific sponsor. Intended partly for peer group and partly for general audience. Author was a graduate student and then an assistant professor in economics at the time.

Sections relevant: In the present context, this paper can be regarded as a collection of three essentially separate empirical studies. These are: (1) a time-series study of the determinants of case applications (pp. 39-48); (2) a cross-sectional study of factors affecting the probability of going on welfare (pp. 48-62); and (3) a study of how long cases stay on welfare (pp. 123-144). Other sections can be skipped.

Type of model: Purely descriptive.

Welfare categories analyzed: AFDC primarily.

Dependent variables: Case applications (A); the probability that a given case unit is on welfare (P); duration of a given case's time on welfare, in months (D); and the probability that a given case in period t will remain on welfare for at least one more period.

Independent variables: For the longitudinal study of case applications: total current unemployment rate, a weighted six-month average of recent changes in the unemployment rate, the number of illegitimate births in the current month, and the number of non-white and Puerto Rican births in the current month. For the cross-sectional study of the probability of being on

*This work was published after revision as Public Assistance for Mothers in an Urban Labor Market, Industrial Relations Section, Research Report Series, No. 118, Princeton University, 1975. The author has a later study now in draft form ("The Relation Between the Labor Market and the Welfare System Through Time"), which applies a dynamic model of welfare decisions to Michigan data. Two studies of related interest are:
welfare: estimated hourly wage, estimated monthly AFDC grant level, unemployment rate, AFDC caseload as a fraction of total population, "expected" wage (estimated hourly rate * (1 - unemployment rate)), "expected" welfare income (AFDC incidence * grant level), number of children in family, six variables on whether family head migrated to current residence from another SMSA and if so when and from where, three dummy variables on educational attainment of family head, race, and health status. For the study on how long cases stay on welfare: variables similar to the previous set, though the exact definitions are slightly different.

Functional form: In each study, three or four regressions were run with various linear combinations of the independent variables mentioned above. The study on duration of enrollment also included several variations of a recursive system (with survival rate as the dependent variable) presented in a Markov framework.

Data used for calibration: For each of the three studies, respectively, the data are: (1) a longitudinal sample (with New York City as the unit of analysis) of 72 monthly observations from 1961 through 1966, drawn from New York City welfare agency records; (2) a cross-sectional sample (with families as the unit of analysis) of over 1300 observations from the 1967 Survey of Economic Opportunities; and (3) a cross-sectional sample containing retrospective welfare histories (with the welfare case as the unit of analysis) on over 500 observations from the 1967 ADFC Characteristics Study for New York City.

Method of calibration: Mostly ordinary least squares regression, with occasional use of generalized least squares.

Fit on calibration data: For each of the three studies, respectively: (1) $R^2$ below .5 and little statistical significance for AFDC-FG, but $R^2$ near .7 and good significance for AFDC-U; (2) low $R^2$ (.24) and marginal significance; and (3) low $R^2$ (.24) but good significance.

Fit on other data: Not tested.

Robert G. Williams, Public Assistance and Work Effort: The Labor Supply of Low-Income Female Heads of Households, Industrial Relations Section, Research Report Series, No. 119, Princeton University, 1975; and J. Donald Rowlatt, Welfare and the Incentive to Work: The Alberta Case, Human Resources Research Council, Alberta Canada, 1971 (this paper was also—like Saks' first one—a Princeton doctoral dissertation). After examining all of these papers, we decided that only the first by Saks was sufficiently germane to our purposes to require extensive review.
Author's principal conclusions: For each study, respectively: (1) regression results are inconclusive on the influence of unemployment on enrollment; (2) the probability of going on welfare depends significantly on expected wage, but although the effects of grant level and family size are of the "right" sign, they are not robustly significant, and (3) results are not conclusive.

Our comments: A very ambitious undertaking that seeks to speak to both theoretically inclined economists and welfare administrators. Data constraints are a serious problem: the author's program calls for better data than he uses.
Author: Frank A. Sloan

Title: A model of State Income Maintenance Decisions*

Publication information: P-4997, The Rand Corporation, Santa Monica, California, June 1973

Sponsor and intended audience: Intended audience is the research community.

Sections relevant: All (25 pages)

Type of Model: A predictive Caseload–Public Assistance Payment Model and a descriptive State Model.

Welfare categories: AFDC

Dependent variable: There are four dependent variables: the number of AFDC eligibles, the number of recipients, the amount of nonassistance income and payments to AFDC recipient families.

Independent variables: The independent variables in the four equations include the number of female-headed households with children under age 18, the income distribution of these households, the expected public assistance payment, expenditures on AFDC administration, social services and training per capita population, expected wage, unemployment compensation availability, race, education, and payment limitation.

Functional form: POOL = f (Y, MOM)
RECP = f (POOL, EPAY, ADMIN, EWAGE, UNCOMP)
NONY = f (YELG, BL, ED)
PAY = f (BIND, NEED, YELG, NONY, FAMS)

where

POOL - Pool of eligible AFDC families
Y - Income
MOM - Number of female-headed households with children under age 18
RECP - Number of AFDC recipient families per state
EPAY - Expected public assistance payment
ADMIN - Expenditures on AFDC administration, social services and training per capita population
EWAGE - Expected wage
UNCOMP - Unemployment compensation availability
YELG - Income eligibility for AFDC
NONY - Family nonassistance income
BL - Percentage of female-headed households in the state that are nonwhite in 1958-59
ED - Mean years of schooling of schooling of females aged 25 and over in the state in 1958-59
BIND - State payment limit
NEED - Payment limitation based on something other than income eligibility
FAMS - Mean size of the AFDC recipient family

Data used for calibration:
Equations estimated separately using first data for the period 1958-59 and then 1967-68.

Method of calibration:
Structural equation parameter estimates of the Case-load-Public Assistance Payment Model were developed using both two-stage least squares and ordinary least squares.

Fit on calibration data:
For the 1958-59 data the $R^2$ ranged from .22 for the nonassistance income equation to .94 for the recipient equation. Using 1967-68 data the $R^2$ was .40 for the nonassistance income equation and .94 for the recipient equation.

Performance on other data:
Not tested

Author's principal conclusions:
"In spite of the widespread belief that the decade of the late 1950s to the late 1960s was one of substantial change in the welfare system and more specifically in AFDC, the parameter estimates for both 1958-59 and 1967-68 are quite similar."

Our comments:
Competent and interesting, but relevant more for analysis of public finance issues than for caseload forecasting.
### 20. **SWEILLAM**

<table>
<thead>
<tr>
<th>Author:</th>
<th>Attia I. Sweillam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong></td>
<td>Modeling the Public Welfare System: A Public Welfare Caseload Forecasting Model</td>
</tr>
<tr>
<td><strong>Publication information:</strong></td>
<td>A Thesis submitted to Rensselaer Polytechnic Institute, Troy, New York, August 1974</td>
</tr>
<tr>
<td><strong>Sponsor and intended audience:</strong></td>
<td>Thesis advisor was Helman I. Stern. Study done in cooperation with the staff of the New York State Department of Social Services.</td>
</tr>
<tr>
<td><strong>Sections relevant:</strong></td>
<td>Chapter IV, Mathematical Structure of the Welfare Modeling System; Chapter V, Data Calibration; and Chapter VI, Validation Processes.</td>
</tr>
<tr>
<td><strong>Type of model:</strong></td>
<td>Predictive</td>
</tr>
<tr>
<td><strong>Welfare Categories:</strong></td>
<td>Old Age Assistance, Aid to the Blind, Aid to Disabled, AFDC and Home Relief treated as one &quot;welfare&quot; system.</td>
</tr>
<tr>
<td><strong>Dependent variables:</strong></td>
<td>Quarterly cases under care for the State of New York.</td>
</tr>
<tr>
<td><strong>Independent variables:</strong></td>
<td>A number of policy and demographic variables which included number of births, number of deaths, unemployment, business index, average weekly earnings and average weekly hours.</td>
</tr>
<tr>
<td><strong>Functional form:</strong></td>
<td>Openings and closings are specified as a linear combination of independent variables; transfers between programs as Markov chains.</td>
</tr>
<tr>
<td><strong>Data used for calibration:</strong></td>
<td>Monthly data for New York for the period 1969-1971. Sources included the New York State Department of Social Services, the New York State Department of Labor, the New York State Department of Commerce and the New York State Department of Health.</td>
</tr>
<tr>
<td><strong>Method of calibration:</strong></td>
<td>Transition probabilities are estimated directly as simple proportions. An openings and a closings equations is developed for each program using step-wise regression selecting from a list of about fifty variables.</td>
</tr>
<tr>
<td><strong>Fit on calibration data:</strong></td>
<td>$R^2$ of about .9 in most cases.</td>
</tr>
</tbody>
</table>
Performance on other data:

Of the three models, the one chosen as being the best was tested quarterly on two consecutive years of 1972 and 1973. The reported error was not usually more than 5 percent.

Author's principal conclusions:

"Analysis of caseload was approached from two different hypotheses: public assistance as a closed system and public assistance as an open system. Prediction of caseload in the closed system was tested by two mathematical techniques: pure Markov Chain with new opened closed cases determined by stable transition rates and modified Markov Chain (version I) with new opened and closed cases determined by anticipatory policy changes. Prediction of caseloads in an open system was tested by modified Markov Chain (version II) with opened and closed cases determined as a function of socio-economic, demographic as well as welfare administrative actions... As a result of the validation processes, it was found that the modified Markov Chain model (version I) gives better results than the other two models in forecasting openings and closings."

Our comments:

The discussion of the Markov chain model seems unnecessary, since transfers from one program to another are rare (.013 is the maximum transfer probability). Regarding the openings model, it appears that Sweillam may be explaining a tautology: his results show that openings depend mostly on "Legal Openings."
21. TOWNSEND

Author: Henry Townsend

Title: A Forecasting Model for AFDC Caseloads and Total Payments


Sponsor and intended audience: Study was sponsored by SRS and intended for use within the sponsoring agency as well as state welfare departments.

Section relevant: Chapter II, Model Formulation, and Chapter III, Econometric Results

Type of Model: Predictive (for 20 states with largest AFDC caseloads and nationally), but used descriptively

Welfare categories: AFDC

Independent variables:
- Average number of families receiving payments = f (average quarterly unseasonalized unemployment rate, number of female headed families with children, fraction eligible)
- Payments per family = f (number of children per family, per capita income)

Functional form:
- Log of the independent variable expressed as a linear combination of the logs of the dependent variables (exponential form). Side equations used to predict the independent variables.

Data used for calibration:
- The source for data on caseloads, total payments and number of children was NCSS 2078 reports; payments standards came from a study by Manuel Helzner, SRS; personal income, population, unemployment and implicit GNP deflator were from Data Resources, Inc.; and data on the number of female headed families with children was supplied by National Planning Associates.
Method of calibration: Multilinear regression on logs.

Fit on calibration data: $R^2$ over .99 in most cases.

Performance on other data: Not tested on other data. Forecasts given through 1979 and could be used ex post to test reliability of estimates.

Author's principal conclusions: The model permits the user to study the effects of the overall health of the economy on the AFDC program. In particular the effects of unemployment and inflation on AFDC costs and caseloads can be examined.

Our comments: The basic estimating equation is

$$C = e^{a_0} \times UNR^{a_1} \times FH^{a_2} \times ELIGF^{a_3} \times PARTF^{a_4}$$

where $C$ is caseload, UNR is the unemployment rate, FH is the number of female-headed households, ELIGF is the fraction of FH eligible for welfare, and PARTF is the fraction of eligible FH's that actually participate in welfare programs. As an estimate of PARTF, the author uses

$$\frac{C_{t-1}}{FH_t \times ELIGF_t}$$

Since $a_1$ turns out to be close to zero and $a_2$, $a_3$, and $a_4$ to be close to unity, it must obviously be asked whether this model is significantly different from the definitional identity

$$C = FH \times ELIGF \times PARTF.$$

Apparently the author did not notice this problem.
### 22. THE BOSTON COLLEGE MODEL

**Author:** Steven F. Venti*  
**Title:** "The Determinants of AFDC in Massachusetts: An Econometric Analysis"  
**Publication information:** Unpublished undergraduate senior thesis at Boston College  
**Sponsor and intended audience:** Not funded research. Intended for welfare researchers  
**Sections relevant:** Entire paper (65 pages)  
**Type of model:** Predictive and descriptive  
**Welfare categories analyzed:** AFDC  
**Dependent variable:** Monthly caseload (c)  

**Independent variables:**  
- **LF** is size of the total labor force, including both males and females (six months moving average)  
- **EMPNM** is employment in 19 nondurable manufacturing industries believed to be "low training, predominantly female" (six months moving average)  
- **EMPSR** is employment in 9 service and retail trade industries (six months moving average, lagged three months)  
- **UN** is estimated female unemployment rate (six months moving average)  
- **UND6** is a dummy variable: 1 when UN is greater than six percent and zero otherwise  
- **DADMIN** is a dummy variable proxying the introduction of WIN and state takeover from local welfare agencies

* A basically similar model is discussed in *User Manual—General Relief Economometric Model: Commonwealth of Massachusetts* by Barry Bluestone, Steven Venti, and Lynn Bernard Ware.
DACCT is a dummy variable: 1 during months coinciding with a change in accounting procedures that occurred in Massachusetts in 1973, and zero otherwise

DXMAS is a dummy variable; equal to EMPSER during December of each year and zero otherwise

DSUM is a dummy variable: equal to LF during June, July, and August of each year and zero otherwise

Functional form:

\[ C = \alpha_0 + \alpha_1 \text{LF} + \alpha_2 \text{EMPNM} + \alpha_3 \text{EMPSR} + \alpha_4 (\text{EMPNM} \times \text{EMPSR}) \]

\[ + \alpha_5 \text{UN} + \alpha_6 \text{UNDG} + \alpha_7 (\text{UN} \times \text{UND6}) + \alpha_8 \text{DADMIN} \]

\[ + \alpha_9 \text{DACCT} + \alpha_{10} \text{DXMAS} + \alpha_{11} \text{DSUM} \]

Data used in calibration: Numerous agency and demographic sources.

Method of calibration: Ordinary least squares regression.

Fit on calibration data: \( R^2 \) is .9985. All coefficients are statistically significant—some very highly so

Performance on other data: Apparently very good

Author's principal conclusions: See Chap. 4

Our comments: See Chap. 4
23. WALKER AND TWEETEN

Author: N. Walker and L. Tweeten

Title: "Determination of Participation Rates in Major Federally Subsidized Public Assistance Programs"


Sponsor and intended audience: No specific sponsor. Intended primarily for peer group. Authors were at Oklahoma State University at the time.

Sections relevant: Entire paper (9 pages)

Type of model: Purely descriptive.

Welfare categories analyzed: AFDC, OAA, and AB.

Dependent variables: Persons receiving assistance by states, divided by total state population. Computed separately for each aid category. Also, average aid payment per aid recipient. All variables evidently are measured in annual terms.

Independent variables: Eleven variables (mostly dummies) describing aid program regulations; per capita personal income; portion of population 18 years or younger; portion of population 65 years or older; state revenue per capita; federal public assistance grants as a fraction of total state public assistance expenditures; percent of population metropolitan; percent of population negro; OASDHI payments per capita; persons unemployed divided by total population; divorces per 1000 population; illegitimate births per 1000 live births; portion of population with annual income $3000 or less.

Functional form: Each dependent variable was regressed, linearly on all of the independent variables. All regressions also included a dummy variable for each state and a time variable.

Data used for calibration: Unit of analysis is states. Sample is pooled cross-section (50 states) and time series (8 years). The years are an odd collection: 1950, 1953, 1956, 1957, 1959, 1962, 1964, and 1967. Welfare-related data are from standard HEW reports. Other data are from Bureau of the Census and Internal Revenue Service.
Method of calibration: Apparently ordinary least squares regression

Fit on calibration data: $R^2$ is .79 for AFDC, .97 for OAA, and .90 for AB. The regressions contain several statistically significant variables, but the meaning of this fact is obscured by the large number (over 60) of independent variables.

Performance on other data: Not tested.

Authors' principal conclusions: (1) Interstate differences in welfare incidence (i.e., persons on welfare, as a fraction of the total state population) can be attributed mainly to regional and socioeconomic factors; (2) welfare incidence is not positively related to allowance levels; (3) but it is positively related to unemployment with very high statistical significance (.001); (4) rising illegitimacy rates have been a major contributor to increases in the incidence of ADC enrollment; (5) interstate variations in program regulations for AFDC turn out not to be significant determinants of welfare incidence, except in three areas—work requirements, school attendance, and shelter codes; (6) southern states have high welfare incidences but low allowance levels compared to other states, controlling for other factors; urbanized states are just the reverse; they have low welfare incidences but high allowance levels.

Our comments: Since the authors did not report any further explorations beyond one round of rather cumbersomely large regressions, their findings must be regarded as extremely tentative.
Author: Lorene Y. L. Yap

Title: "A Gross Flows Model of AFDC Participation"


Sponsor and intended audience: Study was supported by Grant No. 18-P-56665/3-01 from the Social and Rehabilitation Service, Department of Health, Education and Welfare, Washington, D. C.

Sections relevant: All (17 pages of text plus tables and graphs)

Type of model: Predictive

Welfare categories: AFDC

Dependent variables: Quarterly case openings and closings

Independent variables: In the case openings equation, the independent variables are time and the average number of live births as a surrogate for eligible population. In the case closings equation the independent variables are time and acceptance rate defined as the ratio of applications accepted to total applications.

Function form:

\[
\text{LnA}_t = a_0 + a_1 t + a_2 \text{LnB}_t + e_t
\]

\[
\text{LnD}_t = b_0 + b_1 t + b_2 \text{LnP}_t + v_t
\]

where

- A = openings
- B = average number of live births
- t = time
- D = closings
- P = acceptance rate
Data used for calibration: Quarterly caseloads for FY 1970-73 for the U.S. as a whole and for 11 large states. Caseload data came from Applications, Cases Approved and Cases Discontinued for Public Assistance, HEW NCSS Report A-9; average number of live births from Monthly Vital Statistics Report, HEW, National Center for Health Statistics; and acceptance rate was based on Applications, Cases Approved and Cases Discontinued for Public Assistance.

Method of calibration: Ordinary least squares regression of independent variable against pairs of dependent variables selected from a list of four.

Fit on calibration data: $R^2$ never better than .88; typically around .65

Performance on other data: Tested ability of model to predict family caseloads beyond the period of the regression by comparing predicted with actual AFDC families for the third and fourth quarters of 1972.

Author's principal conclusions: On the basis of this preliminary work, it is concluded that using the gross flows approach to explaining past caseload growth and for forecasting future growth is a promising technique.

Our comments: Interesting, but still very preliminary
Appendix D

BIBLIOGRAPHY

This appendix is divided into three parts. Part I lists the 25 studies chosen for review. Part II lists other welfare studies encountered in our literature search. Part III notes a few additional studies referenced in the text.

*With one exception: we omit the Texas methodology since there is no written documentation on it.
Part I

STUDIES CHOSEN FOR REVIEW


Baxter, James T., Summary of Projection Techniques Used in the Formulation of the DPSS Budget Request for the Fiscal Year 1975-76, County of Los Angeles, Department of Public Social Services, mimeo, 1974.


Part II
OTHER WELFARE STUDIES


Fine, Ronald, AFDC Employment and Referral Guidelines, Institute for Interdisciplinary Studies, San Jose State University, California, June 1972.


Handler, Joel F., and Ellen Jane Hollingsworth, The "Deserving Poor": A Study of Welfare Administration, Markham, Chicago, 1971.


Podell, Lawrence, *The Attitudes Toward Social Services of Mothers on Welfare*, Human Resources Administration, Department of Social Services, New York.


Part III

ADDITIONAL REFERENCES


