THE IMPLEMENTATION OF WELFARE REFORM INITIATIVES: A PRELIMINARY SYSTEM DYNAMICS MODEL

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Successful welfare reform is difficult to achieve in practice and to study in theory because the linkages between policy reforms and the actions of clients of the system are many, long, and loose. Reformers can change organizational structure, funding amounts and requirements, as well as mandates. They hope that these reforms will change the behavior of workers who will implement the reforms. In turn, changed behavior of employees and welfare agencies are presumed to change the behavior of clients. Evaluating welfare reforms requires that information about policy changes, organizational changes, changed behavior by workers, and ultimately changed client behavior all be examined empirically and the results combined into a coherent whole.

This paper proposes that system dynamics models may be a new tool in the analyst's toolchest that can help to create integrated theories of welfare reform as well as help to integrate results from empirical studies of welfare reform. Below we present a first cut system dynamics model of the implementation of portions of the welfare reform legislation of 1988. This effort is designed to illustrate how system changes, changes in worker behavior, and client behavioral choices might be simultaneously analyzed within the context of a single feedback system. Of course, the hard work of elaborating and empirically validating the structure of this simple model still remains before us.

WELFARE REFORM LEGISLATION OF 1988

When Aid to Families with Dependent Children (AFDC) in its original version, Aid to Dependent Children, was established in 1935, the goal of the program was to provide cash assistance to needy families on behalf of children. The purpose of the assistance was to spare mothers from the necessity of having to work. Over the years, the scope of AFDC has been expanded, resulting in an increasing number of people on welfare. Also, with increasing government budget constraints and shifting social norms, the appropriateness of some mothers staying at home with their children at public expense

has been questioned. The issue of welfare dependency has become more and more a concern in policy decisions. Today, several programs are designed to encourage mothers to go to work and to get off public support.[1] The Family Support Act of 1988 is one among them.

THE FAMILY SUPPORT ACT AND THE JOB OPPORTUNITIES AND BASIC SKILLS TRAINING PROGRAM

A main objective of the Family Support Act (FSA), which passed Congress in September 1988, is to strengthen the economic self-sufficiency of AFDC recipients in order to move them from the dole into permanent jobs. A new program, Job Opportunities and Basic Skills Training Program (JOBS) is crated to achieve this objective. JOBS provides education, training, and other services that AFDC recipients need to avoid long-term welfare dependency. JOBS includes three major portions: first, services that prepare recipients for employment; second, employment activities; and third, supportive services that enable recipients to participate in training or to accept employment. Services of the first type are basic education, job-skills training, and other job-readiness activities. Services of the second type include job search, work experience, on-the-job training, and work supplementation. The third type of services include child care and transportation.[2]

JOBS mandates all non-exempt recipients to participate in the program, as long as necessary child care is provided. It also allows the exempted recipients to participate on a voluntary basis. The priority target groups are individuals who are , or are likely to become, long-term welfare recipients. There is a built-in sanction clause which stipulates that non-exempt individuals who fail to meet the program requirements or refuse to accept any bona fide offer of employment may be sanctioned by eliminating the adult's portion of the welfare payment.

The Act also requires states to meet specified participation rates for target populations or else face reductions in federal matching payments.[3]

IMPLEMENTATION OF THE JOBS PROGRAM

Implementation of JOBS involves, vertically, all three levels of government; and horizontally, both public and private agencies. The federal government sets

[1] Morris and Williamson (1986), pp.54-57; and Dolgoff and Feldstein (1984), p.187.

[2] Congressional Quartery,1988, pp.2825-2831.

[3] The minimum participation rates set by the Act are 7 percent for fiscal year 1990 and 1991, 11 percent for 1992, 15 percent for 1994, and 20 percent for 1995 and thereafter. The 'participation rate' is depicted in the model as 'JOBS Enrollment Goal'.

requirements and general guidelines for program funding and service provisions, as well as provides matching funds for the program. State governments are responsible for providing the states' portion of program financing, establishing more detailed program guidelines, and assuring coordination of a wide range of services under JOBS. Local welfare agencies are at the interface of program and client interaction. These agencies are responsible for carrying out case management and service delivery tasks. Services such as education, training, and child care may be provided by either the public or private sectors under the supervision and coordination of state welfare agencies.

This program emphasizes case-based management. Assessment of recipients as to their employability potentials and needs for services is required by the Family Support Act. Each recipient, after the initial assessment, is assigned to different service programs that serve her needs.

The characteristic of JOBS implementation is such that each element in the implementation process ties with each other and influences the performance of others over time. For example, for most recipients job training is presumed to be a prerequisite for creating employability. In turn, the availability of child care frees mothers for both job training and employment. Finally, the coordination of all activities is facilitated by the presence of active and effective case management.

Since the Family Support Act stipulates that states meet specified participation rates or else face reduction in federal matching funds, the performance of each service provider will eventually effect the overall financial status of the state; and hence, its own future performance capability. The performance of these elements in turn effect the attainment of program goal. As a consequence, JOBS implementation depends not only on how well each agency carries out the program, but also how well different elements are coordinated in a complex network.

A MODEL OF JOBS IMPLEMENTATION[4]

This paper presents a preliminary system dynamics model of the implementation of the JOBS program--JOBS1. The overall purpose of the model discussed below is to demonstrate the feasibility of looking at JOBS implementation from the system dynamics perspective. We believe that the stocks of clients, program capacity, administrative capability, and program costs all interact in complex feedback loops to determine system performance. These interactions will be addressed in a relative simple first-cut model. The model does not, however, examine causes of successful implementation. It is used here to show the performance of program implementation given certain conditions. Since JOBS is a new program that has not yet been implemented in most states, we can not build a fully validated model at this stage.

[4] For full details of the model see Ratanawijitrasin (1990).

For the above purpose, the following assumptions are made in this model. First, the two population subgroups: non-poor and poor families are in dynamic equilibrium. Second, resources necessary to implement the program will be made available when needed, unless under funding constraint.

This preliminary model does not treat: 1) the reassignment of existing resources from other programs;[5] 2) coordination of program capacity across agencies; 3) differences between different types of program and the influence of one type of program on another, for example, availability of child care service on enrollment to training program; 4) the effect of performance in the case management sector and program service sector on JOBS enrollment rate; and 5) the effect of funding adequacy on continuation of service operations and contracts with private service providers.

MODEL STRUCTURE

Overview

As shown in Figure 1, this model has four main sectors: a Client Flow sector, a Case Management and Administrative Support sector, a Service Program sector, and a Financial sector. The shaded areas of the Service Program sector in Figure 1 represents a number of different types of service programs that might be developed in future versions but are not present in this version of the model.

Client Flow Sector

The Client Flow sector, shown in figure 2, depicts the dynamics among various groups of population relating to poverty and the JOBS program. It consists of three levels which represent three different subgroups of population, namely, Non-Poor Families, Poor Families, and Poor Families in JOBS.

Non-Poor Families here are families with enough income to live above the poverty line as defined by the Social Security Administration.[6] Once a family has an annual income which falls below the poverty line, it becomes a Poverty Family. This change is represented in the model by the Poverty Entry Rate. Families previously living below the poverty line but which have increased annual income above the line will flow back to Non-Poor Families via the Poverty Exit Rate.

Families in poverty may be eligible for AFDC assistance provided that they meet the standards set for AFDC[7] and apply for the cash assistance. The AFDC Families

[5] For example, program operated under Job Training Partnership Act.

[6] Social Security Administration develops multiple poverty lines by taking into account family size and the number of children under eighteen years old. (Morris and Williamson, 1986, pp. 14-15) For example, poverty-line for a family of four persons was at $12,091 in 1988. (Current Population Report,1988, p.5)

[7] These standards vary from state to state. Each state establishes its own need standards, sets income and poverty limits above which families are not eligible for the assistance. (Morris and Williamson, 1986, p. 55)

Figure 1 Overview of the JOBS1 Model Showing Major Levels, Rates, and Auxiliaries

CASE MANAGEMENT AND ADMINISTRATIVE SUPPORT SECTOR

Levels: New Caseworkers
Experienced Caseworkers
Rates: Caseworker Acquisition Rate
Caseworker Quit Rate
Auxiliaries: Caseworker Full-Time-Equivalent
JOBS-Load Ratio

FINACIAL SECTOR

Auxiliaries: Program Costs
Caseworker Total Cost
AFDC Total Cost
Total Family Support Cost

CLIENT FLOW SECTOR

Levels: Non-Poor Families
Poor Families
Poor Families in JOBS
Rates: Poverty Entry Rate
JOBS to Non-Poor Rate
JOBS to Poor Rate
Auxiliaries: AFDC Families
JOBS Success Normal
Case Management Effect on JOBS
Program Effect on JOBS

PROGRAM AND SERVICE SECTOR

Levels: Program Capacity
Program Capacity on Order
Rates: Program Order Rate
Program Loss Rate
Auxiliaries: Mandated Program Need
Desired Program Adjustment
Program Adequacy

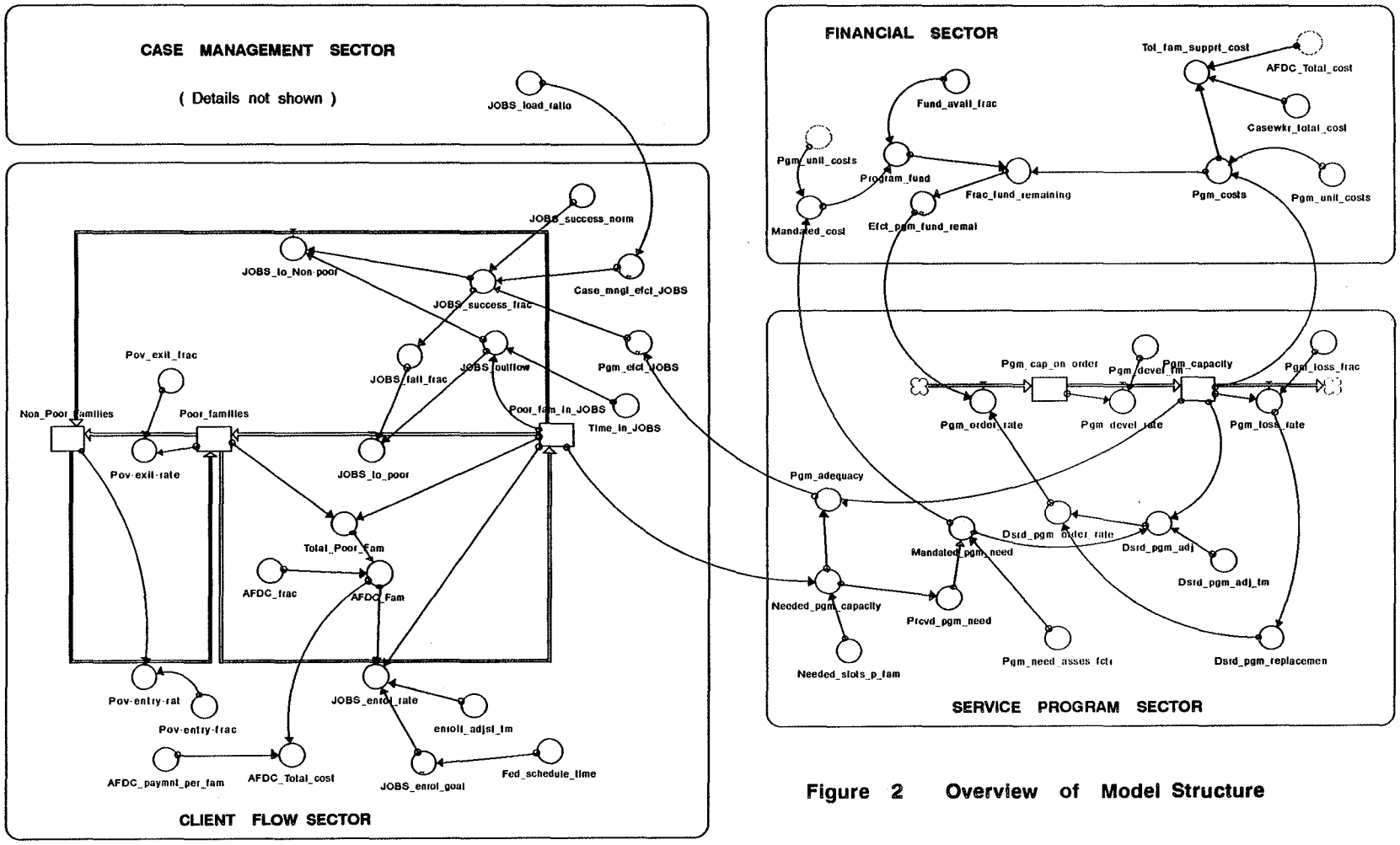

Figure 2 Overview of Model Structure

variable is formulated in the model as a fixed fraction of Poor Families. Some Poor Families who are AFDC recipients will become Poor Families in JOBS at a rate, represented by JOBS Enroll Rate, determined by the JOBS Enrollment Goals set by the Family Support Act.

There are two outflows from Poor Families in JOBS. The first is to Non-Poor Families. This flow represents the change in economic status of JOBS participants who finished the program and have successfully secured employment and now earn the income sufficient to maintain themselves above the poverty line. The rate of this flow, JOBS to Non-Poor Rate, is JOBS-outflow multiplied by JOBS Success Fraction.

The second outflow is from Poor Families in JOBS to Poor Families. JOBS participants who finished the program but are unable to secure an employment that earn them enough income to be Non-Poor Families will still be Poor Families. The rate of this flow is the product of JOBS Outflow times JOBS Failure Fraction. JOBS Failure Fraction is simply 1 minus JOBS Success Fraction.

Two key elements in this sector that tell how well JOBS is being implemented are the *JOBS Enrollment Fraction* and the *JOBS Success Fraction.* The JOBS Enrollment Fraction determines whether or not the program complies to the requirements set by the Family Support Act. This variable represents the success of welfare agencies in screening clients in to JOBS. The JOBS Success Fraction determines whether or not, or how successful the program is in accomplishing the goal of reducing welfare dependency. This variable represents the success of clients themselves in using JOBS to move out of poverty.

In order to highlight the effect of program implementation on the ultimate program goal, ie. the reduction of poverty and welfare dependency, the model is formulated in such a way that states are assumed to meet the enrollment rates as required by the Family Support Act. If states can manage to have the enrollment goals meet federal requirments, then they will be able to receive in full their portions of federal matching payments.

Meeting the requirement for program enrollment, however, does not guarantee that the goal of moving welfare recipients from the dole into permanent jobs will be attained. The rate of moving Poor Families in JOBS to Non-Poor Families depends on the JOBS Outflow and the JOBS Success Fraction. The JOBS Outflow is Poor Families in JOBS divided by time in the JOBS program. The JOBS-Success-Fraction is determined by a JOBS-Success-Normal, as well as by performance of the other two sectors through Case-Management-Effect-on-JOBS and Program-Effect-on-JOBS. As shown in Figure 2, policy variables in the financial sector impact on behavior in the program sector, which in turn modifies client behavior via the JOBS-Success-Fraction.

Case Management and Administrative Support Sector

Caseworkers are key actors in the implementation of JOBS. This sector focusses on the interaction between the welfare personnel, the caseworker, and their clients, Poor Families in JOBS. This sector contains 2 levels: New Caseworkers and Experienced Caseworkers. The number of Caseworkers is simply the sum of the two caseworker levels. These two groups of Caseworker, however, differ in their ability to handle cases. Therefore, the variable Caseworker Full-Time Equivalent is added to the model for a more realistic calculation of caseload.

The number of Poor Families in JOBS determines both the inflow and outflow of the two caseworker levels. On the one hand, it influences Caseworker Acquisition Rate through Perceived Caseload which, in turn, determines the number of Desired Caseworker. On the other hand, it affects Caseworker Burnout Effect through JOBS- Load Ratio which is computed as JOBS Caseload over Caseworker Desired Load. The JOBS Load Ratio, then, influences Case Management Effect on JOBS, which determines JOBS Success Fraction in the Client Flow sector. JOBS-Load Ratio is a key variable. It determines the degree of JOBS success while it is determined by the interaction of various factors in the Case Management and Administrative Support sector. Once again we see that caseworkers' behavior as modeled by the caseworker burnout effect impacts on client behavior via the JOBS-Success-Fraction and hence determines the overall effectiveness of the JOBS program.

Service Program Sector

A generic structure for the service programs in JOBS is presented in this model. The structure may be modified and replicated to depict the dynamics of service provisions for different types of program such as job skills training and child care.

In this model, Program Capacity denotes an aggregate stock of services. Each slot in the Program Capacity stock represents services provided to a family including training for a mother and child care for two children.

Program Fund and Poor Families in JOBS are the two elements crucial in determining Program Capacity. Poor Families in JOBS determines Needed Program Capacity which influences Program Order Rate, while Program Fund determines the ability to build up Program Capacity. The adequacy of Program Capacity, represented by Program Adequacy, then affects JOBS Success Fraction which links to the dynamics in the Client Flow sector. The model assumes that if adequate Program Capacity is available, then, the Program Effect on JOBS will equal 1; therefore, JOBS Success Fraction will be determined only by JOBS Success Normal and other effects within the Case Management sector. Similar to the JOBS-Load Ratio, Program Adequacy is a key variable that relates the dynamics of the Service Program sector to the overall program success.

Financial Sector

Due to the fact that it is still unclear, at this stage, how state and local governments may finance JOBS in order to match the federal funds, the financial sector will be fully developed later when the relevant information becomes available. Therefore, funding of JOBS in this model is formulated in such a way that it computes the needed costs, so that the effect of an abstract budget constraint can be tested, and the cost-effectiveness of JOBS under different scenarios can be compared.

MODEL BEHAVIOR

The simulation starts with the initial conditions of no JOBS program.[8] JOBS is initiated in 1990, the year states are required to implement the program, and is simulated for 15 years. Discussion of model behavior will be focussed on the effects of the JOBS program in reducing poverty and welfare dependency, as well as on how JOBS impacts total family support expenditure, which is defined in this paper as the sum of AFDC Total Cost, Program Costs, and Caseworker Total Cost. In addition, policy runs examine how various constraints to the program affect the model behavior. Figures 3 and 4 show the model behavior under ideal and baseline conditions, respectively. The final equilibrium values for key indicators from different scenarios are summarized in Figure 5.

Under ideal conditions, the model assumes 100 percent client success in getting employment and no constraints in budget and caseload. In contrast, the baseline condition assumes an 80 percent client success rate as well as combined constraints on both the budget and caseload. Here the performance of the system under these two scenarios is compared.

There is a significant difference in the degree of program success in the reduction of poverty and welfare dependency between the two scenarios. The ideal scenario produces a 5 percent increase in non-poor families and a 42 percent decrease in the number of AFDC families as compare to only 1.5 percent increase for the non-poor group and 11.5 percent decrease for the AFDC group in the base run. This indicates that elements in the system can significantly influence the outcome of the program.

Notice that, in Figure 4B of the base run, there is a wide gap between Program Capacity and Needed Program Capacity caused by an assumed budget constraint. This results in a situation where the Program Capacity never meets the Needed Program Capacity throughout the simulation period. In turn, this gap works through the Program Effect on JOBS to reduce the JOBS Success Fraction.

Also, as shown in Figure 4C, the number of Caseworkers is much lower than

[8] The simulation uses 1987 New York State data for population parameters. The Poverty-to-Sustaining-Fraction is derived from research on poverty dynamics using national data (Bane and Ellwood, 1986).

Figure 3 Behavior of Major Variables Under Ideal Condition

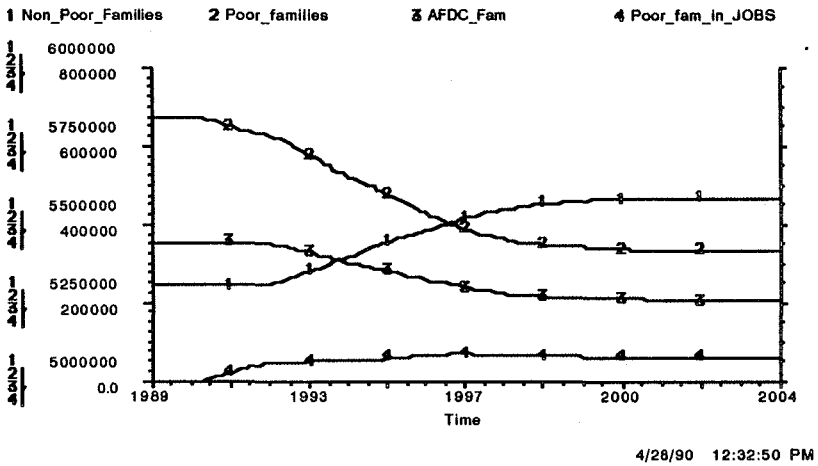

Figure 3A Client Flow Sector

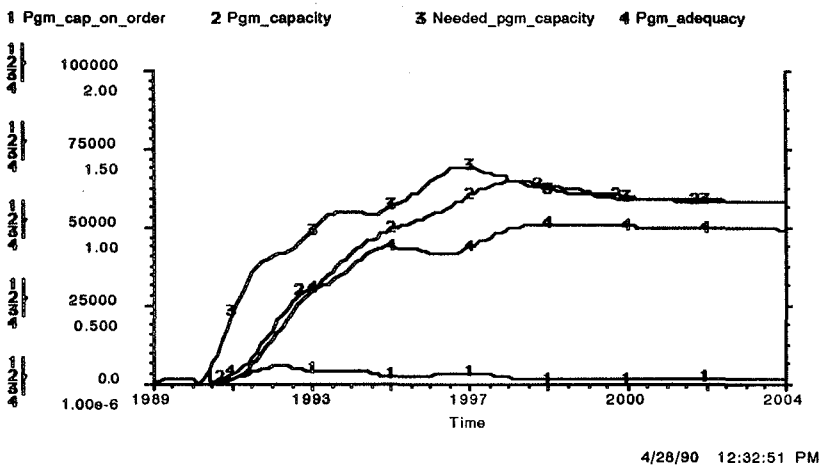

Figure 3B Service Program Sector

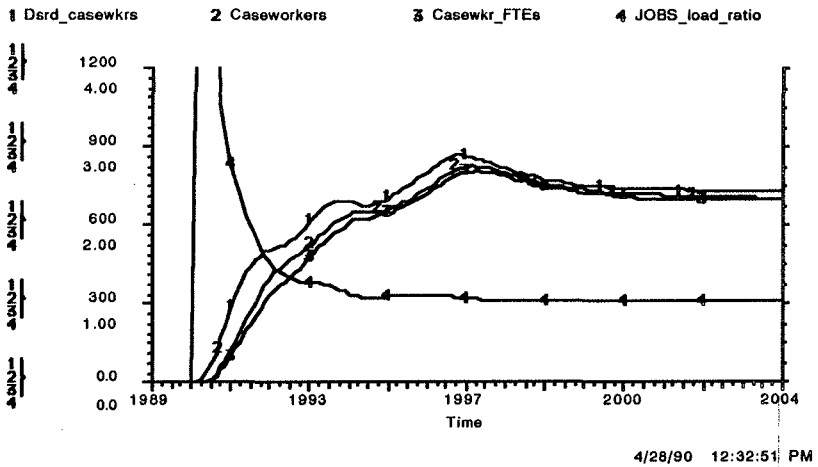

Figure 3C Case Management Sector

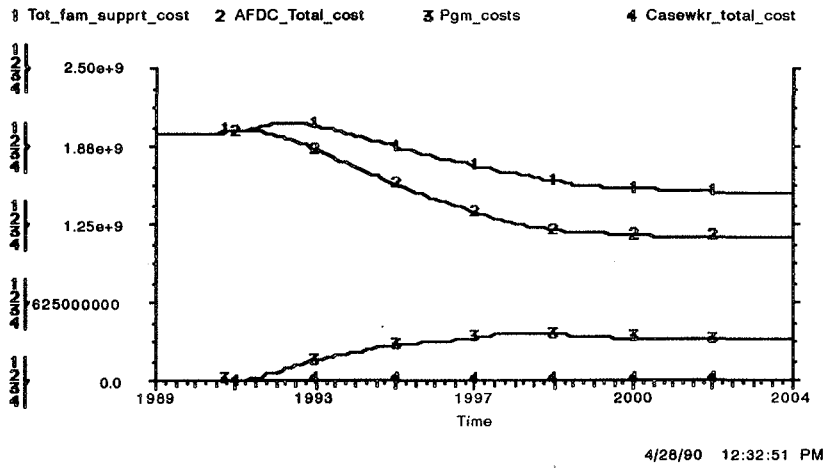

Figure 3D Financial Sector

Figure 4 Behavior of Major Variables Under Baseline Condition

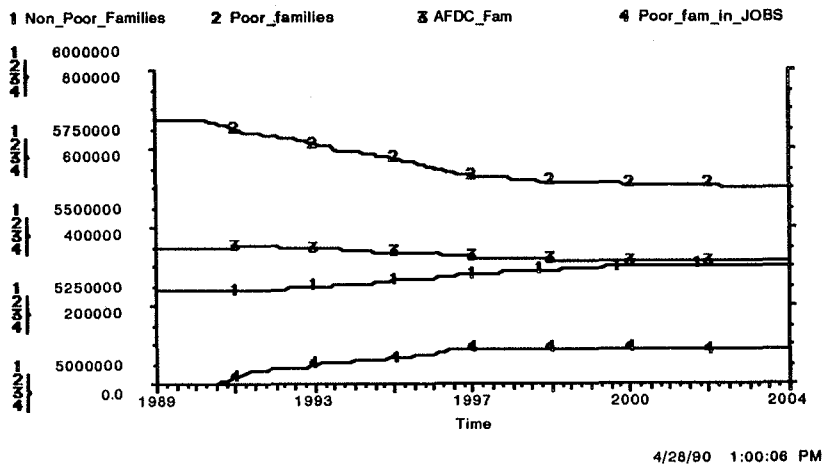

Figure 4A Client Flow Sector

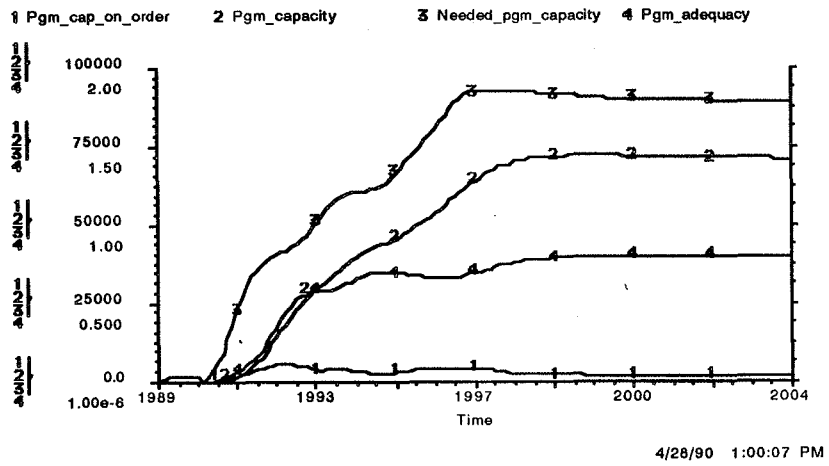

Figure 4B Service Program Sector

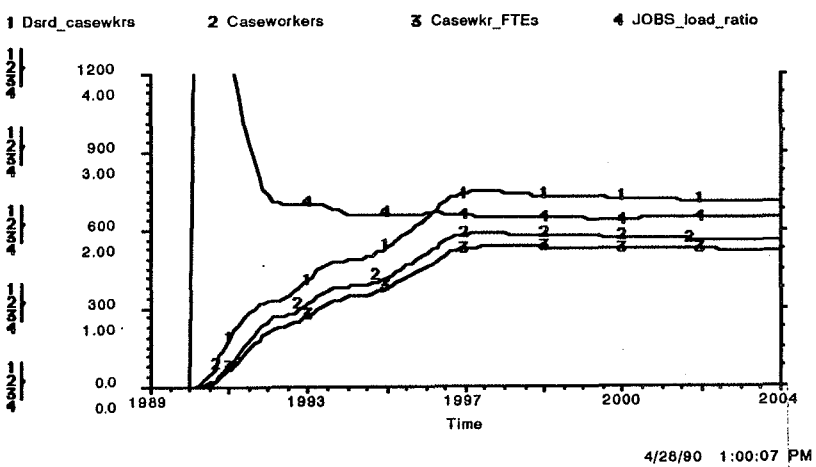

Figure 4C Case Management Sector

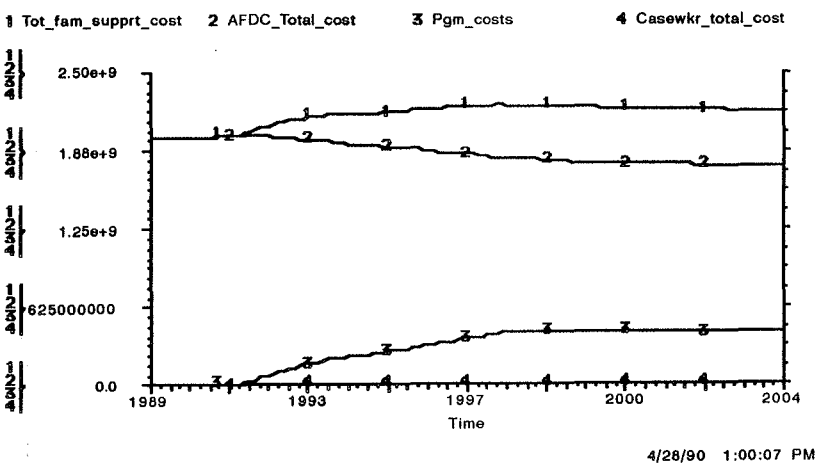

Figure 4D Financial Sector

the Desired Caseworkers. Furthermore, although the Caseload Target is set at 125 families per caseworker while the Caseworker Desired Load is 80, the JOBS-Load Ratio is at all time higher than 2. This large discrepancy between Caseworkers and Desired Caseworkers is largely due to the effect of the budget constraint. The decrease in Caseworkers Full-Time Equivalent in this scenario from that of the ideal scenario, in Figure 3C, is due primarily to caseload constraint, which is the discrepancy between the mandated Caseload Target and the Caseworker Desired Load. When the JOBS-Load Ratio is high because of a large difference between the target load and the desired load, the Caseworker Burnout Effect will lead to an increase in the Caseworker Quit Rate. The result is a higher need to hire New Caseworkers. Since each New Caseworker has a lower FTE than experienced ones, this in turn results in an even higher JOBS-Load Ratio. Overall, a lower than needed Caseworker FTE decreases the JOBS Success Fraction.

When many states are facing budget deficits, it may seem appealing for states to mandate high caseload targets as a measure to save on costs of case management. However, as the simulation results indicate, this effort to reduce cost may eventually produce the opposite result due to the dynamics of various elements in the system itself.

Figure 5 Percent Changes in Major Variables of Final Equilibrium and Under Different Scenarios

SCENARIOS	CONDITIONS			RESULTS (% change)			
	JOBS SUCCESS NORMAL	FRACTION FUND AVAILABLE	CASE LOAD RATIO	NON-POOR FAMILIES	AFDC FAMILIES	TOTAL FAMILY SUPPORT COST	AFDC COST
Ideal Condition	1.0	1.0	80/80	↑ 5.28	↓ 41.76	↓ 23.74	↓ 41.41
Budget Constraint	1.0	0.8	80/80	↑ 4.82	↓ 38.12	↓ 22.73	↓ 37.88
Caseload Constraint	1.0	1.0	125/80	↑ 3.58	↓ 28.29	↓ 6.06	↓ 28.28
80 % Client Success	0.8	1.0	80/80	↑ 4.47	↓ 35.32	↓ 15.15	↓ 35.35
Base Run	0.8	0.8	125/80	↑ 1.45	↓ 11.45	↑ 10.61	↓ 11.11

Note: Caseload Ratio = Caseload Target/ Case-Worker Desired Load

JOBS may be seen as an investment program to which the government allocates resources now to provide services that will save welfare payments in the long run. As shown in Figure 5, except for the base run, the Total Family Support Cost decreases with the implementation of JOBS for all the four scenarios.[9] Even under the

scenario of 80 percent client success, JOBS is still a cost-saving program for the government in the long run. However, when multiple constraints are combined, the total cost is higher with JOBS. This indicates that how well the government manages the program will determines whether JOBS is a cost-saving or cost-enlarging program for government's overall family support expenditure.

IMPLICATIONS FOR WELFARE PROGRAM IMPLEMENTATION

The interaction between clients, program elements, and policy variables in the implementation process determines the overall pattern of system change. Factors intrinsic to the system may play important roles in influencing the degree of program success. The caseload ratio for example, which is less obvious than such factor as program funding, may greatly hinder program outcomes. This behavior is due primarily to the behavior of case managers who are important to overall client success.

Case management, through the assessment of needs and referral of clients to various services, is one of the characteristic features of JOBS, as well as many other welfare programs. It determines directly the types and amount of services a client receives, and indirectly, the capacities needed for different types of services. As a consequence, changes in the details of how case work is managed and how the delivery of services is coordinated have great impact on the overall performance of the program.

The effect of changes in caseload ratio is an example that illustrates the impact of relatively small change in the elements of Case Management and Administrative Support sector on overall system performance. Since the way the Family Support Act structures the implementation is through delineation of legal objectives and provision of financial resources, how the details in the implementation process are designed rest mainly with the state and local welfare agencies. The administrative capability of these welfare agencies to set realistic detailed performance standards and the effort to obtain compliance and cooperation from field-work officials is critical to the degree of program achievement.[10]

Another factor endogenous to the program is the relevancy of education and training programs. Types and quality of the program provided is important because whether JOBS graduates are equipped with qualifications that suit the needs of the labor market at that particular time determines the likelihood of their getting employment. In this model, this factor is included in the parameter JOBS Success Normal. In addition,

[9] Since the cost of both AFDC and JOBS may vary from service to service, from area to area, and from time to time, attention is paid on the changes of the model behavior, not the absolute values of output variables.

[10] The importance of cooperation from lower level or field-work officials has been recognized in a large number of literature on implementation. See, for example, Williams (1980), Mazmanian and Sabatier (1983), and Edwards and Sharkansky (1978).

the JOBS-Success-Normal parameter also stands as a proxy for numerous motivational and behavioral variables on the part of clients. A JOBS-Success-Normal of 100% or even 80% assumes a highly motivated client population that wishes to escape poverty. Of course, the degree of motivation of various client groups is an important issue that will have to be studied in detailed field work.

Finally, JOBS Success Normal also connotes some other factors exogenous to the system. The economic condition, for instance, effects the availability of jobs, both the number and types. Thus, it determines the probability of JOBS graduates getting employment. This factor, however, is considered beyond the control of the system. That is, the program is unable to affect the availability of jobs.[11]

Government overall family support cost is another important dimension to be considered as an outcome of the JOBS program. How cost effective this program is to government's overall family support expenditure depends not only upon whether the welfare agencies are able to provide effective services that enable the recipients to leave welfare, but also upon whether the services are provided at a cost low enough to be offset by the reduction of AFDC payment. In sum, the role of JOBS from the government budgetary perspective depends on the effectiveness and efficiency of program implementation.

CONCLUSION

In this paper, the use of system dynamics model to capture the dynamics of JOBS program implementation is demonstrated. The simulation illustrates how interaction among policy variables, worker and organizational variables, as well as client behavior determines the system performance in reducing poverty and welfare dependency, and how it affects the overall government expenditure levels.

The model suggests that getting a program in place and financial resources secured does not ensure successful program outcomes. How the implementation process is carried out is critical to the achievement of the program goals.

This model does not contain all or even most of the structural refinements that are known to characterize the welfare reform system. For example Bane and Ellwood (1986) have shown that a single level to represent all poor or AFDC families is an inadequate representation of reality. In fact, the time-dependant character of spells of poverty as well as several disaggregate causes of spell starts and completions must be taken into account. In addition, we believe that the model makes grossly simple and consequently unrealistic assumptions about how well-motivated are JOBS clients. These assumptions, aggregated largely in the JOBS Success Normal parameter and the JOBS Success Fraction variable,

[11] Mazmanian and Sabatier (1981), pp.147-8.

need to be tested against detailed field work, preferably using some form of random assignment of clients to test for program effects.

However, these are the variables that must be estimated and concepts that must be clarified in detailed empirical studies of the implementation of JOBS. We do not claim to have completed such a detailed empirical study. Rather we are claiming that we have a new tool that can be useful in synthesizing and analyzing the results from these empirical studies as well as in clarifying the theoretical base that guides the empirical work.

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