The Interaction between Food Stamps and Welfare Programs: An Empirical Model of Program Dynamics in the Cleveland Metropolitan Area, 1992 – 2003

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Introduction

The 1996 welfare reform legislation has spawned a multitude of studies of the experiences of welfare recipients and their families since the reforms have been implemented (e.g. U.S. Department of Health and Human Services, 2000; Cancian, Haveman, Kaplan, Meyer and Wolfe, 1999; Harris, 1996; Coulton et al., 2001a).[1] Many of these studies take a programmatic focus and examine only individuals who are or were TANF recipients. Although many of these studies do consider whether welfare recipients also received Food Stamps along with their cash assistance, the focus is on TANF program dynamics. Taking such a narrow focus fails to place the Food Stamp program into the proper context. The reality of the many cash and in-kind assistance programs is that they are very dynamic – many individuals and their families move on and off of a variety of programs on a month-by-month basis.

In this paper, we examine the dynamics of multiple program usage. We use administrative data encompassing all individuals receiving TANF, Food Stamps or Medical Assistance in Cuyahoga County (Cleveland), Ohio over the period July 1992 through April 2003. In this fashion, we are able to categorize individuals by the array of programs in which they are enrolled on a monthly basis. We model three different aspects of program dynamics: (1) program inflows, which consist of new entry into any assistance program; (2) transitions from one category of assistance to another; and (3) exits from all types of assistance.

In many states, including Ohio, as cash assistance case loads fell dramatically over the 1990s, so did food stamp receipt (Zedlewski and Brauner, 1999; Food Research

[1] A summary of many of these studies can be found at the web site of the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (see http://aspe.hhs.gov/hsp/leavers99/index.htm).

and Action Center, 2001). We investigate the extent to which these declines were and were not related to one another and to other underlying economic, demographic and policy factors. The component approach allows us to decompose the source of changes over time and to distinguish between changes in inflows, transfers, and exits. For example, we measure directly the decline in Food Stamps enrollments that is associated with persons leaving cash assistance versus decreases in new program inflows or exits from food stamp only recipients.

This approach has several advantages. The scope of this inquiry will lend a deeper understanding of assistance than often results from studying individual programs in isolation. Studying the progression of individuals or families through a variety of programs over time can provide a foundation for a more complex typology of poverty and program use than has been typically used. For example, in our approach persons who leave welfare can viewed as either exiters from all types of public assistance or as transfers from one class of assistance (with TANF) to another class of assistance (without TANF). Thus, this approach is more general than studies that focus exclusively on welfare leavers. Furthermore, on a very practical level, a better understanding of the interdependencies between food stamp receipt and other program participation can help program administrators predict how changes in the policies of one program might affect enrollment and the characteristics of the enrollees, in another program category (Besharov, 1995).

Background

While these data are specific to Cuyahoga County and the policy changes that have ensued there in the past 10 years, they should be illustrative of welfare reform implementation and the related issues that have arisen around the U.S. in recent years. The Cleveland metropolitan area is typical of many major Midwestern and Eastern U.S. metropolitan areas along the lines of poverty, income and employment mix (Leete and Bania, 1999). Furthermore, these data allow for a more in-depth analysis over a longer period of time than would be possible using publicly available national survey datasets (such as SIPP, PSID or NSAF). They also confer the advantage of representing the *entire* population of individuals receiving assistance in Cuyahoga County during this ten-year period, releasing us from the need to base estimates on limited samples of individuals.

Welfare Reform in Cuyahoga County

The 1992 to 2003 time period encompassed significant changes in federal, state, and local welfare policy. Such changes have the potential to affect welfare caseloads directly and to have indirect effects on Food Stamp and Medical assistance caseloads as well.[2] Although it would be convenient, it is not possible to point to a single policy that constitutes welfare reform or to a single implementation date for such a policy. Rather welfare reform should be viewed a series of policies that were gradually approved and implemented over a number of years. In Ohio, the picture is complex.[3] In 1995, the federal government approved Ohio's request for a waiver of federal welfare regulations. Under the waiver program, Ohio implemented a time limit on cash benefits in 1995.

[2] For example, sanctions applied to welfare recipients can result in the loss of both Food Stamp and Medical assistance benefits.

[3] See Leete and Bania (1999) and Brock, et. al. (2002).

However, the policy was never realized as the federal welfare reform (PRWORA) was approved in 1996 and implemented in 1997. Ohio approved new legislation creating the Ohio Works First program (OWF) which implemented the federal reforms. A key feature of OWF was a 36 month time limit on cash assistance. This and other provisions of OWF took effect in October 1997. Thus, the first group of welfare recipients lost their benefits due to time limits in October 2000. Another key feature of OWF was a diversion program designed to prevent applicants from entering the cash assistance program. Instead applicants were diverted to other programs such as Food Stamps and given one-time cash grants. The county also placed substantial emphasis on the provision of transitional benefits for those leaving the cash assistance program. Initially, those leaving welfare tended to lose their Food Stamp and Medical benefits when they left welfare (Coulton, et. al, 2002). However, the county made substantial efforts to alter this policy and dramatically increased the percentage of welfare leavers who continued to receive Food Stamps and transitional Medical assistance.

In sum, welfare reform can be viewed as an evolving policy that had its origins in 1995 when Ohio was in the process of requesting its federal waiver. Welfare reform continued to unfold through 1996 as the federal legislation was debated and approved. In 1997, PRWORA became effective and Ohio's OWF 36-month time limit clock began ticking. Further evolution of OWF policies continued in the late 1990s as the front line service providers in Ohio's counties reorganized their service delivery strategies (Brock, et. al, 2002). Finally, the time limits, in many ways the center piece of welfare reform policy became binding in October 2000 as the first group of welfare recipients had their benefits terminated involuntarily.

The Recent Demographic and Economic Context for Cuyahoga County

Table 1 presents selected census data describing demographic and economic characteristics for Cuyahoga residents in 1990 and 2000. By and large the county did not experience significant change during the last decade. Total population declined by 1.2 percent, continuing a population decline dating back to 1970. The racial makeup of the county shifted slightly as the percent white declined by 6 percentage points while the percent African American increased by two percentage points. Interestingly, during the 1990s the tails of the distribution of educational attainment spread outward. More of the county's residents received at least some college education at the same time that more residents also failed to complete high school: the portion of the population age 25 and over with some college education increased substantially from 43 to 52 percentage points, and the share that did not complete high school increased from 26 to 32 percent. During the 1990s, there was some indication of increased labor force participation and decreased reliance on public assistance: the employment to population ratio increased from 57 to 59 percent, and the percentage of households with wage or salary income in the year prior to the census increased from 72 to 75 percent. Finally, the percent of households receiving public assistance income in the year prior to the census declined by half, from 10 to 5 percent.

Data and Methodology

The data for this study is drawn from administrative records provided to us by Cuyahoga Work and Training (CWT), the agency responsible for administering various

welfare programs in Cuyahoga County. The geographic scope of this dataset is Cuyahoga County, the central county of the six-county metropolitan statistical area. Cuyahoga County entirely contains the city of Cleveland and includes close to three-fourths of the metropolitan area's total population and employment. In addition, Cuyahoga County includes nearly eighty percent of the metropolitan area's poverty population. For this study, the specific data sets that we use are the monthly Income Maintenance Files (IMF) (Bania, 2001; Bania, Leete and Coulton, 2001). The IMF data include monthly records for every Cuyahoga County resident enrolled in Food Stamps, TANF,[4] and Medical Assistance programs beginning in July 1992 and continuing through the present.[5] The data set includes basic demographic variables such as age (date of birth), race, gender, monthly benefit payment, home address (geocoded to census tract), and program utilization.

Because of noncompliance, administrative complications and errors, individuals occasionally appear as having left a program or programs only to be reinstated within a short period of time. These data gaps can give the mistaken impression of many more short duration spells of program participation than actually occur. For the purposes of this analysis, we will disregard gaps of less than one month duration and treat the surrounding spells as unbroken.[6]

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[4] Here and throughout we use the term TANF, but we refer more generally to cash assistance programs formerly know as ADC, and now known as TANF.

[5] The IMF data represent the caseload on the first of day of a given month. However the file is created several days prior to the beginning of each month, as such it represents an approximation of the anticipated caseload on the first day of each month.

[6] This is consistent with the methodology employed in the ASPE sponsored studies of welfare leavers. See the web site of the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (see http://aspe.hhs.gov/hsp/leavers99/index.htm).

Assistance Classes. For our analysis, we are interested in all types of assistance that a particular individual receives. Thus, it is necessary to categorize individuals using one or more programs into general classes of assistance. In addition to the Food Stamp program, each Cuyahoga County resident can be enrolled in a cash assistance program and up to three categories of medical assistance. Most recipients of cash assistance in Cuyahoga County generally fall into one of two programs: the single parent program (ADCR) and the two-parent program (ADCU). There are up to 36 different categories of medical assistance and recipients can be enrolled in one, two, three, or none of these programs. Our goal is to summarize all possible combinations of these programs into unified classes of assistance.

At the simplest level, we can define class of assistance as a vector that characterizes a specific individual's use of various programs:

(F, W, M)

where F, W, and M are binary variables that indicate whether an individual is enrolled in a particular program. For this study, we utilize the simplest classification scheme of seven classes of assistance, along with the null set -- those who receive no assistance at all (2x2x2). For purposes of discussion here, we label the seven assistance classes as follows:

F – Food Stamps only
M – medical assistance only
W – cash assistance only
FM – Food Stamps and medical assistance
WF – Food Stamps and cash assistance
WM – medical assistance and cash assistance
WFM – Food Stamps, medical assistance, and cash assistance

Clearly, we expect some groupings to dominate (i.e. WFM), while others occur less frequently (i.e. WF and WM).

Program benefits are delivered to assistance groups, rather than individually to each person who is eligible. While one person is designated as the payee for each assistance group and actually receives the payment, the benefit is intended to be shared among all members of the assistance group. It is tempting to equate assistance groups to family units, but the reality is more complex and varies considerably across programs.[7] Our analysis is conducted at the individual level, focusing on the adult recipients (age 18 and over).

Components of Program Dynamics. In this analysis we will decompose and model separate aspects of program dynamics. After identifying the separate program components and flows, we use time-series regression and survival analysis modeling techniques to decompose the variation of the caseload over time into those changes attributable to shifts in underlying demographic and economic factors, and those changes that are explained only by their coincidence with the implementation of welfare reform. In particular, we look at the effect of welfare reform on inflows, exits, and transfers between classes of assistance. We use the term inflows to refer to new enrollments in an assistance class of person who were *not* enrolled in *any* program in the previous month. Similarly, exits refer to those who leave an assistance class and receive *no* assistance of any kind in the next month.[8] Transfer refers to shifts between assistance classes. The

[7] Assistance groups are collections of individuals that reside at the same physical address and may or may not correspond to specific family units. For example, if two single mothers, each with their own children, share a housing unit, they will form two separate assistance groups for purposes of cash assistance programs, but a single food stamp assistance group (if they share a common food preparation area).

[8] As noted above, we smooth the data by eliminating one-month gaps in program enrollments; the practical implication of this is that any program inflows or outflows occur after a minimum two-month gap.

term survival refers to remaining in a given assistance class with no change in status. Thus, in the constructing the data, we create time series representing each of 56 elements of program dynamics (7 inflows, 7 exits and 42 possible transfers among each of the 7 different assistance classes). We also create a panel data set of individual program participation by month that is suitable for using survival analysis methods to model survival in an assistance class.

Measuring the Implementation of Welfare Reform. As discussed previously, the implementation of welfare reform in Ohio and Cuyahoga County was a complex series of events that did not occur at a single point in time. One could argue that the process began as early as 1995 with the federal government's approval of Ohio's request for a waiver of federal welfare regulations and continued through 2000, when the full effects of time limits were first felt by welfare recipients. Since the early part of this period was marked by several changes in policy and perhaps uncertainty among both frontline caseworkers and welfare recipients themselves, we instead focus on the time period beginning in 1997 when state legislation implementing federal welfare reform in Ohio was enacted. A key aspect of welfare reform in Ohio was the implementation of a 36-month lifetime benefit limit for most individuals. Beginning in October 1997, monthly cash assistance received by welfare recipients in Ohio began to accrue toward the 36-month limit. By October 2000, the first group of welfare recipients lost benefits due to the implementation of time limits. Thus, we will measure the impact of welfare reform in Ohio by introducing two binary variables in the various statistical models. The first binary variable captures a transitional phase and covers the time period from October 1997 to September 2000 (inclusive), while the second binary variable is intended to measure the full

implementation of welfare reform and covers the time period from October 2000 and onward.

Estimating the Effect of Welfare Reform: Simulation Model

Our approach here is not to model caseloads directly but rather to model the components of program dynamics. Thus, we will use time series regressions and survival models to separately model the inflows, exits, and transitions from and among the various classes of assistance. In particular, our empirical strategy is to use these models to identify how the various flows have changed since the implementation of welfare reform. We then estimate the effects of the welfare reform era on overall caseloads by constructing a system of estimates reminiscent of life table approaches applied to demographic issues. Ultimately, we use this system to produce two sets of estimates: a baseline scenario (without the impacts of welfare reform) and a scenario that incorporates the effects of welfare reform. Each scenario includes the same set of controls for underlying levels of economic and demographic conditions. The simulation system itself is constructed from components as follows:

(1) *Estimated Inflows*: aggregate monthly inflows into each class of assistance are estimated from seven separate times-series OLS regression equations. These equations control for underlying county demographic and economic characteristics: the number of blacks in the population, the number of Hispanics in the population, the number of births that occurred in that year and the unemployment rate. Dummy variables indicate whether or not the spell occurs during one of the two welfare reform time periods. The estimated inflow into

each class of assistance for each month of the simulation period is the predicted value generated from the regression model.

(2) *Class of Assistance Outflows*: To model outflows from a particular class of assistance, we first estimate the probability of survival in that class of assistance and then calculate the outflow probability as one minus the survival probability. In this framework, outflows from a class of assistance include both exits from all types of assistance as well as transfers to another class of assistance. These outflows are allocated between exits and various transfers in step (3) below. We use panel data on individual program participation to estimate survival models for each class of assistance, estimating the probability that a given individual will survive in a particular class of assistance conditional on the fact that they have already survived a given number of months. In addition to the length of the current spell, survival models also allow for variation in other characteristics. In our case, we utilized several individual characteristics as statistical controls – age, race, and gender. Finally, we also introduce binary dummy variables indicating whether or not the spell occurs during one of the two welfare reform time periods.

(3) *Transition Matrices*: Outflows from a class of assistance in a given month are further distributed between exits and program transfers with the use of transition matrices. Transition matrices, unique to each month, are constructed from the estimated number of monthly exits and monthly transfers to other classes of assistance. These estimates are the predicted values from time-series OLS regressions, estimated in the same fashion as the inflow estimates. The transition matrix represents the percent of the outflows from each class of assistance that

flow to each other class of assistance or that become exits from the system overall (no assistance in the next month).

As noted above, these three major model components are combined using a life table approach to simulate caseloads over the period October 1997 through March 2003. A schematic showing the construction of the simulation model is shown in Table 2. For each of the seven classes of assistance, we begin with the actual caseload in September 1997, broken down into cohorts according to the number of continuous months already spent in that class of assistance (during the current spell). This is represented as column (3) of the table. For each month that follows, the monthly caseload is constructed as the sum of three components: estimated inflows, estimated transitions in from other classes of assistance (shown as line 1 of column 4) – and estimates of those who survived on the class of assistance from the previous month. The latter are calculated by applying the survival curve probabilities (column 2) to the previous months caseload (column 3). This procedure yields an estimate of those who carry over in the caseload from one month to the next (line 7) and those who do not (line 9). The outflows in line (9) are then distributed among program exits (leaving assistance altogether, shown in line 10) and program transfers (persons entering other classes of assistance in the following month, shown in line 11).

Simulations

In order to construct a system of estimates under two different scenarios, we adjust the components of the model for the presence or absence of welfare reform. In the OLS regression time-series models that were used to estimate inflows, transitions and

exits, this adjustment takes the form of either including the coefficients on the dummy variables representing the welfare reform time periods in the estimated levels, or excluding them. Similarly, we construct three separate survival curves. The first excludes any welfare reform effects, the second incorporates the effect of the first welfare reform period, the third incorporates the effect of the second welfare reform time period. The latter two are used to construct estimates which include the effects of welfare reform, applied differentially to the estimates for the October 1997-September 2000 period and from October 2000 onward.

Modeling Inflows

We model inflows into each class of assistance as a function of local economic and demographic conditions. For inflows to each class of assistance, we estimate:

$$Inflow_{it} = \beta_{0i} + \beta_{1i}Black_t + \beta_{2i}Hispanic_t + \beta_{3i}Births_t + \beta_{4i}Unemp_t + \beta_{5i}T1_t + \beta_{6i}T2_t + e_{1it}$$

Where i indexes each of the seven classes of assistance (F, M, W, FM, WF, WM, and WFM) and t represents the time index running from month 1 to month 129. The dependent variable is the number of individuals in the i^{th} class of assistance who did not receive any type of assistance in the prior month (month t-1). Independent variables include the size of the black and Hispanic populations and the number of births in Cuyahoga County, along with the county's monthly unemployment rate.[9] We add two separate dummy variables (T1 and T2) for the months during which welfare reform was in transition (October 1997 through September 2000) and during which welfare reform

[9] The population figures were obtained annually for the years 1992 through 2002 from estimates produced by the Census Bureau.

was fully implemented (October 2000 and after). The coefficients on these dummy variables should capture any changes in the inflows that were coincident with these two policy periods. Finally, e_1 is a random error term.

Because the inflow equations are likely to contain significant serial correlation, we include auto regressive terms in the equations and use Durbin Watson tests as a guide for the final model forms. Initially, we estimated models using OLS regression without autoregressive terms and found that Durbin Watson tests confirmed the presence of significant serial correlation. After some experimentation, we estimated the models with autoregressive terms representing lags for one and two months. In these models, Durbin Watson tests indicated that the introduction of the lagged autoregressive terms corrected for the problem of serial correlation.

Modeling Survival

As discussed above, we also use a survival analysis approach to estimate the probability that an individual remains enrolled in a particular assistance class. For this analysis, we construct panel data on all individual spells in each assistance classes that occurred between July 1992 and March 2003. Models estimating the statistical relationship between underlying variables and spell lengths are based on hazard functions. The hazard function h(t) expresses the probability of a spell *ending at* time t, *conditional upon* it not having ended prior to time t. The hazard function incorporating the notion of continuous time and is defined as:

$$h(t) = \lim \Pr \{t \leq T < t + \Delta t \mid T \geq t\} / \Delta t \qquad (\text{as } \Delta t \rightarrow 0)$$

The hazard function is closely functionally related to the survival function.[10]

We estimate the relationship between demographic variables (age, race, and sex), local conditions (the county unemployment rate) and time period (welfare reform period) and the length of time that elapses between the beginning and the ending of a spell in each of the assistance classes. The basic specification of the model is that the hazard rate for the j^{th} subject in the data is:

$$h_i(t) = h_0(t) \exp\{\beta_1 x_{i1} + \ldots + \beta_k x_{ik}\}$$

where t is the survival time for the i^{th} individual, x_j is an underlying characteristic, and β_k is the estimated coefficient on the k^{th} covariate. $h_0(t)$ is the baseline hazard rate. The covariates included in the model act as multiplicative shift factors to the baseline hazard function. Taking the ratio of the hazard rates for any two individuals i and j, yields a constant proportion:

$$h_i(t)/\, h_j(t) = \exp\{\alpha_1(x_{i1} - x_{j1}) + \ldots + \alpha_k\,(x_{ik} - x_{jk})\}$$

This ratio does not depend on the form of the baseline hazard function $h_0(t)$, which has been dropped out of the equation. We employ two modeling strategies: the Cox proportional hazards model, as well as a logistic regression approach. We found comparable results using both estimation techniques, but present the logistic regression results here because they provide for more computational convenience in the presence of time-varying covariates. Using logistic regression we are able to obtain the base survival curve for computational use in our model here, while this was not available using the proportional hazards routine (Proc PHREG in SAS). The model we estimated using logistic regression is:

[10] It can be shown that $h(t) = f(t)/S(t)$ where f(t) is the probability density function of the survival data.

$$\text{Log}\,[H_{ij}(t)/\,H_{0j}(t)] = \alpha_{0j} + \alpha_{1j}\text{Age}_i + \alpha_{2j}\text{Black}_i + \alpha_{3j}\text{Female}_i + \alpha_{4j}\text{Other Race}_i + \alpha_{5j}\text{Unemp}_t + \alpha_{6j}T1_t + \alpha_{7j}T2_t + e_{2ijt}$$

$H_{ij}(t)$ is the hazard rate for person i, in program j in month t, while $H_{0j}(t)$ is the baseline hazard for program j in month t. The independent variables subscripted with i are time-invariant characteristics of person i; variables Unemp, T1 and T2 are as defined in previous models and e_2 is a random error term.

Modeling Transfers and Exits

In order to model program transfers and exits we use a similar methodology to that described above for modeling inflows. However, here we construct additional explanatory variables from the individual level data, representing the average characteristics of all individuals in a particular assistance class in the month prior to exit or transition. That is, transfers out of a particular assistance class are be modeled as a function of the characteristics of individuals presently in that assistance class. If those characteristics change over time, transfer/exit behavior may change also. For transitions and exits out of each class of assistance, the models are:

$$\text{Exits}_{it} = \gamma_{0i} + \gamma_{1i}\text{Caseload}_{it} + \gamma_{2i}\text{Age}_{it} + \gamma_{3i}\text{Black}_{it} + \gamma_{4i}\text{Female}_{it} + \gamma_{5i}\text{Other Race}_{it} + \gamma_{6i}\text{Unemp}_t + \gamma_{7i}T1_t + \gamma_{8i}T2_t + e_{3it}$$

$$\text{Transfers}_{ijt} = \delta_{0i} + \delta_{1ij}\text{Caseload}_{it} + \delta_{2ij}\text{Age}_{it} + \delta_{3ij}\text{Black}_{it} + \delta_{4ij}\text{Female}_{it} + \delta_{5ij}\text{Other Race}_{it} + \delta_{6ij}\text{Unemp}_t + \delta_{7ij}T1_t + \delta_{8ij}T2_t + e_{4ijt}$$

Where i and j are indexes for each of the seven classes of assistance (F, M, W, FM, WF, WM, and WFM) and t represents the time index running from month 1 to month 129.

$Exits_{it}$ is defined as the number of individuals in the i^{th} class of assistance who exited from that class of assistance and did not receive any type of assistance in the subsequent month (month t+1). $Transfers_{ijt}$ is defined as the number of individuals in the i^{th} class of assistance during month t who transitioned to j^{th} class of assistance in the subsequent month. The variable $Caseload_{it}$ controls for the size of the existing caseload (the pool of possible exits or transfers). $Unemp_t$, $T1_t$, and $T2_t$ are defined as in the inflow equation. Finally the variables Age_{it}, $Black_{it}$, $Female_{it}$ and Other Race $_{it}$ represent the average age, percent black, percent female and percent other race of the caseload of assistance class i during month t. Finally, e_3 and e_4 are a random error terms.

Descriptive Results

To set the context for our study of program dynamics, we first examine the changes over time in the overall caseloads and their dynamics for all welfare, Food Stamps and medical assistance recipients as well as for the seven assistance classes that represent different combinations of assistance. In Figure 1, we show the adult caseloads over this time period for participation in Food Stamps, welfare and medical assistance (annual monthly caseload averages are also shown in Table 3). As in many locales during this same time period, all three program show significant declines that began early in the 1990s. The adult monthly welfare caseload has dropped steadily from an average of 45,877 in 1992 to only 7,624 in the first part of 2003. A significant portion of this decline occurred prior to the first implementation of welfare reform in Ohio in 1997 and prior to the first implementation of time limits in October 2000. There have been similarly dramatic drops in the use of both medical assistance and Food Stamps as well,

although enrollments in both of these have rebounded some since reaching lows in 1999 and 2000, respectively.

A somewhat more complex picture, emerges however, as we decompose these aggregate caseloads into their constituent parts. Annual averages of monthly caseloads of the seven separate assistance classes are shown in the remaining columns of Table 3 and monthly time series are displayed in Figure 2. Of the seven possible groupings that we define above, two are so small as to not be interesting: welfare and Food Stamps (WF), and welfare alone (W) each have monthly average caseloads of 50 or less in most months. Similarly, the welfare and medical assistance grouping (WM) is only of marginal interest, with a typical monthly caseload below 1,000. Among the remaining four assistance classes, two show relatively steep declines over most or all of this period -- welfare, Food Stamps and medical assistance (WFM), and Food Stamps only (F). In WFM, the decreases have continued through 2003, albeit at much slower rates in recent years. In Food Stamps only (F), there has been a small increase in caseloads since 2001. The remaining assistance classes -- Food Stamps and medical assistance (FM) and medical only (M) -- show considerable increases, particularly in recent years.[11]

From these disaggregated caseloads we can surmise a number of things. First, as might be expected, the significant decline in the aggregate welfare caseload is largely a result of drops in the coincident receipt of all three types of assistance -- WFM. Enrollment in welfare alone (W), and welfare and Food Stamps (WF) are trivial, and enrollment in welfare together with medical assistance (WM), while low, has been

[11] It is interesting to note that in the early part of this period there is some kind of clear program dependence going on between FM and F only. The caseloads for these two classes of assistance fluctuate in a clearly opposing pattern on a six-month cycle. Our experience with program dynamics suggests that this may reflect recertification requirements in medical assistance programs that cause clients to cycle between FM and F only on a regular basis.

relatively stable. Second, the aggregate enrollment in Food Stamps is the result of three countervailing forces: the WFM caseload -- which declined precipitously over the entire period; the Food Stamps only (F) caseload -- which declined dramatically between 1992 and 2001 and has since recovered slightly; and enrollment in Food Stamps together with medical assistance (FM) -- which has risen 61 percent since 1998. Thus, one can conclude that the overall decline in Food Stamp usage over this period does indeed have roots in declining welfare usage (WFM) as many have suspected. However, a decline in the usage of Food Stamps only (F) is an almost equal partner. The sum of these two effects has been mitigated by a sharp increase in the use of Food Stamps in conjunction with medical assistance (FM) in recent years.

Program Dynamics: Inflows, Transfers and Exits

Caseloads, of course, are the net outcome of a dynamic process. Each month individuals may enter or leave program assistance entirely, change the configuration of assistance they receive or simply receive the same type(s) of assistance that they did the previous month. We decompose caseloads here into these underlying components -- inflows, program transfers, and outflows. Inflows and outflows are conceptually simple. For the purposes of this discussion, we represent program transfers in a given month for a given assistance class as the net of all transfers into and out of that assistance class (where a positive net transfer represents a net inflow to that assistance class and a negative net transfer is a net outflow). For consistency, outflows are presented as negative numbers. In the appendix, Figures A-1 through A-7 display the time series components of program dynamics for each of the seven classes of assistance.

In Figures 3, 4 and 5, we examine these flows in even more detail for three classes of assistance of particular interest. In each of these figures, for the relevant program, we display the inflows, outflows and the net transitions with each other class of assistance.[12] Figure 3 shows the underpinnings of the dramatic drop in WFM enrollments over this decade. As we might have expected, beginning around 1997 there is a decline in inflows to WFM; outflows also begin to decline around the same time. Net transfers consistently show a net outflow from WFM to other programs. Interestingly, the magnitude of these net transfers begins increasing in mid-1994 and they are dominated by net transfers from WFM to WM and, as might be expected, to FM. The increase in net transfers from WFM to WM is particularly interesting, as this represents the loss of Food Stamp benefits to individuals who previously received all three forms of assistance. The transfers from WFM to FM are what we might have typically expected from welfare reform -- the greater use of transitional medical assistance and Food Stamps for individuals who are no longer receiving cash assistance.

Next we examine the same kind of detail for the assistance class FM. In Figure 4, we see that the rise in program enrollments since 1999 seems to be largely attributable to rising inflows, while outflows and net transitions remain relatively steady. This is consistent with the implementation of a TANF diversion program in 1999, in which new potential TANF recipients were diverted to receiving Food Stamps and medical assistance only. Net transitions involving FM are variable, but generally negative. They are dominated by net outflows to medical only (M) and net inflows from WFM, both of which increase some in magnitude beginning in 1996.

[12] To improve visual clarity, we have deleted those net transitions that are stable and very close to zero.

Of final interest in understanding total Food Stamp enrollments is Figure 5, which shows the underlying program dynamics of Food Stamp only (F) enrollments. The sharp declines in this assistance class that became apparent in mid-1995 are a result of program outflows consistently exceeding program inflows; this situation is not reversed until early 2001 when total program enrollment begins to rise again. Transitions to or from other classes of assistance play little role in determining the caseload of Food Stamp only enrollments. Net transitions with each of the other programs are close to zero.

Model Results

Table 4 presents the means of the independent variables included in the various models estimated here for each of the seven classes of assistance. In addition, Figure 6 charts the monthly unemployment rate for Cuyahoga County from July 1992 to April 2003. We have no particular prior expectations for the coefficients on the demographic variables, taking these to be statistical controls only. We are more interested in the coefficients representing the two time periods associated with welfare reform; we also have some theoretical priors about the relationship between program flows and economic conditions (represented here by the unemployment rate).

Inflow Models. In the equations modeling inflows into assistance (Table 5), the coefficients representing the two welfare reform periods are statistically significant in only two of the equations. In the case of the WFM assistance class, the coefficients on both of the time periods are negative and significant, and the coefficient for the second time period (October 2000 onward) is twice the size of that for the first time period (October 1997 through September 2000). The opposite holds with respect to the M only assistance class. In this case, inflows rose during the welfare reform periods, with the

effect in the second period again being far greater than the first. These results are consistent with the view that welfare reform had a large impact on inflows into the traditional use of cash assistance and accompanying programs, and that associated reforms also encouraged the use of other supports such as Medicaid in the absence of cash assistance. The unemployment rate did not have a statistically significant effect in any of the inflow equations.

Hazard Models. We also estimate the relationship between our independent variables and the hazard of leaving a particular class of assistance. The estimated model coefficients equations are reported in Table 6. Each model includes several demographic variables (age, race, and gender) as statistical controls, and the monthly unemployment rate in Cuyahoga County is included to measure local labor market conditions. The estimated coefficient on the unemployment rate is negative and statistically significant for all five of the seven classes of assistance with significant enrollments (WFM, WM, FM, F, and M). This is as expected – higher unemployment rates are associated with lower rate of leaving (or a higher rate of remaining in) a particular class of assistance.

We also find that the hazard of leaving the assistance class is higher during the welfare reform transitional period for five of the seven groups (WFM, WM, W, F, and M). Generally, the policy effects strengthen as time goes on. For four of these classes of assistance (WFM, WM, W, and F) the estimated model coefficients associated with the full implementation of welfare reform (post-October 2000), are positive, statistically significant and larger than the comparable coefficient for the transitional phase. In the case of medical assistance only (M), we find mixed results. Specifically, we find that the transitional phase was coincident with a rising hazard, while a larger (in absolute value)

decrease in the hazard was associated with the post-October 2000 period. Finally, for FM class of assistance, we find negative and statistically significant effects for both time periods. That is, during the post-October 1997 time period, we find a lower hazard and the magnitude of the effect (in absolute value) increases in the post-October 2000 time period.

Figure 7 displays the magnitude of the effect of welfare reform on the estimated survival functions derived from the hazard models for four selected classes of assistance (WFM, FM, and F). [13,14] It is clear from the three panels of Figure 7, that the effect of welfare reform was to reduce survival (or increase the hazard of outflow) for WFM. A similar result holds in the Food Stamp only (F) class of assistance; however the magnitude of the effect is much smaller. The opposite effect holds true for the FM class of assistance.

Transitions and Exits. The coefficients from the equations explaining program exits and transitions are shown in Table 7. Each of the panels displays the coefficients relating to flows *out* of one assistance class. The first column of each panel relates to exits (flows out of this assistance class to no assistance) and the remaining columns relate to transitions to other classes of assistance.[15]

[13] Together with assistance class WF, these are the groupings that account for all Food Stamp enrollments. Results for assistance class WF are not shown here, as the enrollments are too small to be of either statistical or policy interest.

[14] The hazard model includes binary variables for each month of a given spell of time in a particular class of assistance. The estimated model coefficients can be used to calculate, for various spell lengths, the instantaneous probability of non-survival or outflow conditional on having survived in a particular class of assistance for a given spell length (also known as the hazard rate). These hazard rates can be used to generate the implied survival function, which depicts the probability of surviving in a particular class of assistance for a given spell length.

[15] These are not net transitions as discussed previously, but one-way transitions from one class of assistance to another. They are positive numbers representing the absolute number of individuals who made that particular program shift.

Among the exit and transition equations, we again treat the demographic variables as controls. In the exit equations (in the first column of each panel), we would generally expect negative coefficients on the unemployment rate: as unemployment drops and the economy improves, we expect exits from all programs to increase. This is the case in each of the exit equations; in 4 out of the 7 equations the negative estimated coefficient is also statistically significant. With regard to the relationship between unemployment and program transfers, our expectations are generally less clear. However, we might also expect a negative relationship between the unemployment rate and transitions out of assistance classes that include cash assistance to those that do not. This is the case for assistance class WFM, where the unemployment rate is negatively related to transitions from WFM to FM, M and F (the first two of these being statistically significant).

Our expectations for other changes in exits and transitions during the welfare reform period are less clear. Where we might expect higher exits from cash assistance programs during the welfare reform period, we do not this. In some assistance classes (WM, W and F) we estimate statistically significant *decreases* in exits during both time periods. Similarly, we do not have clear priors for changes in program transitions during the welfare reform period, and in fact we see a range of results, including both statistically significant positive and negative coefficients.

Estimating Effects of Welfare Reform on Food Stamp Dynamics

As described in the methodology section above, the estimated models can be used to derive a projected Food Stamp caseload under two scenarios – with and without welfare reform. In addition, the projected caseloads under each scenario can be further

decomposed into their constitute components: inflows, transitions and exits. The impact of the two scenarios on the total Food Stamp caseload is summarized in Figure 8, along with the actual Food Stamp caseload. Based on our analysis, the *absence* of welfare reform would have resulted in a higher total Food Stamp caseload during the time period from October 1997 and continuing through end of 2001. After January 2002, the total caseload in the absence of welfare reform would have been smaller than in the scenario that includes the affects of welfare reform.

To examine the sources of the differences between the two scenarios, we examined each of the components (inflows, outflows, and net transitions among programs) separately. Figure 9 illustrates how each of the three types of components contributed to differences in the total Food Stamp caseload under the two scenarios. From October 1997 to October 2000, inflows (into all classes of assistance that include Food Stamps) were projected to be less under the welfare reform scenario than the no-welfare reform scenario. Of course, lower inflows would result in lower total caseloads. After October 2000, these differences largely disappeared.

The opposite occurred with respect to exits. During the implementation phase, our projections show that there are only very small differences in exits under the two scenarios. However, beginning in October 2000, we find that exits under the welfare reform scenario are smaller (in absolute value) than under the no welfare reform scenario. This would tend to result in higher total caseloads under the welfare reform scenario.

In the case of net transitions, we generally see a pattern of smaller (in absolute value) net transitions under the welfare reform scenario, although this effect starts out relatively small and then grows in magnitude over the period studied. Decreases in net

transitions (in absolute value) under welfare reform would tend to contribute to higher total caseloads.

In summary, there were two distinct phases of the effect of welfare reform on Food Stamp caseloads. From October 1997 through the end of 2001, the welfare reform scenario projected lower total caseloads. The pattern reversed in 2002 and 2003 – welfare reform was associated with higher total caseloads. These differences in the total projected caseloads associated with each scenario were driven by the underlying dynamics. During the implementation phase of welfare reform (October 1997 through October 2000), two factors stand out as the primary drivers of differences in the scenarios. Lower inflows contributed to lower total caseloads under the welfare reform scenario. However, this was partially offset by smaller net transitions (in absolute value) which contributed to higher total caseloads under the welfare reform scenario. During this phase, exits were similar under both scenarios. During the full implementation phase of welfare reform (post October 2000), two factors again stand out as the primary drivers of differences in the scenarios. Again smaller net transitions (in absolute value) contributed to higher total caseloads under the welfare reform scenario. This effect was reinforced by smaller exits (in absolute value) which also contributed to higher total caseloads under the welfare reform scenario. During the post-October 2000 phase, inflows were similar under both scenarios.

Analysis by Class of Assistance. The discussion above indicates that three factors contributed to differences in the two scenarios for the total Food Stamp caseload: (1) lower inflows under the welfare reform scenario in the implementation phase; (2) smaller (in absolute value) net transitions under the welfare reform scenario throughout the post

October 1997 time period; and (3) smaller (in absolute value) exits under the welfare reform scenario. In this section, we examine these factors in detail to determine which classes of assistance most affected the overall result.

Figure 10 displays inflows for the four classes of assistance that together comprise the total Food Stamp caseload: WFM, WF, FM, and F. Inflows were lower under the welfare reform scenario in two of the four classes of assistance: WFM and F. In the post October 2000 period, these effects persist but are roughly offset by higher inflows in the FM class of assistance.

Figure 11 displays exits by class of assistance under the two scenarios. It is clear from Figure 11, that the primary driver of differences in exits under the two scenarios is the lower level (in absolute value) of exits for the FM class of assistance in the post-October 2000 time period under the welfare reform scenario.

As discussed previously, for the overall Food Stamp caseload we estimate that net transitions with welfare reform were somewhat less negative then those without welfare reform (contributing to a higher Food Stamp caseload under welfare reform than otherwise would have been expected). In Figure 12 we show these net transitions disaggregated into the constituent classes of assistance. This result derives largely from the same pattern that is exhibited in assistance class F only -- net transitions contributing to a higher caseload under the welfare reform scenario than otherwise. In the period following mid-2001, this is reinforced by the appearance of the same pattern in WFM as well.

Table 8 summarizes the difference between the welfare reform scenario and the no-welfare reform scenario in total and for each of the various components classes of

assistance. Because the results in Table 8 represent monthly averages over the time period October 1997 to March 2003, the variations over time evident in Figures 9 through 12 are masked. However, Table 8 is a useful summary in that it provides a sense of the scale of the various effects.

Conclusions and Future Research

Food Stamp recipiency changed dramatically in the last decade in Cuyahoga County, Ohio. The disaggregations we are able to make here allow us to document a variety of changes in program usage and how they are related to changes in underlying correlates and causes. Using two alternate caseload simulation scenarios, we estimate that the periods of welfare reform transition and implementation were largely coincident with declines in the Food Stamp caseload that were not attributable to underlying changes in demographics and economic conditions. It is not until January 2002 and after, that we estimate that overall Food Stamp usage was higher under the influence of welfare reform policies than it would have been without those policies. It should be noted that while all but the last few years covered here where a period of significant economic growth, our control for the county unemployment rate would have captured any declines in Food Stamp usage that were associated with a rising economic tide.[16]

The era of welfare reform appears to have initially dampened Food Stamp receipt through a number of avenues: in the first period of welfare reform transition, reform appears to be associated with a sharp decrease in inflows into WFM and into F alone. The first is likely to have been due to increased restrictions on welfare receipt, and while

[16] This would be the case unless there was a period of extremely tight labor markets in which wage increases (which might have raised working-poor families above Food Stamp eligibility levels) were not paralleled by dropping unemployment rates.

we see a concomitant increase in enrollments in medical assistance only (M), we do not see a corresponding increase in inflows into medical assistance *and* Food Stamps (FM). The drop in Food Stamp only cases is likely to be partly related to changing eligibility for able-bodied adults without dependents (ABAWDs), a factor that we will look at in future research.

In the second welfare reform period, during the full implementation from 2000 onward, we saw a substantial increase in inflows into FM as well as a decrease in exits from that category, consistent with the efforts to 'divert' applicants for cash assistance to non-cash programs. During the same period, we also saw a decrease in the net transitions out of WFM to other combinations of assistance. Note that these are all changes that occurred during these periods in addition to any changes attributable to changes in underlying demographics and economic conditions.

The disaggregation afforded by this data also allows us to make a number of other observations about the nature of Food Stamp usage and caseload dynamics. First, Food Stamps only (F) is a relatively 'stand alone' program -- transitions to and from other programs are minor.[17] Second, an important change we notice here is a shift in the relationship between WFM and WM. During the post-welfare reform period, fewer individuals added Food Stamps assistance when they were already receiving cash and medical assistance. We suspect that this change (along with an increase in inflows into WM) could be related to the 'doubling-up' phenomena. Some practitioners and researchers have suspected that as welfare work and job search requirements increased and the receipt of assistance become more uncertain, that recipients increasingly choose

[17] This is true after 1995. Prior to 1995, there were ongoing systematic transfers between F and FM which we suspect had its origins in administrative or record-keeping processes.

to share households with friends or relatives with other sources of income. In doing so, they retained their eligibility for cash and medical assistance but not for Food Stamps.

Future research should verify that such effects are general and not just particular to Cleveland. We also believe that a better understanding of the "micro" causes of each particular flow can lead to superior program design as well as better forecasting of changes in the level and demographic composition of the caseload that may result from any particular policy change. Finally, future research should focus on the how the well-being of families is affected by enrollment in various classes of assistance and how various transitions might affect such well being.

References

Bania, Neil, *Cuyahoga County TANF/ADC Food Stamp & Medicaid Database Report, An Empirical Comparison of the Income Maintenance Files and the Case and Individual Extract Files*, Center on Urban Poverty and Social Change, Case Western Reserve University, June, 2001.

Bania, Neil, Leete, Laura and Claudia Coulton, *Public Housing, Public Transportation, and the Welfare to Work Transition*, Center on Urban Poverty and Social Change, Case Western Reserve University, Final Report to the U.S. Department of Housing and Urban Development, Office of the Assistant Secretary for Policy Development and Research, Grant Number H-21166RG, November 2001.

Bartik, Timothy J. "Displacement and Wage Effects of Welfare Reform" in *Finding Jobs: Work and Welfare Reform*, edited by David Card and Rebecca M. Blank, New York: Russell Sage Foundation, 2000.

Besharov, Douglas J. *The Welfare Balloon: Squeeze Hard On One Side And The Other Side Will Just Expand*. Welfare Reform Academy, University of Maryland, June 1995.

Brock, Thomas, Coulton, Claudia, London, Andrew, Polit, Denise, Richburg-Hayes, Lashawn, Scott, Ellen and Nandita Verma, "Welfare Reform in Cleveland: Implementation, Effects, and Experiences of Poor Families and Neighborhoods," MDRC, September 2002.

Cancian, M., Haveman, R., Kaplan, T., Meyer, D. & Wolfe, B., "Work, Earnings And Well-Being After Welfare," in *Economic Conditions and Welfare Reform*, S. H. Danziger, editor, Kalamazoo MI. W.E. Upjohn Institute for Employment Research, 1999.

Coulton, C. J., Pasqualone, C., Bania, N., Martin, T., Lalich, N., & Newburn M., *How are they managing? A six month retrospective of Cuyahoga County families leaving welfare in fourth quarter of 1998 and first quarter of 1999*. Cleveland, OH: Center on Urban Poverty and Social Change, Mandel School of Applied Social Sciences, Case Western Reserve University, 2001a.

Coulton, C. J., Pasqualone, C., Bania, N., Martin, T., & Lalich, N., *Continuation And Longitudinal Retention Of Food Stamps And Medicaid Benefits Among Welfare Leavers An analysis of Cuyahoga County families who left welfare in fourth quarter, 1998 through third quarter, 2000*, Center on Urban Poverty and Social Change, Case Western Reserve University, 2001b.

Food Research and Action Center, *Food Stamp Participation Rises from June 2000 to June 2001: Despite Increased in Last Year, Caseload Drops by 7.7 Million from June*

1996 to June 2001, June 2001, Newsletter (cited on www.frac.org/html/news/fsp/01une.html).

Harris, K. M. "Life After Welfare: Women, Work, And Repeat Dependency," *American Sociological Review*, 61, 407-426, 1996.

Leete, Laura and Neil Bania, "The Impact of Welfare Reform on Local Area Labor Markets", *The Journal of Policy Analysis and Management*, Vol. 18, No. 1., 1999.

Leete, Laura and Bruce Gates, *Forecasting Methodologies for Oregon's Medical Assistance Program Caseloads*, Willamette University Public Policy Research Center, with Bruce Gates, April 2001.

Mishel, Lawrence and J. Schmitt, *Cutting Wages by Cutting Welfare: The Impact of Reform on the Low-Wage Labor Market*. Washington DC: Economic Policy Institute, 1995.

Oregon Center of Public Policy, Budgetary and Spending Implications of a food stamp outreach program, reported prepared by ECONorthwest, Portland, Oregon, undated.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, "Status of Research on the Outcomes of Welfare Reform", Report to the Congressional Appropriations Committees, (http://aspe.hhs.gov/hsp/welf-ref-outcomes00/index.htm), December 2000.

Zedlewski, Shelia R. and Sarah Brauner, *Declines in Food Stamp and Welfare Participation: Is there a Connection?* The Urban Institute Discussion Paper 99-13, October 1999.

Figure 1. Total Adult Caseload Counts
(F-all Food Stamp recipients, W-all cash assitance recipients,
M-all medical assistance recipients)

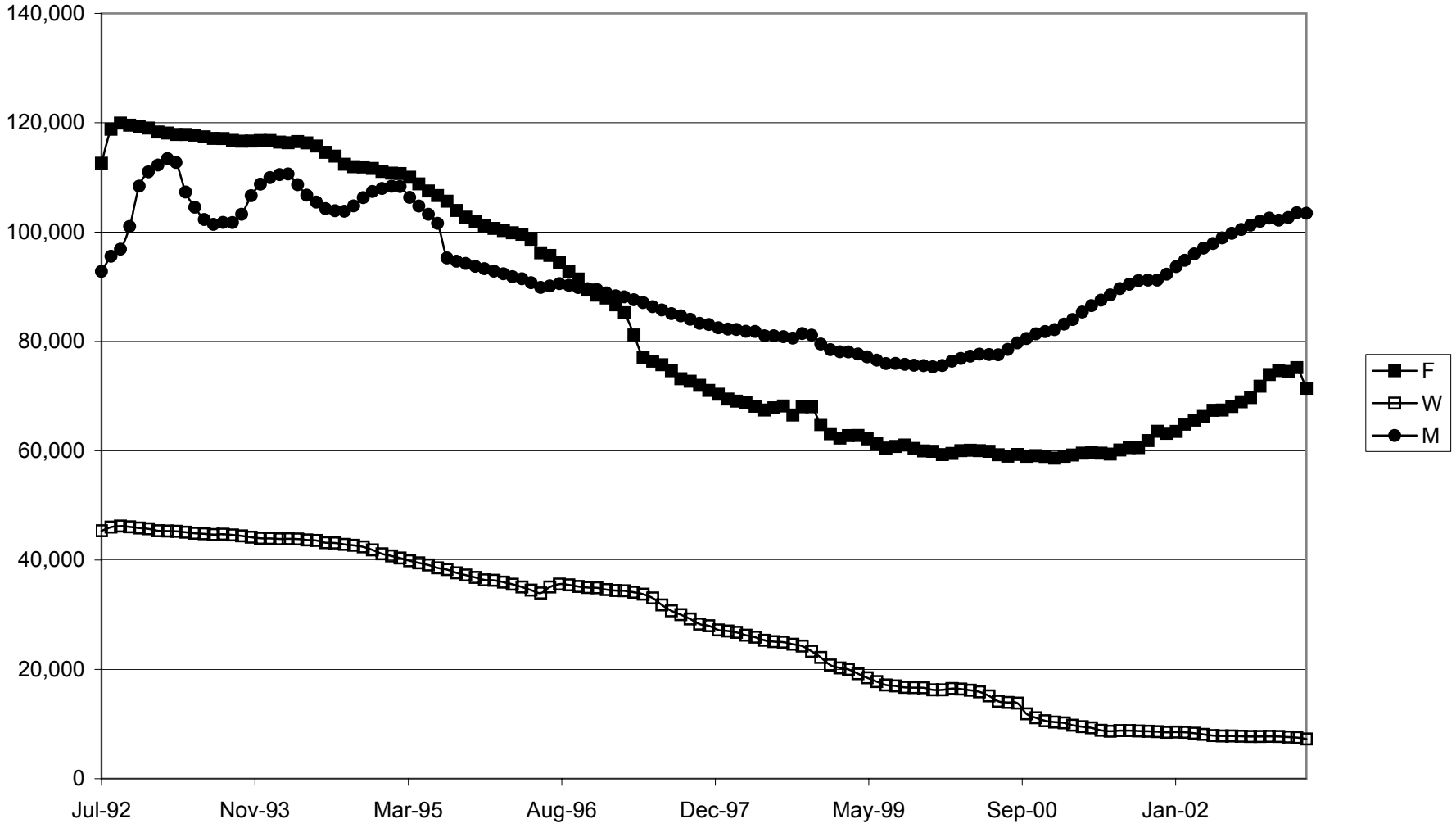


Figure 2. Adult Caseload Counts for Classes of Assistance (Adults)

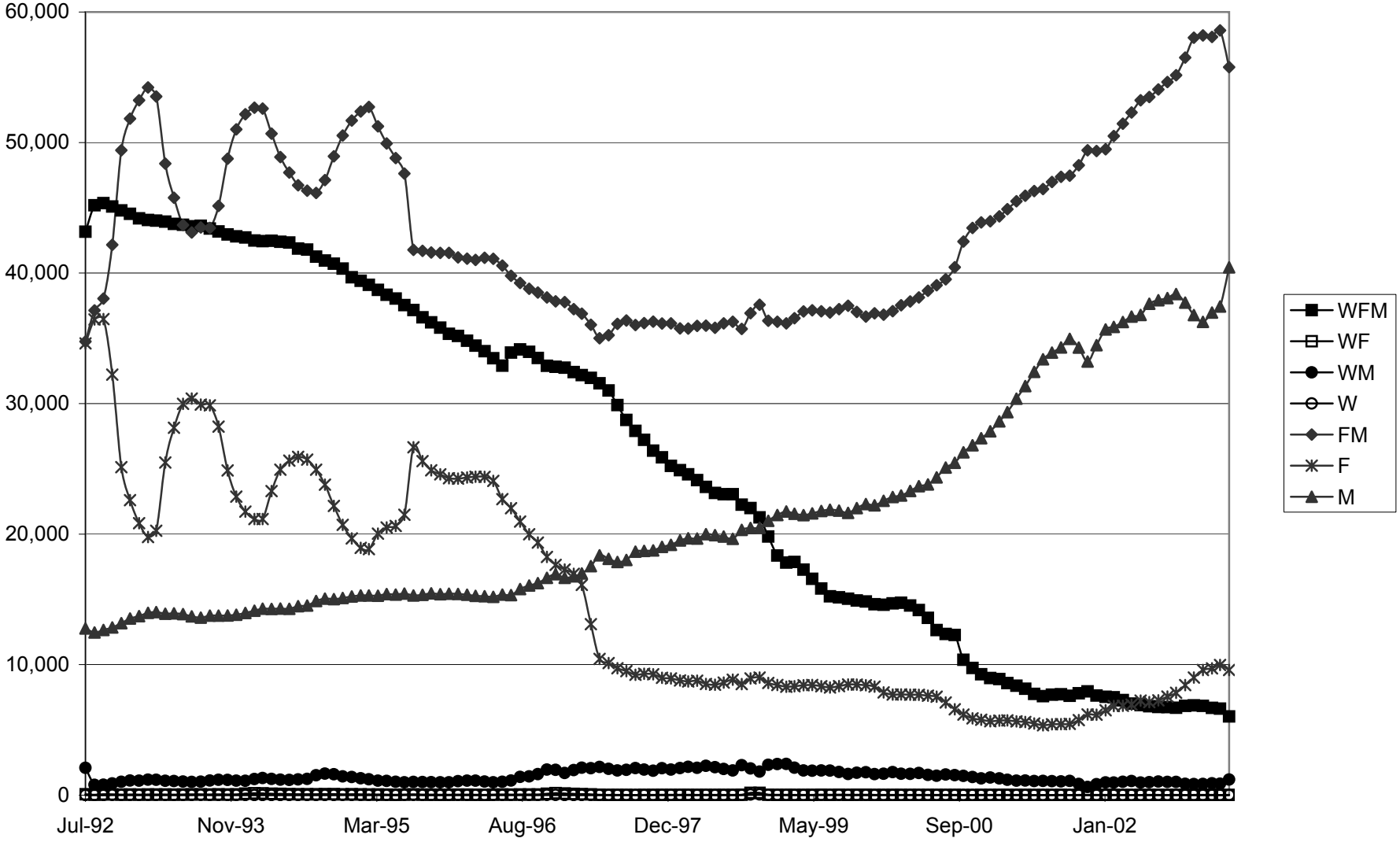


Figure 3. WFM Inflows, Exits and Net Transitions to Other Classes of Assistance (12 month moving average)

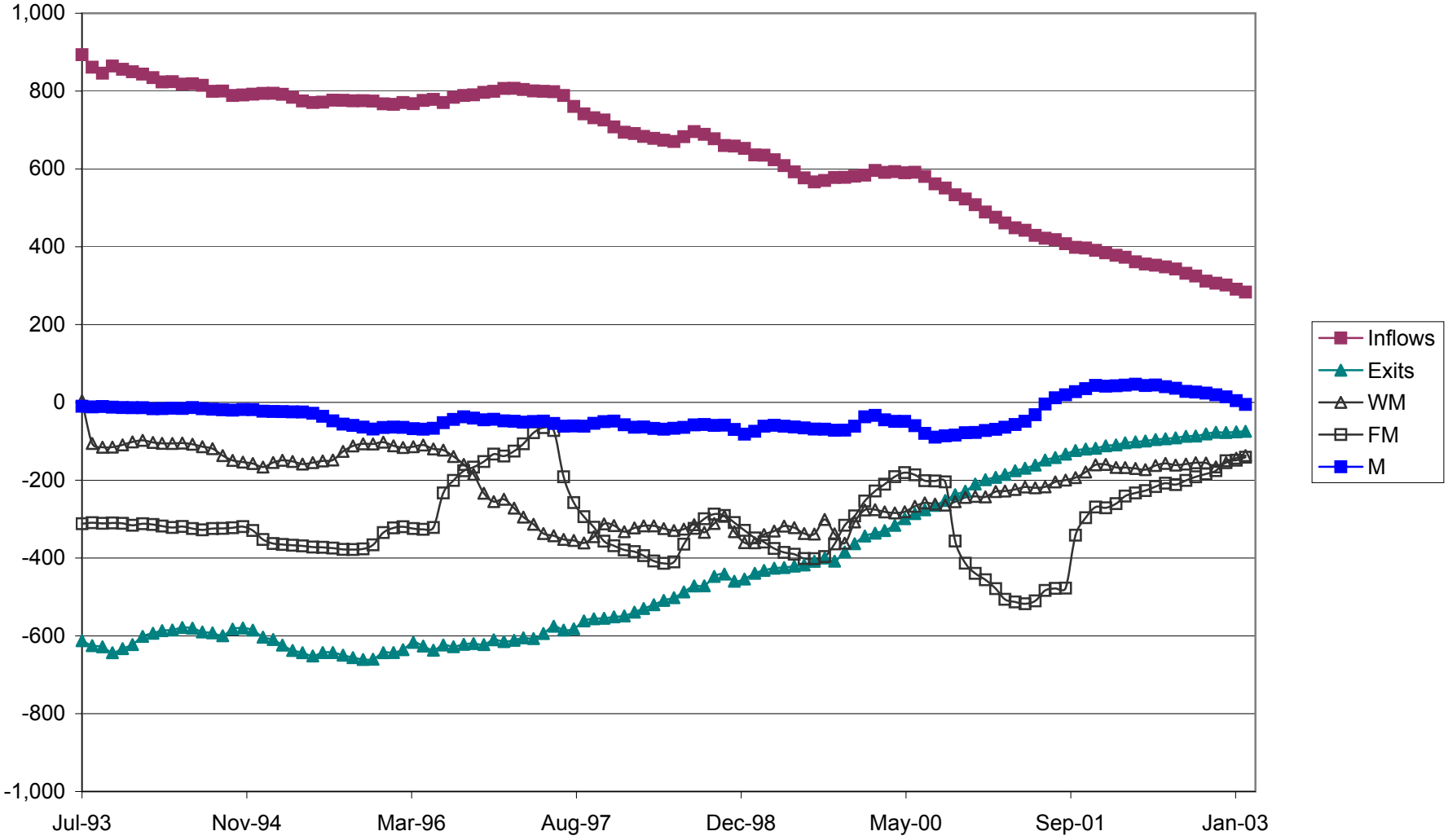


Figure 4. FM Inflows, Exits and Net Transitions to Other Classes of Assistance (12 month moving average)

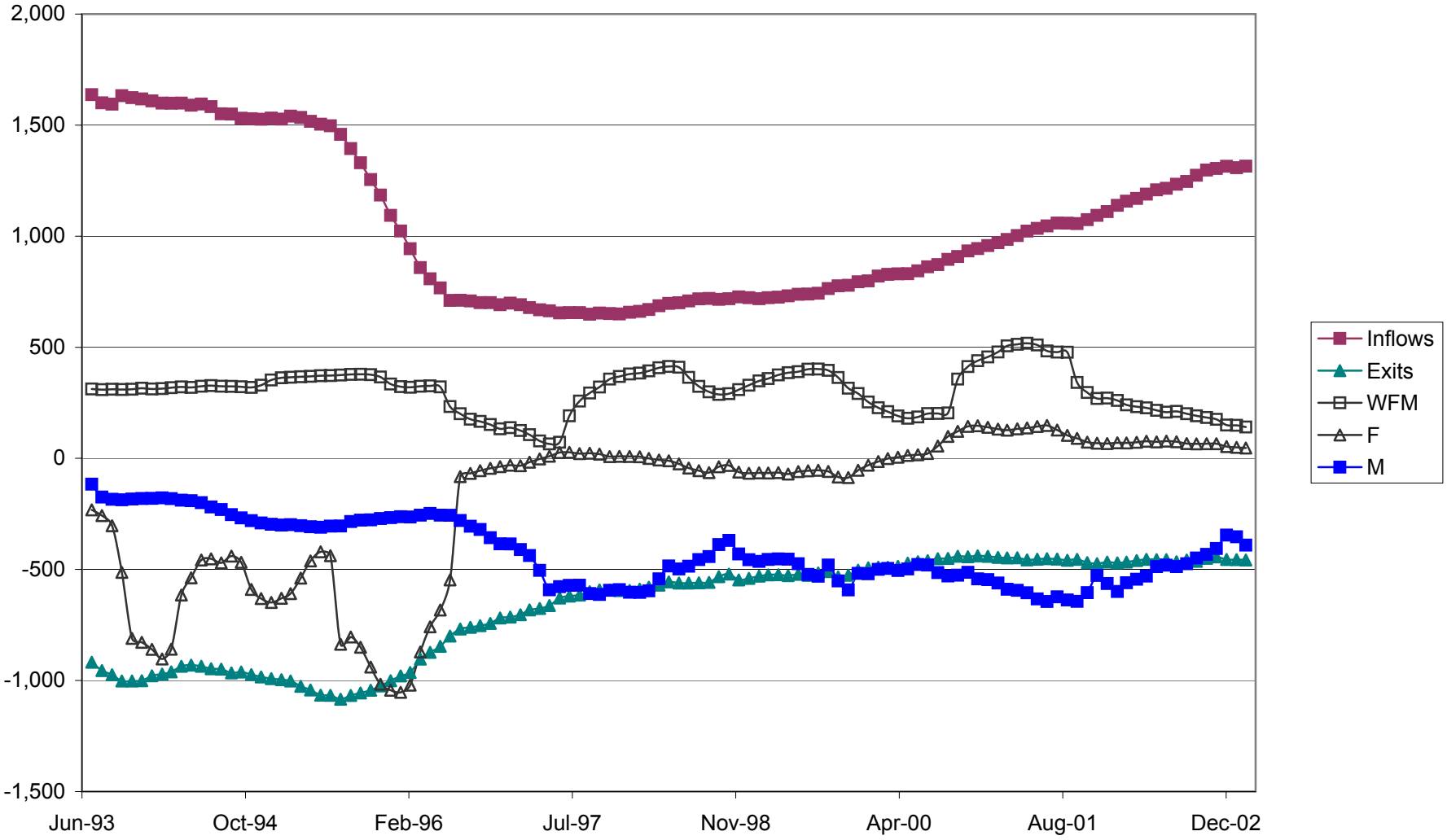


Figure 5. F Inflows, Exits and Net Transitions to Other Classes of Assistance (12 month moving average)

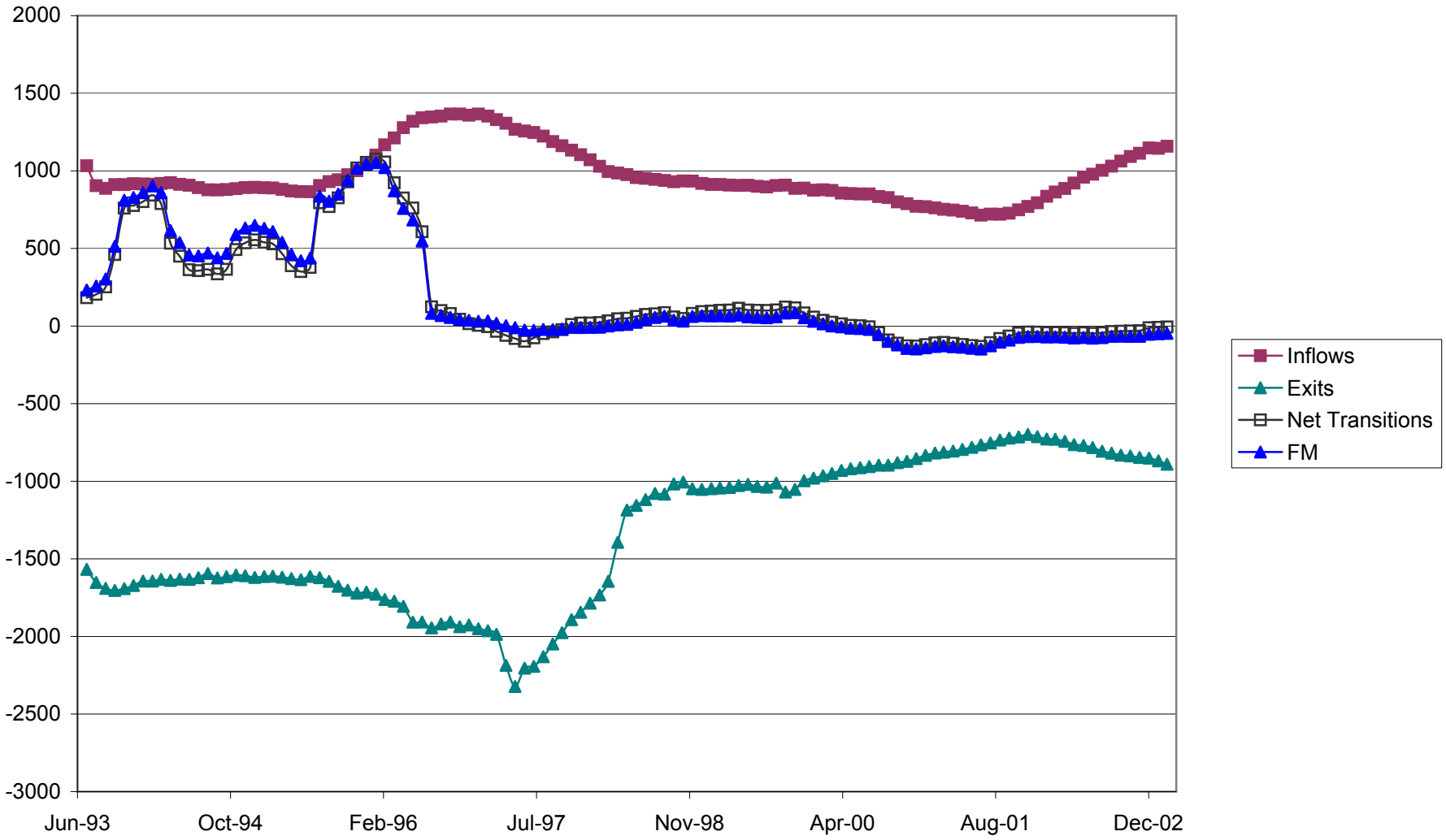


Figure 6. Unemployment Rate, Cuyahoga County, July 1992 through April 2003

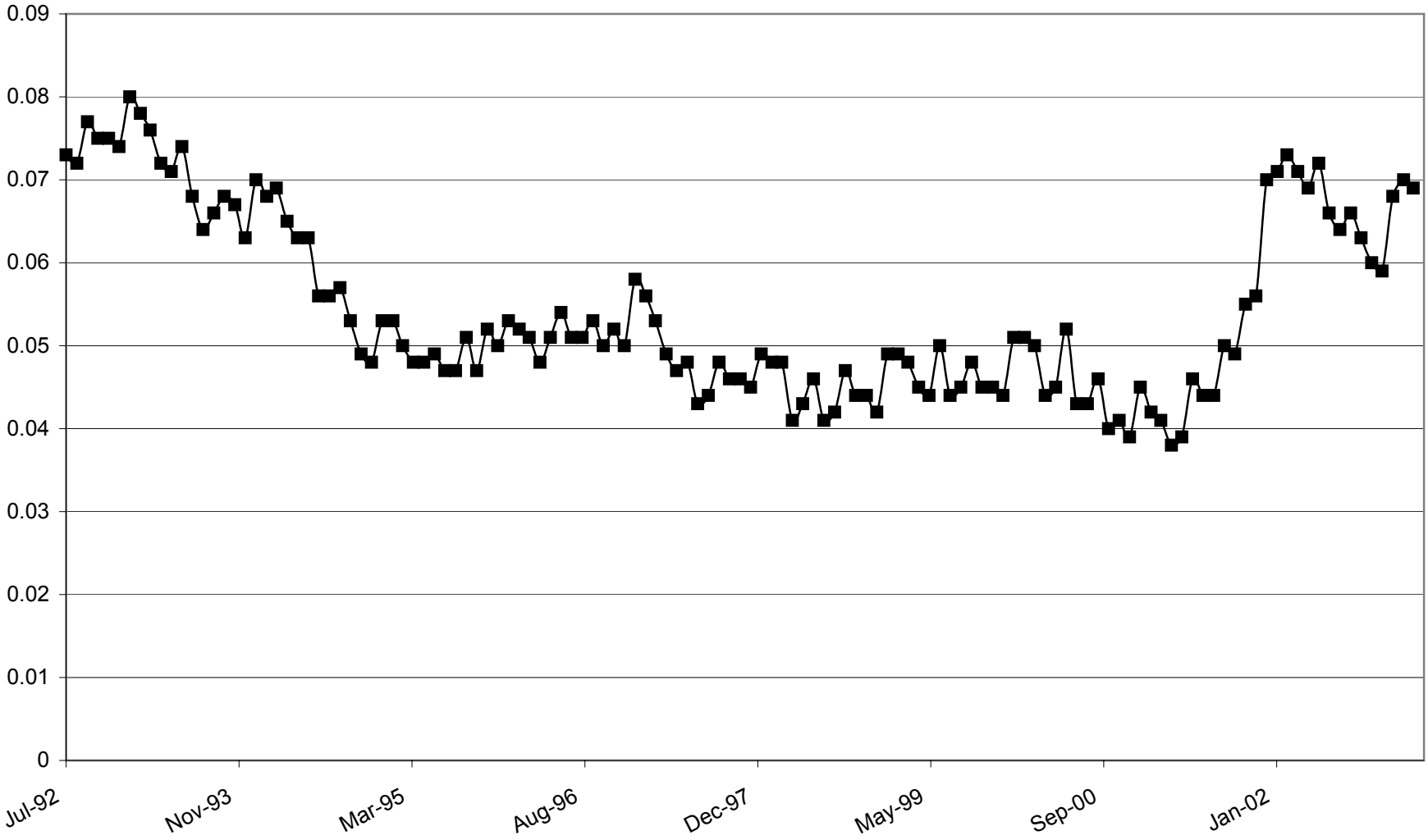


Figure 7. Survival Curves Under Three Scenarios, by Assistance Class for Those Including Food Stamps
Cuyahoga County, Ohio, July 1992 through March 2003

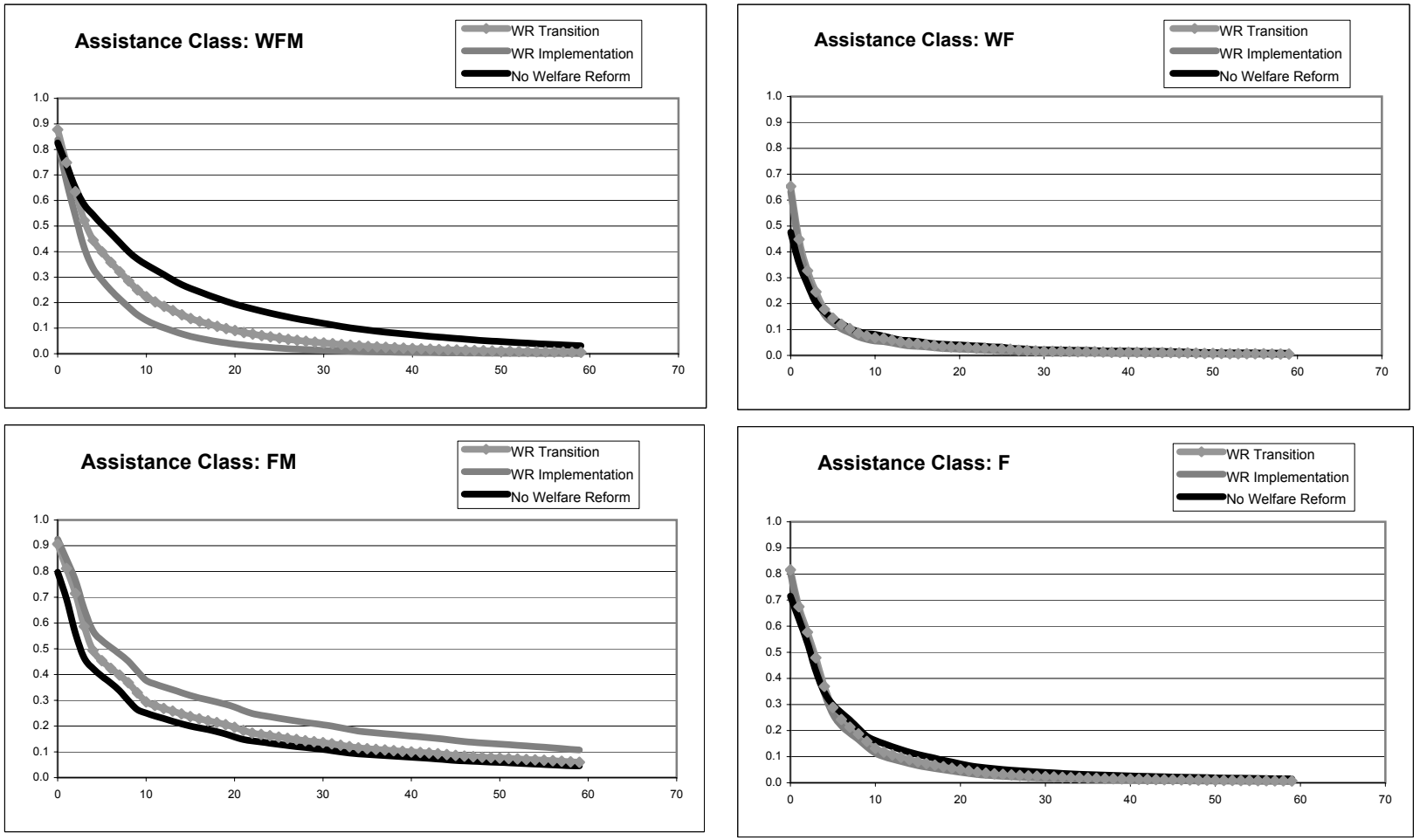


Figure 8. Total Caseload in All Assistance Classes including Food Stamps (WFM, WF, FM, and F)
Actual and Estimated, with and without Welfare Reform
Cuyahoga County, Ohio, July 1992 through March 2003

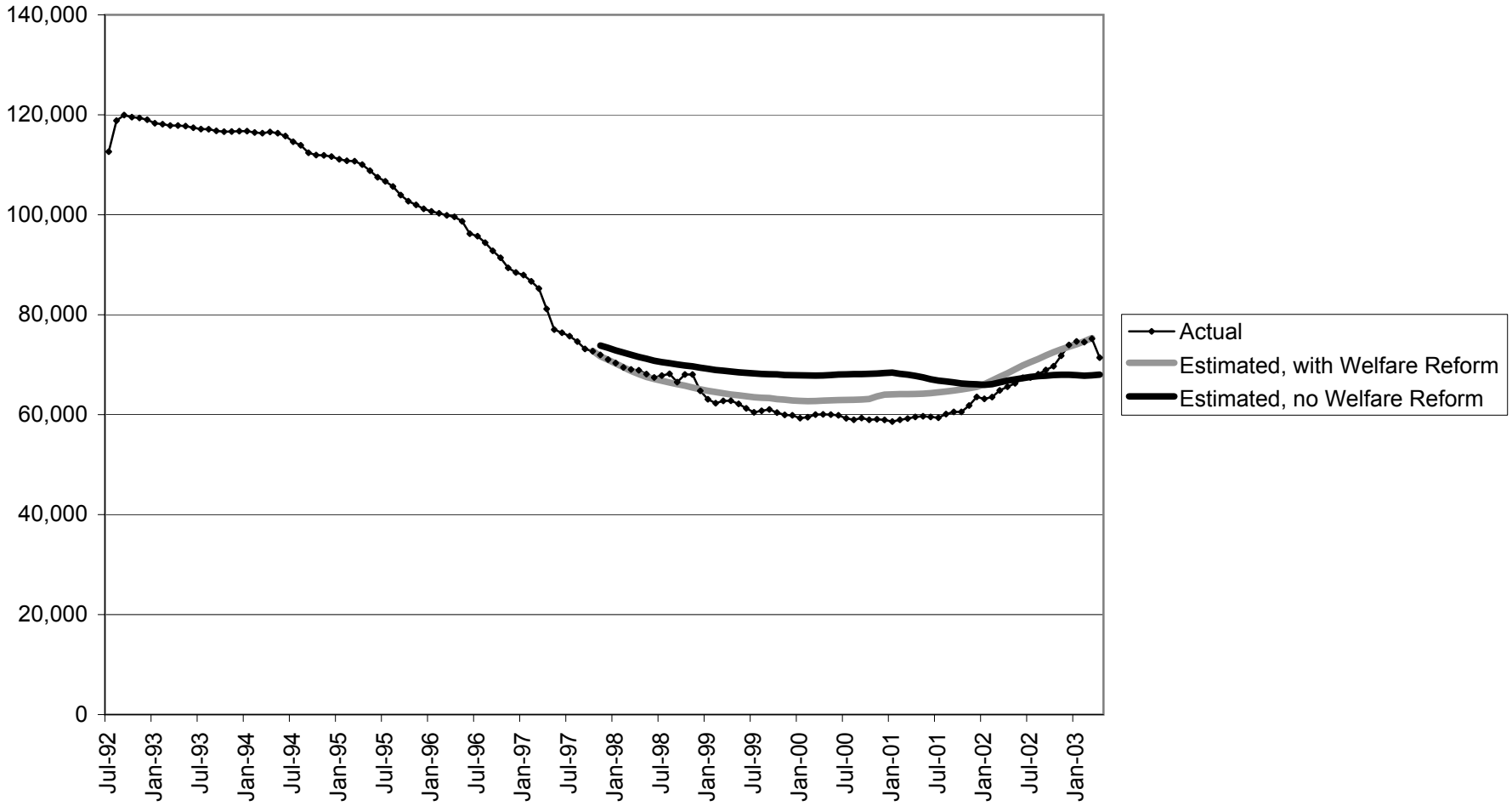


Figure 9. Caseload Components for Assistance Classes including Food Stamps (WFM, WF, FM, and F) Estimated, with and without Welfare Reform Cuyahoga County, Ohio, October 1997 through March 2003

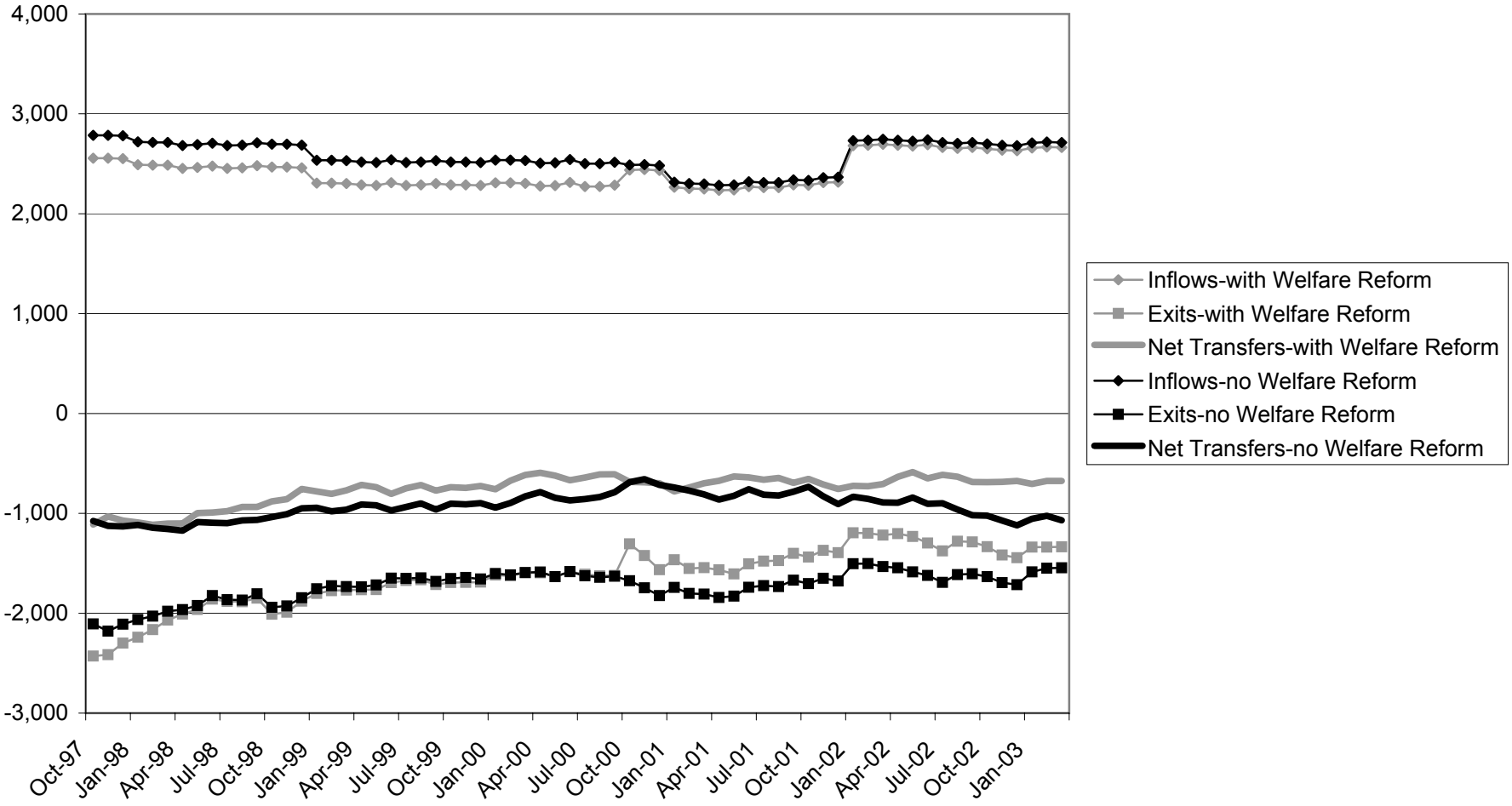
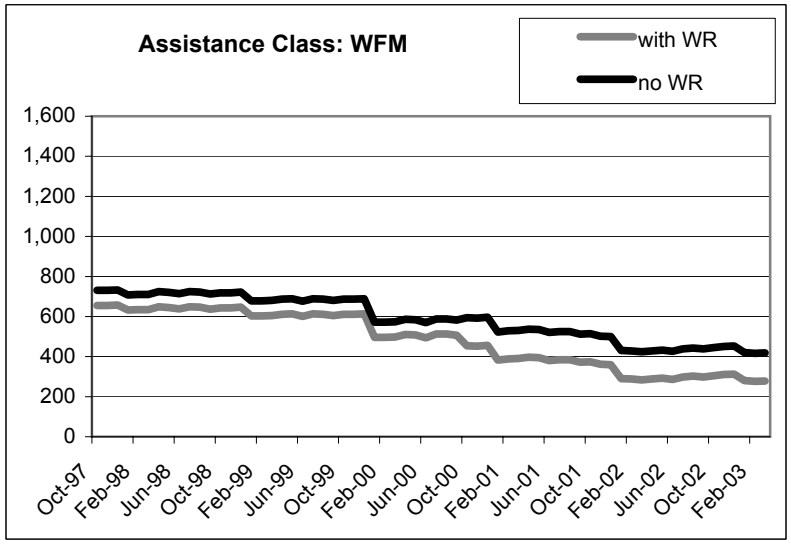
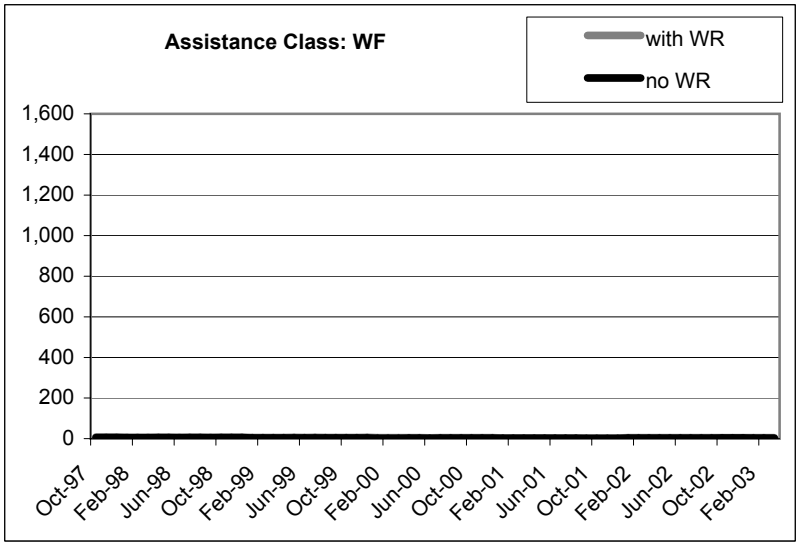
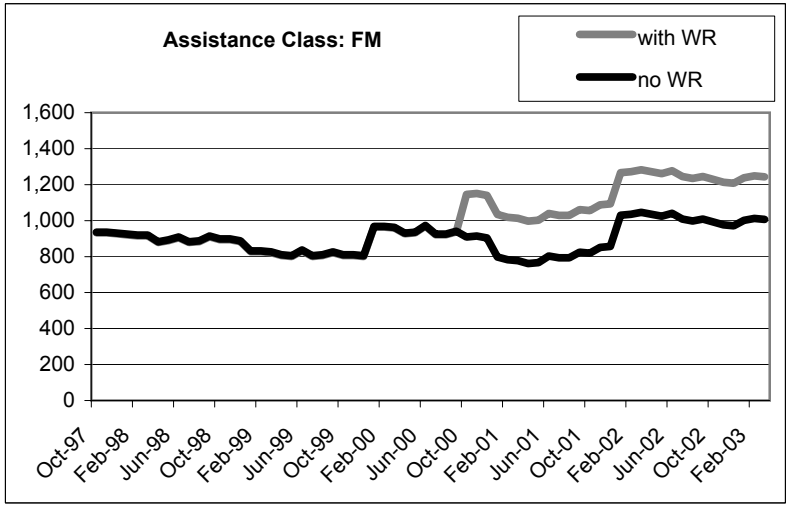


Figure 10. Estimated Inflows with and without Welfare Reform by Assistance Class (for those including Food Stamps), October 1997 through March 2003 Cuyahoga County, Ohio







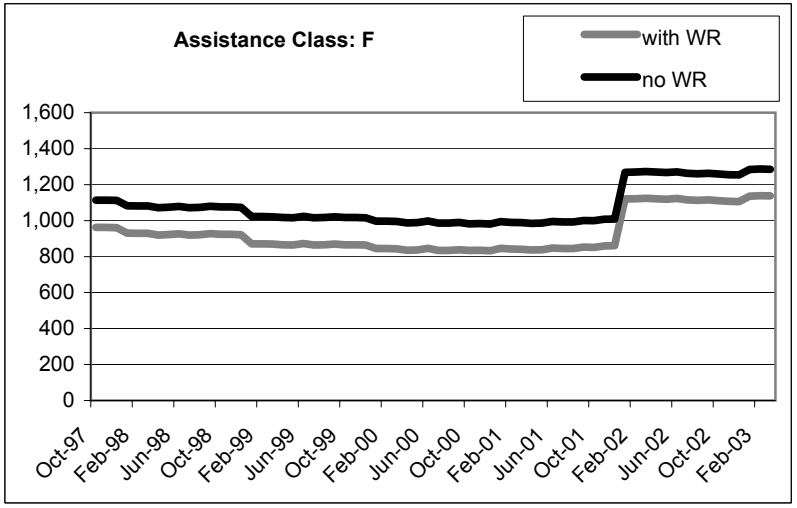
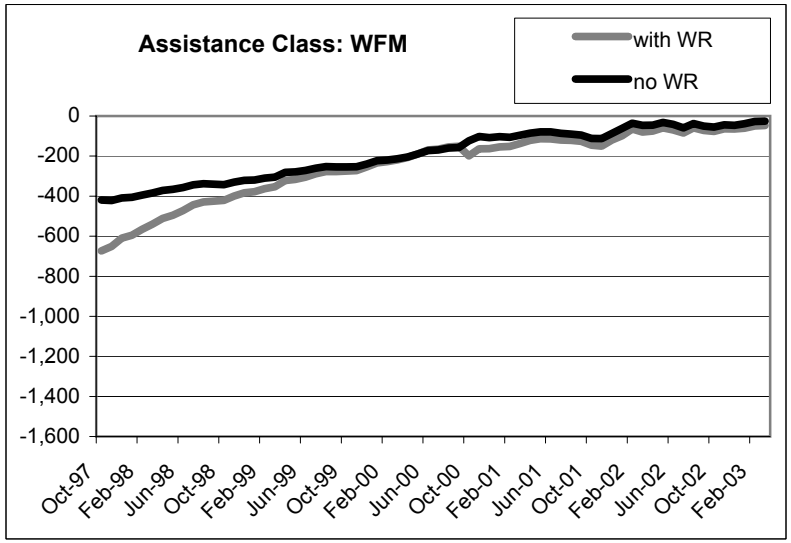
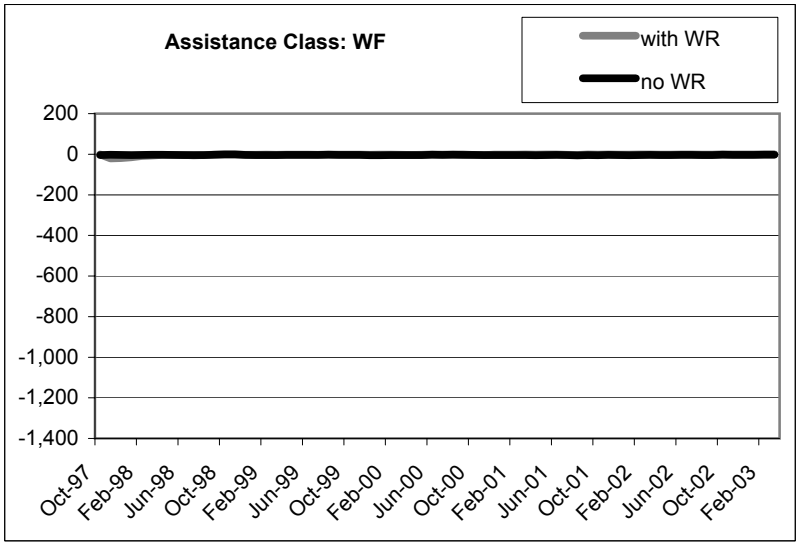
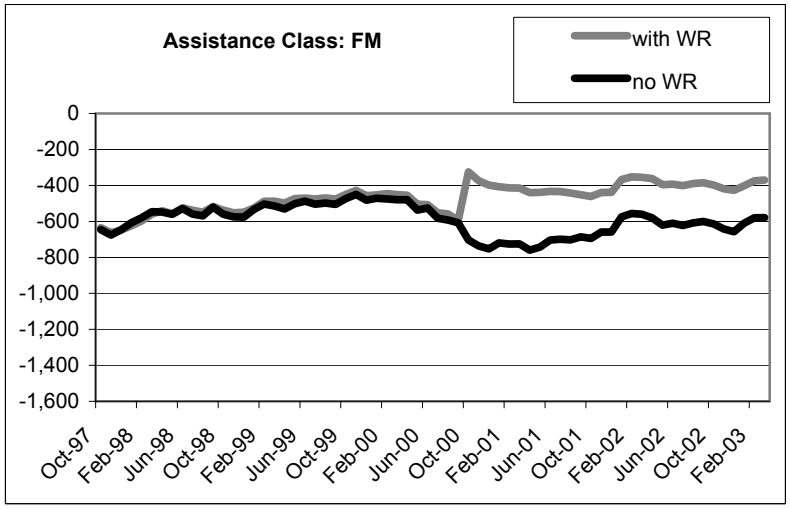


Figure 11. Estimated Exits with and without Welfare Reform by Assistance Class (for those classes including Food Stamps), October 1997 through March 2003 Cuyahoga County, Ohio







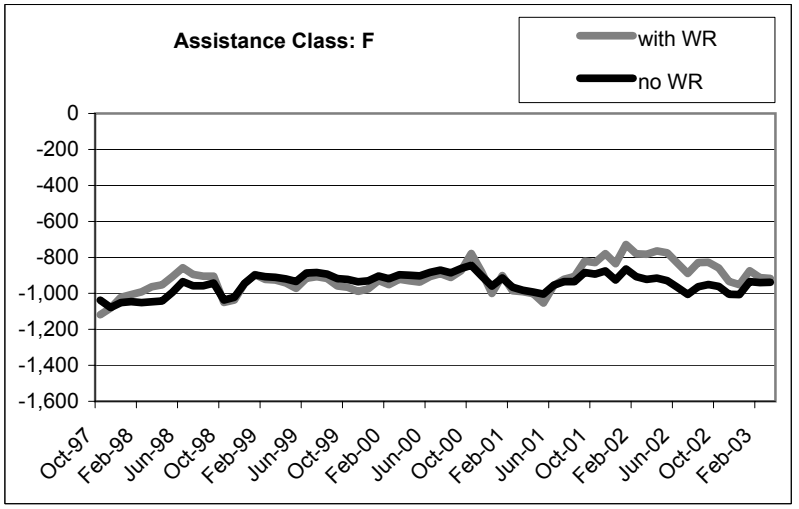
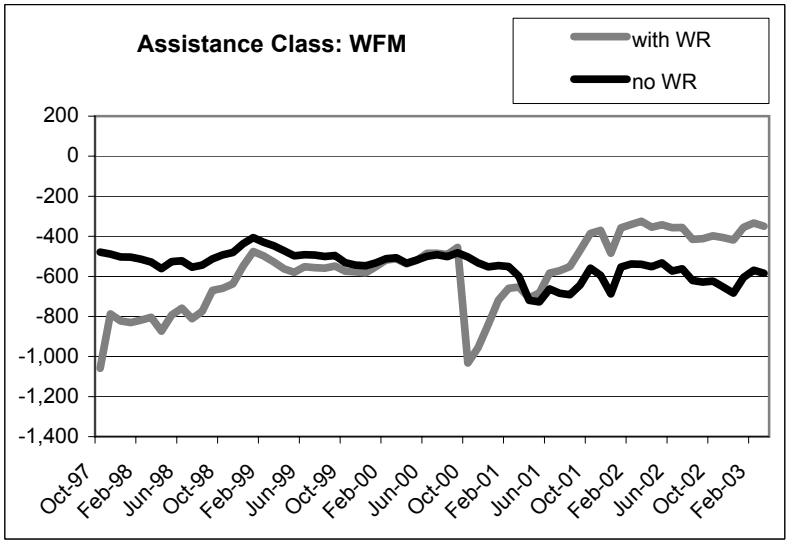
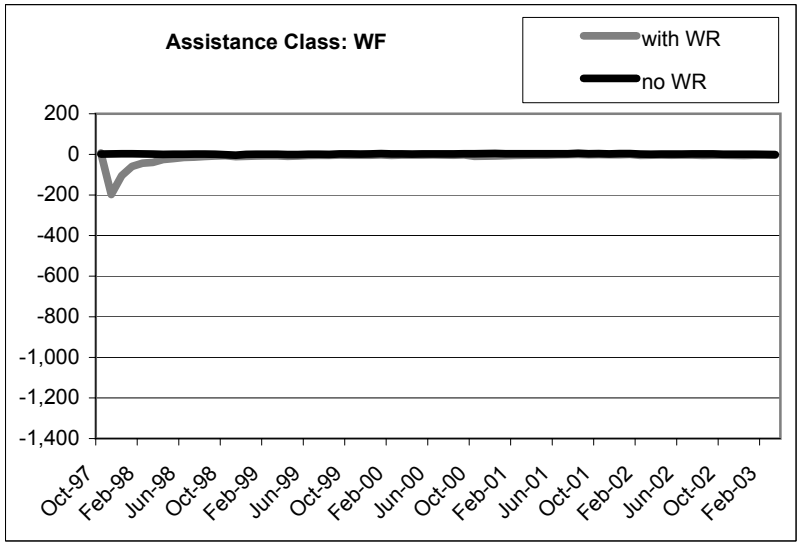
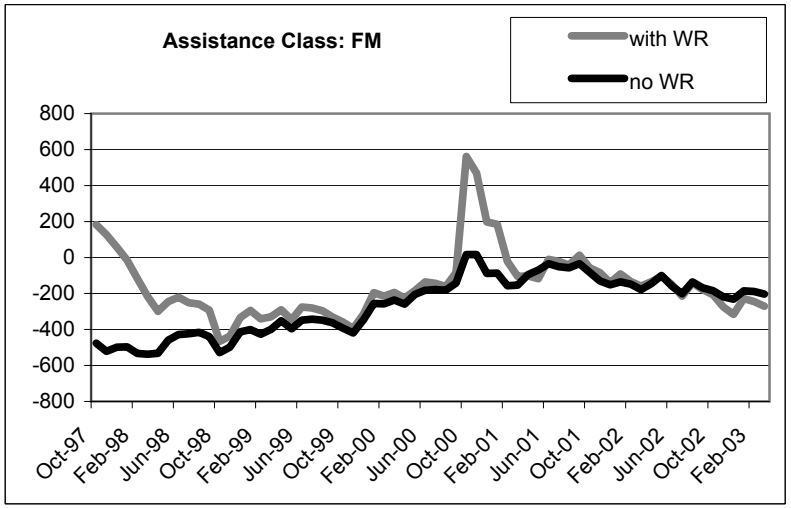


Figure 12. Estimated Net Transitions with and without Welfare Reform by Assistance Class (for those classes including Food Stamps), October 1997 through March 2003 Cuyahoga County, Ohio







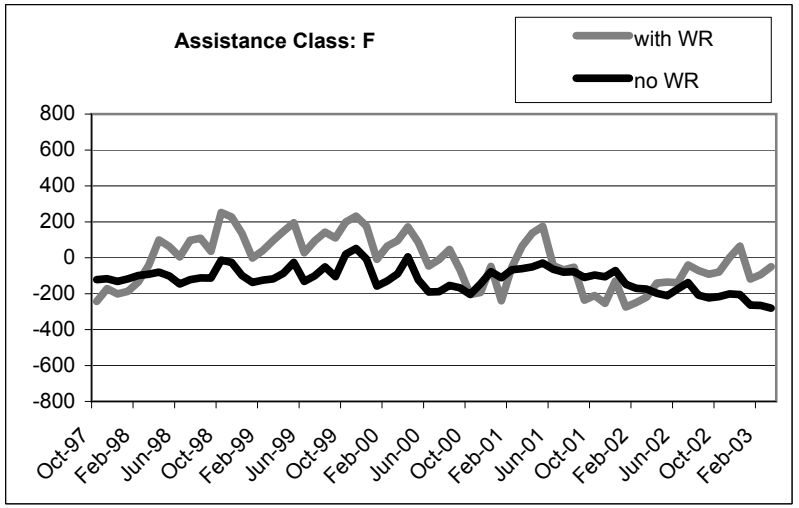


Table 1. Selected Characteristics, Cuyahoga County 1990 and 2000

	1990	2000
Total population	1,412,140	1,393,978
Percent population non-Hispanic white	72%	66%
Percent population non-Hispanic black	25%	27%
Percent households with children under 18	66%	62%
Percent households with children under 18, single-parent	18%	19%
Percent population 25 years and over, less than HS degree	26%	32%
Percent population 25 years and over, with some college	43%	52%
Number of employed persons	629,512	634,419
Employment to population ratio (age 16 and over)	57%	59%
Median household income	$ 28,595	$ 39,168
Percent Households with wage or salary income	72%	75%
Percent Households with public assistance income	10%	5%
Child poverty rate	22%	20%
Adult poverty rate	11%	11%
Percent below 50% of poverty line	8%	6%
Percent below 100% of poverty line	14%	13%
Percent below 150% of poverty line	21%	21%

Source: U.S. Census STF3A (1990) and SF3A (2000).

Table 2. SCHEMATIC OF CASELOAD SIMULATION MODEL

Row Number	(1) Months in Assistance Class	(2) Survival Probabilities (by months in assistance class)	(3) Actual Sept'97 Caseload	(4) Estimated Oct'97 Caseload	(5) Estimated Nov'97 Caseload
1	1	p1	c1	d1 = inflow + transfers from other assistance classes	e1 = inflow + transfers from other assistance classes
2	2	p2	c2	d2 = p1 x c1	e2 = p1 x d1
3	3	p3	c3	d3 = p2 x c2	e3 = p2 x d2
4	4	p4	c4	d4 = p3 x c3	e4 = p3 x d3
5	5	p5	c5	d5 = p4 x c4	e5 = p4 x d4
	…			…	…
	…			…	…
6	60+	p60	c60	d60 = p60 x (c59+c60)	e60 = p60 x (d59+d60)
7	**Carry Over (Stayers)**			*d61* = d2 + …+ d60	*e61* = e2 + …+ e60
8	**Total Caseload**		**c62** = c1 + …+ c 60	**d62** = d1 + …+ d60	e62 = e1 + …+ e60
9	**Exits**			d63 = **c62** - *d61*	e63 = **d62** - *e61*
10	**Outflows**			d63 x transition matrix	e63 x transition matrix
11	**Transfers to Other Programs**			d63 x transition matrix	e63 x transition matrix

Table 3. Total Caseload -- Monthly Averages by Year

	Program Totals			Class of Assistance						
Year	F	W	M	WFM	WF	WM	W	FM	F	M
1992	118,215	45,877	100,944	44,694	50	1,122	11	42,223	31,248	12,906
1993	117,357	44,773	106,347	43,603	50	1,110	10	47,817	25,887	13,817
1994	114,544	43,247	106,876	41,818	91	1,327	11	49,208	23,427	14,524
1995	106,760	38,805	100,985	37,663	44	1,090	8	46,879	22,175	15,353
1996	95,621	35,216	90,760	33,836	54	1,316	10	39,871	21,860	15,738
1997	77,806	31,860	86,029	29,824	44	1,981	11	36,270	11,668	17,953
1998	68,055	25,239	81,346	23,088	44	2,087	20	36,197	8,726	19,974
1999	61,410	18,071	76,694	16,128	22	1,907	14	36,880	8,381	21,780
2000	59,446	14,329	78,409	12,747	18	1,556	8	39,567	7,114	24,539
2001	60,132	9,191	87,576	8,091	16	1,075	9	46,402	5,623	32,007
2002	67,558	8,039	98,060	7,048	14	969	7	53,183	7,312	36,859
2003	74,790	7,624	102,787	6,719	15	882	8	58,295	9,761	36,891

Note: The 1992 and 2003 averages were computed over 6 and 3 months respectively.

Table 4. Means for Variables in Regressions

Mean Caseload Characteristics (July 1992-March 2003)

Class of Assistance:	WFM	WF	WM	W	FM	F	M
Caseload	25,848	40	1,414	11	43,512	14,905	21,169
Percent Black	69.0%	68.1%	65.2%	58.4%	59.2%	65.3%	41.6%
Percent Other Race	3.6%	4.0%	4.2%	8.7%	3.1%	3.8%	2.9%
Percent Female	91.3%	87.2%	87.0%	60.9%	65.9%	57.8%	67.6%
Age	29.8	30.9	27.4	28.7	48.7	40.8	55.3
N	129	129	129	129	129	129	129

Mean County Characteristics by Year

Year:	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number Black	360,606	364,949	368,224	370,553	372,656	373,976	374,801	376,105	382,634	385,729	388,823	389,597
Number Hispanic	33,177	34,075	34,837	35,745	36,565	37,367	38,246	39,091	47,078	48,344	49,609	49,925
Births	9,543	9,389	8,650	8,472	8,220	8,300	8,147	7,756	8,070	7,726	8,593	8,593
Unemployment Rate	7.4	7.1	6.0	5.0	5.1	4.9	4.5	4.6	4.5	4.6	6.7	6.9

Table 5. OLS Regressions Inflows

Inflows to Class of Assistance:	WFM	WF	WM	W	FM	F	M
Intercept	7,599.1 ***	-78.8	-322.8	-29.2	12,202.4	-14,596.3 **	6,260.0
births	0.017	0.0025	0.003	0.0003	0.20 *	0.19	0.01
num_black1	-0.019 ***	0.0002	0.001	0.0001	-0.04 *	0.04 **	-0.02 *
num_hisp	0.002	-0.0004	-0.003 *	-0.0002	0.04	-0.05 *	0.05 ***
t1	-75.7 **	2.6	3.2	0.58	-3.9	-151.8	149.8 **
t2	-140.3 **	2.1	-4.0	0.68	236.4	-148.1	627.7 ***
unemprate	-20.6	-0.5	-3.9	-0.11	53.3	13.3	2.9

Note: Significance levels denoted by * (10%), ** (5%), and *** (1%).

Table 6. Coefficients from Estimated Hazard Models (Logistic Equations)

Hazard of Exit in Class of Assistance:	WFM	WF	WM	W	FM	F	M
Intercept	-3.60	-8.78	-3.80	-9.38	-2.55 ***	-2.85 ***	-2.81 ***
Black	-0.08 ***	0.03	0.07 ***	0.08	0.13 ***	0.02 ***	0.29 ***
Other Race	0.17 ***	0.19	0.04 *	0.18	0.31 ***	0.12 ***	0.33 ***
Male	0.38 ***	0.001	0.02	-0.18 **	0.03 ***	0.05 ***	-0.09 ***
Age (at beginning of spell)	0.004 ***	0.001	0.01 ***	0.01	-0.02 ***	-0.01 ***	-0.01 ***
County Unemployment Rate (Monthly)	-0.14 ***	0.01	-0.09 ***	-0.07	-0.01 ***	-0.04 ***	-0.04 ***
Time Period 1	0.44 ***	0.09	0.36 ***	0.40 ***	-0.09 ***	0.18 ***	0.05 ***
Time Period 2	0.77 ***	0.18 *	0.39 ***	0.60 ***	-0.33 ***	0.26 ***	-0.11 ***

Note: Significance levels denoted by * (10%), ** (5%), and *** (1%).

Table 7. OLS Regressions for Transitions and Exits from 7 Classes of Assistance

To Class of Assistance:	EXITS	WFM	WF	WM	W	FM	F	M
FROM WFM								
Intercept	-3,970.6 ***		59.7	-6,743.1 ***	-9.8	4,009.9	-3,238.2 ***	2,156.7 **
age	96.0 ***		-2.1	361.6 ***	1.9	-145.7	39.4	-85.2 ***
black	-2,020.4 **		-62.0	3,279.1	25.7	10,105.3 ***	-967.9	1,266.0
caseload	0.01 **		0.0004	-0.01 **	0.0002	0.031 ***	0.001	0.001
female	3,182.4 *		39.7	-5,970.9 *	-72.6	-6,860.6	3,294.3 ***	-191.5
other_race	-2,538.0		54.2	539.4	38.5	-3,172.9	-3,157.2 **	-553.8
t1	-24.3		6.8	-131.4	1.6	-49.6	-88.9 ***	22.7
t2	24.3		5.5	-46.6	4.0	-50.8	-30.8	-116.6 **
unemprate	-15.1		0.2	-11.8	-0.3	-68.3 **	-1.8	-24.3 ***
FROM WF								
Intercept	4.5	16.2		1.2	3.2 **	-1.9	10.9 **	0.4
age	-0.1	-0.2		-0.02	-0.1 **	0.04	-0.1	-0.01
black	-0.1	-2.9		0.2	-0.7	0.1	-0.3	-0.5
caseload	0.03 ***	0.5 ***		0.01 ***	0.0060 ***	0.013 ***	0.041 ***	0.001
female	-0.4	-23.0 *		-1.6 **	-0.1	0.2	-5.6 *	0.5
other_race	3.0	-15.3		0.0	1.7	-2.6	-0.6	-0.3
t1	-0.1	9.9 ***		0.5 ***	0.4 **	0.3	0.0	0.1
t2	-0.03	8.0 **		0.4 ***	0.2	0.4 **	-0.3	0.1
unemprate	-0.3 *	0.2		0.03	-0.1	0.1	-0.1	-0.03
FROM WM								
Intercept	245.2	-2,935.3 ***	6.5 *		-6.4	-224.0 **	-31.8	-273.7
age	0.6	33.7 **	-0.03		0.4	3.7 **	0.7	-1.7
black	128.5	697.2	-3.2		-5.7	29.2	18.3	21.5
caseload	0.2 ***	0.2 ***	-0.000004		0.0017 ***	0.016 ***	0.003 ***	0.036 ***
female	-394.6	1,496.5 **	-3.2		-4.3	118.8 *	0.7	450.9 **
other_race	1,342.2 *	-758.1	-10.5		0.3	-206.1	7.5	-575.9
t1	-38.7 *	-95.8 **	0.1		1.6 *	8.4 *	-2.2 *	48.3 ***
t2	-67.7 *	45.7	-0.2		2.7 *	25.6 ***	-1.9	105.1 ***
unemprate	-11.5 **	28.6 **	-0.03		0.2	0.3	0.1	-10.7 ***
FROM W								
Intercept	3.9 *	-0.9	-1.5 ***	-0.7		0.3	-0.9 **	-0.4
age	0.001	0.011	0.034 **	-0.018		-0.006	0.025 **	0.010
black	-1.1	0.8 **	0.1	0.023		-0.2	0.1	-0.1
caseload	0.5 ***	0.1 ***	0.0591 ***	0.14 ***		0.003	0.025 ***	0.000
female	-4.2 ***	0.6	0.3	0.4		0.2	-0.1	0.1

To Class of Assistance:	EXITS	WFM	WF	WM	W	FM	F	M
other_race	1.2	0.1	-0.7	-0.5		0.1	-0.2	0.016
t1	-1.7 ***	-0.5 **	-0.2	-0.3		0.1 *	0.028	0.1
t2	-1.0 **	-0.2	-0.1	-0.1		0.1	-0.019	0.040
unemprate	-0.047	-0.1	0.005	0.034		-0.018	0.019	0.036
FROM FM								
Intercept	-2,345.0	-886.0	-15.9	144.4 **	-10.9 **		41,318.6 *	12,912.8
age	23.7	4.2	0.2	-0.2	0.0		-103.1	40.6
black	2,060.0	175.0	15.5	-136.7 ***	8.1 **		-29,683.5 *	-14,030.3 *
caseload	0.029 ***	0.007	-0.00001	0.00005	0.00001		0.040	0.015
female	-1,071.3	747.3	-2.6	-63.7 **	3.5		-27,992.7 ***	-5,980.8
other_race	13,734.6 **	6,643.4	0.5	-180.9	22.3 **		-20,720.2	-73,901.3 ***
t1	-4.8	44.9	-0.1	1.0	0.1		395.8	-178.7
t2	-158.6	64.9	0.2	2.6	0.1		885.7	438.6
unemprate	-58.2 ***	-12.3	0.1	-0.6	0.02		-150.8	10.2
FROM F								
Intercept	13,875.7 ***	1,462.6 **	-133.2	9.7	-3.3	-8,534.9		193.6 **
age	-240.5 ***	-26.6 ***	1.4	-0.3	0.04	229.2		-1.0
black	3,347.7	-130.4	86.7	5.7	1.4	-7,044.3		-130.9 ***
caseload	-0.1 ***	-0.001	0.0003	-0.00009	0.00001	0.153 ***		-0.0003
female	-5,382.4 ***	-155.0	36.1	2.5	1.3	3,736.7		-73.9 **
other_race	-10,155.8	742.3	-58.5	15.5	-4.0	-7,238.2		-61.7
t1	-336.3 *	-83.4 ***	-3.2	-0.9	-0.2	87.0		1.5
t2	-581.6 **	-89.6 **	-12.1	-1.5	-0.4 **	90.6		0.1
unemprate	-4.3	-1.8	0.6	0.3	0.01	53.1		0.2
FROM M								
Intercept	2,225.2	-386.3	-3.7	-146.4	4.5	-1,440.8	210.5	
age	26.8	-18.2 ***	0.05	0.4	-0.02	29.6	-0.3	
black	3,182.3 *	1,106.7 ***	-4.6	203.3 **	-3.6	2,247.1 ***	142.6	
caseload	0.1 ***	-0.01062 ***	0.00003	0.00006	0.00002	0.063 ***	0.0003	
female	-6,801.9 **	1,883.9 ***	4.2	82.7	-2.8	-3,069.1 **	-312.9	
other_race	-5,106.7	1,124.8	-7.9	307.3	4.2	4,232.8	-838.7 *	
t1	-15.4	3.8	0.3	2.1	0.1	-47.0	10.0	
t2	43.5	-7.8	0.2	-4.7	-0.1	32.8	11.4	
unemprate	-66.1 **	-2.0	0.0	1.1	-0.1	31.6 **	2.0	

Note: Significance levels denoted by * (10%), ** (5%), and *** (1%).

Table 8. Comparison of Caseload Dynamics Under Welfare Reform Scenario and No-Welfare Reform Scenario
Monthly Average Oct-97 through Mar-03

	WFM	WF	WM	W	FM	F	M	Total	F Caseload
Inflows	**-105**	**2**	**0**	**1**	**107**	**-150**	**370**	**225**	**-146**
Transitions In	**-2**	**0**	**8**	**4**	**300**	**217**	**10**	**536**	**515**
from WFM	0	3	4	2	63	-34	-8	30	32
from WF	13	0	0	0	1	-1	0	13	12
from WM	-5	0	0	2	20	-2	80	94	12
from W	1	0	1	0	1	0	1	5	3
from FM	17	0	1	0	0	240	-68	190	257
from F	-39	-4	-1	0	154	0	6	116	111
from M	12	0	2	0	62	13	0	89	87
Outflows (multiplied by -1)	**426**	**6**	**409**	**15**	**1058**	**1855**	**2726**	**6496**	**3345**
Transitions Out (multiplied by -1)	**-16**	**-13**	**-93**	**-5**	**-200**	**-116**	**-92**	**-535**	**-345**
to WFM	0	-13	6	-1	-16	39	-12	3	11
to WF	-3	0	0	0	0	4	0	0	1
to WM	0	0	0	-1	-1	1	-2	-4	-1
to W	-2	0	-2	0	0	0	0	-4	-2
to FM	-57	-1	-20	-1	0	-154	-66	-298	-212
to F	34	1	2	0	-247	0	-13	-222	-211
to M	11	0	-80	-1	64	-6	0	-10	70
Average Monthly Caseload Change	**303**	**-5**	**323**	**15**	**1265**	**1806**	**3015**	**6722**	**3369**

Note: Each component in the table is calculated as the value for the welfare reform scenario less coresponding value for the no-welfare reform scenario.

Figure A-1. WFM Components of Change

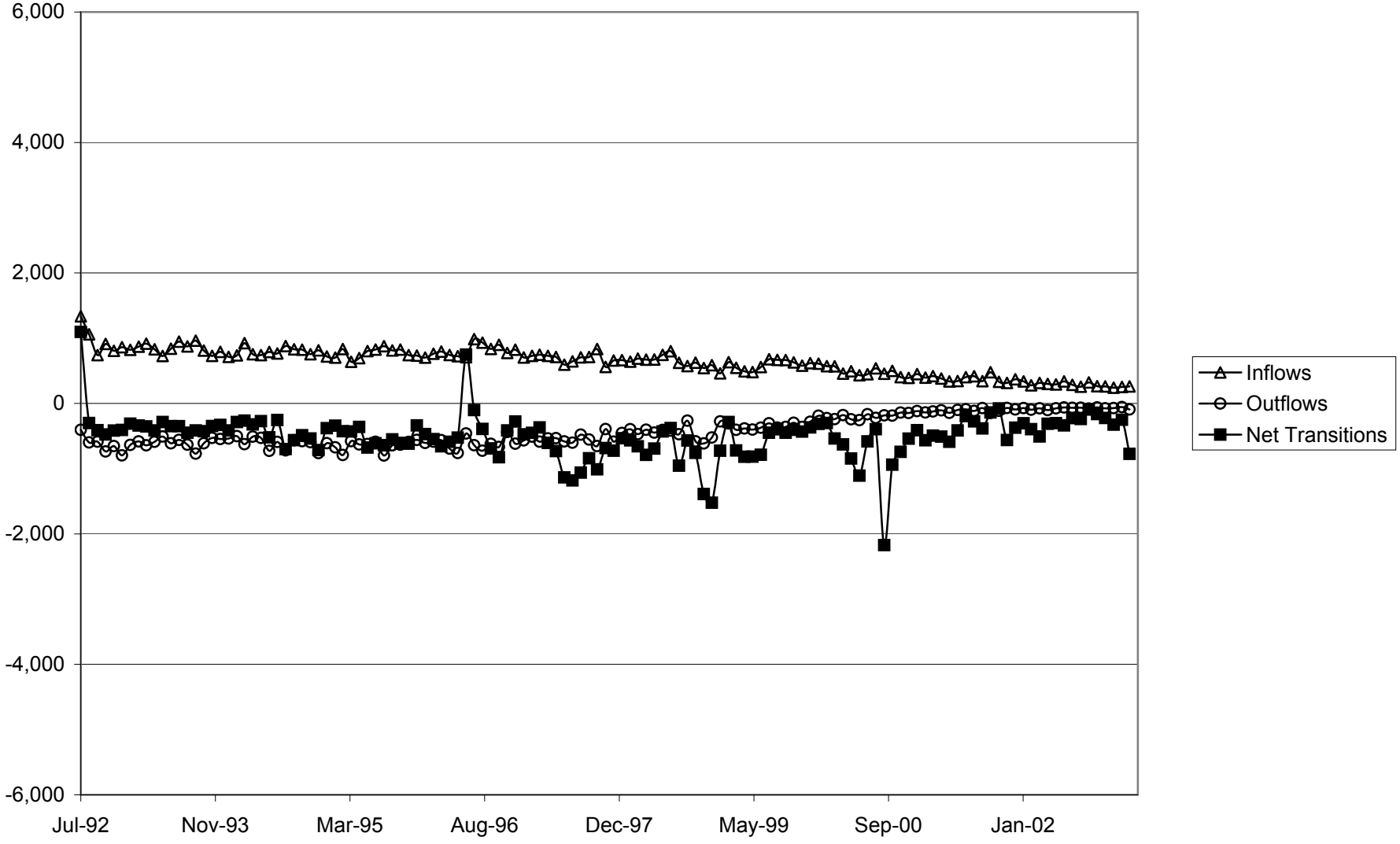


Figure A-2. WF Components of Change

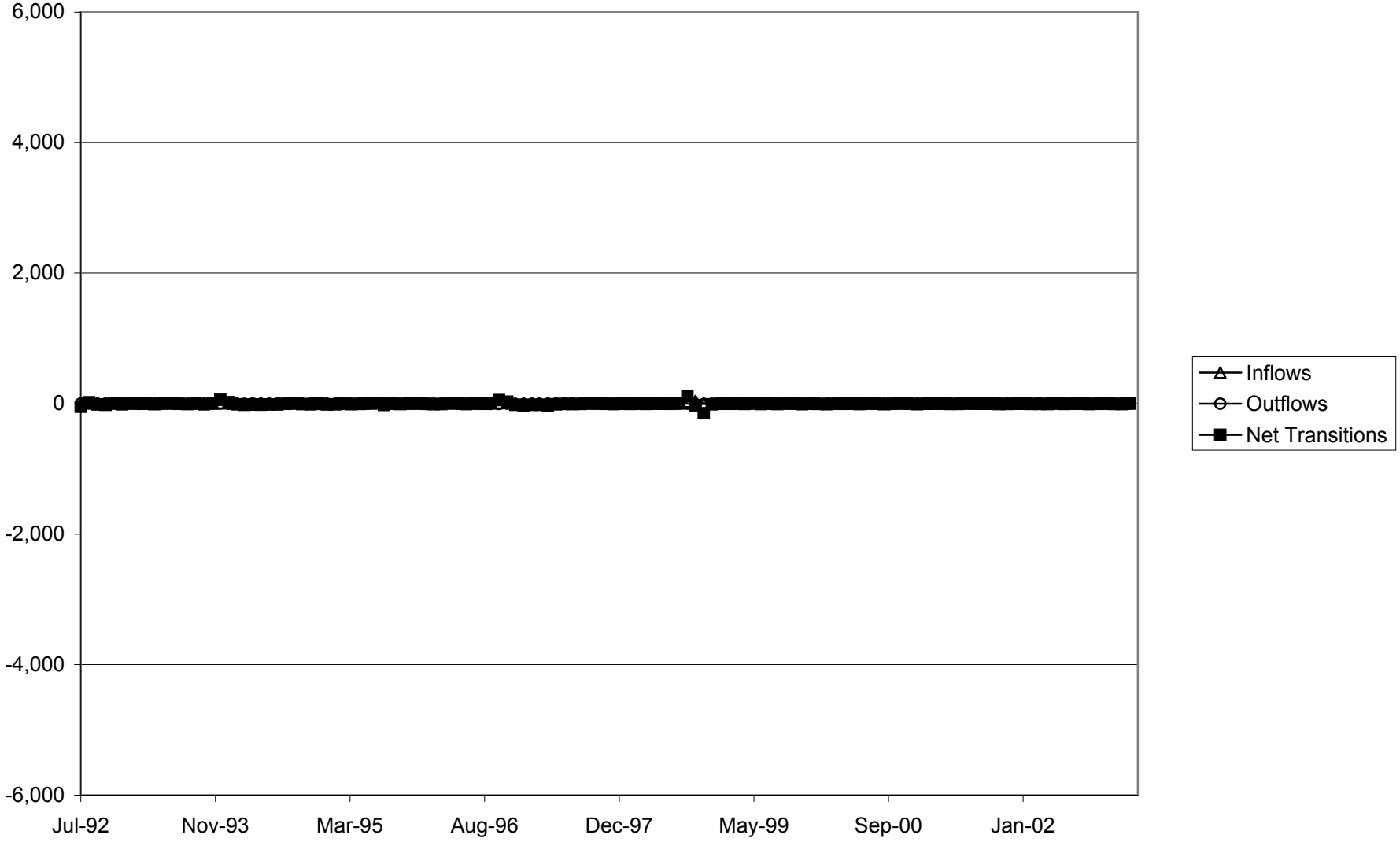


Figure A-3. WM Components of Change

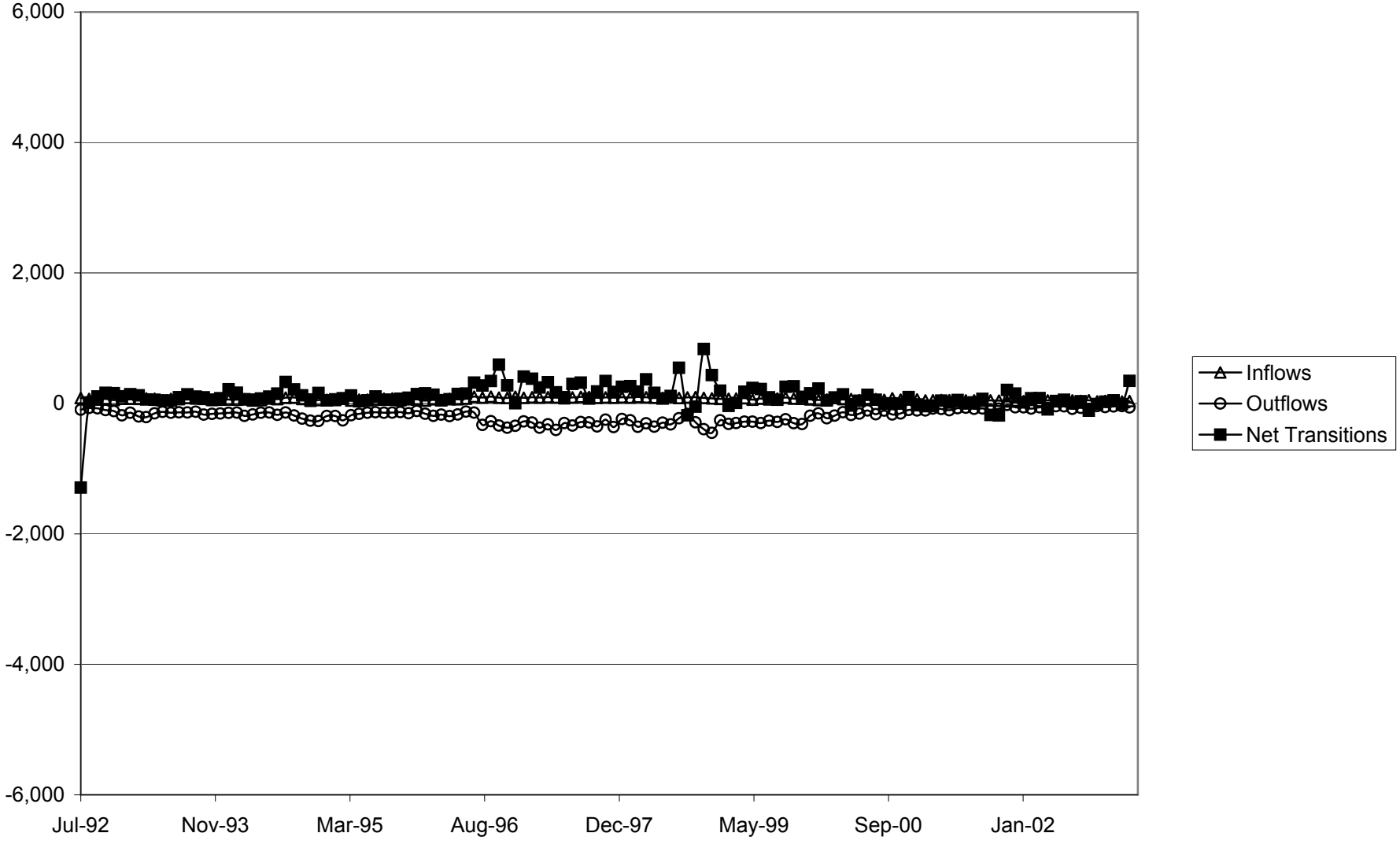


Figure A-4. W Components of Change

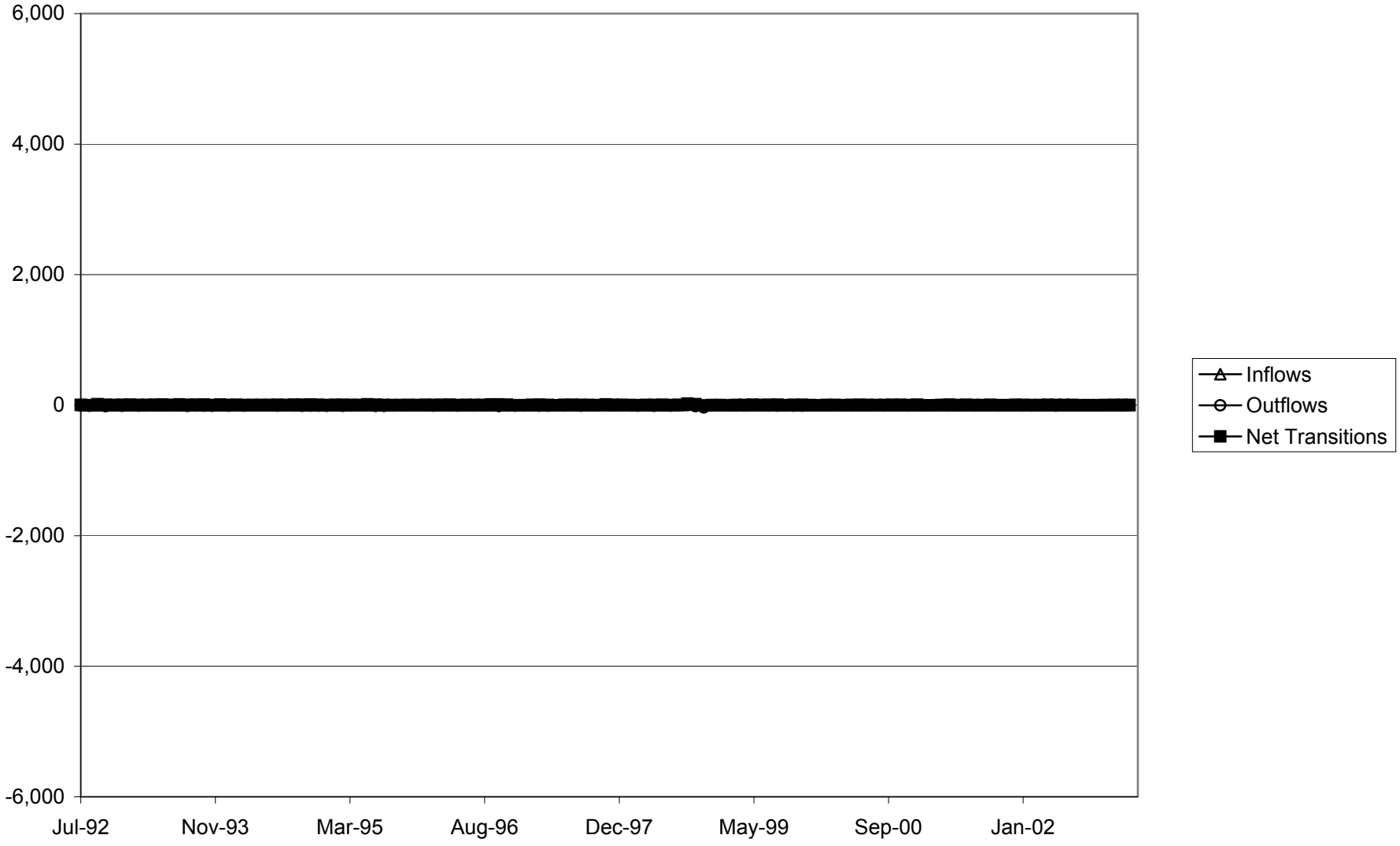


Figure A-5. FM Components of Change

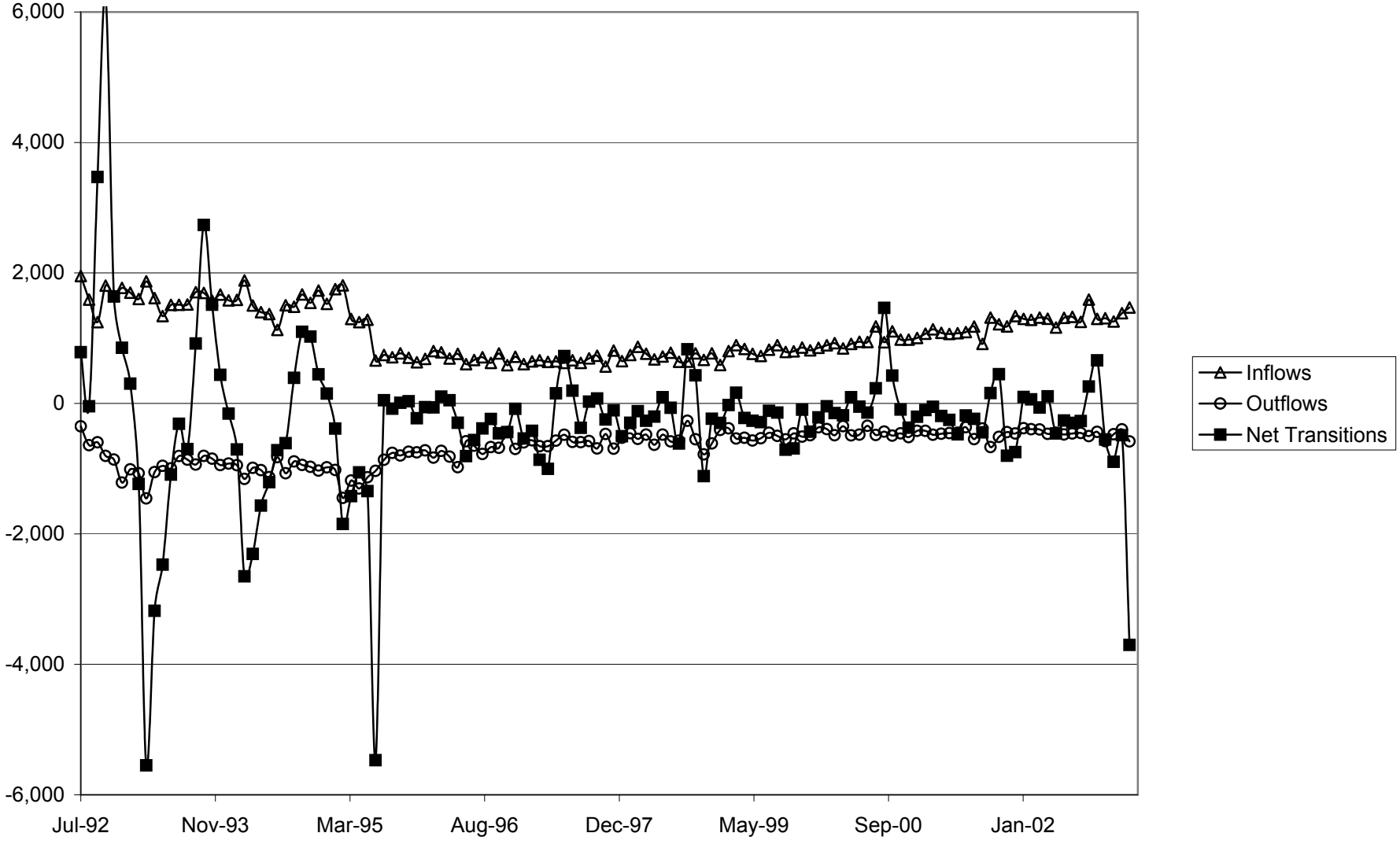


Figure A-6. F Components of Change

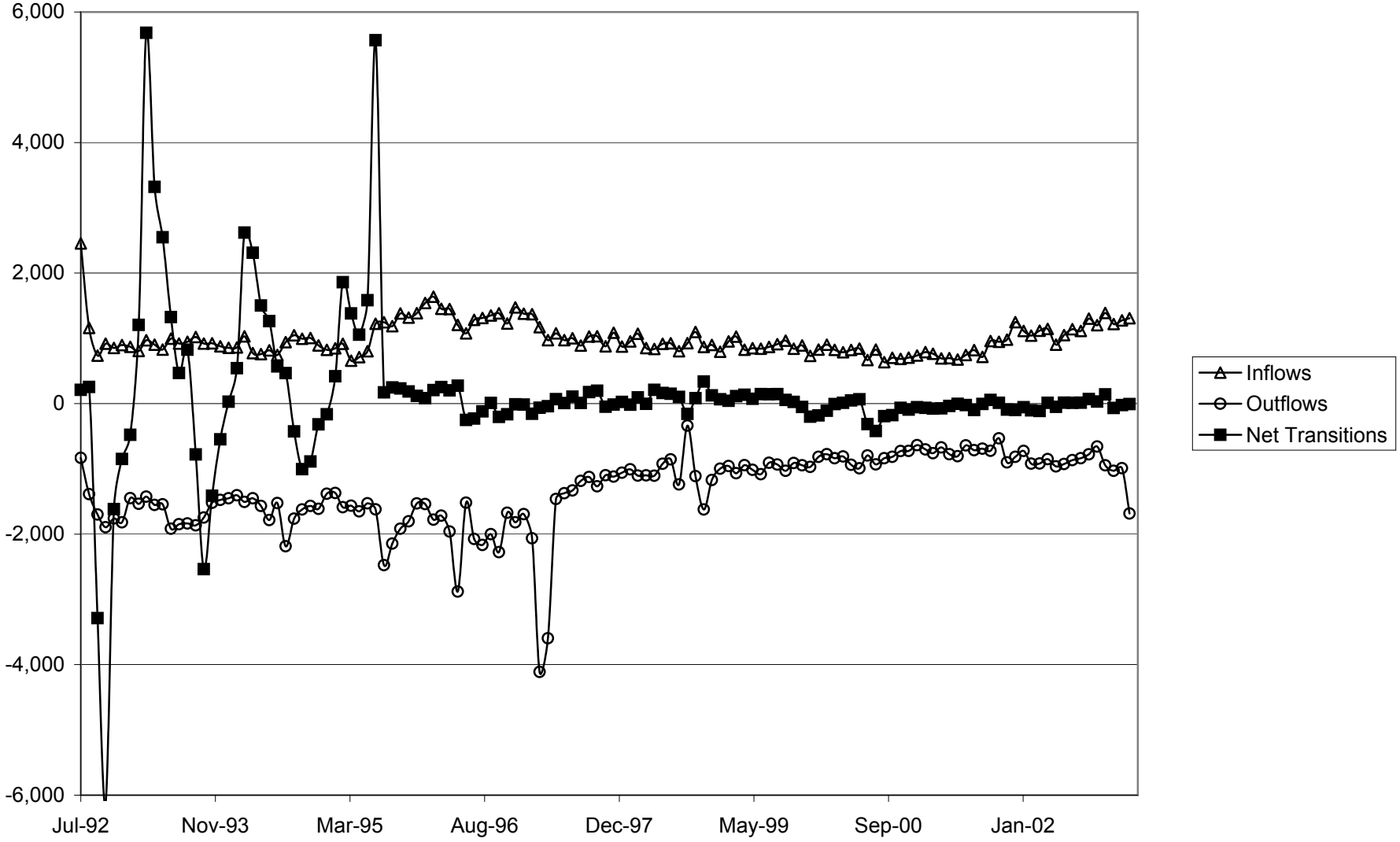


Figure A-7. M Components of Change