Estimation of the Long-Run Food Stamp Program Caseloads Equation

1. Introduction

Between federal fiscal years 1994 and 1999 caseloads in the Aid to Families with Dependent Children (AFDC) declined by approximately 41 percent and those in the Food Stamp Program (FSP) declined by approximately 31 percent. Efforts to identify how much of the reduction in caseloads was due to the Responsibility and Work Opportunity Reconciliation Act (PRWORA)[1] and various waivers to AFDC program provisions that were granted to individual states beginning in the early 1990's have been confounded by the strong performance of the economy during the decade.

Several studies have attempted to determine what part of the caseload reduction was due to PRWORA and the waivers, and what part was due to the economy by employing a regression strategy based on state level panel data. The studies by Blank (1997), Council of Economic Advisers (1997, 1999), Figlio and Ziliak (1999), Wallace and Blank (1999), and Ziliak *et. al.* (2000) include estimates for AFDC/TANF caseloads. Estimates for FSP caseloads are presented in the studies by Wallace and Blank (1999), Figlio, Gundersen, and Ziliak (2000) (hereafter denoted as FGZ), Ziliak, Gundersen and Figlio (2001, 2003) (hereafter denoted as ZGF), Currie and Grogger (2001), and Kornfeld (2002).[2]

All of these papers have used regression procedures that apply to data generated by *trend stationary* processes. Evidence from previous studies and additional tests indicates, however, that FSP and AFDC/TANF caseloads as well as the variables that have been used to measure economic activity may be generated by *integrated* or *unit root non-stationary* data processes. In the following sections of this paper, the different methods associated with analyzing data containing unit-roots, compared to trend stationary data, are illustrated and applied to the annual state level panel caseload data set from 1980 to 1999. (The data set consisting of FSP and AFDC/TANF caseloads plus the variables measuring economic activity is referred to as the *caseload data set* in this paper.)

However before proceeding to these results it is important to first discuss how the nature of the data process affects the interpretation of policies regarding public assistance programs; and in particular, how the role of the economy in evaluating the consequences of welfare reform changes when the caseload data set follows unit-root processes.

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[1] In 1996, PRWORA replaced the AFDC program with a new state block grant program called Temporary Assistance for Needy Families (TANF). In what follows, we refer to the AFDC/TANF program. PRWORA also involved changes in the FSP but these were less far reaching.

[2] Some authors (Wallace and Blank, Currie and Grogger, and Kornfeld) have included estimates of the FSP caseload equation for different segments of the caseload. In this paper, any comparisons are limited to aggregate caseload equation.

Assume that a (discrete) time series contains a unit-root.[3] Then, according to the Beveridge-Nelson (1981) decomposition the series can be written as the sum of two terms: one where the effect of (current and past) random shocks to the series is permanent; and the other where the effect of shocks is transitory. Shocks accumulate in the permanent component so that a shock at any point in time contributes the same amount to all future realization of the time series. In this sense, the shock alters the future path of the series by imparting a permanent effect on the time series. The effect of the same shock in the transitory component, on the other hand, dies out over time. The relative strength of the permanent component measures the proportion of a given shock that would persist into the future.[4]

The accumulation of shocks in the permanent component means that at any given time this component contains a complete history of the time series. The permanent component is often referred to as a trend, but because this component is determined by random shocks to the series, the series is said to display a *stochastic trend*. For public assistance programs the effect of the permanent component might reflect some notion of persistence in program enrollment.

Multiple regression analysis undertaken in the previously cited studies have implicitly characterized movements in the time series of the caseload data as consisting of stationary movements around deterministic trends.[5] Under this characterization, the resulting regression analysis relates random shocks in the economy (conceptually through transitory changes in FSP eligibility) to transitory changes in FSP caseload levels. The finding that the caseloads data are integrated implies, however, that shocks to the economy can be associated with changes in the stochastic trend as well as with transitory changes in FSP caseloads.

With integrated data, shocks to the economy, even though they are transitory, can have a permanent effect on FSP caseloads. Such an effect might happen, for example, if greater employment (such as associated with cyclical improvement in the economy in the late 1990's) provided added work experience to the (potentially) FSP-eligible population. This added work experience in turn may translate into greater future employment opportunities and a permanent reduction in future FSP caseloads below what they would be otherwise. For some analysts, such as Rector (2001), this type of human capital accumulation seems to describe the lesson of welfare reform.

The potential for the economy to change the trend in FSP caseloads is in contrast to its role presented in previous studies. In these studies, the assumption that FSP caseloads and the variables used to measure economic activity are trend stationary leads to conclusion that changes in FSP caseloads attributed to an improved economy are temporary changes (from a deterministic trend) that will be reversed in the future when the economy reverted back to its deterministic trend (see, for example, Blank 2001, p.28).

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[3] A discrete time series is defined as a sequence of random variables in which each element of the sequence is indexed by an integer value of time.

[4] Of course the relative strength of the permanent and transitory components depends on the particular time series.

[5] A deterministic trend changes the series each time period by a fixed (non-random) function of time.

The finding that the caseload data contain unit-roots implies, however, that an analysis of these data based only on their transitory component is incomplete. While for certain policy questions it may be useful to know how *changes* in FSP caseloads respond to *changes* in economic activity, the existence of a permanent component in FSP caseloads means that changes in economic activity does not provide sufficient information to explain the *level* of FSP caseloads.

Given the existence of unit-roots in the caseload data, the objective of this paper is to extend the analysis of these data by evaluating whether or not there exits a stable relationship connecting the (stochastic) trend in FSP caseloads levels with the (stochastic) trends of other variables in the caseload data set (and, in particular with the stochastic trends of the variables measuring macro-economic activity). Such a relationship will be referred to as the *long-run food stamp caseload equation.*

The plan of the paper is as follows. In the next section, a more detailed comparison of differences between stationary and integrated time series and resulting regression methods is presented. This section also include a discussion of how the recent advances by Phillips and Moon (1999) on estimation with non-stationary panel data are used in obtaining the long-run FSP caseload equation using annual state level panel data.

In section 3, the specification of the FSP caseload equation that has been estimate with annual state level panel data is introduced and a discussion of the types of explanatory variables that have been used is provide. In section 4, formal evidence that the caseload data follow unit-root processes is presented. This section also reports on the results of several specification tests of the FSP caseload equation based on tests of cointegration. Here we report the important result that in order to estimate a long-run (cointegrated) FSP caseload equation AFDC/TANF caseloads must be included in the regression. In this section the estimated coefficients of the long-run FSP caseload equation are also reported and the contributions of the different regressor variables to explaining variations in FSP caseload over the sample period 1980-1999 are evaluated.

Section 5 addresses the issue of how much of the decline in FSP caseloads in the mid-1990's was due to the economy and how much was due to PRWORA and the waivers. This question has been addressed by all previous caseload studies. However, since AFDC/TANF caseloads are themselves a function of the economy and policy, and since they must be included in the FSP caseload equation in order to define a stable long-run relationship, it is not possible to calculate the *unconditional* impact of the economy and policy on FSP caseload using *only* the FSP caseload equation. Partial measures conditional on the level of AFDC/TANF caseloads is the best that can be done if the analysis is limited to the FSP caseload equation.

In section 6, a brief discussion of how the long-run FSP caseload equation could be used in making period-by-period estimates of FSP caseloads from the error correction form of the data is presented. The final section provides conclusions.