



Challenges of Forecasting in the Storm:

TANF and Child Care Subsidy in Maryland, 2007-2008

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1- Introduction: Forecasting in the Storm

“THESE are the times that try men's souls. The summer soldier and the sunshine patriot will, in this crisis, shrink from the service of their country . . .”



Thomas Paine, Dec 23, 1776

Introduction: Forecasting in the Storm 2

Our Focus: Maryland experience in the Great Recession of 2007 to date in:

- Child Care Subsidy and
- TANF (in Maryland, “Temporary Cash Assistance,” or TCA).

We will review caseload behavior to date and update multiple regression modeling in both areas.

Introduction: Forecasting in the Storm 3

Cold Winds:

- o NO ONE knows what is going on, so there is no one to rely on.
- o The popular press has been exceedingly negative.
- o The downsides are impressive and the risk to social programs is great. (Impending crises in 2011 for Child Care Subsidy and in 2012 for TANF.)
- o We have not seen a strong recession in the Welfare Reform era.

Introduction: Forecasting in the Storm 4

Campfires in Trying Times:

- Not the model
- Historical data
- Analysis of that historical data, including multiple regression.
- Maintaining perspective, distance and a rational approach.

2- Multiple Regression Model, Child Care Subsidy: 2006 Model

Dependent Variable: NTCA_FAMS

Sample (adjusted): June 1999 to April 2006

Included observations: 83 after adjustments

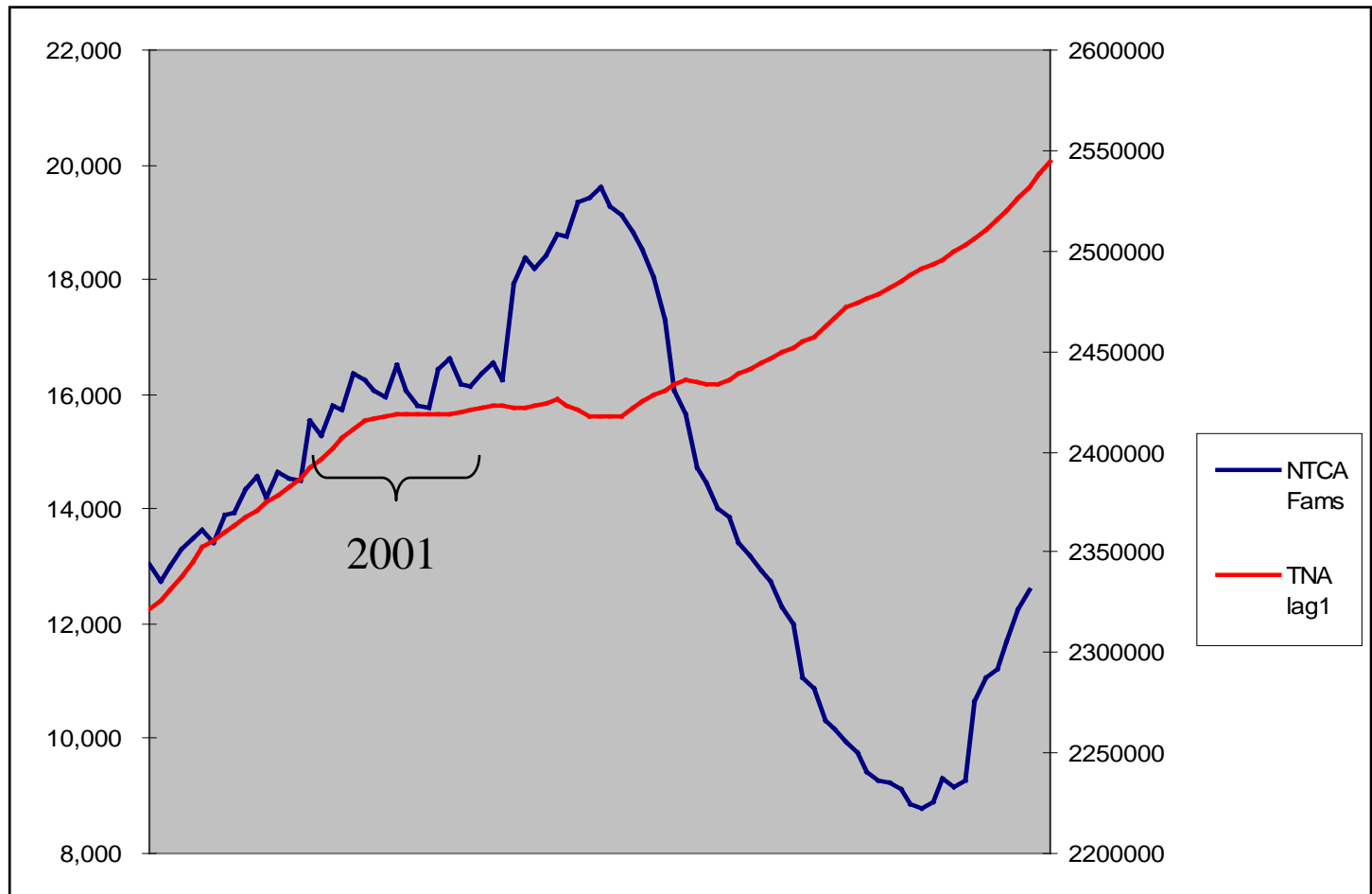
| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---------------------------|-----------------|---------------------------|-----------------|-------------|
| C | -94284.41 | 28522.93 | -3.305565 | 0.0015 |
| Employment | 0.045053 | 0.011917 | 3.780539 | 0.0003 |
| Eligible Households | 0.025091 | 0.011031 | 2.274675 | 0.0258 |
| Reopening Phase 1 | -11859 | 1296.821 | -9.144628 | 0.00000 |
| Reopening Phase 2 | -10422 | 1382.240 | -7.540020 | 0.00000 |
| Closure period | -402 | 41.25696 | -9.758837 | 0.00000 |
| Closure Lag 9 | 973 | 261.8 | 3.717631 | 0.0004 |
| Eligibility Change Lag3 | -635.4 | 204.8 | 3.101128 | 0.0027 |
| First Order Residuals | 0.8457 | 0.06645 | 12.72545 | 0.00000 |
| Adjusted R-squared | 0.987462 | F-statistic | 808.232 | |
| S.E. of regression | 348.48 | Probability (F-statistic) | 0.000000 | |
| Sum squared residuals | 8986321 | Durbin-Watson statistic | 2.112918 | |



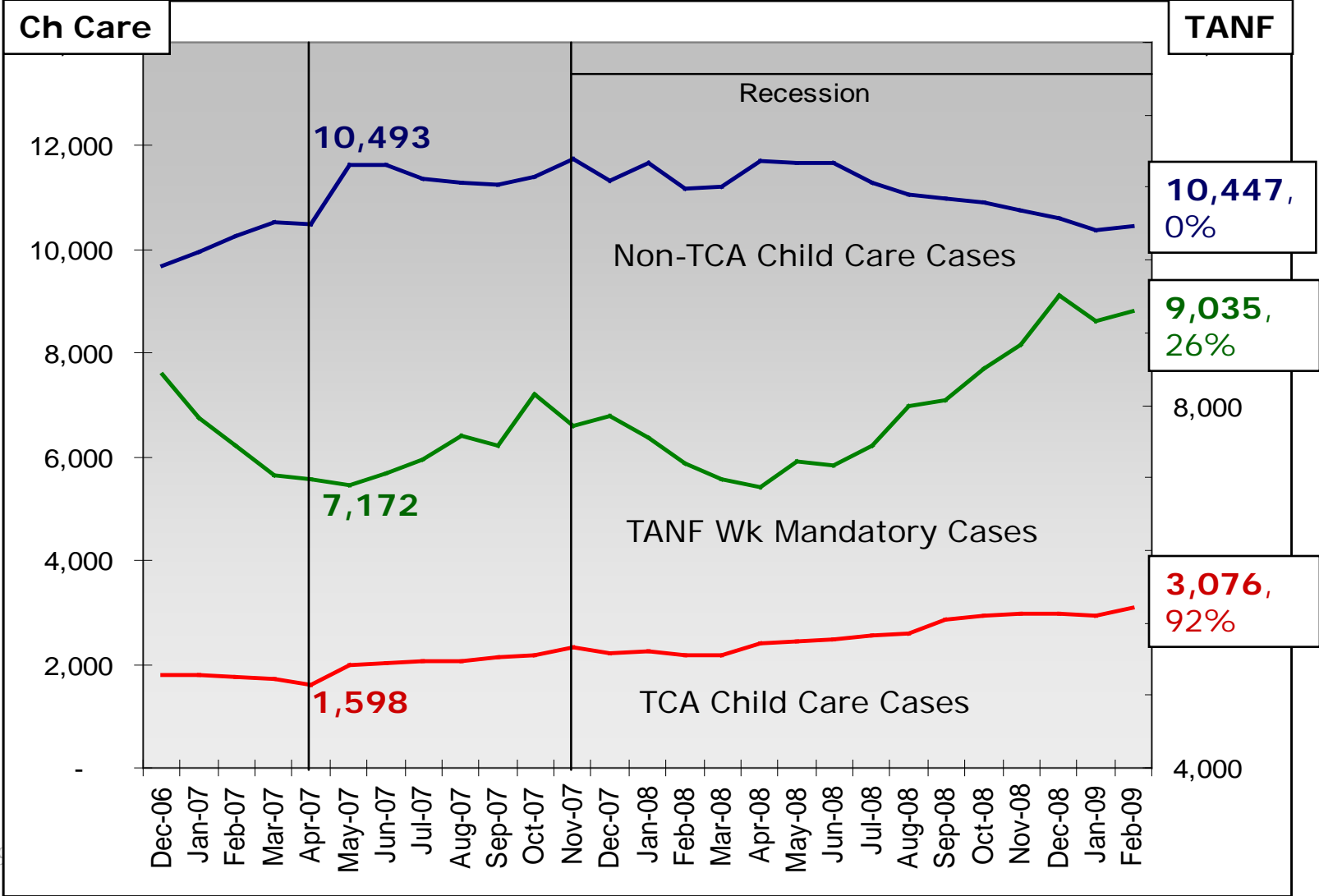
Multiple Regression Model, Child Care Subsidy: Legacy of the 2006 Exercise

- o Employment has the largest effect on the caseload.
- o Eligibility has the next largest effect.
- o Do not expect noticeable effects from typical rate increases or co-pay adjustments.
- o Do expect delays of 3-6 months in the implementation of program changes.

Multiple Regression Model, Child Care Subsidy: The Last Recession Experience



Multiple Regression Model, Child Care Subsidy: The Recession Effect

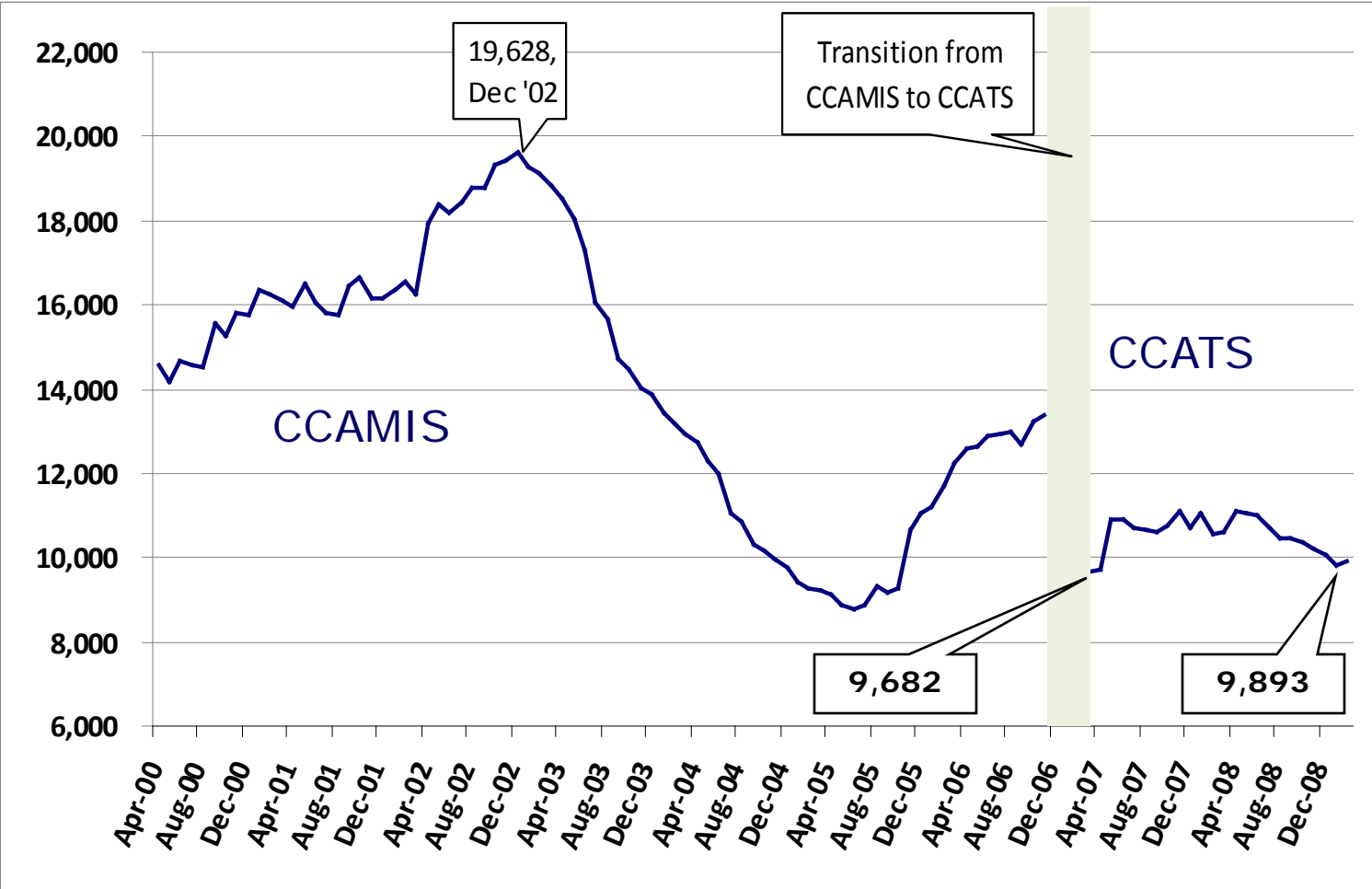




Multiple Regression Model, Child Care Subsidy: Big Changes from 2006

- o The Recession
- o The New Computer System
- o The End of the Wait List Recovery

Multiple Regression Model, Child Care Subsidy: Enrollment Trends



Multiple Regression Model, Child Care Subsidy: The Updated Model, Stats

Dependent Variable: Non-TANF Child Care Subsidy Cases

Sample (adjusted): 2000M07 2009M02

Included observations: 104 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------|-------------|-------------------|-------------|----------|
| C | 14390.48 | 2177.614 | 6.608372 | 0.0000 |
| UNEMPLOY_MD(-2) | -825.1444 | 313.8697 | -2.628940 | 0.0100 |
| ELIG_NEW | 0.090279 | 0.030324 | 2.977145 | 0.0037 |
| WAIT_LIST_IN_EFFECT1 | -297.1355 | 32.58422 | -9.118998 | 0.0000 |
| WL_RECOV1 | -8543.718 | 953.8669 | -8.956929 | 0.0000 |
| WL_RECOV3 | -354.2496 | 47.09128 | -7.522615 | 0.0000 |
| CLOSURELAG9 | 810.1249 | 236.4169 | 3.426678 | 0.0009 |
| ELIG_CHNG_LAG3 | -734.5556 | 234.2683 | -3.135531 | 0.0023 |
| CCATS | -4163.856 | 334.3574 | -12.45331 | 0.0000 |
| AR(1) | 0.922797 | 0.046101 | 20.01664 | 0.0000 |
| R-squared | 0.990382 | | | |
| Adjusted R-squared | 0.989461 | | | |
| S.E. of regression | 320.9257 | | | |
| Log likelihood | -742.5184 | F-statistic | | 1075.436 |
| Durbin-Watson stat | 2.424619 | Prob(F-statistic) | | 0.000000 |

Multiple Regression Model, Child Care Subsidy: The Updated Model, Variables (1)

UNEMPLOY_MD(-2)

The unemployment rate for Maryland, not seasonally adjusted. A two month lag is applied.

ELIG_NEW

An estimate of MD families eligible for the Child Care Subsidy program. Constructed by updating the number of families from Census 2000 PUMS using projections of household growth in the State (MD Dept. of Planning) and annual poverty estimates (Current Population Survey, ASEC, Children ages 5-7 in poverty).

WAIT_LIST_IN_EFFECT1

A linear series, 1-30, representing the number of months that admissions were closed, counting from January of 2003.

WL_RECOV1

A dummy variable for the period July through November 2005, when only the lowest four income levels were reopened.

WL_RECOV3

A linear series, 1-20, representing the period of recovery of enrollments, counting from the first month of full reopening in November of 2005.

Multiple Regression Model, Child Care Subsidy: The Updated Model, Variables (2)

CLOSURELAG9

A dummy variable of nine months' duration, acting as both an implementation anticipation effect and then an implementation lag, for the beginning of the waitlist period (from October 2002 through June 2003).

ELIG_CHNG_LAG3

A dummy variable of three months' duration for the two rate increase/co-pay adjustment/eligibility increase events of September 1999, May 2000 and January 2002.

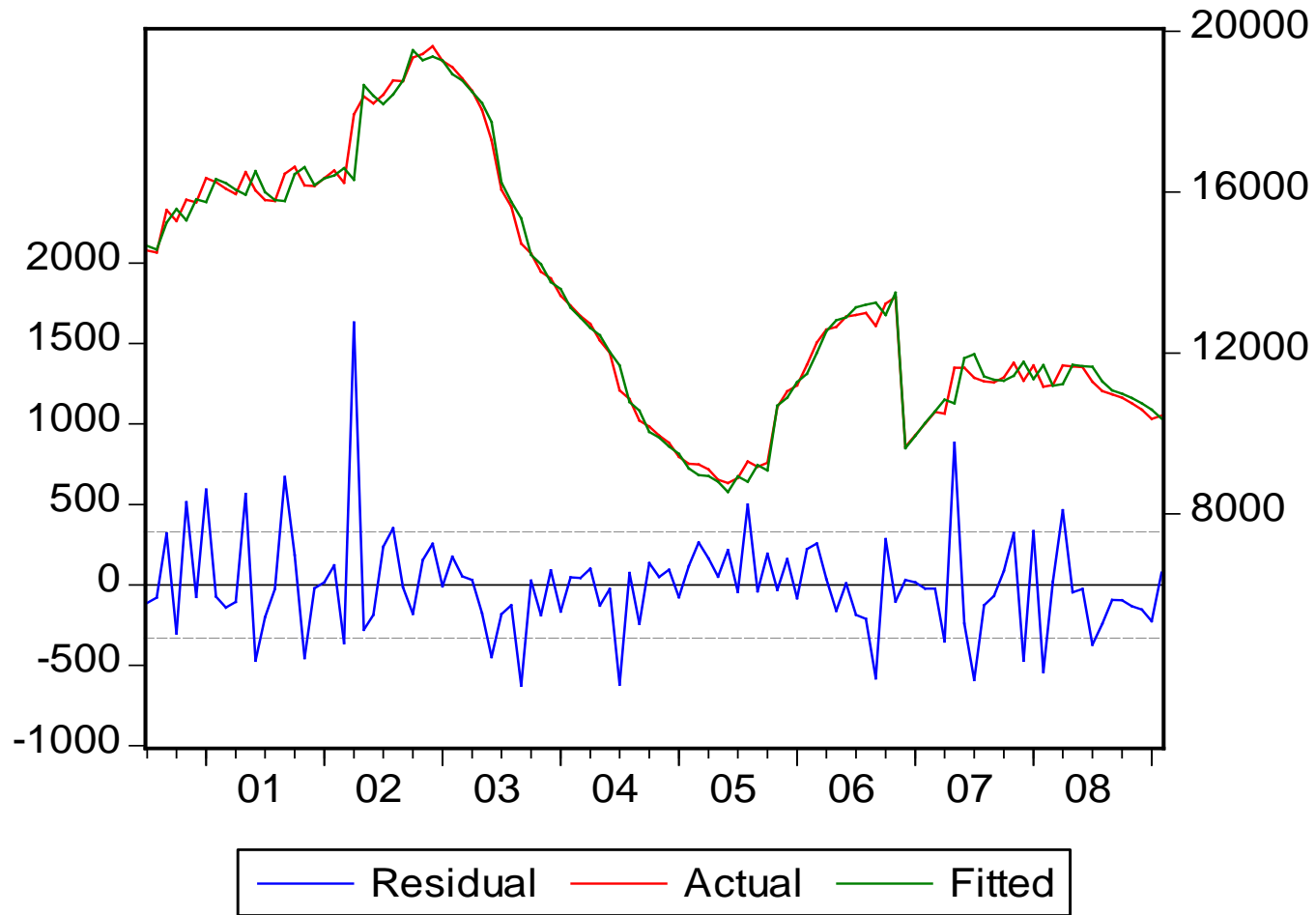
CCATS

A dummy variable representing the flow of data from the new computer system, CCATS, introduced in February 2007. This dummy compensates for the difference between family counts in the old computer system and the new computer system.

AR(1)

First order lagged residuals, in order to counteract the typical auto-regression problem of working with time series data. Without this adjustment, coefficients would be biased.

Multiple Regression Model, Child Care Subsidy: The Updated Model, Graphic



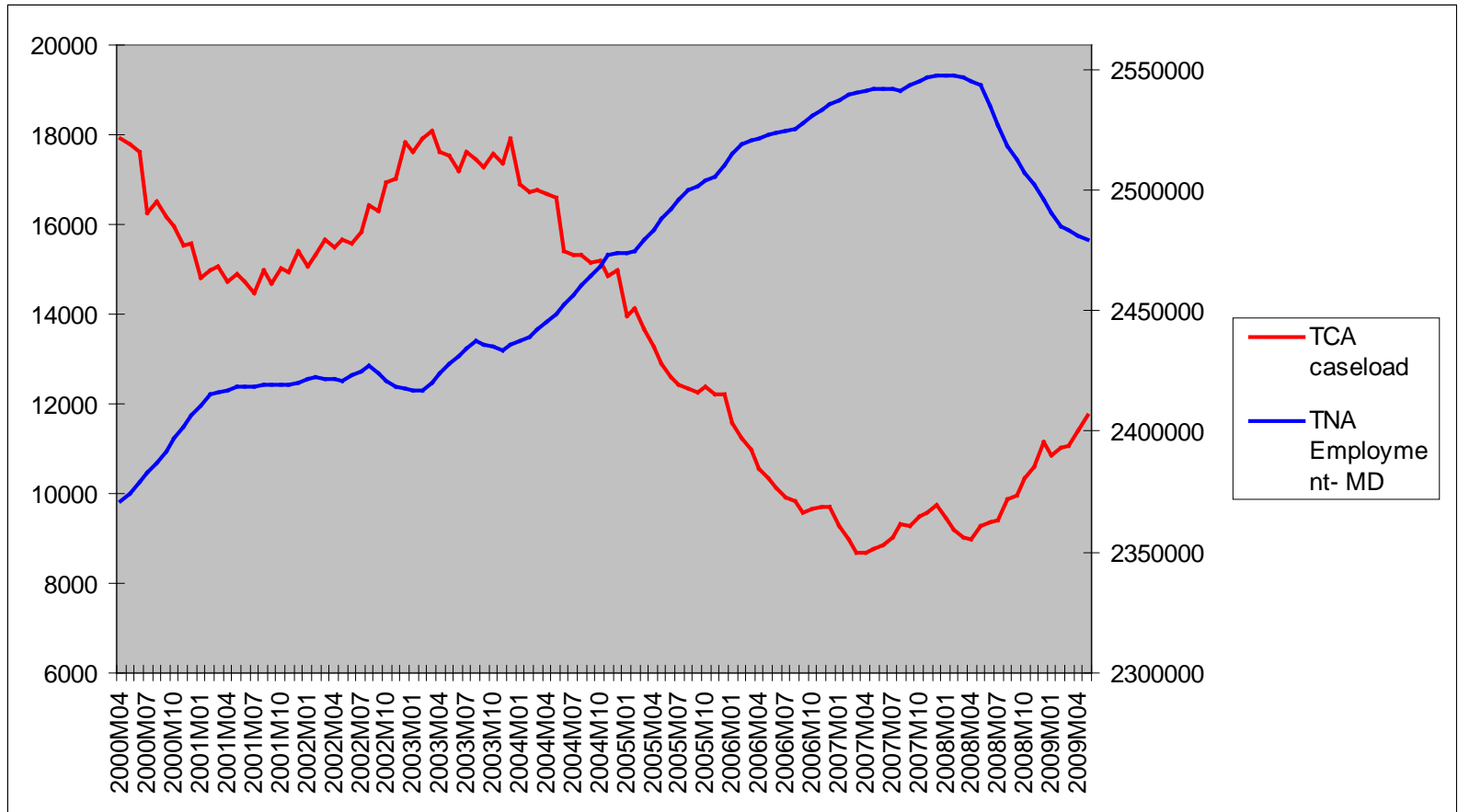
3- Modeling the TANF Caseload: Why?

- MD needs more precise estimates for its TANF assistance payments budget:
 - Prior year TANF “surplus” was down to \$0.9 million after second quarter reports were filed.
 - This indicates a much smaller margin for error.
- We must determine the size of the TANF budget for the post-ARRA environment.
- We want to share our experience with other states, many of which are facing the same challenges.

Modeling the TANF Caseload: The Project

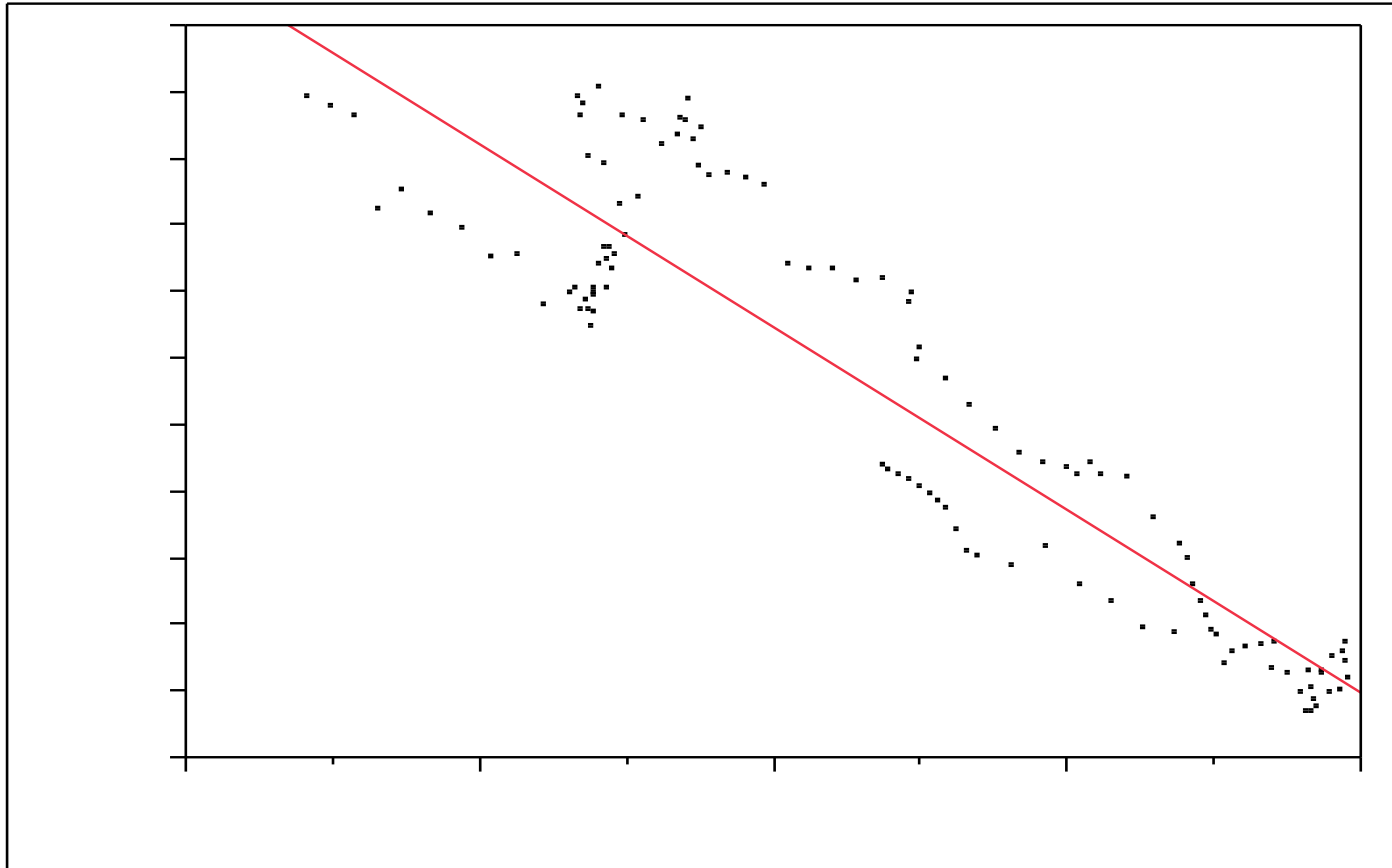
- Create a forecasting model that is relatively simple to use for intermediate term projections and “interim” revisions outside the standard budget submission cycle.
- Gathering data to determine policy and operational impacts:
 - Some straightforward, such as COLA’s and changes to earned income disregard.
 - Others are more difficult to identify, like a management overhaul of a metro county office or changes to performance standards.

4- Multiple Regression Model, TANF Cases: TCA Caseload and MD Employment Trend



Only counts cases with mandatory work participation; MD series is total non-agricultural employment.

Multiple Regression Model, TANF Cases: TCA Caseload and MD Employment Linear Fit



Linear fit, adjusted R2 = .846

Multiple Regression Model, TANF Cases: Policy Variables Tested as Useful

| Policy Variable | Description | Coeff t-statistic |
|--------------------------------|---|-------------------|
| CITY MGT CHANGE '03 | Change in administration in Baltimore City | 2.33* |
| STATE JOBSTAT '05 | Phase II of management outreach to DSS | .0020** |
| CITY WORK CONTRACTS '06 | Baltimore City moves to pay-for-performance in training contracts | -2.36* |

* Significant at the 5% level; ** Significant at the 1% level.



Modeling the TANF Caseload: Comments on the Significant Policy Variables

- 2003- A management shake up in a large jurisdiction was ultimately successful, but its immediate impact was to reclassify many cases as requiring engagement.
- 2005- Holding local offices to a more stringent standard for high impact policies such as the work participation rate put downward pressure on the caseload.
- 2006- Holding vendors to a pay-for-performance standard in the city work programs seems to have paid off.

TANF Model with Policy Dummies: Stats

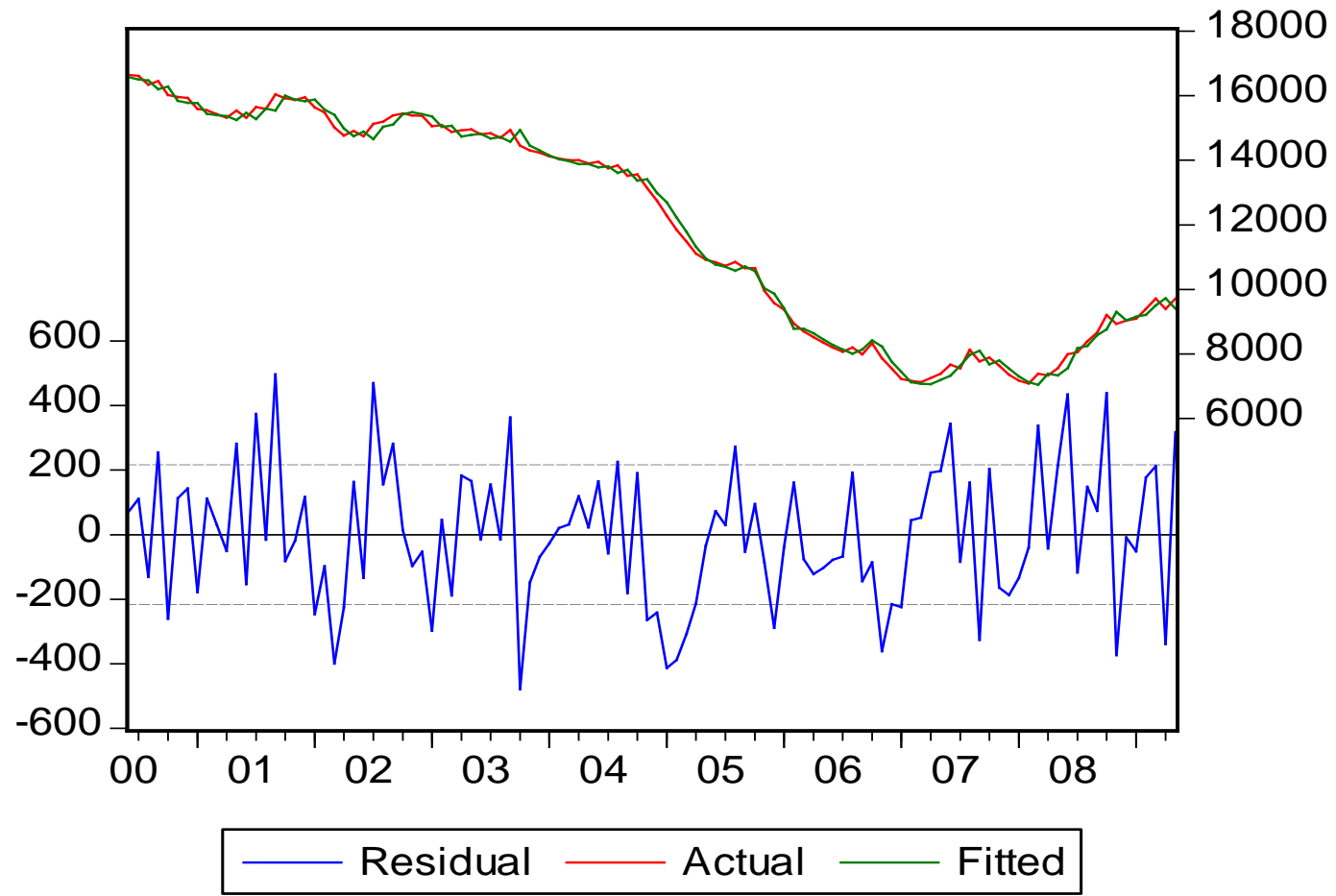
Dependent Variable: TANF Cases Wk Requirement

Sample (adjusted): 2000M06 2009M05

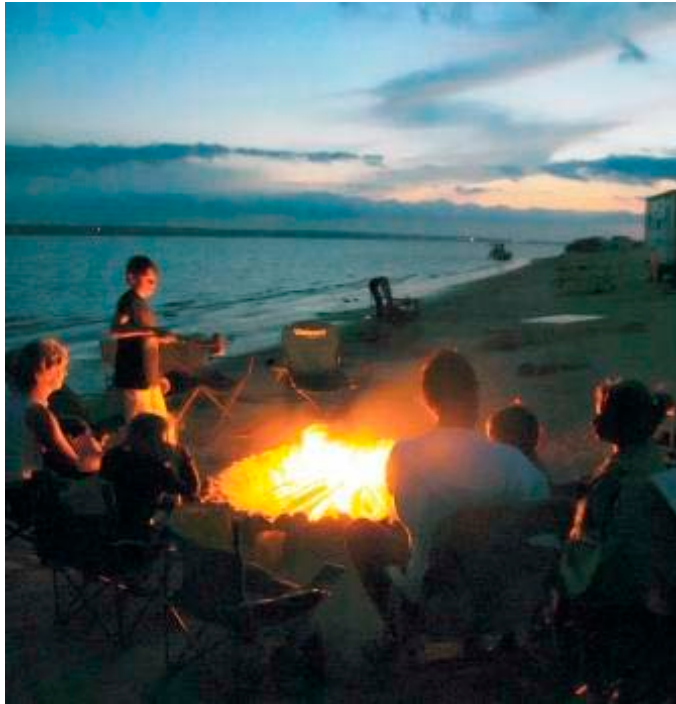
Included observations: 108 after adjustments

| <u>Variable</u> | <u>Coefficient</u> | <u>Std. Error</u> | <u>t-Statistic</u> | <u>Prob.</u> |
|--------------------|--------------------|-------------------|--------------------|--------------|
| C | 162859.6 | 8030.944 | 20.27901 | 0.0000 |
| TNA_FCAST1(-1) | -0.060517 | 0.003189 | -18.97659 | 0.0000 |
| UNEMPLOY_MD | -311.1282 | 121.8447 | -2.553482 | 0.0122 |
| CITY_WKCONTR_06 | -390.7964 | 165.2708 | -2.364582 | 0.0200 |
| CITY_MGTCHNG_03 | 373.3010 | 160.0450 | 2.332476 | 0.0217 |
| STATE_JOBSTAT2_05 | -528.1485 | 166.6748 | -3.168737 | 0.0020 |
| AR(1) | 0.854783 | 0.045485 | 18.79282 | 0.0000 |
| R-squared | 0.995598 | | | |
| Adjusted R-squared | 0.995336 | | | |
| S.E. of regression | 227.9738 | | | |
| Log likelihood | -735.9837 | F-statistic | | 3806.911 |
| Durbin-Watson stat | 1.915619 | Prob(F-statistic) | | 0.000000 |

TANF Model with Policy Dummies: Graphic



Conclusion



Here's wishing all forecasters enjoyment of campfires in warmer times!