Say Goodbye to April Surprises

FTA Revenue Estimation Conference

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"April Surprise"

- Significant departure of net final payment activity from forecast.
- April 2002, Oregon surprise equaled -$324.0 million, a -7.3% reduction in tax year 2001 liability estimates. Total 2001-03 impact much larger.
- Immediate response from lawmakers, public, etc.: "Could you have seen this coming? At what point is it possible?"

Prior research/documentation:

- Ann D. Parcell, “Challenges and Uncertainties in Forecasting Federal Individual Income Tax Receipts”, National Tax Journal, September 1999
- Congressional Budget Office, “Where Did the Revenues Go?” August 2002
- Rockefeller Institute, State Revenue Report, September 2002.

Basic Forecast Problem

- Most informative data, income and liability data from tax returns, lags collection activity significantly.
- Forecast accuracy depends on the ability to infer changes in income and liability from current collections data.
- Was there any indication in the 2001 collections data pointing to April 2002 correction?

Composition of payments

Prospective Payments — Reconciliation

$$(1) \quad L_t = [W_t + E_t] + [F_t + R_t],$$

where L = "net collections liability" and t = tax year

Volume of Reconciliation — Volume Percent

$$(2) \quad V_t = [F_t - R_t] \qquad v_t = V_t/L_t$$

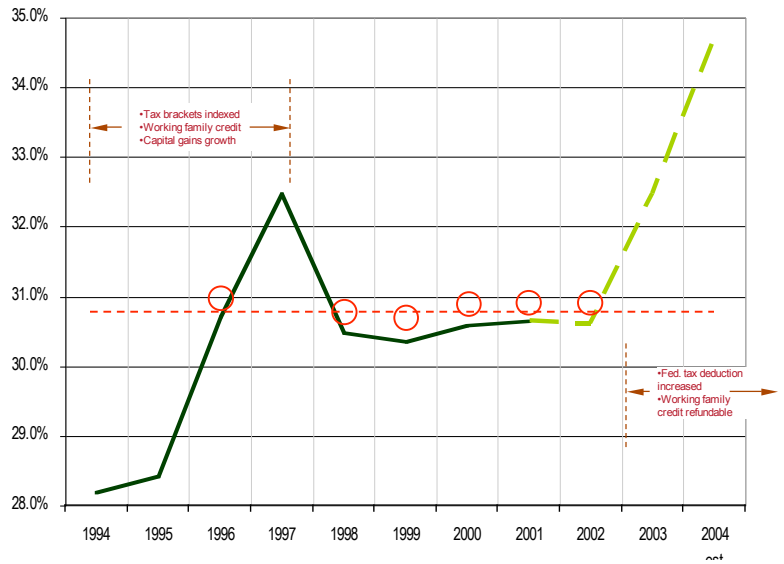
Final Payment Ratio

$$(3) \quad f_t = F_t/V_t$$

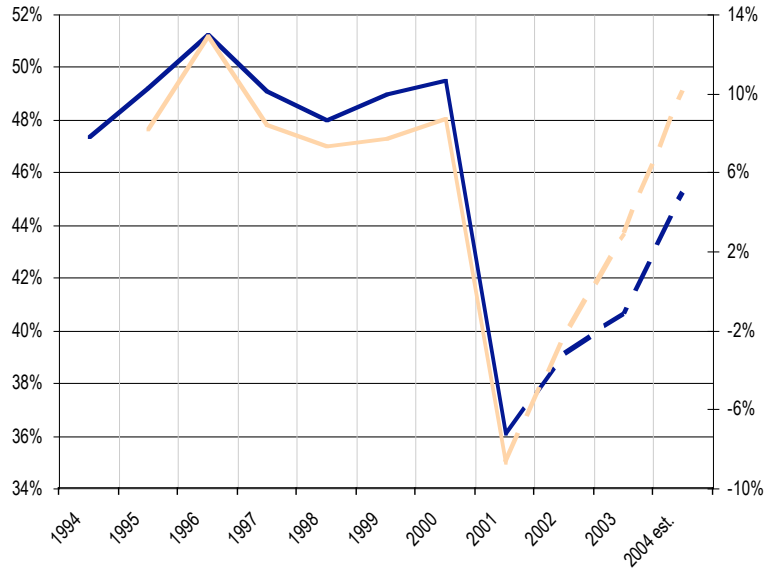
Table 1: Historical Collections Patterns by Tax Year

(millions)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 est.	1994-2000 AVG	1994-2000 STDEV
Prospective Payments													
Withholding	$2,222.4	$2,413.5	$2,681.3	$2,927.9	$3,122.8	$3,361.4	$3,665.2	$3,702.9	$3,626.9	$3,750.1	$3,981.1		
% Change		8.6%	11.1%	9.2%	6.7%	7.6%	9.0%	1.0%	-2.1%	3.4%	6.2%	8.7%	1.5%
% of Net Collections	82.1%	82.4%	81.1%	81.7%	81.1%	81.0%	81.3%	89.9%	90.2%	90.5%	87.3%	81.5%	0.6%
Estimated Payments	$524.7	$527.6	$600.0	$677.7	$774.4	$811.9	$859.8	$768.2	$665.0	$645.3	$730.3		
% Change		0.6%	13.7%	12.9%	14.3%	4.9%	5.9%	-10.6%	-13.4%	-3.0%	13.2%	8.6%	5.7%
% of Net Collections	19.4%	18.0%	18.1%	18.9%	20.1%	19.6%	19.1%	18.6%	16.5%	15.6%	16.0%	19.0%	0.8%
Prospective Payments	$2,747.0	$2,941.1	$3,281.3	$3,605.7	$3,897.2	$4,173.4	$4,524.9	$4,471.1	$4,291.9	$4,395.4	$4,711.4		
% Change		7.1%	11.6%	9.9%	8.1%	7.1%	8.4%	-1.2%	-4.0%	2.4%	7.2%	8.7%	1.8%
% of Net Collections	101.5%	100.5%	99.2%	100.6%	101.2%	100.6%	100.3%	108.5%	106.7%	106.1%	103.3%	100.6%	0.7%
Reconciliation													
Final Payments	$361.4	$409.5	$520.3	$572.0	$662.8	$616.8	$683.0	$456.1	$481.4	$546.1	$717.7		
% Change		13.3%	27.0%	9.9%	-1.6%	9.6%	10.7%	-33.2%	5.5%	13.4%	31.4%	11.2%	9.2%
% of Reconciliation	47.4%	49.2%	51.2%	49.1%	48.0%	49.0%	49.5%	36.1%	39.1%	40.6%	45.3%	49.1%	1.2%
Refunds	-$401.5	-$422.9	-$495.2	-$592.4	-$610.5	-$642.1	-$697.1	-$806.7	-$750.3	-$799.3	-$867.1		
% Change		5.3%	17.1%	19.6%	3.0%	5.2%	8.6%	15.7%	-7.0%	6.5%	8.5%	9.6%	6.9%
% of Reconciliation	52.6%	50.8%	48.8%	50.9%	52.0%	51.0%	50.5%	63.9%	60.9%	59.4%	54.7%	50.9%	1.2%
Reconciliation	$762.9	$832.4	$1,015.5	$1,164.4	$1,173.2	$1,258.9	$1,380.0	$1,262.8	$1,231.7	$1,345.5	$1,584.8		
% Change		9.1%	22.0%	14.7%	0.8%	7.3%	9.6%	-8.5%	-2.5%	9.2%	17.8%	10.4%	7.2%
% of Net Collections	28.2%	28.4%	30.7%	32.5%	30.5%	30.3%	30.6%	30.6%	30.6%	32.5%	34.7%	30.2%	1.5%
Net Collections	$2,706.9	$2,927.8	$3,306.4	$3,585.2	$3,849.4	$4,148.0	$4,510.8	$4,120.5	$4,023.0	$4,142.2	$4,562.0		
% Change		8.2%	12.9%	8.4%	7.4%	7.8%	8.7%	-8.7%	-2.4%	3.0%	10.1%	8.9%	2.0%
Liability from Tax Returns	$2,514.2	$2,747.3	$3,038.1	$3,436.6	$3,639.4	$3,871.8	$4,196.2	$3,835.7	$3,740.7	$3,841.8	$4,239.0		
% of Net Collections	92.9%	93.8%	91.9%	95.9%	94.5%	93.3%	93.0%	93.1%	93.0%	92.7%	92.9%	93.6%	1.3%

Volume of Reconciliation



Final Payment Ratio



Initial inferences

- Prospective payments are insensitive to changes in income, and even more so to changes in liability.
- Possible explanations include:
  - Withholding parameters predicated on full-year earnings, AND assume only those wage earnings.
  - Safe harbor computations for estimated payments.
  - Deductions rise even as income falls.
- Tax law changes not reflected in withholding formulas/tables will also affect f_t.

Posit relationship

$f_t = g(l_t, d_t)$,

where $l_t = (L_t/L_{t-1}) - 1$), d_t is a measure of tax code/withholding discrepancy.

System becomes:

(1) $L_t = [W_t + E_t] + [F_t + R_t]$

(4) $f_t = b_0 + b_1 * f_{t-1} + b_2 * l_t + b_3 * d_t + e_t$

(5) $F_t = [v * L_t] * f_t$

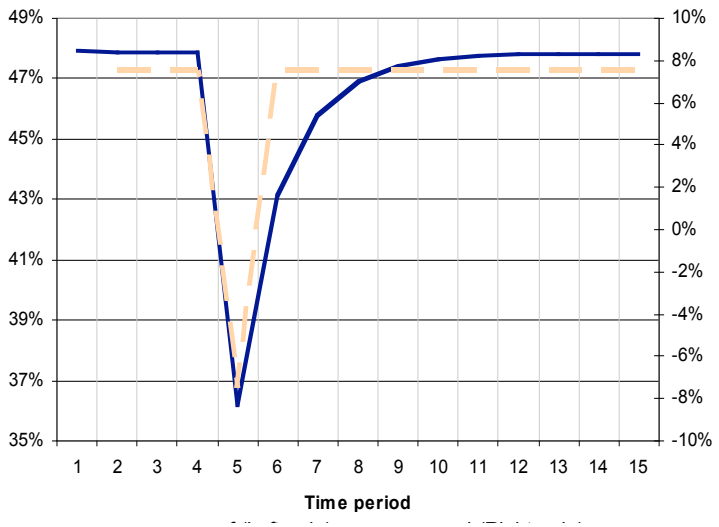
Given values for W_t, E_t, and v_t, solution exists for L_t, F_t and R_t.

Note: f_t is unsuitable as endogenous variable. $r_t = F_t/-R_t$ substituted for tractability. Note that $f_t = r_t / (r_t + 1)$. Simple monotonic transformation does not affect results.

Results

Dependent variable:	F/-R	
Variable	B	Significance
Constant	0.33	0.002
F(-1)/-R(-1)	0.45	0.001
I	2.33	0.000
d	0.22	0.020
R^2	0.98	
Adj. R^2	0.97	
Prob (F)	0.00	
D.W. Stat	1.46	

Response to negative shock



Tax Year 2001 Redux

	Y/Y change (Jan.-June 2001)	2001 Total changes
Withholding	2.5%	1.0%
Estimated payments	-9.2%	-10.6%
Prospective payments	0.7%	-1.2%

Assume rates hold for all of 2001. Estimate Eq. (4) for 1994-2000.

	f_{2001}	l_{2001}
Estimated using existing coefficients	**41.4%**	**-4.5%**
Estimated using current coefficients	38.6%	-6.1%
Actual 2001 results	36.1%	-8.7%
Sept. 2001 forecast	N/A	3.6%

Issues

- Very limited observations, spanning a unique boom-bust cycle. Does not cover multiple business cycles.
- Replication. Similar results for other states, federal government?
- Data availability (collections by tax year). Although assumptions can be made to simulate tax year.
- Are steady state parameters (i.e., f, v) stationary? Changes in the distribution of income – between wage and non-wage types, across taxpayers, etc. – will cause f_t to migrate.

For further information

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