Intra-Fiscal Year Forecasting Issues and Options: The Connecticut Experience

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Introduction

- Tom Fiore
  - Connecticut's Office of Policy and Management (OPM)
  - Budget Agency for the State
  - My area is responsible for revenue forecasting

- Here today to talk about:

  - Development of Monthly Revenue Targets

  - Translating Monthly Revenue Targets into Daily Forecasts

Introduction

▸ Why do we do have monthly and daily targets?

▸ What is our motivation?

Requirements in Connecticut

▸ Since the late 1970s, OPM has been legally required to produce a monthly status report on the projected balance in the General Fund (C.G.S. 4-66).

▸ This report is produced on or before the 20th day of each month and is provided to the State Comptroller.

▸ The report details any change in revenues or expenditures relative to the originally adopted budget.

▸ The monthly reports are published on OPM's website:
  ◦ http://www.ct.gov/opm/cwp/view.asp?a=2965&q=382950

State of Connecticut
General Fund
Statement of Revenues, Expenditures, and Results of Operations, GAAP and Budgetary Bases
Projected to June 30, 2013
As of September 30, 2012
(In Millions)

	General Assembly Budget Plan [1.]	Revised Estimates OPM	Over/ (Under)
REVENUE			
Taxes	$ 15,483.8	$ 15,472.0	$ (11.8)
Less: Refunds	(1,075.6)	(1,072.1)	3.5
Taxes - Net	$ 14,408.2	$ 14,399.9	$ (8.3)
Other Revenue	1,158.3	1,135.5	(22.8)
Other Sources	3,576.7	3,624.6	47.9
TOTAL Revenue	$ 19,143.2	$ 19,160.0	$ 16.7
OTHER FINANCING SOURCES			
Prior Year Appropriations Continued to FY 2013		$ 130.4	$ 130.4
Current Year Appropriations Continued to FY 2014		-	-
TOTAL Revenue and Other Financing Sources	$ 19,143.2	$ 19,290.3	$ 147.1
EXPENDITURES			
Current Year Appropriations	$ 19,256.4	$ 19,256.4	$ -
Appropriation Revisions		-	-
Prior Year Appropriations Continued to FY 2013		130.4	130.4
TOTAL Initial and Continued Appropriations	$ 19,256.4	$ 19,386.8	$ 130.4
Net Additional Expenditure Requirements		100.0	100.0
Estimated Lapses	(116.3)	(136.3)	(20.0)
Current Year Appropriations Continued to FY 2014		-	-
TOTAL Estimated Expenditures	$ 19,140.1	$ 19,350.5	$ 210.4
Estimated Balance - Budgetary Basis - 6/30/2013	$ 3.1	$ (60.1)	$ (63.3)

Source: Office of Policy and Management October 19, 2012 Letter to the Comptroller

Requirements in Connecticut

- Approximately ten days after receiving the OPM report, the State Comptroller must then issue his own report to the Governor on the 1st of each month reporting on the OPM forecast (C.G.S. 3-115).

- The Comptroller will provide his own commentary on OPM's projections and, at times, provide an alternate projection.
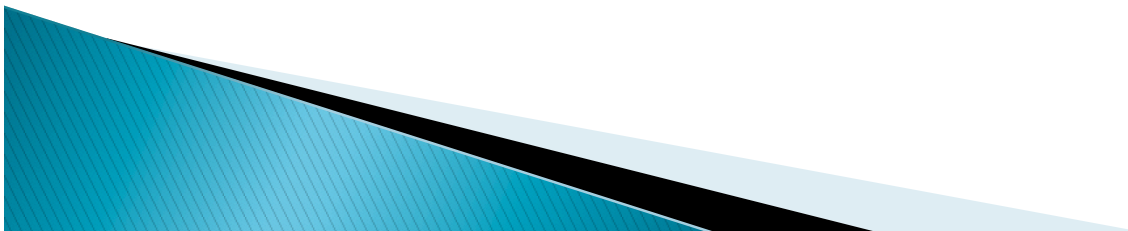
- Current and prior reports can be found:
  - http://www.osc.ct.gov/reports/index.html

Motivation

The only thing worse than receiving bad news...
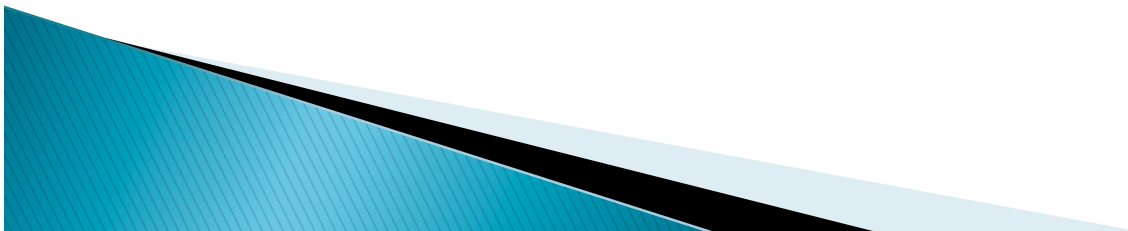
Motivation

…is being <u>surprised</u> by bad news.

Target Development Process

▸ We have 3 separate targets in Connecticut: annual, monthly, daily.

▸ Creating the annual forecast is an entirely different process that is not part of today's discussion.
  ◦ Includes review of economic variables, outside forecasts, and historical collections
  ◦ Iterative process of reaching a consensus with our Legislative colleagues
  ◦ Suffice it to say, we start with the annual forecast for each revenue stream, which is reviewed on a monthly basis.

▸ For each major revenue source we take monthly data for 5 years.

▸ Then we calculate the percentage each month represents of total annual collections.

▸ From there we calculate a 5-year average for each month and apply those percentages to the annual forecast.

▸ We have a total of 35 separate monthly targets in Connecticut, one for each of our major revenue sources.

Monthly Target

STATE OF CONNECTICUT
PERSONAL INCOME TAX - WITHHOLDING
ACCOUNT # 40110
FIVE YEAR MOVING AVERAGE
FY 2013

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
			Monthly								Cumulative			
	Monthly Average	Cumulative Average	Target 000's	Actual 000's	Variation 000's	Range +/-000's	Mean Deviation +/-000's	Target 000's	Actual 000's	Variation 000's	Range +/-000's	Mean Deviation +/-000's	Mean Dev/ Cumulative Target	Variation/ Cumulative Target
August	5.30%	5.30%	281,636	320,983	39,347	44,620	24,485	281,636	320,983	39,347	44,620	24,485	8.7%	14.0%
September	7.21%	12.51%	383,524	342,279	(41,244)	23,974	14,845	665,160	663,262	(1,897)	33,565	19,553	2.9%	-0.3%
October	7.61%	20.12%	407,013	-	-	46,645	23,468	1,072,172	-		53,711	40,682	3.8%	
November	7.79%	27.90%	413,970	-	-	39,578	22,479	1,486,142	-		79,931	58,015	3.9%	
December	9.99%	37.89%	528,454	-	-	42,484	23,895	2,014,596	-		85,734	49,718	2.5%	
January	9.80%	47.69%	521,035	-	-	36,407	26,895	2,535,631	-		80,210	57,764	2.3%	
February	8.99%	56.69%	478,138	-	-	10,292	7,756	3,013,769	-		87,859	59,385	2.0%	
March	10.68%	67.37%	567,772	-	-	55,623	29,870	3,581,541	-		61,967	33,416	0.9%	
April	7.61%	74.98%	404,714	-	-	25,389	14,299	3,986,255	-		50,475	31,185	0.8%	
May	7.47%	82.45%	397,352	-	-	21,599	15,330	4,383,606	-		54,881	29,444	0.7%	
June	7.55%	90.00%	401,289	-	-	40,623	27,609	4,784,896	-		40,989	27,940	0.6%	
Accrual	10.00%	100.00%	531,604	-	-	40,989	27,940	5,316,500	-		0	0	0.0%	
TOTAL			5,316,500											

Growth FY 2013 Over 2012   0.96%

Daily Targets

▶ Daily targets developed during the late 1990's as a way of providing more real-time information instead of waiting until month-end.

▶ Particularly useful during the critical collection months of January – April.

▶ From the monthly forecasts, we then break down the monthly target into daily forecasts for our 4 main tax types in Connecticut:

  ◦ Personal Income Tax- Withholding
  ◦ Personal Income Tax- Estimates & Finals
  ◦ Sales Tax
  ◦ Corporation Tax

  ◦ Sometimes we also produce a daily target for Income Tax Refunds – during heavy refund periods

▶ Again we primarily look at historical collection patterns.

▶ However, we may also use a blend of methods in breaking down a monthly target into a daily target.

Daily Targets

Accounting Date:18-OCT-2012

Account Code	GL Account Name	Amount
40110	Withholding	$ 25,347,001.05
40121	Personal Income Tax Est Pmts	1,273,918.52
40122	Personal Income Tax-General	16,226,029.92
40221	General Sales and Use Tax	6,905,173.49
40222	Business Use Tax	191,818.98
40223	Individual Use Tax	2,751.00
40240	Room and Occupancy Tax-General	36,846.00
40410	Business Entity Tax	49,932.15
40420	Corporate Business Tax	1,043,131.90
40450	Unrelated Business Income Tax	3,260.00
40830	Gift and Estate Tax	438,535.86
40920	Foreign Insurance Co Tax	5,626.90
41116	Cigarette Tax	605,880.00
41131	Tobacco Products Tax	3,257.00
41210	Controlling Int Transfer Tax	78,376.00
41300	Petroleum Gross Earnings	366,183.30
41420	Taxes on Adm, Dues	1,642.00
41510	Dry Cleaning Tax	4,705.52
41520	Accounts Receivable	344,663.24
41540	Nursing Home Provider Tax	96,089.00
41640	Estate Tax	14,527.76
41650	Hospitals Net Revenue Tax	1,099,040.00
41842	IFTA Motor Carrier Tax	5.20
42330	Sales and Use Tax Licenses	6,700.00
42588	Motor Carrier Reg Licenses	140.00
42589	IFTA Motor Carrier Reg License	240.00
43788	Bottle Deposit	1,008,931.11
		$ 55,154,405.90

▸ Each day the revenue unit at OPM receives an email from the Department of Revenue Services with the amount of the previous day's collection.

▸ These amounts are then entered into the daily targets.

Daily Targets

State of Connecticut
Daily Tax Collections versus Target
Dollar Amount in Millions
Fiscal Year 2013

Withholding

| Day #	Date	Target Revenue		Actual Revenue		Variance	
		Daily	Cumulative Total	Daily	Cumulative Total	Over/(Under) Cumul. Target	% Over/(Under) Target
1	1-Oct	$ 7.9	$ 7.9	$ 17.1	$ 17.1	$ 9.2	53.8%
2	2-Oct	7.9	15.8	7.0	24.1	8.3	34.6%
3	3-Oct	33.4	49.1	36.8	60.9	11.7	19.3%
4	4-Oct	45.6	94.7	47.1	108.0	13.3	12.3%
5	5-Oct	15.8	110.6	14.9	122.9	12.4	10.1%
6	9-Oct	7.9	118.4	4.6	127.5	9.1	7.1%
7	10-Oct	21.3	139.7	25.6	153.1	13.4	8.7%
8	11-Oct	27.4	167.1	30.6	183.7	16.6	9.0%
9	12-Oct	7.9	175.0	6.0	189.7	14.7	7.7%
10	15-Oct	7.9	182.9	9.1	198.8	15.9	8.0%
11	16-Oct	7.9	190.8	8.2	207.0	16.2	7.8%
12	17-Oct	33.4	224.1	24.3	231.3	7.2	3.1%
13	18-Oct	45.6	269.7	25.3	256.6	(13.1)	-5.1%
14	19-Oct	15.8	285.6	-	-	-	-
15	22-Oct	7.9	293.4	-	-	-	-
16	23-Oct	7.9	301.3	-	-	-	-
17	24-Oct	21.3	322.6	-	-	-	-
18	25-Oct	27.4	350.0	-	-	-	-
19	26-Oct	7.9	357.9	-	-	-	-
20	29-Oct	7.9	365.8	-	-	-	-
21	30-Oct	7.9	373.6	-	-	-	-
22	31-Oct	33.4	407.0	-	-	-	-

Amount Over/(Under) October Target $ (150.4)

Note:
1. The boxes around the dates highlight higher collection days– typically Wednesdays/Thursdays.
2. The underlines on the dates highlight state payroll deposit days– every other Friday.

Report Distribution

▸ Who uses these reports?

▸ The daily reports are distributed by email each day to:

  ◦ Revenue Unit Staff

  ◦ Executive Budget Officer

 ◦ Agency Head- Secretary of the Office of Policy and Management
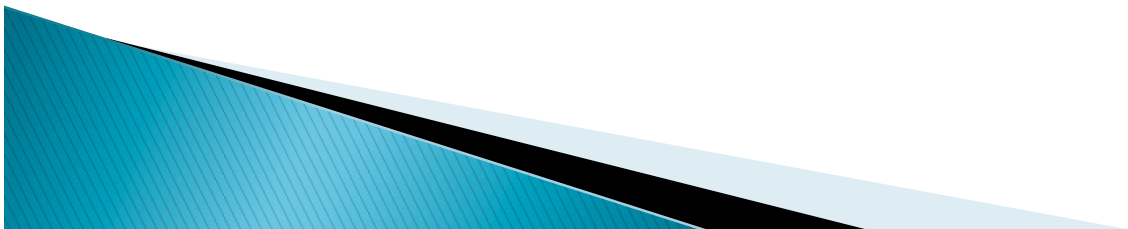
Advantages

- Our superiors see what we see.

- Not caught by surprise.
  - Particularly helpful when the revenue forecasters have to deliver bad news.

- Keeps us disciplined in the process of reviewing revenue performance.

- Reports can be critical during the period when annual revenue forecasts are being debated and adopted.

Problems/Pitfalls

- Developing monthly and/or daily targets is not just a routine calculation based on historical averages, one should also consider:
  - Timing of tax increases/decreases
    - Affects on historical data or if a new change must be incorporated into the target
  - Impact of large one-time payments need to be removed from historical data
  - Calendar quirks
    - Extra/fewer collection days per month
    - Due dates falling on weekends
    - Odd/Even years-biennial taxes and/or fees
    - Number of heavier collection days in the month, for example in CT this would be Wednesdays/Thursdays for the withholding tax
 - Collection patterns can change over time
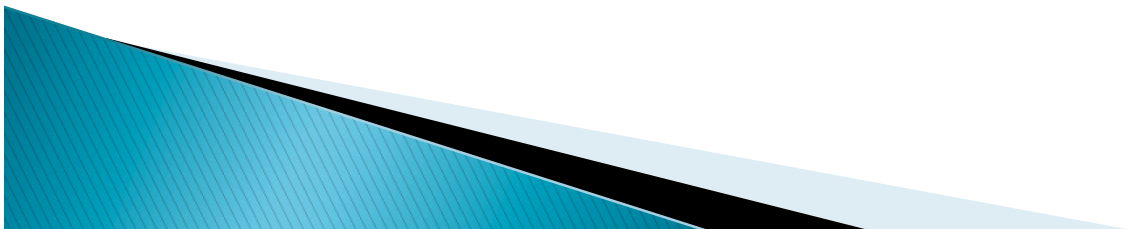
Where do we go from here?

▸ **Working on mid-month regression analysis for withholding**

◦ As I mentioned previously, OPM must prepare a report on the 20th of the month.

◦ This model will take the collection data that we have received just prior to the 20th of the month and make a projection for withholding for the remainder of the month.

◦ The model we are testing includes the following variables:
  • Total amount of collections received prior to the 20th of the month
  • Number of collection days remaining in the month
  • Number of heavier collection days remaining in the month
  • Change in non-farm employment from previous month

Where do we go from here?

- ▶ **Business Intelligence (BI) – Dashboards**
  - ○ Exploring with our IT personnel the creation of dashboards to both retrieve collection data and produce internet based reports automatically for decision makers.
    - • Still in its infancy
    - • Although elements of our process may lend themselves to BI, not sure if all of our customization of developing targets can easily be built into such a system.

- ▶ **Other suggestions?**
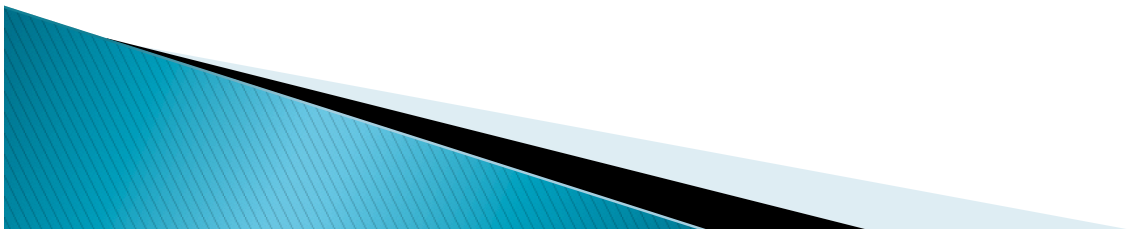
Contact Information/Questions

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