

Association of Public Treasurers of the United States & Canada

54th Annual Conference -

The Sky's the Limit

Cash Flow Forecasting and Analysis

**The Key to a Successful Investment
Program**

Presented By: **Keith Sawdon**
Retired Director of Finance
City of Rochester Hills

Introduction

Public Treasurers face many challenges

- They collect all forms of revenues using many different methods;
- They disburse those collected funds using many different bank tools
- In between the collection and disbursement of those funds, they manage the money by investing those funds
- They are also expected to keep the public's funds:
 - Safe
 - Provide needed liquidity, and
 - Provide for a fair and competitive rate of return

They ensure the public's funds are safe by:

- Analyzing each investment's credit worthiness;
- Design a solid system of internal controls to control the flow of money into and out of the government; and
- Diversify investment portfolios by instrument type(s) and institutions

But How do Treasurers ensure liquidity?

They design and develop a method to forecast cash flows by:

- Determining (from history, personal experience or commonsense) monthly collections, as a percentage, by major category, inflows and outflows of cash;
- Applying that monthly cash flow percentage(s) to the current fiscal year's budget to predict monthly cash flows (in and out); and
- Verify the effectiveness of the cash flow predicting model by comparing forecasted cash flows with actual cash flows (variance analysis).

Cash Flow Forecasting

At the conclusion of today's program you should be able to answer the following cash flow questions:

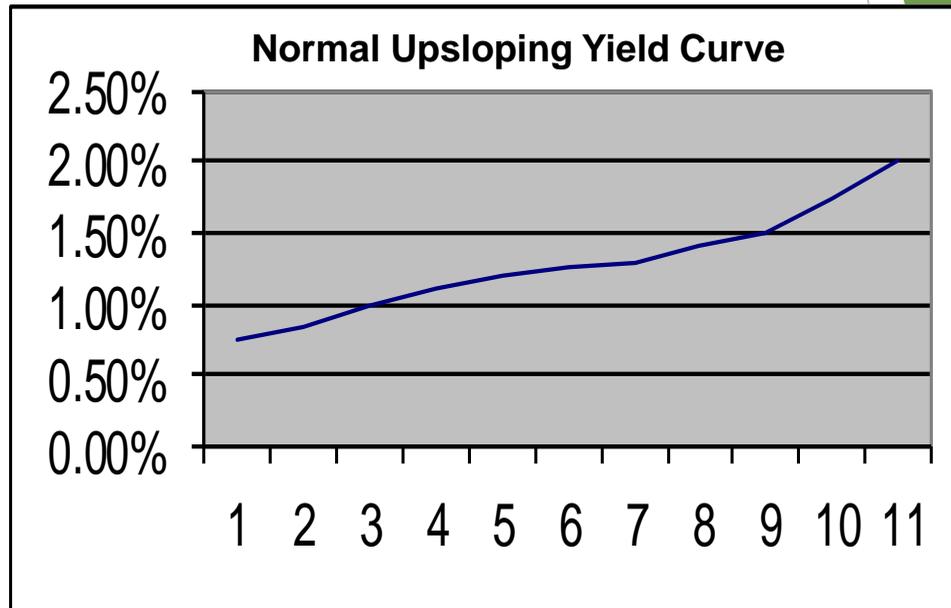
- How much cash do I have available?
- When will it become available?
- How long will it be available?

Investing is a Structured Process

- Identify your objectives, constraints, preferences and capabilities.
- Develop a written investment policy.
- Develop a system of internal controls and administrative policies.
- Forecast your cash flow.
- Analyze the yield curve.
- Establish an investment strategy.
- Determine your investment outlook.
- Select investment instruments.
- Monitor and report the market and investment results.
- Adjust and rebalance the portfolio.

What Makes Up an Interest Rate?

- Federal Funds Rate,
- Length to Maturity, and
- Credit Risk.



Assumptions

- Cash flows for the current year will follow a pattern similar to that of the previous years
- All of the budgeted revenues will flow in as cash (within the fiscal year)
- All budgeted appropriations will flow out as cash (during the fiscal year)

The Cash Flow Forecast Process

- Review historical cash flows (typically monthly for 2-5 years), your professional knowledge or commonsense to determine cash flow percentages by month;
- Determine if there are any “statistically significant” seasonal changes in monthly flows;
- Identify any growth trends;
- Adjust our percentage cash flow data and apply it to your current year budget to project your cash flows; and
- Review projected flows with actual flows.

Historical Cash Data	Month 1				Month 2			
	Year 1	Year 2	Year 3	3 Year Average	Year 1	Year 2	Year 3	3 Year Average
Revenue								
Property Taxes	13%	15%	14%	14%	13%	15%	14%	14%
State Grants	14%	15%	15%	15%	14%	15%	15%	15%
Charges for Services	16%	14%	15%	15%	16%	14%	15%	15%
Investment Income	9%	8%	8%	8%	9%	8%	8%	8%
Other Revenues	10%	8%	8%	9%	10%	8%	8%	9%
Gain on Exchange of Assets	0%	0%	10%	3%	0%	0%	10%	3%
Expenditures								
Salaries & Wages	8%	8%	9%	8%	8%	8%	9%	8%
Fringe Benefits	8%	9%	8%	8%	8%	9%	8%	8%
Professional/Contractual Services	10%	10%	15%	12%	10%	10%	15%	12%
Commodities	8%	8%	9%	8%	8%	8%	9%	8%
Interest on Debt	50%	50%	50%	50%	0	0%	0%	0%
Capital Outlay	10%	10%	15%	12%	10%	10%	15%	12%

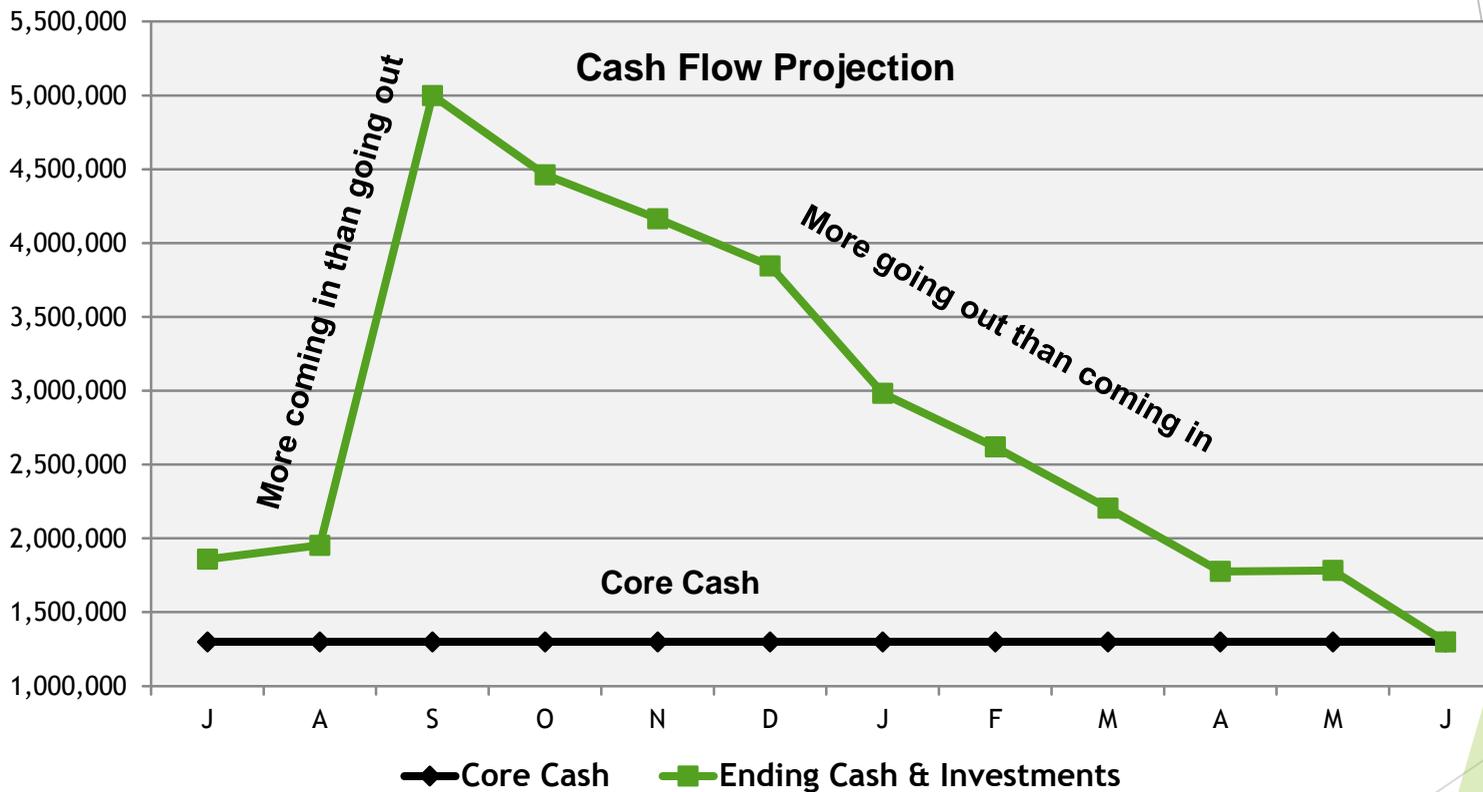
Components of Cash Forecasts

- Cash/Investment Balances;
- Projections of Receipts; and
- Projections of Disbursements.



Current Budget			Month 1		Month 2	
	Adopted Budget		Ave %	Est for Mo	Ave %	Est for Mo
Revenue						
Property Taxes	6,000,000	60%	14%	840,000	14%	840,000
State Grants	800,000	8%	15%	117,333	15%	117,333
Charges for Services	2,000,000	20%	15%	300,000	15%	300,000
Investment Income	500,000	5%	8%	42,167	8%	42,167
Other Revenues	250,000	3%	9%	21,917	9%	21,917
Gain on Exchange of Assets	50,000	1%	3%	1,667	3%	1,667
Transfers In	400,000	4%	0%	-		-
	10,000,000	100%		1,323,083		1,323,083
Expenditures						
Salaries & Wages	5,000,000	50%	8%	421,667	8%	421,667
Fringe Benefits	2,250,000	23%	8%	183,750	8%	183,750
Professional/Contractual Services	750,000	8%	12%	87,500	12%	87,500
Commodities	500,000	5%	8%	42,217	8%	42,217
Interest on Debt	500,000	5%	50%	250,000	0%	-
Capital Outlay	1,000,000	10%	12%	58,333	12%	116,667
Transfer Out	-	0%		-		-
	10,000,000	100%		1,043,467		851,800
Cash from Operations	0.00			279,617		471,283
Beginning Cash & Investments	1,300,000			1,300,000		1,579,617
Ending Cash & Investments	1,300,000			1,579,617		2,050,900

What a Cash Flow Forecast Will Look Like



The Forecasting Method Used will Depend On:

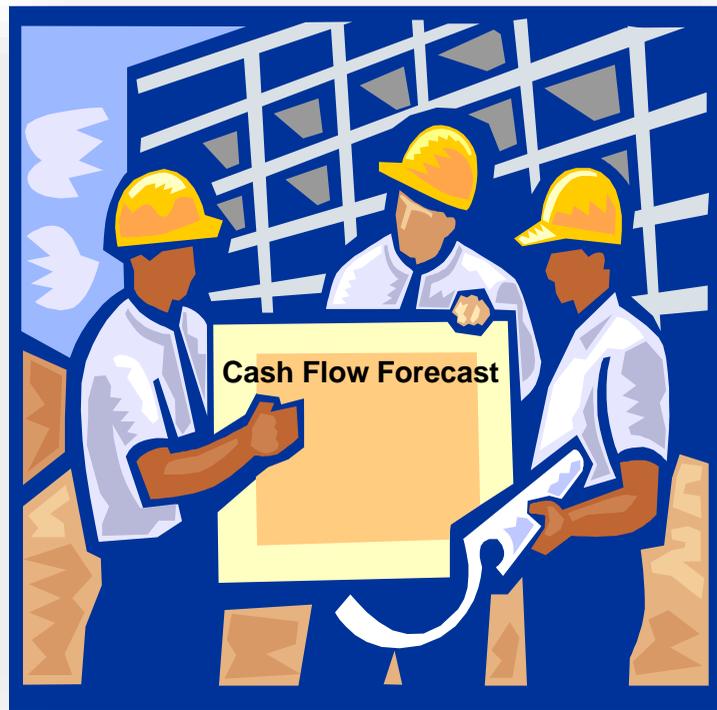
- The time and resources you have available for forecasting;
- The amount of funds you're working with;
- Your level of commitment to forecasting; and
- Ability to get accurate information.

Benefits of Cash Forecasting

- Ensure liquidity;
- Improve investment earnings;
- Helps from being too “short” and losing opportunities with “longer” rates; and
- Helps minimize borrowing needs by identifying any cash shortfalls



Tools Needed to Build Your Cash Flow Forecast



- Beginning cash/investment balance
- Historical or professional experience analysis of cash receipts and disbursements
- Apply our historical data and experience against current fiscal year's budget
- Capital budget spending projections

7/15/2019

Recurring and Nonrecurring Receipts and Disbursements

Receipts and disbursements that flow in and out can be characterized as either **recurring** or as **nonrecurring**

- **Recurring flows** are regular and predictable and the timing and amount is usually known in advance. An example of recurring receipts include property taxes. Examples of recurring disbursements include salaries and wages.
- **Nonrecurring flows** are irregular and unpredictable. The timing and amounts are usually not known in advance. An example of nonrecurring flows include receipts from the sale of assets. Nonrecurring disbursements include items like capital project expenditures.

Major Revenue Sources

- Taxes
- Special Assessments
- Federal, State and Intergovernmental Revenue
- Charge for Services
- Investment Earnings
- Other Revenues
- Transfers In

Nonrecurring Revenues

Bond Proceeds

Sale of assets

- Land
- Buildings
- Surplus Equipment



Estimated Monthly % Applied to Revenue Budget



Cash Flow Worksheet

Major Expenditure Sources

- Salaries & Fringe Benefits
- Contractual Service
- Commodities
- Internal Services
- Non-Departmental
- Capital Outlay
- Interest on Debt
- Transfers Out

Nonrecurring Expenditures



Capital projects are the largest nonrecurring expenditure item

- Work with department heads and engineers to develop estimates for projects.
- Explain the importance of cash flow to the success of the capital expense.

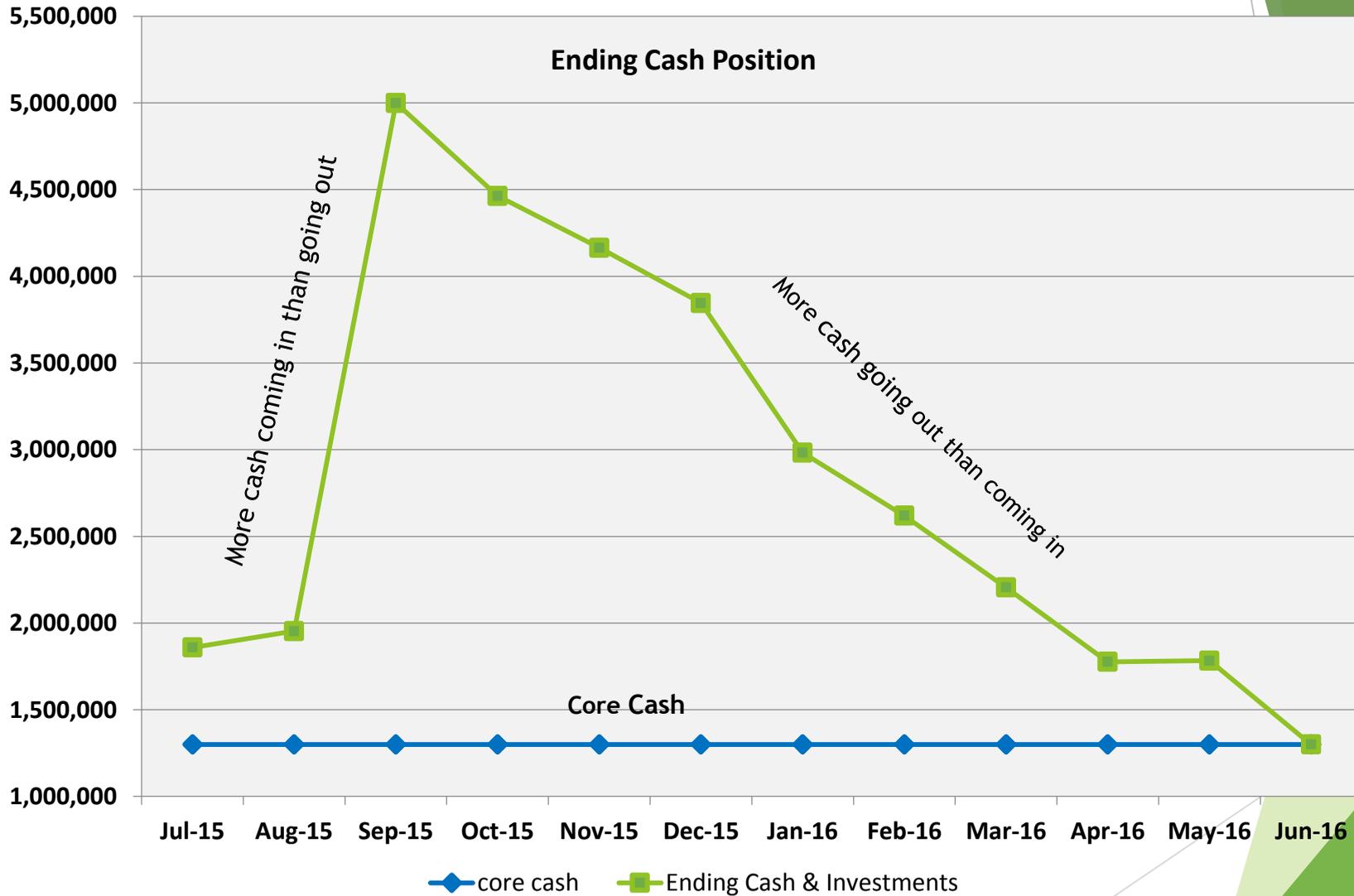


7/15/2019

Estimated Average Applied Against the Expense Budget



Cash Flow Worksheet



The Forecast Identifies Your Short and Long Term Needs

- Identifies an optimal allocation of Funds
 - Funds needed short-term to meet your cash flow needs for operations
 - Funds that could be invested longer-term (core cash)
- The management of short-term funds are based on cash flow requirements
- The management of longer-term funds (Core Cash) are based on market conditions and the current yield curve

General Rule in Cash Forecasting

It is best to forecast only those categories that account for 5% or more of the budget

Combine those items that fall outside of the 5% range into an “Other” category



Watch Out for Changes!

Remember that changes in the economy, state law, user fees, etc., will force you to re-think and adjust your past experience so you don't get a false reading on future collections and/or disbursements.

- As an example, the shift to a July tax bill vs. the current December tax bill will affect/change collection patterns. i.e. the history would now produce a false signal.
- Changes in the State's Revenue Sharing Payment methods and schedules will change the flow of those dollars as compared to the past.

The Following Tips Should Help You Improve Your Forecast:

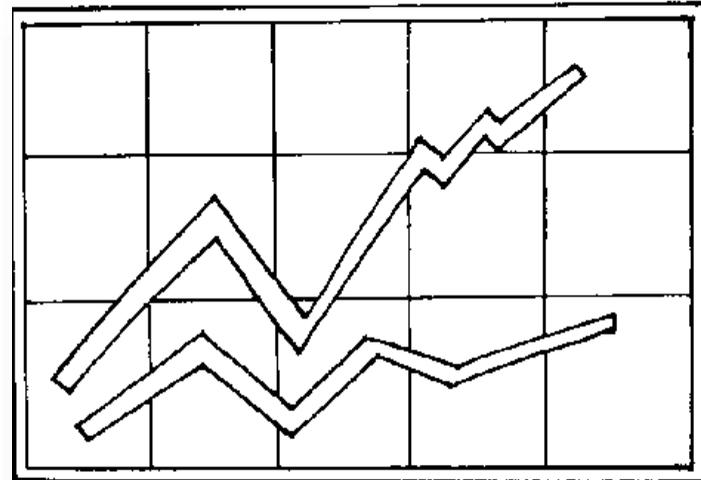
- Try to be accurate and err on the conservative side.
- Concentrate on forecasting major items.
- Keep your forecast simple.
- Retain all your forecasting documentation.

Review Your Cash Flow Forecast

Compare actual cash flow to the projected amount.

Identify any large variances.

Adjust assumptions as needed.

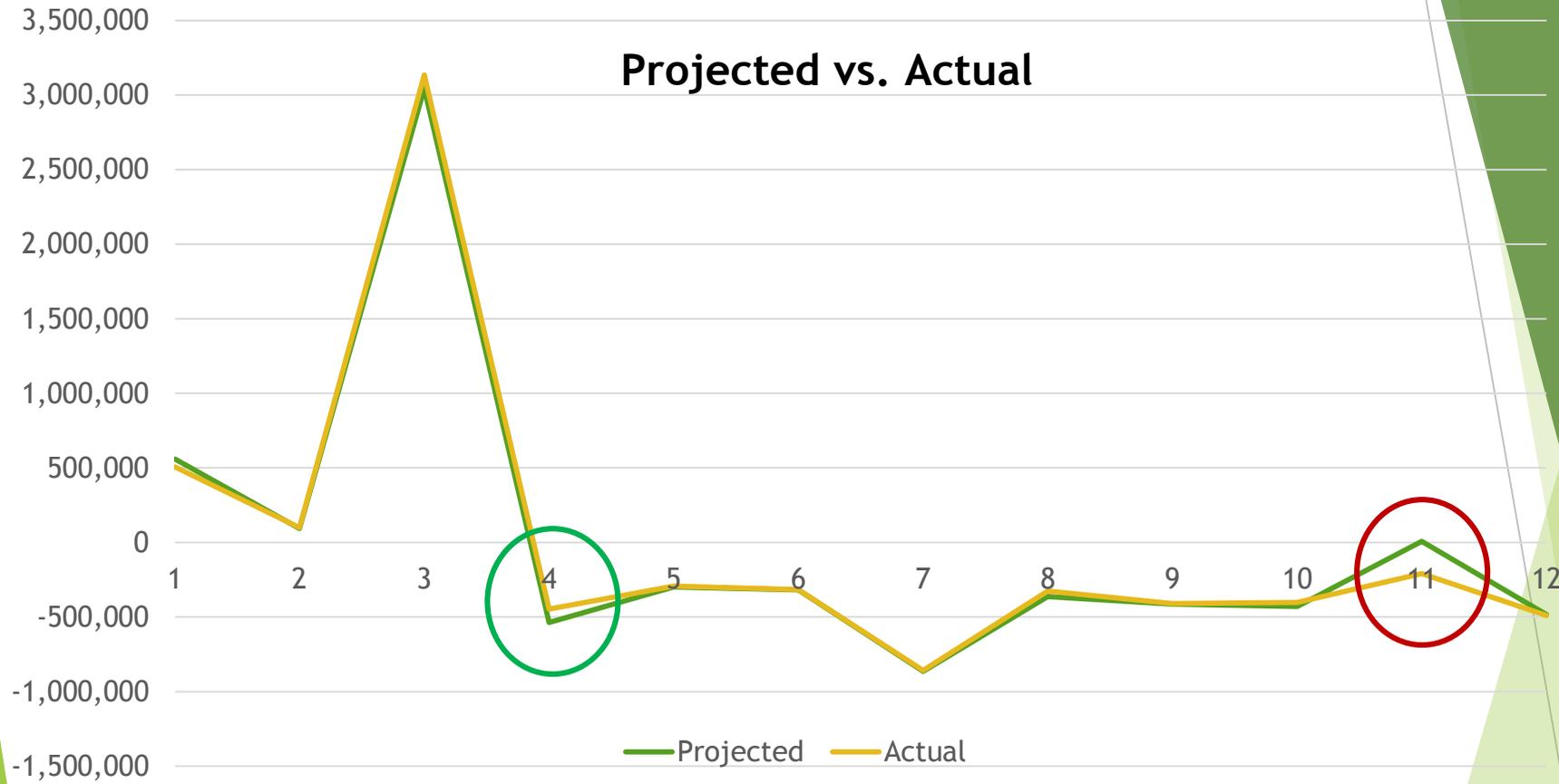


Actual vs. Projected



Cash Flow Worksheet

Projected vs. Actual



Get Going on Forecasting

Like exercising, getting started is the hardest part;

Once the forecast is laid out it's easy to keep updated; and

The benefits are worth the work.



Cash Flow Analysis

What is Cash Flow Analysis?

- Comparing the current investment holdings with the cash flow forecast to determine cash over funding and cash under funding.

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Cash Flow Analysis

Combine cash flow forecast with the investment maturity schedule

Will help you see:

- periods of time where you may be over or under invested
- where you may need to borrow funds to meet cash spending requirements.

The Investment Portfolio

Investing is a Structured Process

- ▶ Identify your objectives, constraints, preferences and capabilities.
 - ▶ Develop a written investment policy.
 - ▶ Develop a system of internal controls and administrative policies.
 - ▶ Forecast your cash flow.
 - ▶ Analyze the yield curve.
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 - ▶ Determine your investment outlook.
 - ▶ Select investment instruments.
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 - ▶ Adjust and rebalance the portfolio.

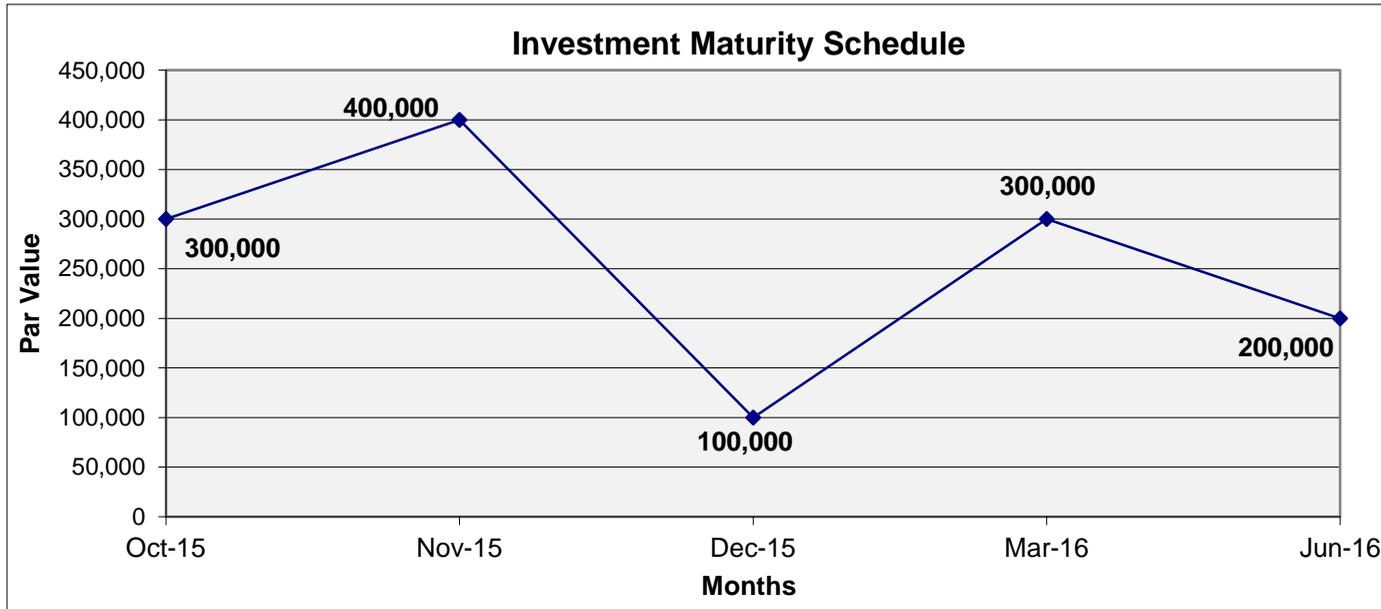
Sample Investment Portfolio

Investment Position Before Cash Flow Forecast

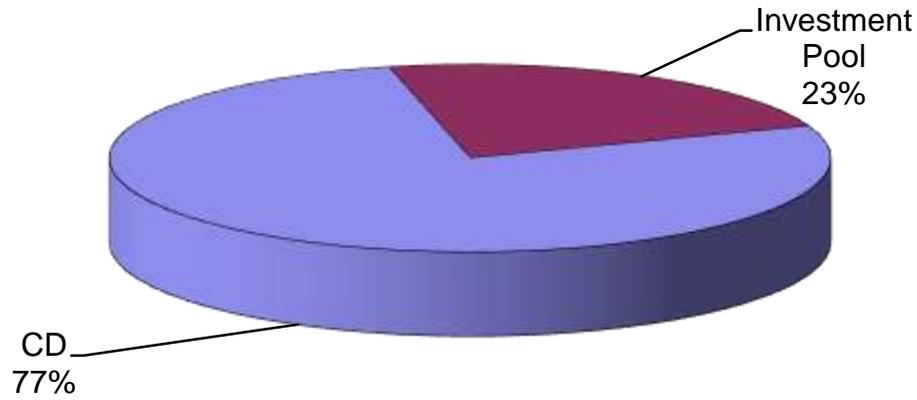
25-Oct-15

<u>Investment Type</u>	<u>Issuer</u>	<u>Par Value</u>	<u>% Portfolio</u>	<u>Purchase Date</u>	<u>Maturity Date</u>	<u>Days</u>	<u>Yield to Maturity</u>
Investment Pool	Bank A	300,000	23%	Oct-15	Oct-15	1	0.50%
CD	Bank B	400,000	31%	Sep-15	Nov-15	69	1.25%
CD	Bank A	100,000	8%	Sep-15	Dec-15	107	1.30%
CD	Bank C	300,000	23%	Sep-15	Mar-16	183	1.50%
CD	Bank C	<u>200,000</u>	15%	Sep-15	Jun-16	274	1.60%
Total		1,300,000					

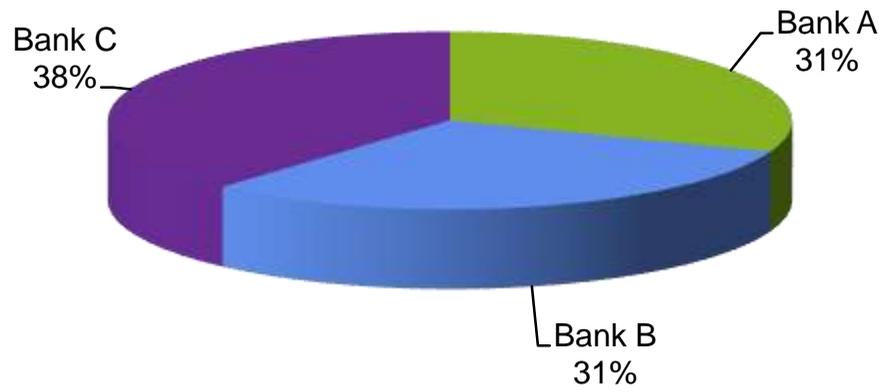
Sample Investment Portfolio



Investment by Type

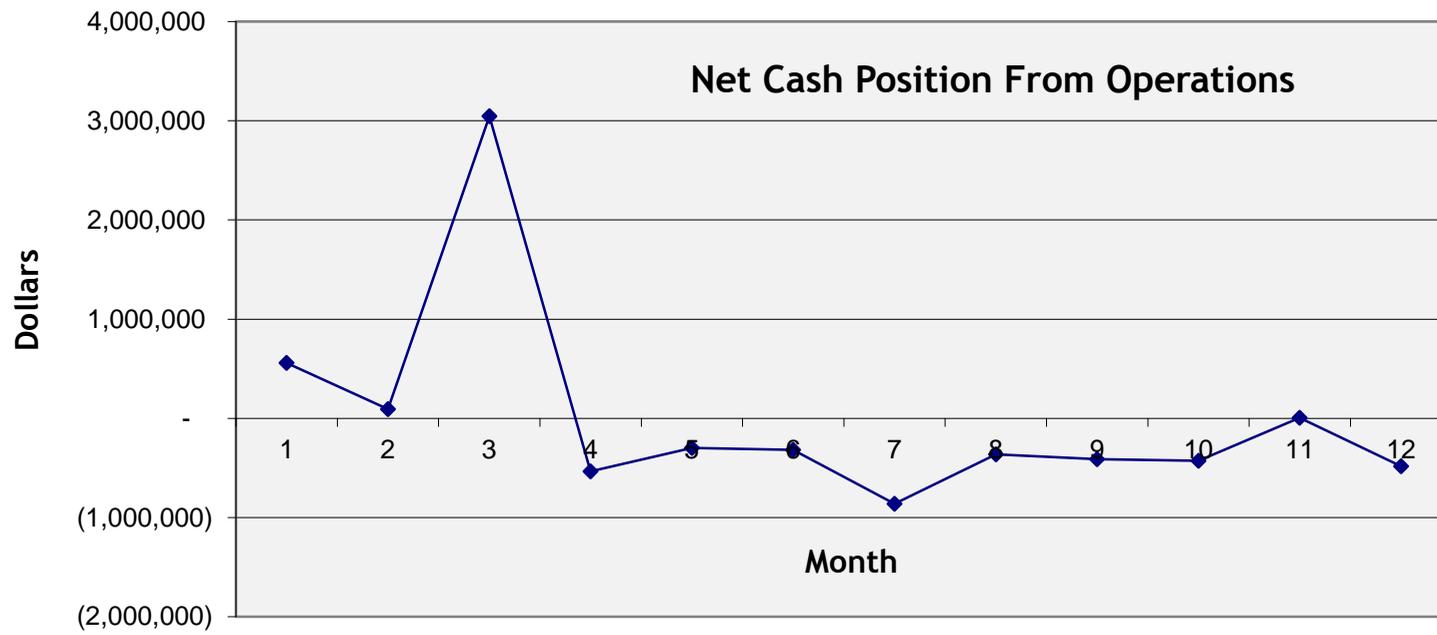


Investments by Issuer

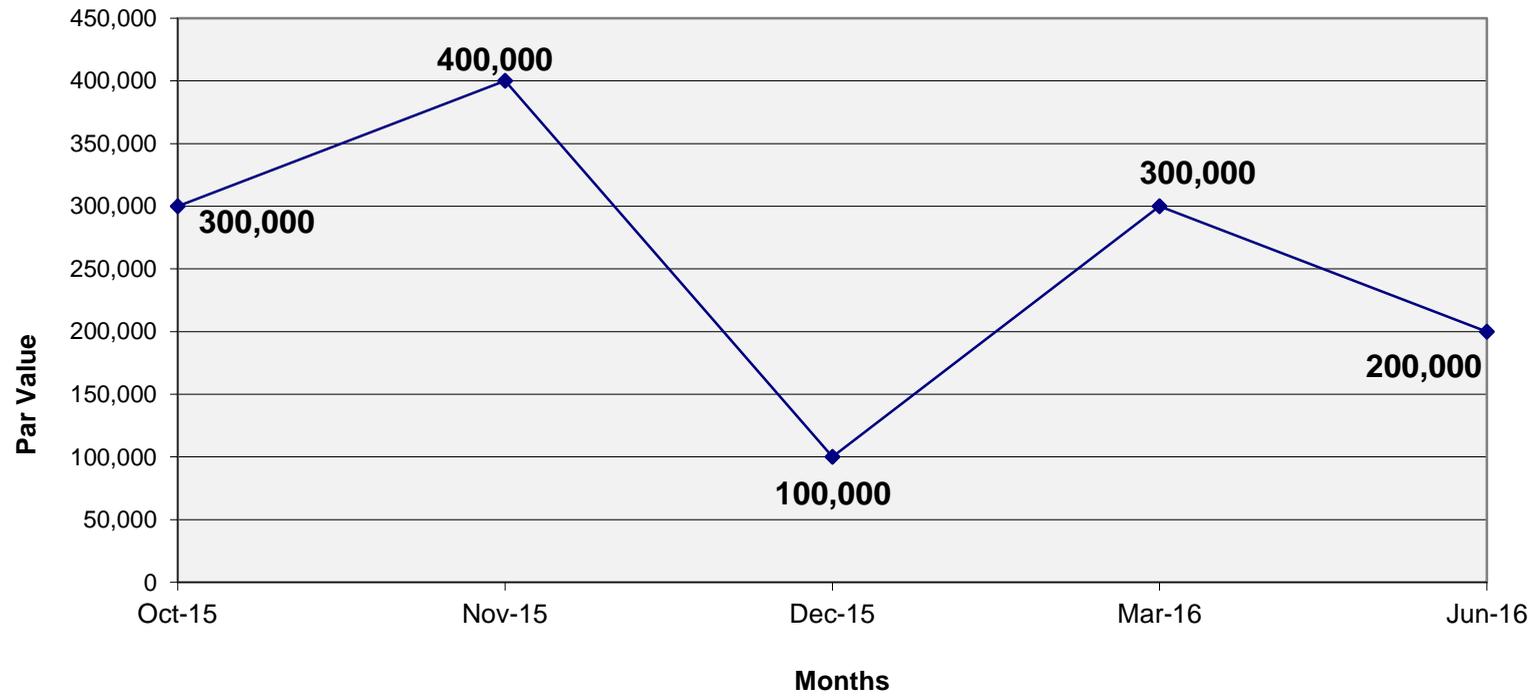


Cash Flow Analysis

Overlay of forecasted cash flows with investment positions and related maturity dates



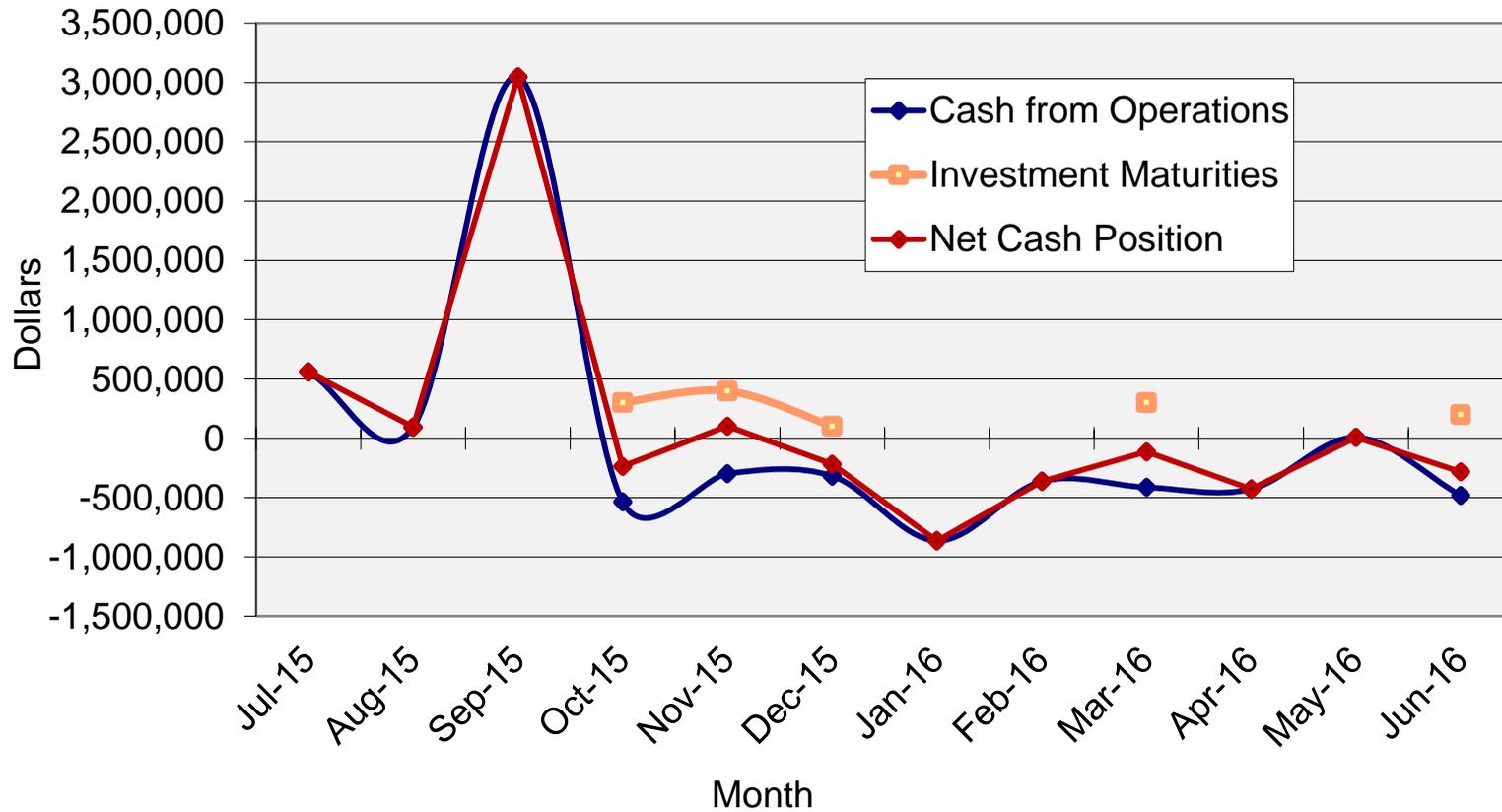
Investment Portfolio



Combined Cash Flow

	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Total
Cash from Operations	559,350	93,850	3,046,375	-536,125	-298,650	-318,650	-863,650	-363,625	-413,625	-428,800	6,525	-482,975	0
Cash From Investments				300,000	400,000	100,000			300,000			200,000	1,300,000
Net Cash Position	559,350	93,850	3,046,375	-236,125	101,350	-218,650	-863,650	-363,625	-113,625	-428,800	6,525	-282,975	1,300,000

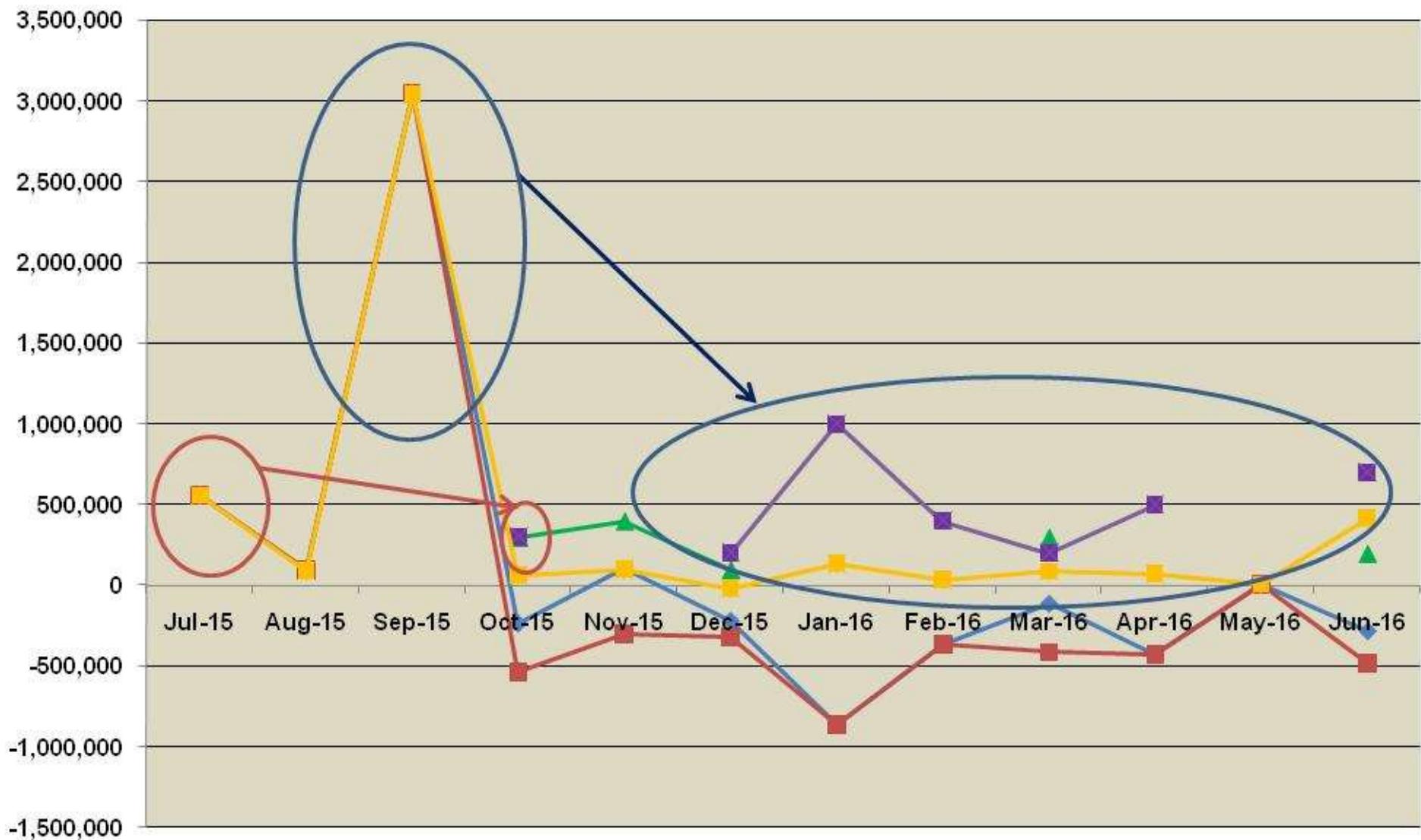
Net Cash Flows & Investment Maturities



What will does an Overlay Tell Us?

- Identifies months where the investment coming due was not large enough to meet cash flow needs
- Identifies months where investments are coming due but aren't needed because of positive cash flow
- Helps you identify excess cash so you can invest the excess to periods where you need additional funding.

Revised and Re-balanced Investment Portfolio



◆ Net Cash Position

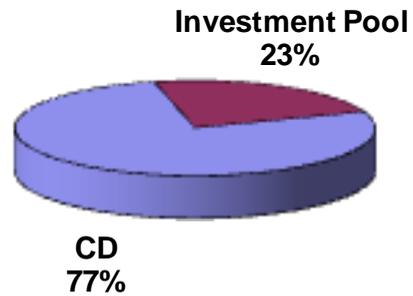
■ Cash from Operations

▲ Cash Original Investments

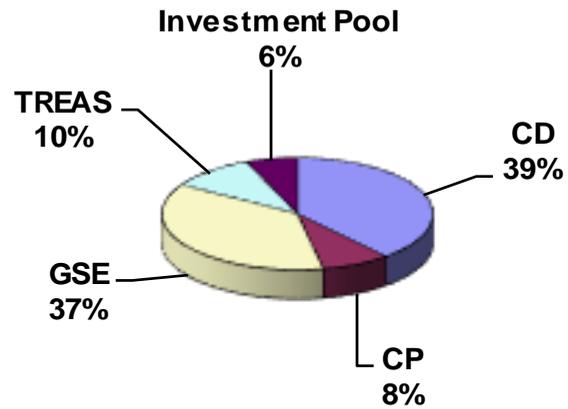
■ Cash From New Investments

■ New Net Cash Position

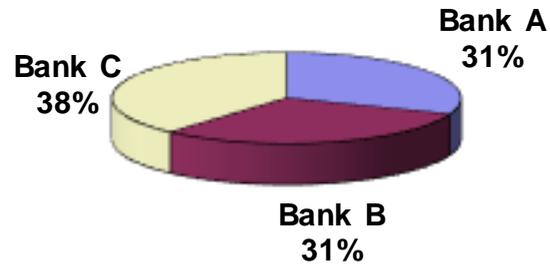
Before Cash Flow Investment by Type



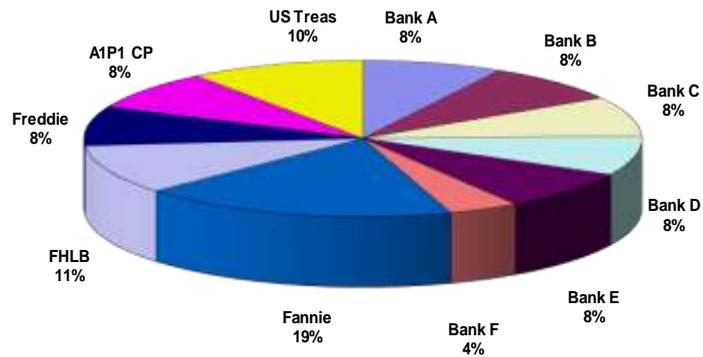
Adjusted Investment Portfolio Investment by Type



Before Cash Flow Investments by Issuer



After Cash Flow Investments by Issuer



Conclusion

- Like exercising, getting started is the hardest part of cash flow forecasting
- Once you begin to gather your historical data and build the model, the process tends to flow pretty smoothly
- Once built, the forecast model is easy to keep updated and only requires a relatively small amount of time to keep it up to date
- I believe the benefits of a cash flow forecast outweigh the effort

Thanks for having me!

ANY
QUESTIONS
?

Cash Flow Forecasting and Analysis

The Key to a Successful Investment Program

Keith Sawdon

Voice: 248 836-8599

e-mail: sawdonk@gmail.com