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## **“Best Practices” Budgeting Boot Camp**

**Session 1: Forecasting Growth**

**Session 2: Pricing Models**

**Session 3: Prepayments, Decay Rates**

**Session 4: Final Tips and Client Checklist**



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## Agenda:

- **Prepayment Modeling**
- **Decay and Alternate Discount Rates**
- **Forecasting Taxes**
- **Forecasting Dividends**



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# Prepayment Modeling

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## What are Prepayments?

- **Payments received in advance of the contractual date**
- **Typically occur to the bank's disadvantage**



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## **What are Prepayments?**

- **Longer Term fixed Rate Instruments: Securities (Calls), Residential Mortgages, Commercial RE, FHLB Advances**
- **Regulatory expectations: understand and utilize bank-specific prepayment rates**



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## **What effect do prepayment assumptions have on results?**

- **Average Life and Duration of an account**
- **Profitability – especially as rates change**
- **Rate Shock – Net Interest Income & Market Value of Equity**

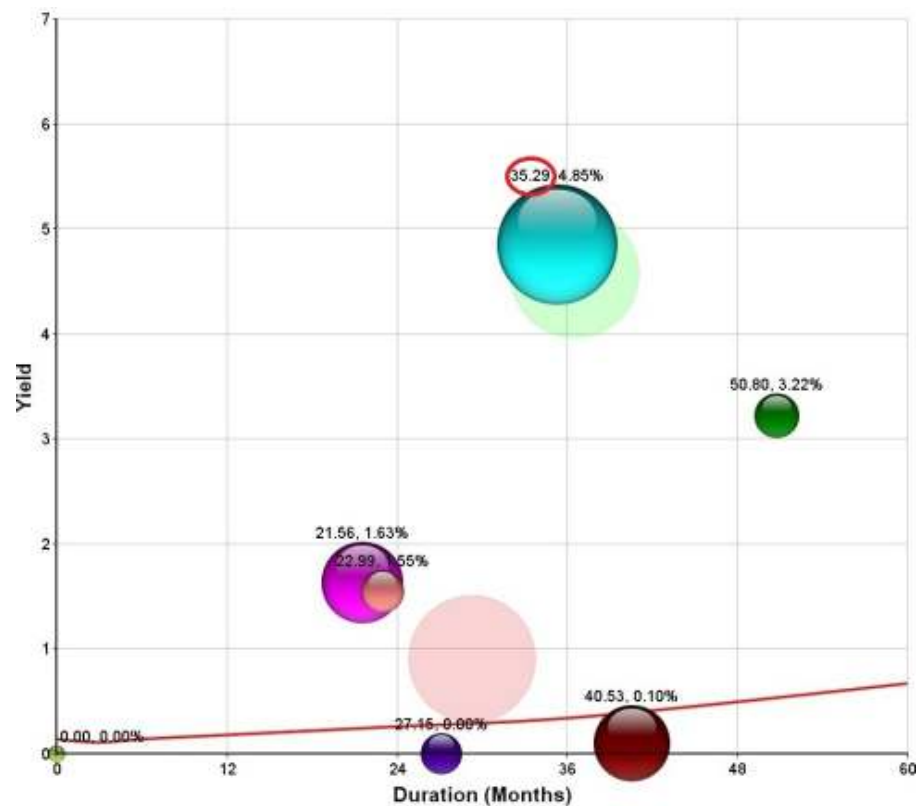


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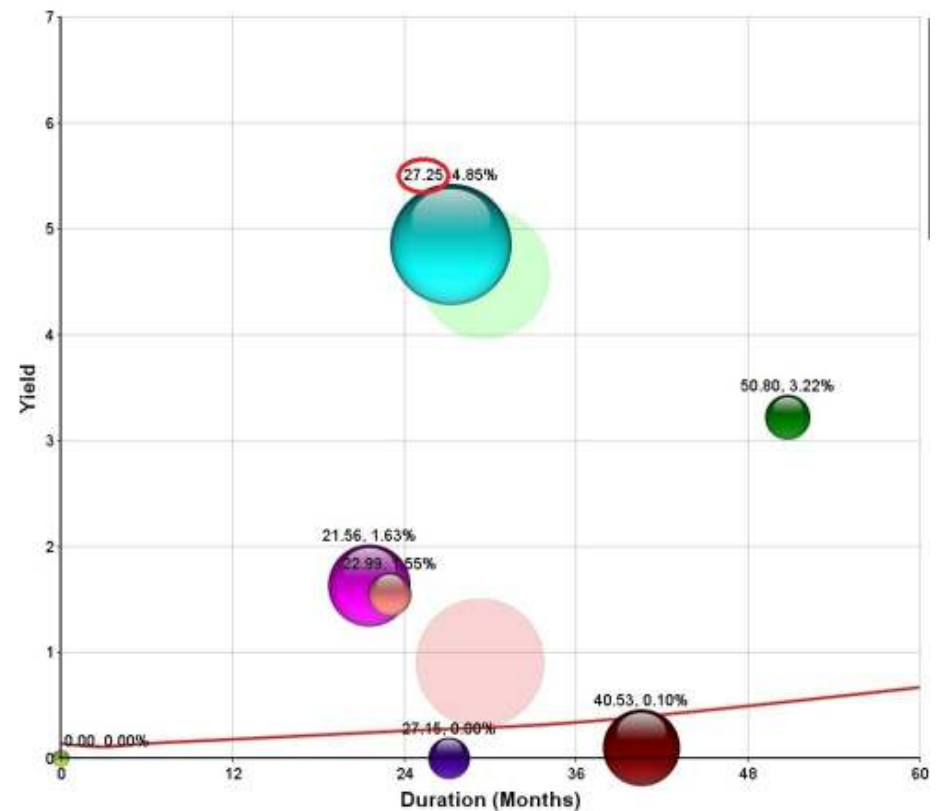
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## Rate Risk Bubbles – Detail

Model WITHOUT Prepayment Models



Model WITH Prepayment Models





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## Callable Bonds

### US Agencies - Projections

Projections	Budget	Maturity	Variance	Callable	Fed Funds	Notes			
	Bond ID	Book Value (thousands)	Coupon Rate	Yield to Maturity	Call Date	Call Freq (months)	Spread	Final Maturity Date	First Repricing Date
1	3133792E8	1,000	1.70	1.50	04/07/12	0	0.00	10/07/15	
2	31331K5G1	2,000	2.50	2.20	06/09/14	3	0.00	12/09/15	
3	31331KS92	1,000	2.50	2.25	05/05/14	3	0.00	05/05/16	
4	313376SR7	2,000	1.75	1.50	07/03/14	12	0.00	07/03/15	
5	3133783W9	1,000	1.05	1.05	01/06/14	1	0.00	10/06/15	
6	3133786N6	1,000	1.20	1.10	12/08/11	1	0.00	12/08/15	
7	3133793L1	1,000	1.30	1.19	03/01/14	1	0.00	03/01/16	
8	3133EACF3	1,000	1.55	1.50	02/04/14	1	0.00	12/04/16	
9	3133EACH9	1,000	1.75	1.40	02/01/15	6	0.00	12/01/16	
10	3133EAES3	1,000	1.50	1.31	04/08/14	1	0.00	01/08/17	
11	3133EAKY3	1,000	1.85	1.50	05/01/14	1	0.00	08/01/17	
12		0	0.00	0.00		0	0.00		





## Callable Bonds

## Call determined by comparing Coupon to Offering Rate

	Bond ID	Book Value (thousands)	Coupon Rate	Yield to Maturity	Call Date	Call Freq. (months)	Spread	Final Maturity Date	First Repricing Date
1	3133792E8	1,000	1.70	1.50	04/07/12	0	0.00	10/07/15	

US Agencies - Projections

Projections		Budget	Maturity	Variance	Callable
	EOM Balance	New Balance	Offering Rate	Total Maturities	Total Maturities Xrate
2012	Manual	[User Edit]	Quick		
Dec	16,000				
2012 Jan	13,000				EOM Yield:
Feb	14,000				1.51
Mar	14,000	0	1.65	0	0.00
Apr	14,000	1,000	1.65	1,000	1.50

	Scheduled Maturities	Scheduled Maturities Xrate	Adj. Scheduled Maturities	Adj. Scheduled Mats Xrate	Scheduled PrePmts	Scheduled PrePmts Xrate
2012	[User Edit]	[User Edit]			No Model	
Dec						
2012 Jan						
Feb						
Mar	0	0.00	0	0.00	0	0.00
Apr	0	0.00	0	0.00	1,000	1.50

## Do not model prepayments if using Call Tab

US Agencies - Maturity							
Projections	Budget	Maturity	Variance	Callable	Fed Funds		
Last EDM Balance	14,000	Total Scheduled Maturities		14,000	Balance Difference		
EDM Yield	1.51	XRate		1.51	Yield Difference		
	Scheduled Maturities	Scheduled Maturities Xrate	Adj. Scheduled Maturities	Adj. Scheduled Mats Xrate	Scheduled PrePmts	Scheduled PrePmts Xrate	
2012	[User Edit]	[User Edit]			No Model		
Dec							
2012 Jan							
Feb							
Mar	0	0.00	0	0.00	0	0.00	
Apr	0	0.00	0	0.00	1,000	1.50	



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**Calls can occur for Liabilities - data may require manual entry**

**Call will default to rising rate trigger**

FHLB Advances - Projections									
Projections	Budget	Maturity	Variance	Callable	Fed Funds	Notes			
	Bond ID	Book Value (thousands)	Coupon Rate	Yield to Maturity	Call Date	Call Freq. (months)	Spread	Final Maturity Date	First Repricing Date
1	9235633412	5,000	2.50	2.50	05/25/12	0	0.00	09/25/14	
2		0	0.00	0.00		0	0.00		







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## Model Types:

- Quick Model
- Detailed Model
- Automated Quick Model

 No Model	 Detailed Model
 Quick Model	 Automated Quick Model



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## Converting PSAs and CPRs

		When rates decline				When rates rise			
		PSA	PSA	PSA	PSA	PSA	PSA	PSA	
		-300	-200	-100	0	100	200	300	
Type	Book Value	Speed	Speed	Speed	Speed	Speed	Speed	Speed	
=====	=====	=====	=====	=====	=====	=====	=====	=====	
FIXED MBS	819919.88	1310	1179	865	453	192	138	112	
FIXED MBS	1903613.32	1318	1182	870	452	193	135	112	
FIXED MBS	1952544.71	0	0	0	0	0	0	0	
<b>WEIGHTED AVG PSA</b>		348.02	314.19	243.33	144.19	74.99	54.17	44.18	
<b>CPR</b>		20.88	18.85	14.60	8.65	4.50	3.25	2.65	
<b>MONTHLY PREPAYMENT PERCENT</b>		<b>1.74</b>	<b>1.57</b>	<b>1.22</b>	<b>0.72</b>	<b>0.37</b>	<b>0.27</b>	<b>0.22</b>	

<i>Financial Compass Model</i>										
-10	-4	-3	-2	-1	0	1	2	3	4	10
0.22	0.22	0.22	0.27	0.37	0.72	1.22	1.57	1.74	1.74	1.74



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## **Loan and CD Prepayment Assumptions**

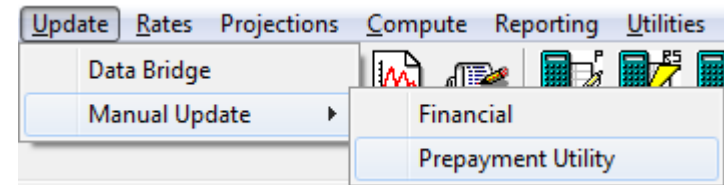
- **In-house review**
- **3<sup>rd</sup> Party review**
- **Compass Prepayment Utility**



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## Financial Compass Prepayment Utility



FileSpec		
	Extract File	Description
254	0	N/A--Default=0
255	0	N/A--Default=0
256	43	Start--Current interest rate location--Default=0
257	49	End--Current interest rate location--Default=0
258	0	Divisor needed to place decimal properly--Default=0
259	123	Start--Non-Accrual Code location--Default=0
260	123	End--Non-Accrual Code location--Default=0
261	Y	Code to indicate a Non-Accrual Loan--Default=Blank
262	1	Start--Instrument ID location--Default=0
263	15	End--Instrument ID location--Default=0
264	0	N/A--Default=0



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- Instrument Level
- Bank Specific
- Export Detail
- Loans and CDs

Commercial Lns - Fix Go to Account Projections

Historic Prepayment %:  Current Time Period:  Export to Excel

Model | History | Instruments

Instruments:  Calculated Prepayment %:  Adjusted Prepayment %:

Instrument ID	Maturity Date	BOM Principal	EOM Principal	Current Rate	Expected Principal Payment	Actual Principal Payment	Calculated Prepayment	Adjusted Prepayment
		1,691,851.62	1,814,374.87	6.41	251,985.52	-122,523.25	17,083.00	17,083.00
ID000001	22 May 2012	1,855.71	1,239.04	7.00	614.98	616.67	2.00	2.00
ID000002	12 Sep 2016	27,687.84	27,262.41	6.00	429.66	425.43	0.00	0.00
ID000003	31 Jan 2016	121,217.76	120,328.96	6.00	902.60	888.80	0.00	0.00
ID000004	12 Sep 2012	15,300.00	15,300.00	5.00	1,884.78	0.00	0.00	0.00
ID000005	12 Sep 2012	16,704.17	16,704.17	5.00	2,057.76	0.00	0.00	0.00
ID000006	02 Apr 2012	15,000.00	15,000.00	6.50	15,000.00	0.00	0.00	0.00
ID000007	12 Feb 2012	50,000.00	50,000.00	5.00	50,000.00	0.00	0.00	0.00
ID000008	21 Jan 2015	59,560.93	59,560.93	8.25	1,561.01	0.00	0.00	0.00
ID000009	01 Dec 2013	11,033.44	10,605.60	7.00	429.63	427.84	0.00	0.00
ID000010	11 Jan 2014	7,747.48	7,438.02	8.00	328.13	309.46	0.00	0.00
ID000011	21 Jan 2015	21,706.12	20,950.36	6.00	569.04	755.76	187.00	187.00
ID000012	02 Dec 2012	3,196.84	2,916.62	8.25	280.77	280.22	0.00	0.00
ID000013	02 Dec 2012	3,496.29	3,189.68	8.25	307.07	306.61	0.00	0.00





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## **Considerations:**

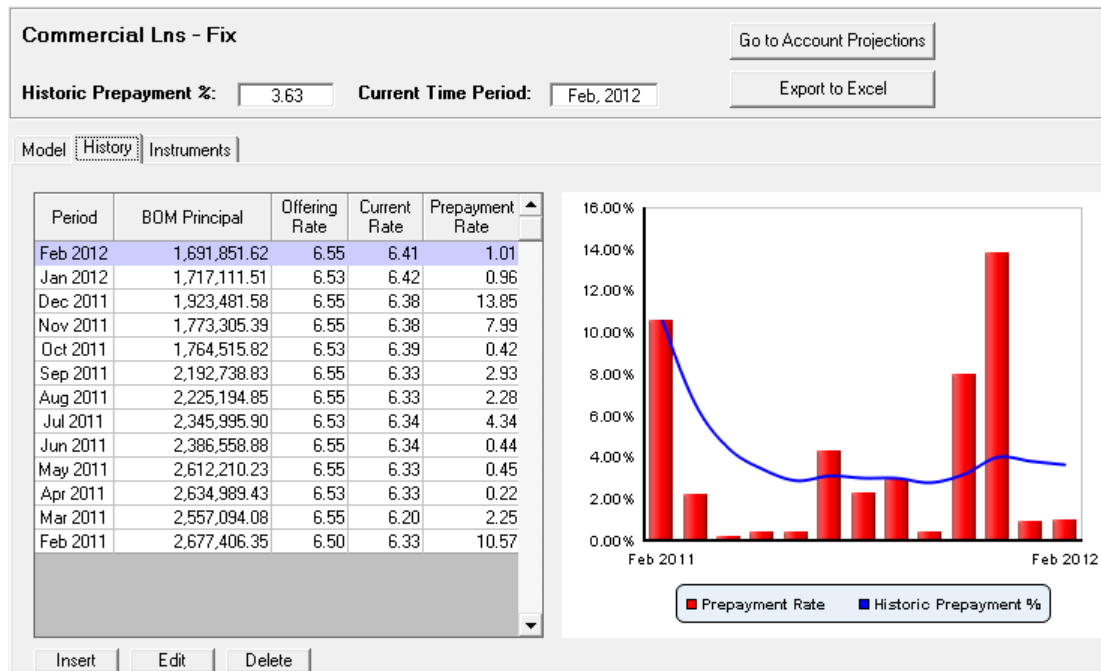
- **Sample size**
- **True prepayment?**
- **Review periodically**
- **Materiality**



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## Prepayment History





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## **SBU:**

- **Data Loaded into each unit and totaled**
- **Can Export at Total Bank (SBU) Level**
- **Model Assumptions set and maintained at unit level**



## Review Assumptions at least Annually

- Assumption Reports
  - Alt Discount & Decay Rates
  - Balance Sheet Growth
  - Callable Assumptions
  - Driver Assumptions
  - Income Expense
  - Plan Notes
  - Prepayment Assumptions**
  - Pricing Assumptions
  - Repricing Assumptions

	<u>Model Description</u>	<u>Value</u>
<b>Assets</b>		
Loans		
Commercial		
Commercial Lns - Fix	Auto Quick Model	3.63

### Sample Bank Plan Prepayment Assumptions

	<u>Model Description</u>	<u>Value</u>
<b>Assets</b>		
Securities		
Mortgage-Backed Securities		
MBS	MBS Bloomberg Prepay	
Spread	-10.00 -4.00 -3.00 -2.00 -1.00 0.00 1.00 2.00 3.00 4.00 10.00	
Percent	0.22 0.22 0.22 0.27 0.37 0.72 1.22 1.57 1.74 1.74 1.74	



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# Decay Rates

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## Why Use Decay Rates?

- Portion Out Balances for Gap Beta
- Assign 'Maturity' Structure for Present Value





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# Gap

Account Wizard - NOW Accounts: NOW Accounts

Enter the Decay Rate. System estimate is 78 months.

Decay Rate:  (months)

[More Info](#)

	Immediate	0-1 months	1-3 months	3-6 months	6-12 months	12-24 months	24-36 months	36-48 months	48- 49 months	> 49 months	Totals
NOW Accounts											
NOW Accounts	0	700	1,400	2,100	4,201	8,401	8,401	8,401	700	20,303	54,608



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## Present Value

**Sample Bank Plan**  
Account Market Value Duration  
NOW Accounts  
As of the end of February, 2012

Period	Total Maturity	Interest Payment	Total Cashflow	Discount Rate	Discount Period	Discount Factor	Discounted Cashflow	Cashflow x Period
3 Mar 12	700	7	707	0.90	1	0.99925	706	706
4 Apr 12	700	7	707	0.90	2	0.99850	706	1,411
5 May 12	700	7	707	0.90	3	0.99775	705	2,116
6 Jun 12	700	6	707	0.90	4	0.99701	704	2,818
7 Jul 12	700	7	707	0.90	5	0.99626	704	3,520
8 Aug 12	700	6	707	0.90	6	0.99551	703	4,220
9 Sep 12	700	6	706	0.90	7	0.99477	703	4,918
10 Oct 12	700	6	706	0.90	8	0.99402	702	5,617





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## Alternate Discount Rates

- Offer Rate NOT Used for Present Value
- Alternate Rate Term =  $\frac{1}{2}$  Decay  
(Average Life)
- New Driver Rate

$$78 / 2 = 39$$





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## **SBU:**

- **Decay needed at Total Bank (SBU)for Gap**
- **Present Values recalculated at total**
- **Model Assumptions at unit level**
- **EVE results = sum of branches**



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## Present Value Without Decay Rates

	<b>-200</b>	<b>-150</b>	<b>-50</b>	<b>-25</b>	<b>0</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>
NOW Accounts									
NOW Accounts	54,608	54,608	54,608	54,608	54,608	54,608	54,608	54,608	54,608

## Present Value With Decay Rates

	<b>-200</b>	<b>-150</b>	<b>-50</b>	<b>-25</b>	<b>0</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>
NOW Accounts									
NOW Accounts	54,608	54,608	54,608	54,106	53,873	51,947	50,197	48,546	46,979



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## How Do I Calculate Decay Rates?

- **In-house review**
- **3<sup>rd</sup> Party review**
- **Financial Compass Calculation**



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## Decay Rates in Financial Compass

Account Wizard - NOW Accounts: NOW Accounts

Enter the Decay Rate. **System estimate is 78 months**

Decay Rate:  (months)

[More Info](#)

<b>Rising Beta</b>	NA	0.00	<input type="text" value="0.00"/>
<b>Falling Beta</b>	NA	0.01	<input type="text" value="0.30"/>

# Rising and Falling Average = 15

	Immediate	0-1 months	1-3 months	3-6 months	6-12 months	12-24 months	24-36 months	36-48 months	48- 49 months	> 49 months	Totals
NOW Accounts											
NOW Accounts	0	700	1,400	2,100	4,201	8,401	8,401	8,401	700	20,303	54,608

$$54,608 / 78 = 700$$

$$700 \times 12 = 8,400$$

$$8,400 / 54,608 = .15$$



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- **Demand Deposit Decay = Weighted Average of All NOW Accounts**
- **Calculated Decay Rate Upper Limit = 100 Months**

Account Properties Editor - Demand Deposits

Name/Abbreviation:

Cost factor:

Decay rate (months). System estimate is 78 months:



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## Review Assumptions at least Annually

- Assumption Reports
  - Alt Discount & Decay Rates
  - Balance Sheet Growth
  - Callable Assumptions
  - Driver Assumptions
  - Income Expense
  - Plan Notes
  - Prepayment Assumptions
  - Pricing Assumptions
  - Repricing Assumptions

**Sample Bank Plan**  
Alternate Discount & Decay Rates

	Account Name	Decay Rate	Alternate Discount Rate
<b>Assets</b>			
<b>Liabilities</b>			
<b>Demand Deposits</b>			
	Demand Deposits	78	3 yr CMT
	Other Demand Deposits	100	3 yr CMT
<b>Interest Bearing Deposits</b>			
<b>NOW Accounts</b>			
	NOW Accounts	78	3 yr CMT
<b>Money Market Accounts</b>			
	Money Market Accounts	26	1 yr CMT
<b>Savings</b>			
	Savings Accounts	89	3 yr CMT



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# Taxes

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## Annual Calculation

Tax Information

		2012	2013	2014	2015	2016
State taxes	Rate ▼	6.00	6.00	6.00	6.00	6.00
Federal taxes	Rate ▼	34.00	34.00	34.00	34.00	34.00
Federal tax credits		0.00	0.00	0.00	0.00	0.00
Federal tax loss carry forward		0.00	0.00	0.00	0.00	0.00
Other adjustments: State		0.00	0.00	0.00	0.00	0.00
Other adjustments: Federal		0.00	0.00	0.00	0.00	0.00

Should state taxes be distributed according to net pre-tax income? No ▼  
Should federal taxes be distributed according to net pre-tax income? Yes ▼  
Allow for the calculation of negative state taxes? No ▼

Edit Budget Taxes Ok Cancel

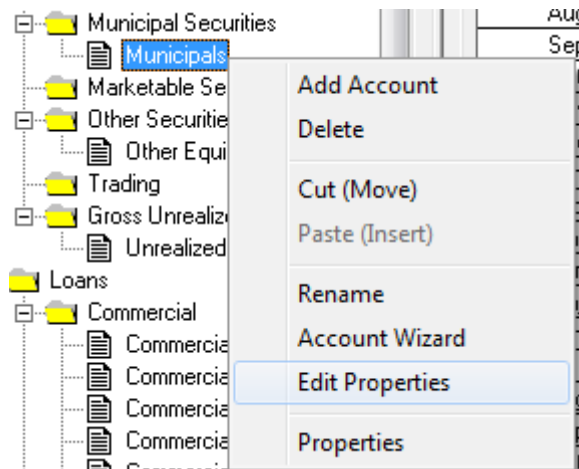
Operating Income	1,549,297
Federal Tax	497,964
State Tax	80,135
<b>Net Income</b>	<b>971,198</b>



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## Right Click to view Tax Status



Account Properties Editor - Municipals

<b>Name/Abbreviation:</b>	<input type="text" value="Municipals"/>	<input type="text" value="Munis"/>
<b>Risk Based Capital factor:</b>	<input type="text" value="50%"/>	
<b>Custom RBC factor:</b>	<input type="text" value="0"/>	
<b>Cost factor:</b>	<input type="text" value="0"/>	
<b>Payment frequency:</b>	<input type="text" value="Semi-Annually"/>	
<b>Tax status:</b>	<input type="text" value="20% TEFRA"/>	
<b>Accrual method:</b>	<input type="text" value="30/360"/>	
<b>Average term for new transactions (months):</b>	<input type="text" value="120"/>	



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Should state taxes be distributed according to net pre-tax income?  
Should federal taxes be distributed according to net pre-tax income?  
Allow for the calculation of negative state taxes?

No  
Yes  
No

**Distribution  
method will be  
reflected on  
income statement**

**State Income Tax Calculation**

Pretax Income	1,549,297
Less: US Treasuries	0
US Agencies	213,711
State Taxable Income	1,335,587
Rate	6.00%
Unadjusted State Tax	80,135
State Tax Adjustments	0
State Tax	80,135

**Federal Income Tax Calculation**

Pretax Income	1,549,297
Less: State Tax	80,135
Tax Exempt Lns - Fix	2
TEFRA Disallowance	4,559
Fed Loss Carry Forward	0
Federal Taxable Income	1,464,601
Rate	34.00%
Tax Before Adjustments	497,964
Tax Adjustments	0
Tax Credits	0
Tax	497,964



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## Distribution of Taxes

<b>Annual Federal Tax Liability</b>	<b>\$497,964</b>
<b>- YTD Accrual</b>	<b>(\$197,628)</b>
<b>Remaining Annual Liability</b>	<b>\$300,336</b>

	Sample Bank Plan Income Statement FTE Adjusted												
	*Jan 2012	*Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012	Oct 2012	Nov 2012	Dec 2012	Total
Tax Equivalent Adjustment	197	197	194	195	195	196	195	196	196	196	196	196	2,349
Operating Income	405,193	221,728	87,242	68,580	95,239	71,519	98,893	104,408	83,653	109,935	86,094	116,813	1,549,297
Federal Tax	137,965	59,663	28,419	22,390	31,004	23,340	32,184	33,966	27,260	35,751	28,049	37,973	497,964
State Tax	19,741	8,468	5,193	5,193	5,193	5,193	5,193	5,193	5,193	5,193	5,193	5,193	80,135
Net Income	247,487	153,597	53,630	40,998	59,042	42,986	61,516	65,249	51,200	68,991	52,853	73,647	971,198



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## **Tax Adjustments:**

- **Federal Tax Credits – Enter as Positive number, will reduce taxes**
- **Loss Carry Forward – Reduces tax liability if entered as positive number**
- **Other Adjustments – Will offset tax liability as entered. Positive added and negative subtracted.**



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- **SBU's: Tax Settings only apply to Total Bank plan.**
- **Holding Company Consolidations: Tax settings applied to individual sub plans and taxes summed to total level.**



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# Dividends

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# Manual Setting

Preferences - Dividends

General | Chart of Accounts | **Dividends** | Reports

Models | Last Files List | Fonts | Date Formats

Method: Manual

Year	Month	Amount
2012	January	
	February	
	March	200
	April	
	May	
	June	200
	July	
	August	

OK Cancel

Dividends - Projections

Projections		Budget	Variance	Fec
		EOM Balance	New Balance	Average Balance
2012	Manual			
	Dec	0		0
2012	Jan	0		0
	Feb	0		0
	Mar	-200	-200	-100
	Apr	-200	0	-200
	May	-200	0	-200
	Jun	-400	-200	-300
	Jul	-400	0	-400
	Aug	-400	0	-400
	Sep	-600	-200	-500
	Oct	-600	0	-600
	Nov	-600	0	-600
	Dec	-800	-200	-700
2013	Jan	0	800	0
	Feb	0	0	0
	Mar	-200	-200	-100





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## Other Dividend Distribution Methods

Preferences - Dividends

General	Chart of Accounts	Dividends	Reports
Models	Last Files List	Fonts	Date Formats

Method: **Percent of Net Income** Frequency: Monthly First month: January

Percent of Net Income: 5 %

OK Cancel

Preferences - Dividends

General	Chart of Accounts	Dividends	Reports
Models	Last Files List	Fonts	Date Formats

Method: **Excess Equity** Frequency: Monthly First month: January

OK Cancel



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# Conclusion



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**THANK YOU FOR ATTENDING**

**1-800-323-3281**

**support@plansmith.com**