from spreadsheet forecasting, and with new and improved products on the market, it is important to understand basic data requirements and terminology common to most of today’s planning software. This white paper will help guide community bankers through the conversion process, increasing the likelihood of a smooth transition.

WHY SWITCH?

There are many reasons spreadsheet forecasting remains popular at community banks. The software is already on every desktop and Excel is taught as early as grade school. In other words, it is an inexpensive way to create custom forecasts that even the most junior analysts can prepare with little training.

The sheer flexibility of spreadsheet modeling however, is one of the strongest arguments against using it as a forecasting tool. Building a spreadsheet model is similar to a fingerprint ... no two are exactly alike. In fact, variations can be so extreme that when the budget analyst or current “keeper of the model” leaves the bank, even the most savvy replacement has little chance of entirely unraveling the tangled web of formulas, database downloads and lookup table references before embarrassing mistakes lead to mistrust of your department’s output. It is sometimes better to start from scratch than take on someone else’s creation.

A second argument for switching to forecasting software is the ability to track both actual and projected profitability...
at the branch or product level. Many software packages include both transfer pricing and income and expense allocation features that are either very difficult or extremely time-consuming to create and maintain using spreadsheets.

Yet, for most community banks, the most important reason for switching to an instrument level forecasting model can be summed up in two words: CASH FLOW. We all know that forecasting can sometimes be more of an art than a science, but there is no substitute for accurate cash flow projections and regulators have become increasingly skeptical of cash flows projected without the aid of a good instrument level planning tool. In fact, regulators are placing increased scrutiny on any process managed by spreadsheets due to the more inherent risk and inaccuracy of spreadsheet-based modeling.

Interactive yield curves, contractual maturities, repricing, amortization, prepayments, decay rates, betas and the interaction among these and other components of cash flow modeling are often much too complex to be handled within the confines of a spreadsheet model.

Note: Unlike other industries, Net Interest Income comprises more than of 70% of the average community bank’s revenue (see Figure 1), so having the tools to accurately forecast its components are absolutely critical and will therefore be the primary focus of this discussion. This paper is not intended to address the complexities of asset-liability modeling including Earnings at Risk (EaR) and Economic Value of Equity (EVE), often available features within forecasting software programs.

PRODUCT AND ACCOUNT MAPPING

Preparing for the integration of planning software is an excellent time to take a close look at your chart of accounts and review how loans and deposits are combined on the general ledger. In particular, pay attention to products that combine both fixed and variable accounts. Most software is sophisticated enough to utilize your bank’s core systems by identifying fixed and variable products at the account level. However, a clean chart of accounts that matches products to GL accounts will result in easier setup and fewer calculations to allocate balances and income among multiple products, especially when forecasting at the branch or cost center level.

Although product and account mapping can be modified at any time, it is important to consider any ratios, statistics or other calculations you want to include. Also keep in mind the potential difficulties associated with the restatement of historical data. Forecasting is more than projecting balance sheet growth and net income and it is always easier in the long run when you think ahead and take time to do it correctly the first time, even if that takes a bit of “up-front” work.

Figure 1: Net Interest Income/Total Revenue for Community Banks

Net interest income/total revenue (%)*

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2008Y</td>
<td>72.1%</td>
<td>72.1%</td>
<td>75.0%</td>
<td>76.4%</td>
<td>71.0%</td>
<td>71.7%</td>
<td>73.5%</td>
</tr>
</tbody>
</table>

* Includes all commercial banks in the U.S. under $10 billion in assets. Source: SNL Financial
COMMON FORECASTING SOFTWARE FEATURES

INTERACTIVE YIELD CURVES
Most forecasting software allows the user to create custom interest rate projections. Banks price products using an index (such as Prime Rate or a rate from the Treasury Yield curve) plus a margin. Changes to interest rates on existing variable-rate products that reprice periodically are also tied to an index. The ability to accurately calculate the impact to the net interest margin by changing the shape of the yield curve or to determine your bank’s sensitivity to parallel rate changes, whether from an immediate rate shock or a ramped rate change over a specific period of time is virtually impossible using a spreadsheet model. These changes can be accurately projected in minutes when using the right software.

Rate tables found in most software will display the Treasury and FHLB yield curves, Prime, Fed Funds and select LIBOR rates. Some may also allow the user to choose a set of custom rates applicable to their institution’s products. Updating for actual results will range from a completely manual process to a 100% automated download.

NEW PRODUCT/ACCOUNT SETTINGS
Forecasting the net interest margin combines existing portfolio behavior with new production. Each product identified during the mapping process requires setting options unique to that particular product type for accurate cash flow projections on new production. The settings for a particular product are based on the instrument type and don’t necessarily match the existing portfolio as new product offerings often change, even within a specific category or product.

Loans, Non-Maturity Deposits, Investments and Other Borrowings will all have different, unique setting options we will identify in the Cash Flow Projections section below.

Common among every instrument level forecasting model is that they all require new account settings to price new product offerings for accurate cash flow projections.

CASH FLOW PROJECTIONS
Instrument level forecasting software utilizes your bank’s core systems to project cash flows for existing loan and deposit accounts and most often relies on spreadsheet downloads from either outside sources such as an investment broker or the Federal Home Loan Bank for investments and other borrowings such as FHLB Advances. Your bank’s existing loan and deposit portfolios require user-defined fields from a database file either downloaded into or linked directly to the software via a data warehouse application.

INVESTMENTS
There are a wide variety of options to help project cash flows from your investment portfolio. Some software companies sell add-on products with tools designed to provide more detailed investment strategies and analysis. These tools almost always include the use of the CUSIP code. CUSIP (“Committee on Uniform Security Identification Procedures”) is a nine-character code that identifies
publicly traded North American (U.S. and Canada) securities. CUSIP maintains a database of information on each unique CUSIP security, making it a valuable tool for automating existing security cash flow forecasting.

Investment brokers can also provide a valuable service to help community banks forecast cash flows on their investment portfolio. They have the tools required to provide cash flow data such as prepayment speeds and call rates on callable bonds, and will usually provide most any monthly data at their disposal in exchange for your continued business. All they normally require is a month-end spreadsheet download of your investment portfolio.

**LOANS**

No products on a community bank's balance sheet contain more cash flow variables than the loan portfolio. Whether forecasting cash flows on your existing portfolio or populating account settings for new product offerings, loan products often vary significantly, even those sometimes booked to the same GL account. Some less sophisticated software products apply the assumptions provided in the new Account Settings section (described below) to both new production and existing portfolio cash flows, while other, more accurate and sophisticated software solutions utilize new account settings almost entirely separate from the existing loan portfolio and allow the data within the designated fields of the bank's core loan system to drive the existing portfolio's cash flows.

**New Loan Account Settings**

The following is a list of settings common to most forecasting software models:

A. Interest Accrual Method
B. Amortization Type
C. Maturity Period
D. Index
E. Margin
F. Lifetime Floor
G. Lifetime Ceiling
H. Prepayment Speed
I. Taxable or Tax Exempt
J. Risk Weighting

**Existing Loan Database Fields**

Most core systems have report writing capabilities, providing the user with the ability to create a database consisting of the specific fields required to forecast cash flows on the existing loan portfolio. As long as the loan system is accurately maintained, the portfolio can be sliced and diced to produce accurate cash flows by product type, by branch, by region or even by loan officer. The fields required to run your forecasting software must be identified so the model knows which fields to use for what purpose. Each system uses unique names and codes and software products have their own ways of selecting fields and converting these codes. The following required fields are common to most systems, however, the names often vary:

A. Principle Balance — Make sure the field chosen excludes loan participations.
B. Fixed/Variable
C. Interest or Note Rate — Excluding Participations
D. Maturity Date
E. Note or Product Type
F. Index
G. Margin
H. Note Accrual Indicator — Accruing or Non-Accruing
I. Next Repricing Date
J. Repricing Frequency
K. Period Cap
L. Lifetime Floor
M. Lifetime Ceiling

You might have noticed many of these fields overlap those required in the “New Loan Account Settings” section. It is important to forecast existing cash flows separately at the account level to incorporate contractual differences in existing accounts within the same category.
DEPOSITS

Non-Maturity Deposits

Much less complex than loan portfolios, non-maturity deposits are driven by a few basic cash flow assumptions such as Betas, Decay Rates and Lags.

Although decay rates are most often associated with EVE calculations since they impact the fair value of your non-maturity deposit portfolio, decay rates also play an important role in forecasting for a number of reasons. Unlike time deposits that have hard maturity dates, the runoff of non-maturity deposits are more difficult to predict and can therefore create significant liquidity risk if ignored. Understanding deposit decay can also help you make better informed product pricing decisions and provide the data required for improved allocation of marketing budgets.

Note: The OTS provided industry averages for decay rates for over 25 years but ended this practice in 2012. Federal examiners strongly recommend banks calculate these rates using internal data as industry averages are not suitable in every case and available data might be outdated.

As stated earlier, this discussion focuses on community bank forecasting and does not address the complexities of interest rate risk topics such as EaR and EVE and how beta and decay assumptions impact these calculations.

Below are some common terms that are used when forecasting Deposits, along with their definitions:

Decay Rate — the speed at which non-maturity deposits run off or “decay” over time.

Calculating Decay Rates — There are various methods of calculating decay rates. Each has advantages and disadvantages, but in general, there are a few basic rules to follow:

1) Choose the appropriate level of detail to study, i.e. break out the primary products your bank offers
2) Select the time period you wish to study (rates are calculated on an annual basis so make sure to annualize your results if the period chosen is greater than or less than one year)
3) Eliminate unusual activity such as one-time events

The most common decay rate method is simply to choose a starting point and track the behavior of a set of accounts and balances over a specific time period.

---

<table>
<thead>
<tr>
<th>Products</th>
<th>Current Balance Year End - 2012</th>
<th>Current Balance Year End - 2013</th>
<th>Current Balance as of 12/31/13</th>
<th>Accounts Opened in 2013</th>
<th>Accounts Opened in 2013</th>
<th>2013 Year End Balance Excl Accts Opened in 2013 2013 Deposit Decay (1 - 4)</th>
<th>2013 Deposit Decay Rate (5 / 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Deposits</td>
<td>$ 716,313,955</td>
<td>$ 734,963,170</td>
<td>$ 61,477,878</td>
<td>$ 673,485,291</td>
<td>$ 42,829,864</td>
<td>5.98 %</td>
<td></td>
</tr>
<tr>
<td>DDA CONSUMER</td>
<td>$ 44,993,459</td>
<td>$ 45,089,080</td>
<td>$ 3,889,506</td>
<td>$ 41,199,574</td>
<td>$ 3,793,885</td>
<td>8.43 %</td>
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<tr>
<td>DDA BUSINESS</td>
<td>$ 125,500,562</td>
<td>$ 143,131,172</td>
<td>$ 16,387,546</td>
<td>$ 126,743,625</td>
<td>($1,243,063)</td>
<td>-0.99 %</td>
<td></td>
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<tr>
<td>MMA CONSUMER</td>
<td>$ 9,207,403</td>
<td>$ 8,900,078</td>
<td>$ 413,399</td>
<td>$ 8,486,679</td>
<td>$ 720,724</td>
<td>7.83 %</td>
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<tr>
<td>MMA BUSINESS</td>
<td>$ 7,290,593</td>
<td>$ 9,958,844</td>
<td>$ 2,524,639</td>
<td>$ 7,434,205</td>
<td>$ 143,611</td>
<td>-1.97 %</td>
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<tr>
<td>BUSINESS MONEY MARKET</td>
<td>$ 59,179,283</td>
<td>$ 60,275,859</td>
<td>$ 4,558,004</td>
<td>$ 55,717,854</td>
<td>$ 3,461,429</td>
<td>5.85 %</td>
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<td>NOW ACCOUNTS</td>
<td>$ 18,851,481</td>
<td>$ 19,094,081</td>
<td>$ 511,911</td>
<td>$ 18,582,169</td>
<td>$ 269,312</td>
<td>1.43 %</td>
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<td>CONSUMER NOW</td>
<td>$ 215,060,146</td>
<td>$ 225,611,674</td>
<td>$ 21,935,162</td>
<td>$ 203,676,512</td>
<td>$ 11,383,634</td>
<td>5.29 %</td>
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<td>HUNT CLUB ACCOUNTS</td>
<td>$ 47,554,818</td>
<td>$ 47,492,857</td>
<td>$ 2,509,828</td>
<td>$ 44,983,028</td>
<td>$ 2,571,790</td>
<td>5.41 %</td>
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<td>INTEREST CHECKING - BUSINESS</td>
<td>$ 2,568,663</td>
<td>$ 3,677,617</td>
<td>$ 87,399</td>
<td>$ 3,590,218</td>
<td>($1,021,555)</td>
<td>-39.77 %</td>
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<tr>
<td>SAVINGS CONSUMER</td>
<td>$ 22,508,924</td>
<td>$ 24,783,493</td>
<td>$ 2,974,548</td>
<td>$ 21,808,944</td>
<td>$ 699,980</td>
<td>3.11 %</td>
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</tr>
<tr>
<td>SAVINGS HUNT CLUB</td>
<td>$ 82,167,958</td>
<td>$ 81,491,783</td>
<td>$ 4,851,627</td>
<td>$ 76,640,155</td>
<td>$ 5,527,803</td>
<td>6.73 %</td>
<td></td>
</tr>
<tr>
<td>SAVINGS BUSINESS</td>
<td>$ 3,283,767</td>
<td>$ 3,602,330</td>
<td>$ 732,783</td>
<td>$ 2,869,548</td>
<td>$ 414,220</td>
<td>12.61 %</td>
<td></td>
</tr>
<tr>
<td>IOLTA ACCOUNTS</td>
<td>$ 2,014,462</td>
<td>$ 1,651,698</td>
<td>$ 101,526</td>
<td>$ 1,550,173</td>
<td>$ 464,289</td>
<td>23.05 %</td>
<td></td>
</tr>
</tbody>
</table>
Example:
1) Choose a product
2) List all accounts with balances as of 12/31/12
3) List all accounts with balances as of 12/31/13
4) Subtract all balances from new accounts opened in 2013 from your 12/31/13 data
5) Calculate the change or “decay” in balances — this will include both the decay in balances for accounts still on the books from the prior year-end and will eliminate all accounts closed in 2013 that were on the books at the end of 2012
6) Divide the resulting decay calculated in #5 by your 12/31/12 balance in #2

Example using Data:
1) Personal Savings Account
2) December 31, 2012: Total Balances = $12,000
3) December 31, 2013: Total Balances = $18,500
4) New accounts added in 2013 = $8,000, subtracted from #3 leaves $10,500.
5) #2 - #4 or ($12,000 - $10,500) = $1,500 (amount of 2013 decay)
6) Divide #5 by #2 or $1,500 / $12,000 = 12.50% Decay Rate

Note: There is no need to annualize the result since the data is for one year — 12/31/12 to 12/31/13

Applying an estimated decay rate to your products will show the level of deposit inflows required to reach targeted balance projections and allow your team to make more informed decisions.

Pricing Beta — Stated simply, pricing beta is a product’s sensitivity to changes in market rates. It is also described as the extent to which a change in market rates is passed along to the customer.

Example: If a product has a beta of 20%, a 100-basis-point increase in market rates will result in a 20-basis-point increase in that product’s offering rate. If projecting changes in market rates, it would be prudent to analyze your institution’s pricing behavior during a time period of market rate changes consistent with your projections.

Pricing Lag — The length of time a bank waits to modify the pricing of a product after a change in market rates occurs or, more specifically, a change in the index tied to that product’s offering rate.

Often, a bank will be reluctant to immediately increase deposit rates in a rising rate environment. Although banks do fear deposit runoff, raising the cost of a non-maturity deposit product increases the cost on the entire portfolio. Banks will often wait to see the reaction of competitors and closely track the portfolio to ensure a run on the product does not occur before they have a chance to react. Analyzing your institution’s actual pricing lags during historical periods of market rate changes is highly recommended as the best method for determining future assumptions.

New Account Settings
Common new account setting requirements:
1) Interest Accrual Method
2) Index
3) Beta
4) Margin
5) Annual Decay Rate
6) Pricing Lag
7) Lifetime Floor
8) Lifetime Ceiling

Existing Non-Maturity Database Fields
The database required for the existing non-maturity deposit portfolio contains no more than a few key fields:
1) Product Type
2) Outstanding Balance
3) Current Rate
Additional fields are required to perform decay rate or other calculations, but these are normally done outside the forecasting software application.

*Note:* Non-Interest-Bearing Non-Maturity deposits need only decay rate assumptions for forecasting purposes. Betas, lags or any other interest related assumptions are not required.

**TIME DEPOSITS**
Forecasting cash flows on time deposits, also known as certificates of deposit (CDs), are fairly straightforward. In fact, the only significant difference between time deposits and non-maturity deposits is the contractual maturity date inherent in every time deposit, eliminating the need to calculate decay. Almost all financial institutions charge a penalty for early withdrawal that is sufficient to avoid significant prepayment activity in their portfolio.

Maturity terms for products usually range from 30 days to 60 months.

**New Account Settings**
Common new account setting requirements:
1) Interest Accrual Method
2) Index
3) Beta
4) Margin
5) Pricing Lag
6) Lifetime Floor
7) Lifetime Ceiling

**Existing Time Deposit Database Fields**
The database required for the existing time deposit portfolio will contain a few key fields:
1) Product Type — including maturity term
2) Outstanding Balance
3) Current Rate
4) Maturity Date

**OTHER BORROWINGS**
Other borrowings can range from Overnight Repurchase Agreements to Federal Home Loan Bank (FHLB) Advances to Subordinated Debentures. These tend to be very common accounts that behave in a very predictable manor. The settings for new accounts should be straightforward as well.

Some accounts such as FHLB Advances can have automated downloads the user can pull directly from the FHLB website and will include call rates similar to those described in the investment section above.

**NON-INTEREST RELATED ACCOUNTS**
Non-Interest related accounts include the following:
1) Non-Earning Assets
2) Non-Interest-Bearing Liabilities & Equity
3) Non-Interest Income
4) Non-Interest Expense

Some software packages might lump together balance sheet sections and/or income statement sections while others keep them separate. In addition, statistics such as number of accounts or FTEs are often calculated within the software and can be used to create formulas, eliminating the need to export data to a spreadsheet model.

**OTHER FEATURES**
Most products on the market have unique features that make forecasting more accurate and less time consuming.
Many offer features such as capital expenditure or compensation and benefits tools. Others have the ability to create what-if scenarios and top-down assumptions that are then allocated to the branch level based on existing balances or user-defined percentages. Many have built-in calculators, allowing the user to create balance sheet targets or grow income accounts by a percentage or specific dollar amount with a couple of keystrokes or a single click of the mouse. Almost all provide balancing tools, graphs and multi-level reporting capabilities.

CONCLUSION

With all the features and capabilities described in this paper, I’ve yet to use a model that does not allow the import and export to and from Excel and I’ve yet to find an analyst who will concede spreadsheets do not remain significant to the planning process.

Play it smart and combine the best tools available for successful planning at your institution. Remember, a good forecasting tool is one that results in an accurate business plan based upon the assumptions provided.

Community banks would do well to avoid asset/liability models designed for larger, more complex financial institutions. When preparing your annual budget or quarterly forecast, less is often more.

SNL Banker offers an easy-to-use account-level budgeting and forecasting tool. Built on SNL Banker’s data warehouse, it works in tandem with your general ledger and core systems so you can focus on more accurate and detailed forecasts instead of updating for actual results. All SNL Banker clients have a dedicated SNL Banker adviser for expert consultation on implementation best practices.

To see how SNL Banker can help you automate account-level forecasting at your bank, contact 866.296.3743; SNLBanker@SNL.com.