

IDENTIFYING DEFENDABLE ASSUMPTIONS



The words “Asset and Liability Management” make our field sound very precise, but often the most important part of managing your risk and profitability is overlooked: assumptions.

Assumptions are critical when modeling potential future outcomes, as the data your model reports is only as good as the data put *into* the model. Where do you get your assumptions and how do you know they are “right”?

First, a few key points to consider when developing modeling assumptions:

1. Assumptions should be grounded in specific historical experience whenever possible.
2. Adjustments should be made to reflect changes from the past (such as new management).
3. Common sense and intuition are allowable.
4. Industry averages and/or third party supplements may be appropriate when lacking quantifiable experience.
5. Stress testing your assumptions is very important.

AL models differ in look and feel, but most offer the ability to perform valuation and income simulation. We will examine several of the most common assumptions, and offer thoughts on how to derive these assumptions for those cases where you don’t have the time or tools to derive them internally. Assumptions are grouped into those that impact cash flows, pricing and economic factors.

Before we begin the assumption discussion, it is important to reiterate the age-old saying “garbage in garbage out.” The data you use as a foundation for your modeling must be as accurate and complete as possible. Layering assumptions on top of bad data, regardless of the correctness of the assumptions, can magnify inaccuracies and lead to wrong conclusions.

Loan and deposit details should be loaded by instrument to correctly capture attributes such as caps, floors, pricing and payment structures. A strong data loading tool can be helpful to find and fix bad or missing data. For investments, we see clients using interfaces to systems such as TPG, Bloomberg, Reuters, IDC and YieldBook to gather details needed for modeling.

CASH FLOW ADJUSTMENTS

- 1. Prepayments** occur when borrowers make payments ahead of schedule on their loans. These should be layered onto contractual cash flows for lending-based products, such as mortgage loans, commercial loans and mortgage-backed securities. Most AL models allow the use of prepayment speed projections (e.g., CPR) and allow you to vary the speeds by forecast scenario. Sources such as Bloomberg offer estimates for residential prepayment speeds by rate scenario. Commercial and other loans can be more challenging given their unique structure. Regression analyses and formulas are more appropriate, although it may be simplest to calculate historical averages and apply them to your projections for these loans. Some AL models also allow integration with third parties such as Andrew Davidson and Black Knight (longer list [here](#)). These vendors and certain AL models, like ZM Financial Systems' solutions, incorporate multiple factors beyond rates to provide more dynamic prepayment modeling. On a related note, prepayment penalties exist in many loan contracts and should be modeled when they exist.
- 2. Structured Cash Flows** are unique to instruments such as CMOs. The correct way to model these is to use an engine backed by a deal library containing the payment rules for a particular scenario. Intex, Moody's and YieldBook are the leaders in modeling of these instruments. Bloomberg has base case modeling, but is not as robust when performing full scenario modeling. Another approach is to import scenario-specific cash flows for your portfolio from the broker who provides the instruments. This is acceptable as long as the scenarios you receive match up with the scenarios you are modeling. Many institutions model CMOs like regular mortgages, ignoring the payment rules and only applying simplified prepayment matrices. This is rarely an acceptable approach and can lead to hidden risk. You should strongly consider the significance of these balances before taking such an approach.
- 3. Defaults and Recoveries** happen when loans cannot be repaid under the contractual terms. Modeling for these has become common in AL models given that DFAST, CCAR and CECL have hit the mainstream. Probability of default (PD) and loss given default (LGD) are the most common projection metrics, although migration matrices are also popular. We see Moody's and CRM Analytics' projections used directly through our models for loans, although we also see Sagemworks, Main Street and others used indirectly. A wide range of sources can be used for the securities market, such as Bloomberg, YieldBook, Andrew Davidson and Black Knight.
- 4. Early Withdrawals** are very similar to prepayments, and occur when depositors withdraw their money prior to maturity for their term deposits. Decays are declines in deposit balances that do not have specific maturities. Deposit studies may be required to understand your unique behavior. We see ALM First, Darling, MPS, Velligan Blaxall and several others used by our clients. Alternative approaches to modeling deposits, such as the one offered by ALCO Partners, might also be worth consideration. A more detailed list of providers is offered [here](#). As with loans, early redemption penalties often exist on term deposits and should be modeled when they exist.

PRICING

- 1. Pricing/Spread** is an assumption driven more by policy and committee than historical experience. A recent historical analysis is a great place to start. You might look at loans or deposits originated last month against a driver rate or yield curve to get a baseline; however, understanding your pricing process could lead you to model future business differently than past business. One hint here: remember business is negotiable. Published spreads often differ from reality, so spend a little time researching and comparing before settling on spread assumptions.

2. **Rate Responses and Lag Effects** are used to mimic the timing delay between market rate moves and rates on products such as deposits. Often the same companies performing the deposit balance studies noted earlier are engaged to study rate behaviors. Single- and multi-betas are often the assumptions derived and then put into AL models for forecasting these rate movements.
3. **New Business Term Structure** is tied to pricing/spread in most models: instruments are priced by referencing term points on a yield curve. Development of this assumption also requires research of your recent history to understand patterns and behaviors. A data warehouse can be an excellent tool for understanding both the pricing and term structure behavior in your new business.

ECONOMIC FORECASTS

1. **Determining the Rates** to use when modeling depends on your purpose:
 - For valuations, an implied curve derived from market rates is preferable. Bloomberg and Reuters are commonly used sources of market rates.
 - Stress testing can take many forms. Rate shocks, ramps and twists are usually derived from market rates, again from a source such as Bloomberg.
 - When projecting earnings it is generally appropriate to use an internally-developed rate forecast. The premise is you plan based on expectations, so your budgets and goals should be set based on some sort of most likely forecast. Some institutions are uncomfortable making projections, in which case they rely on S&P (Global Insights) or another consensus-type forecast.
2. **Balance and Fee Projections** usually come from either line of business feedback or top-down goals. Advanced institutions may use econometric models to estimate behavior, but direct feedback and estimates are usually preferable. Mortgage Servicing contains very unique attributes that may

require external assistance to model. Some AL models contain tools to value and project servicing. Companies such as ALM First and Chatham are commonly used by our clients for this.

3. **Economic Factors** such as CPI, GDP and unemployment are important ingredients when moving beyond basic income forecasting to projecting losses, capital, liquidity and other aspects of your business. These are standard components of DFAST projections, but savvy companies will work with providers such as Moody's or S&P to integrate these projections into their processes.

AL models contain other broad assumptions such as discount curves and volatilities, as well as instrument-specific assumptions, including discounting methodologies and spreads. Assumptions in your modeling process should be understood and defensible by someone in your organization. The last thing you want is for an examiner or your manager asking a question you cannot answer!

About the Author

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