**RiskGPS: Loan Assumptions Guide**

**Overview**

This document outlines the loan assumption inputs available in RiskGPS. Accurate loan assumptions are critical for calculating economic value and simulating interest rate risk. There are four primary types of assumptions:

1. **Market Rate on Loans Used as the Discount Rate**
2. **Floating Rate Loan Details**
3. **Adjustable Rate Mortgages (ARMs) – Ceilings and Floors**
4. **Loan Prepayment Assumptions**

**1. Market Rate on Loans**

**Purpose**

RiskGPS calculates the “economic value” of loans by discounting principal and interest cash flows over the life of the loans in your portfolio on the last day of the quarter. Discounting requires a market rate to measure the impact of the yields already existing in your portfolio to what they would be if the loans were made today. Like bonds, if the current market rate is higher than the portfolio yield, the market value of the asset will be less than its book value. If the current market rate is lower than the portfolio yield, the market value will be greater than the book value.

Call report data does not include information on recent loan rates, just the yields in the portfolio from time to time. RiskGPS estimates these current rates by comparing call report yields from quarter to quarter, but you can easily get a more accurate rate to replace the system default.

**Input Guidance**

* **Use Weighted Average Rate on New Loans** (offering rate), may be sourced from:
  + Senior management or lender estimates
  + Loan origination reports (recent months)
* **Avoid These Common Mistakes**:
  + Do **not** use portfolio yield reports. Use origination data (new loan report) reflecting current loan rates.
  + Do **not** use a simple average unless all loans are similar in size. A **weighted average** considers loan size, and big loans have much more impact over portfolio yield than small ones. For further information, contact the BankersGPS support team for assistance calculating weighted average.

**2. Floating Rate Loan Assumptions**

Because of the maturity data breakdown in the call report, RiskGPS separates loans into two categories. The two categories are: all loans except for closed-end 1-4 family first mortgages and closed-end 1-4 family first mortgages.

In the first category, RiskGPS lets you add information on floating rate loans. That’s because the call report does not include the details we need to capture the behavior of these loans. In the call report, floating rate loans accruing at their floor rate are shown the same as they would be if they were a fixed rate loan, at the final maturity. And there is no information on loan floors and ceilings in the call report. More precise information is usually available from your loan processing system and may also be estimated by senior management.

**Weighted average contractual (indexed) rate** – this is the weighted average rate that loans would yield if they didn’t have floors. For example, if your bank typically prices loans with floors at Prime plus 1%, the Average Indexed Rate is equivalent to the current prime rate (e.g., 8%) plus 1% = 9. %Using the information entered in this section, RiskGPS will calculate rate shocked income more accurately.

**Additional Resources**

An E-Learning session on Floating and Adjustable Loan Assumptions is available in the RiskGPS Tutorial Library.

**3. Adjustable Rate Mortgages (ARMs)**

The second major category of loans to enter are **1-4 family closed-end first mortgages**. RiskGPS uses the “ARM method” for loans in this category that re-price before maturity. **ARMs, or Adjustable Rate Mortgages**, *are loans that re-price before they mature; oftentimes, these do not reprice immediately, but rather once a year.*

*Adjustable loans may contain limits on the amount of rate adjustment. Because that detail is not included in the call report, and the call report may not reflect the earliest re-pricing date, nor ceilings and floors on the loans, the user will find it valuable to enter this level of detail into the Loan Assumptions section of RiskGPS.* Adding that information will improve results for both rate shocked income and market value analysis, so it is worth the effort to get those numbers.

Users must remember that the ARMs in this section are limited to those loans that are secured by closed-end 1-4 family first mortgages. *This does not include Commercial Real Estate loans, home equity lines of credit, or construction loans*; those should be included in the appropriate area of the adjustable rate loans section.

The amounts on the first line (**RE Loans as Reported**) are completed by the model and include the breakdown of the bank’s 1-4 family first mortgages by final maturity, based on the way they were reported in the call report. As such, the total amount of all maturities on this line will be equal to the amount the bank reported on line 1.c.(2).a in Schedule RC-C Part 1 less the non-accrual loans on line 1.c.2.a in column C in Schedule RC-N. However, *since many banks have material volumes of residential ARM loans with characteristics that alter their repricing (such as floors and ceilings), RiskGPS allows the user to separate the model’s defaulted repricing data that came from the Call Report.* Completing this section is optional but highly recommended if the bank has ARMs secured by residential first mortgages.

If you enter data in the section, first separate the defaulted data into “Non ARM Volume” and “ARM Volume.” The total amount of “Non ARM Volume” should equal the amount reported on line 1.c.(2).a in Schedule RC-C Part 1 of the call report, less the non-accrual loans on line 1.c.2.a in column C in Schedule RC-N, less the amount on line 4 in the memorandum section of Schedule RC-C Part 1. For many community banks, line 4 is only reported semi-annually in June and December. In the other quarters, the user may either use the same source used to get the data in the required months or use an estimate. RiskGPS only requires that the total of both ARM and Non-Arm volume equals the residential first mortgage total from the call report line 1.c.(2).a in Schedule RC-C Part 1 less the non-accrual loans on line 1.c.2.a in column C in Schedule RC-N.

*Both the “Non-ARM Volume” and “ARM Volume” should be divided among the time buckets, based on the earlier of their scheduled repricing or maturity.* If your bank does not have a balance in that column, enter a zero. This information should be available from a bank’s loan application, if it includes a breakdown that separates fixed loans from ARM loans.

After completing the repricing inputs, complete the “Floor,” “Ceiling,” and “Average Contract (Indexed) Rate” inputs. RiskGPS uses this data to appropriately reprice the balances in each repricing bucket.

1. the “Floor Rate” line is the weighted average floor rate for the ARM loans in each repricing bucket. If this information is not readily available from your bank’s loan system, you may estimate the average floor level based on knowledge of your bank’s loan underwriting standards and terms. Additionally, if it is believed that the floor rate is consistent regardless of repricing term/bucket, you may input the usual floor rate. You can enter a zero if there is not a floor rate or balance in that column.
2. The next line is the “Ceiling Rate” data. This should be completed the same way as the “Floor Rate” inputs. That is, either from the bank’s loan system, or by making an estimate based on knowledge of the bank’s loan underwriting standards and terms. Again, if you think the ceiling rate is consistent regardless of repricing term/bucket, the bank’s usual ceiling rate can be entered. If there is no ceiling rate, you can enter either 99 or zero, and RiskGPS will not apply a ceiling.
3. Finally, input the “weighted average indexed rate” for each repricing bucket. The “weighted average indexed rate” is the average rate the loans in each bucket would be paying if there were no floor or ceiling.

**Contract (Indexed) Rate Example:**

If

Current prime rate = 8.5%

Loans in the repricing bucket are priced at Prime + 1% with a floor of 6%

Then the weighted average Contract rate = 9.5%.

The Indexed Rate is typically available from your loan system, but if not, the user may have to estimate the rate based on their knowledge of the bank’s loan underwriting standards and terms. Once again, a zero may be entered in any columns where an averaged indexed rate does not apply.

*Entering loan details in the RiskGPS loan assumptions often results in reducing the bank’s rate sensitivity to both margin and EVE shocks. And it certainly creates a more accurate estimate of the bank’s rate risk profile.*

**4. Amortize Loans? Setting**

**Concept**

Call report instructions require the full amount of the loan to be reported at its final maturity or, in some cases, its first repricing date. But most loans have monthly payments that include principal reductions or amortization. RiskGPS can estimate the additional cash flow from loan amortization, which results in faster repricing. It also lowers the average life and duration for EVE. The impact of amortizing loans is more change in income and less change in market value as rates change.

**Default Setting**

The Amortize Loans? flag in RiskGPS defaults to Yes . That setting is appropriate for banks with only small amounts of balloon loans. But the choice will result in loans being amortized to their final maturity. If your bank has significant amounts of balloon loans (that is, loans that do not fully amortize by their maturity date), then we recommend you set the “Amortize Loans?” flag to “No” and use prepayment percentages in the following section that include both scheduled and additional (prepayment) principal reductions.

**5. Loan Prepayment Assumptions**

**Importance**

Prepayments influence both income and market value sensitivity, making them one of the top three interest rate risk assumptions questioned by examiners (alongside deposit assumptions). This assumption is important because prepayments make your loan income more sensitive to rate change. That helps on positive rate shocks but hurts on negative rate shocks.

Prepayments also affect market value. Prepayments accelerate effective maturity and shorten duration. That means that on positive shocks (rising rates), the market value will decrease less when the prepayment rates are higher, and negative shocks, the market value will not increase as much when prepayment rates are higher. High prepayment rates can cause a bank to significantly underestimate its exposure to rising rates, so it is important for the bank to address this assumption.

**Default vs. User Defined Inputs**

**Plansmith Defaults**: these are proprietary estimates based on Plansmith’s analysis of recent industry data. RiskGPS looks at historical prepayment patterns that have occurred in the bank’s own portfolio as well as broader industry data. This historical context helps establish a baseline for expected prepayment behaviors under various market conditions.

We highly recommend that our clients engage in periodic prepayment studies of their loan activity and overwrite the system estimates with their bank specific prepayment experience. In doing so, bank management must consider how prepayments would increase or decrease in response to rapid changes in market levels of interest rates.

Prepayment rates are likely to be much higher when rates are falling and much lower when rates are rising. We recommend that you document a discussion of how your bank might be affected, and make sure that you use different prepayment rates for different levels of rate shock. An E-Learning session is available in the Tutorial Library in the main menu of RiskGPS, which provides a method for [estimating prepayment levels](file:///\\EARTH\Company\Bill\Webinars%20and%20Seminars\GPS%20Loan%20Assumptions\GPS%20Estimating%20Loan%20Prepayments\GPS_Estimating_Prepayments.mp4) for positive and negative shocks.

**Best Practices**

* Make sure that the results are appropriate for your bank, your customer base, and the types of loans in your portfolio.
* Conduct annual **prepayment studies** and override system estimates based on findings at least once a year.
* Use **different prepayment rates** under various rate shock scenarios.
* Document internal discussions and assumptions.
* Consider engaging outside specialists for additional guidance (Plansmith Advisory Services available).
* Perform an **annual stress test** using RiskGPS’s “Stress Testing Key Assumptions” E-Learning module.

**Support and Resources**

Many banks seek assistance from outside specialists in the development and review of their assumptions. Plansmith offers Advisory Services that will include that support. For more information, contact the RiskGPS support team.