Appendix 1a: Re-estimate Funding Losses Due To Drawdown Optionality and Correlation

Concepts

1. FCRA interest rate subsidy re-estimates are inevitable when there is a material time period between the execution of a fixed-rate loan commitment based on US Treasuries and the drawdown and funding of the loan at then-current Treasury rates. For infrastructure projects with long construction phases, the time period between loan commitment execution and funding is likely to be at least several years.

2. Treasury interest rates are volatile but tend to mean reversion and are generally cyclical over time. As a result, funding losses (positive subsidy re-estimate) and gains (negative re-estimate) on individual loans should balance out over time on an aggregate net basis in a large-scale, long-term portfolio. This is the rationale for FCRA's special re-estimate account with Permanent Indefinite Authority (PIA). The PIA account separates (1) endogenous program costs (e.g., credit reserve, administration) subject to discretionary appropriation from (2) an exogenous interest rate re-estimate factor, the cost of which will be a mandatory appropriation but should tend to zero over time.

3. However, if loan drawdown by the borrower is *optional and correlated to Treasury rates*, the PIA account will not work as intended. In this case, the borrower will be less likely to draw if Treasury rates have fallen since loan execution and more likely to draw if they have risen. Program funding losses will therefore not tend to zero, but instead accumulate in the PIA account regardless of other portfolio characteristics.

4. Loan drawdown optionality and correlation to Treasury rates are the result of program design and operation (e.g., offering penalty-less fixed-rate loan commitments to borrowers with near-Treasury alternatives). As such, these factors are not exogenous (they can be influenced by the program itself) and re-estimate losses arising from them should not be accrued under Permanent Indefinite Authority but subject to discretionary appropriations. To do otherwise is to distort loan program subsidy budgeting by recording the true cost of endogenous loan features in an off-budget account.

5. WIFIA loan commitments to date appear to have explicit optionality and very strong correlation to Treasury rates. WIFIA's borrowers have universally been highly rated public water agencies with access to the tax-exempt municipal bond market, rates in which (as in all public debt markets) are highly correlated to the Treasury yield curve. More specifically, due the tax-exemption, interest rates for highly rated municipal bonds are almost always near or below Treasury rates all along the curve. Since there is no penalty or make-whole for not drawing a WIFIA loan commitment, these borrowers will compare their WIFIA commitment rate to their current tax-exempt alternatives. If Treasury rates have risen since loan commitment execution, borrowers will be more likely to draw the WIFIA loan. If Treasury rates have fallen, the borrowers are less likely to draw the WIFIA loan and issue in the bond market instead -- unless the WIFIA commitment rate is reset to the current market, as WIFIA did in at least six cases in FY 2020.

6. WIFIA's problem with optionality and correlation provides the correct context for the portfolio's estimated realized and unrealized funding losses of $685 million on 9/30/2021. Unless WIFIA addresses the issue by adding non-correlated loan products to the portfolio, these funding losses will not be balanced by future funding gains, since these are unlikely to be significant regardless of interest rate direction. Significant additional losses are more likely due to new loan commitments being executed or reset at low rates relative to future Treasury market normalization.

Appendix 1b: Illustration Model of Drawdown Optionality and Correlation

The effects of optional and correlated loan drawdown on the PIA re-estimate account can be illustrated with a simple model.

Assumptions

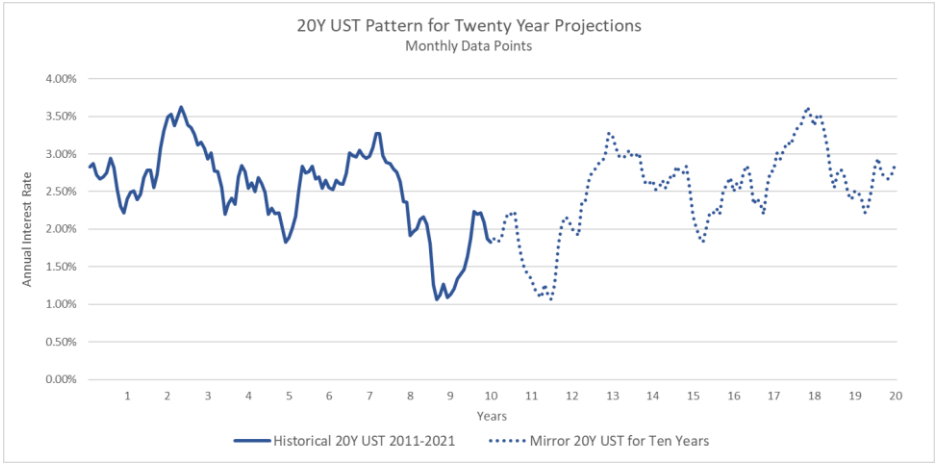
A new loan program will execute $100 million of loan commitments each month for twenty years. All loans will amortize in accordance with a twenty-year weighted average life schedule. The fixed-rate loan commitment will be set at then-current 20YR UST rate on day of execution.

Loan drawdown by borrower will occur (or not) exactly one year after commitment execution. Two cases are considered:

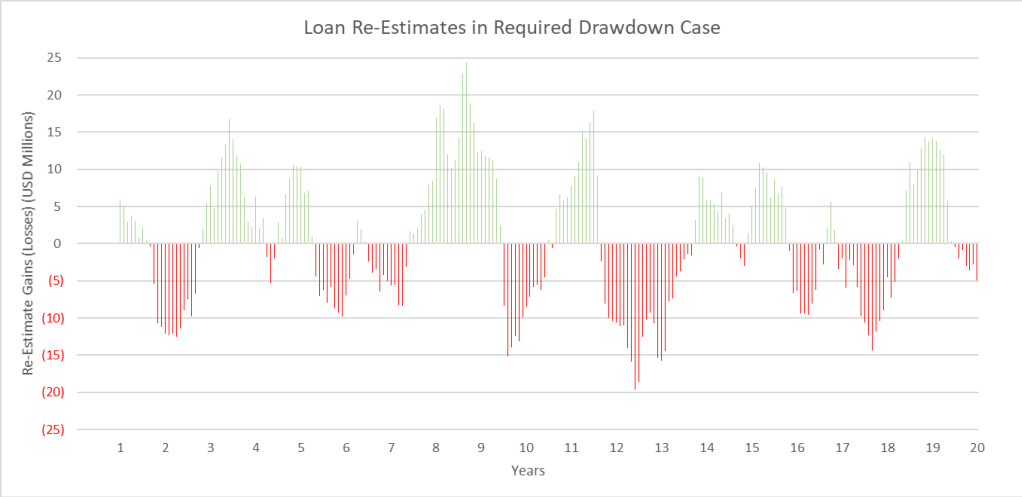
1. **Required Drawdown**: The borrower will draw regardless of then-current UST rates because it (1) is contractually required to do so, or (2) has no financing alternatives that are close to a UST rate at any time. The latter is the usual situation for federal loan programs that are meant to address a lack of cost-effective financing for sound projects that advance a policy objective.

2. **Optional/Reset Drawdown**: The borrower will only draw if the then-current 20YR UST is *higher* than its commitment rate, or the commitment is *reset* downward to the then-current 20YR UST rate. This situation arises when (1) there is no contractual requirement or penalty for not drawing, and (2) the borrower has efficient financing alternatives that are available at UST rates, such as highly rated tax-exempt bonds. This is an unusual situation for a federal loan program because the policy objective is not clear, but it appears to describe WIFIA's current practices and borrowers.

To model a twenty-year UST interest rate pattern that reflects realistic volatility while being completely cyclical, the last ten years (120 months) of 20YR UST rates 2011-2021 are used for years 1 through 10 of the model. This pattern is then 'mirrored' for years 11 through 20 of the model:



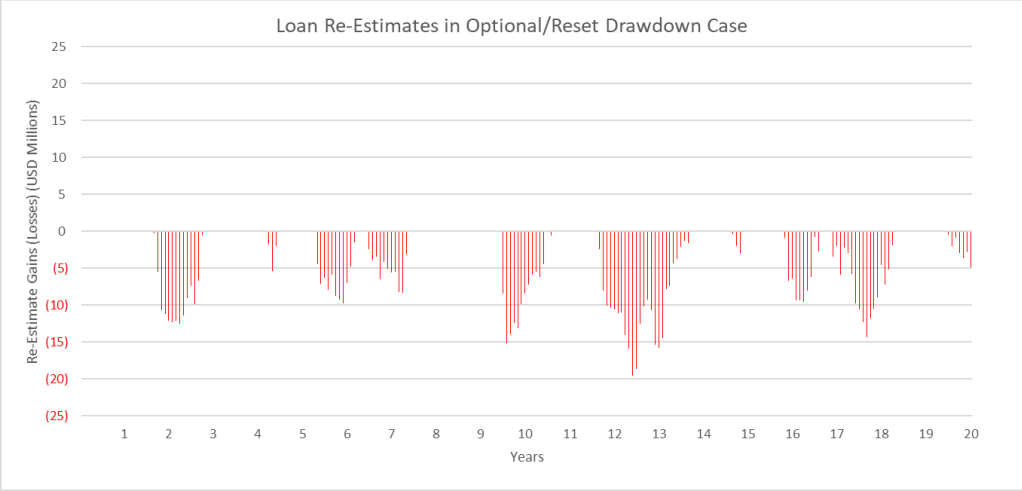
Appendix 1c: Individual Loan Drawdown and Re-estimate Losses and Gains



In the Required Drawdown case, loan commitments are drawn monthly, starting one year after the initial commitment.

Re-estimate losses and gains are estimated as the difference between loan principal ($100 million) and the present value of loan debt service, discounted at then-current 20YR UST. This is approximately FCRA's process.

Re-estimate losses occur when UST rates have risen over the year since commitment, and Re-estimate gains when UST rates have fallen. Loss or gain trends of about 3 years occur but reverse to an opposite trend thereafter. The average tends to zero, about a 0.4% gain on each loan.



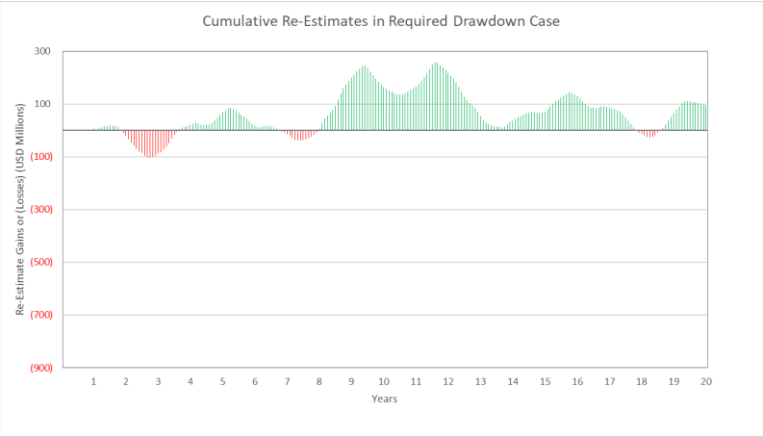
In the Optional/Reset Drawdown case, loan commitments are drawn monthly whenever then-current UST rates are higher than the commitment or the commitment rate is reset downward to the then-current UST rate.

In this case, there are no re-estimate gains because the loan either is not drawn or is reset, zeroing out any re-estimate.

Re-estimate losses are the same as in the Required Drawdown case. The average is about a 4% funding loss on each $100 million loan.

Appendix 1d: Cumulative Re-estimates

The cumulative impact of interest rate re-estimates illustrates the important difference between the two cases in terms of the program's overall cost budgeting.



In the Required Drawdown case, cumulative re-estimates both rise and fall into net gain and loss balances, reflecting US Treasury rate volatility. The cumulative balances can become relatively large at points due to recent UST trends (e.g., years 9 through 13) but they generally start to reverse to zero within a year. The final balance of $90 million gain is less than 0.4% of the program's $24 billion portfolio at that point, simply as a result of this specific interest rate pattern. More importantly, Treasury rate reversion to the mean and cyclicality can be predicted to drive the balances towards zero over the long timeframe of the program.

The Required Drawdown case shows the correct application of Permanent Indefinite Budget authority for interest rate re-estimates. The PIA account will have a useful 'smoothing' function that separates the true cost of the program's endogenous policy factors from temporary and exogenous funding cost factors.

In contrast, in the Optional/Reset case, re-estimate funding losses simply accumulate throughout the program's life. For the first years of program operation, the scale of balances is not that different than in the Required Drawdown case (e.g., in years 3 and 9) but this is misleading. The important point is that there are never any reversals and aggregate losses are therefore permanent. Treasury rate reversion and cyclicality will simply determine the rate at which losses accumulate.

Since loan drawdown optionality and correlation to Treasury rates are policy decisions made by the program or legislators (intentionally or not), an account for re-estimates with Permanent Indefinite Authority in this case does not provide better budgeting but instead obscures a major endogenous cost factor. Drawdown optionality and resets are certainly attractive features to borrowers with near-Treasury financing alternatives. If their true cost is hidden, a loan program offering these features may appear to be more cost-effective than it is.