



April 20, 2016

## Weekly Post: Adjusting the Funding Duration to Enhance Earnings

Dear Clients-

Last week, I showed an example of issuing fixed rate mortgage loans with funding that matched the loan's duration. This week, I will discuss further the trade off between earnings and interest rate risk exposure using alternative funding durations.

By adjusting the funding duration, you can target your EVE duration to manage your interest rate risk exposure *dynamically* (as discussed in my previous post).

You may be surprised that this Post's results link EVE duration and ROE. This linkage can be most helpful for your overall balance sheet strategy.

### Challenges

- Given the current upward sloping curve, how beneficial is it to use long term funding to originate fixed rate mortgage loans?
- Should you originate 15 yr FRMs instead of 30 yr FRMs to avoid funding with longer duration?
- To reduce interest rate risk should you originate more short duration loans or ARMs? If you do this are you forgoing opportunities?

### Solution

Consider the example of a bank balance sheet to analyze the duration of funding. Suppose a bank has \$100mm and \$20mm economic value of total asset and EVE respectively. The EVE ratio is 20%. The bank is considering adding \$10mm 30 yr fixed rate mortgage loans and funding with FHLB advances.

The loan rate is 3.785% with a duration of 5.59, FICO 720, 75% LTV, and the property is owner occupied. Based on the FHLB (Chicago) rates, the funding rate with the same duration is around 1.59%. The margin is 2.195%. The net interest income (NII) is estimated to be \$219,000. The impact on EVE ratio is to lower it to 18.18% (= \$20mm/\$110mm). Note: even an 18% EVE ratio should still be generally sufficient.

### Market Wisdom - Art Hilliard\*

"Price talk" is a term used amongst buyers, sellers and brokers. It refers to the price that a potential seller might be willing to take for their loans or if a buyer is looking for loans, what price they might be willing to pay for a pool of loans that meet their inquiry parameters.

Price talk is "indicative" meaning it is not a firm commitment. It just gives a counterparty an idea of where they should be bidding. If the price talk is too high, a bidder may not want to waste time on the deal and move on.

Some sellers believe that they are tipping their hand by showing price talk. They may feel they may be leaving money on the table. That whole problem is solved when TFO is used to determine the value for the seller's pool. TFO will provide a value based on the seller's data and provides tools to make sure that transaction fits the balance sheet.

Sellers also have the ability to increase the price by adjusting the OAS. Just remember, pigs get fat, and hogs get slaughtered.

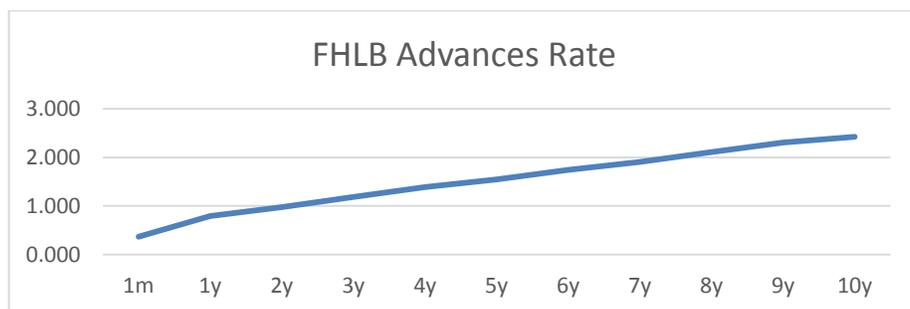
<https://www.thcdecisions.com/tro>



Now suppose we use a longer term funding strategy. Instead of funding duration of 5.59 years, we use FHLB advances with duration of seven years. Since the FHLB curve is upward sloping, the NII would decrease by the additional funding cost. The benefit of this strategy is lowering the EVE duration.

First, lets look at the impact of lowering the EVE duration using a longer term funding. A recent FHLB curve shows that the yield increases consistently by 20 bpts for every year up to the ten year maturity. That means, roughly speaking, for every additional year extension in funding, the cost to NII is 20 bps.

Bullet	3M	4M	6M	1Y	1.5Y	2Y	2.5Y	3Y	4Y	5Y	6Y	7Y	10Y	15Y	20Y
Bullet	0.45		0.55	0.80		0.93		1.13	1.34	1.49	1.69	1.87	2.41	2.93	3.24



Source: THC Financial Officer (TFO)

Using the above numerical example, when the duration is matched, the NII is approximately \$219,000. If the funding is extended by two years, then the NII is reduced by \$40,000 (= 0.002 \* 10,000,000 \* 2 yrs). The decrease in NII is weighed against the lowering of EVE duration. That for most banks is lowering interest rate risk exposure.

The reduction of EVE duration is surprisingly simple to calculate. The change in EVE duration is simply the proportion of the transaction size relative to the EVE value as a fraction of the extended duration. Simply put, the extended duration of funding should reduce the EVE interest rate risk, and the reduction is a function how large the transaction is to the EVE value. Again, using the numerical example above to illustrate. The proportion of the transaction size to EVE is 0.5 (= \$10mm/\$20mm ). Therefore, the reduction of the EVE duration is one year (= 0.5 \* 2 year).

I have described the cost and benefit of the extending the funding duration. The benefit is shortening the EVE duration, and the tradeoff is lowering earnings. In putting the two parts together, I can derive a simple rule, which has important implications on how you management the bank. This is my Tom Ho Rule #1. The rule says: Let me define ROE(%) as NII to EVE for an incremental impact of a transaction. Then the increase ROE (%) relative to the increase in EVE duration is a constant ratio 0.2 in current market condition.

**Tom Ho Rule #1                      ROE% increase = 0.20 EVE duration increase**

This rules says, if your EVE duration can be extended by two years, then you can fund the loan purchase with shorter term FHLB Advances. The increase in duration enhances the ROE by 0.40%. Therefore, the change of



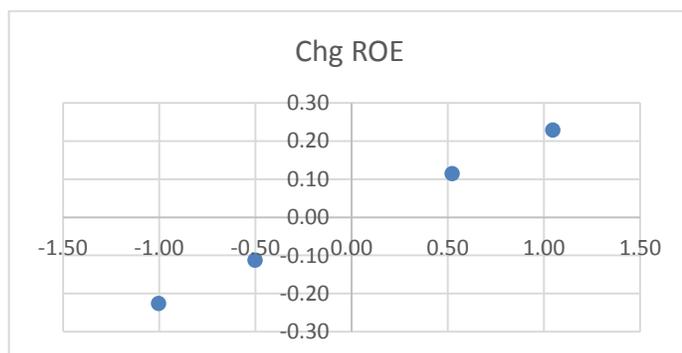
EVE duration directly impacts the ROE by a factor of 0.2, not the loan transaction size nor the funding duration per se. This rule has important implications which I will explain below.

**Numerical Example**

Let me consider a hypothetical bank. Using Risk Officer/Trade Simulation, I simulated a \$161mm bank originating \$10mm and \$20mm loans and funding with FHLB advances with the loan duration two years extended and shortened. The dashboard values for Sept and Dec cycles are in blue.

Performance Dashboard											
Economic Values			capital			NII and Earnings 12mo Projections			performance(%)		
assets	loans	deposits	EVE	EVE ratio(%)	duration	NII	earnings	margin (%)	ROA	ROE	
161,508	110,055	116,491	30,469	18.87	1.34	4,813	2,983	2.83	1.85	9.79	
162,308	110,578	116,558	32,827	20.23	1.39	4,797	2,971	2.80	1.83	9.05	

The resulting change of ROE relative to the change of EVE duration using multiple simulations is presented below, confirming my analysis. The ROE increases are directly related to the EVE duration increases (x-axis) by a multiple of 0.20. The cost and benefit of using alternative funding durations and different transaction sizes have a simple relationship. If you allow your EVE duration to increase by N years, then your ROE will increase by 0.2N %. Conversely, if you need to lower your EVE duration by N, then your ROE would be lowered by 0.2N %



So, here are the implications from the Tom Ho Rule #1.

- The loan officer's focus should be on the margin of the loan, which is the spread between the yield of loan relative to the funding with a similar duration, not on how the loan is funded. ALCO should decide on the EVE duration, the tradeoff between the cost of lowering EVE duration regarding the ROE as explained in the Rule. This ALCO process in separating loan pricing and interest rate management by ALCO is a common practice. Rule #1 provides the rationale behind this practice.
- These results also imply that the use of amortization, barbell, and other more structured Advances has limited value. These structured products are in essence rearranging the funding cash flows, something that ALM management should consider in managing the balance sheet and not in the loan origination process to manage the new loan's cash flows.

**Conclusions**



Funding new loans is a common discussion and key issue in ALCO meetings. This post shows that the ROE% increase relative to the EVE duration remains a relatively constant ratio of 0.2 with alternative transaction size and funding duration. Therefore, profitability of a loan purchase has two distinct components: the initial margin and the EVE duration effect. Hence, you can separate the responsibility of loan officer in pricing by focusing on the margin using duration matching method, as explained in the Post last week, and the ALCO in interest rate risk management in adjusting the EVE duration as explained in the Post Importance in Managing EVE duration.

*If you have further questions on the use of Trade Simulation and Financial Simulation to determine the appropriate level of EVE ratio, please do not hesitate to contact THC.*

Regards,  
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