Funds Gap Management
An Asset-Liability Management Technique in Banks

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Abstract

The spread or interest margin is the difference between the return on assets and the expenses paid on liabilities. Assets are classified as Rate Sensitive Assets and fixed Rate Assets. Liabilities are classified as Rate Sensitive Liabilities and fixed Rate Liabilities. An asset or liability is identified as sensitive if cash flows from the asset of liability change in the same direction and general magnitude as the change in short-term rates. The cash flows of fixed rate assets and liabilities do not change within the relevant time period as the name implies, "fixed". The interest margin or spread, would decrease if short-term interest rate would increase or decrease. This would happen if there is a gap or difference between rate sensitive assets and rate sensitive liabilities. The decrease in interest margin or spread would be prevented by the use of three management strategies or techniques which are discussed in this paper.

Keyword: Fund Gap, Rate Sensitive Assets and Liabilities, Zero Gap, Positive and negative gap, Spread, Hedging.

Introduction

"Funds gap" or "gap" is positive when the peso amount of sensitive assets exceeds that of sensitive liabilities. The gap is negative if sensitive liabilities exceed sensitive assets. When sensitive assets are equal to sensitive liabilities, we have a zero fund gap. With a positive gap, the interest margin would increase if short-term rates rose and decrease if short-term interest rates fell. With a negative gap, the interest margin would decline if short-term rates rose and increase if short-term rates fell. If there is zero gap, interest margin will be stable or will not change regardless of the rise or fall of short-term rates.

The first strategy is to accept fluctuation in interest margin and do nothing about it. The second strategy is to manage the funds gap over the rate cycle. If management expects a fall in short-term interest rate and there is a positive gap, it should widen the gap or increase rate sensitive assets. If management expects a rise in short-term interest rate and there is a negative gap, it should narrow the gap or increase rate sensitive assets. The third strategy is for management to decide not to take interest rate risk by seeking a zero gap position. The fourth strategy is for management to use artificial hedges-i.e. financial futures to cover the loss that might result from the rise or fall of short-term interest rate. Bank management may use not only one strategy but a combination of strategies.

The illustrative examples touch on what happen to the spread when short-term interest rises or falls under the following situations and what to do when spread decreases under said situations:

1. Zero fund gap or perfect match;
2. Positive gap or where more rate sensitive assets (RSA) are financed by Fixed Rate Liabilities (FRL);
3. Negative gap or where more Fixed Rate Assets (FRA) are financed by Rate Sensitive Liabilities (RSL).

Statement of the Problem

The problem that this paper would like to address is the determination of the appropriate strategies to adopt in order to avoid the decrease in spread or interest margin due to the rise or fall of short-term interest rates. This problem is a concern of banks and other financial institutions.

Rationale

Obtaining an interest margin adequate to cover a bank's burden (the net of other expenses less other income) and to earn a satisfactory return on the owner's investment in the bank is as important as, if not more important than, reasonable stability in the interest margin. Interest margin for a bank is the difference between all interest revenues on bank assets and interest expenses on bank funds.[1]

The causes of fluctuation in interest margins are classified into endogenous or internal factors and exogenous or external factors. The exogenous factors are the business cycle movements influencing savings or credit demands, fiscal and monetary policy and the resulting fluctuations in interest rates. Business borrowing is said to be weak in the beginning of an economic cycle upturn and strong in the final stages. Monetary policy and tightness influence borrowing behavior. As the availability of funds tightens, borrowing terms tighten and interest rates rise, producing a decline in borrowing. With a downturn in the business cycle, demand for business output and thus, borrowing eventually declines. Government deficit financing increases in this stage in order to sustain or increase planned government expenditures in the face of a shortfall in tax revenues.

The interest margin performance of individual banks varies during such cyclical periods. These differences in interest margin performance appear to be explained primarily by endogenous factors such as the nature of the bank's assets and liabilities and the reaction of the bank to expected exogenous factors.

The wide disparity in interest margin performance among individual banks and predictions that interest rates may have relatively large and rapid fluctuations indicate that most banks should develop a system to manage their interest sensitivity. The most widely used system is the so-called <u>funds gap management</u>. The system is a management tool that has been designed for the purpose of maintaining a high and relatively stable interest margin through the entire rate cycle.

In the typical funds gap management system, management is asked to classify all items in each side of the bank's balance sheet into groups of items whose cash flows are sensitive and those whose cash flows are insensitive to changes in short-term interest rates.[2] Thus, an asset

or liability is identified as sensitive if cash flows from the asset or liability change in the same direction and general magnitude as the change in short-term rates. The cash flows of insensitive (or nonsensitive) assets or liabilities do not change within the relevant time period.

"Funds gap" or "gap" is positive when the peso amount of sensitive assets exceed that of sensitive liabilities. The gap is negative if sensitive liabilities exceed sensitive assets.

When sensitive assets are equal to sensitive liabilities, we have a zero fund gap. With a positive gap, the interest margin would increase if short-term rates rose and decrease if short-term rates fell. With a negative gap, the interest margin would decline if short-term rates rose and increase if short-term rates fell. If there is zero gap, interest margin will be stable or will not change regardless of the movement of short-term rates.

Implications, Issues and Strategies

The implications for bank management seem straightforward. If management expects interest rates to fall and there is a positive gap, it should widen the funds gap or increase rate-sensitive assets. On the other hand, management should narrow the banks funds gap or increase rate sensitive assets if interest rates are expected to rise and there is a negative gap. If used effectively, such gap management decisions should lead to higher returns.

However, there are four categories of concerns as to whether gap management can achieve such lofty goals.[3] First is the concern about which time period is appropriate to use in determining whether assets and liabilities are rate-sensitive. Second, there are concerns about the ability of bank management to predict the direction, magnitude and timing of interest movements. Third, there are doubts about bank management's ability to flexibly adjust assets and liabilities to obtain the desired gap. Fourth, there are concerns that gap management is myopic because it focuses only on the interest sensitivity due to current flows and ignores reinvestment risk and potentially significant changes in the values of bank asset and liabilities usually deemed to be insensitive from a cash-flow standpoint.

Although the above concerns are real, gap management still appears to be a helpful tool. This is particularly true if a frequently updated interest-sensitivity profile is used, if management is aware of practical problems in predicting rates and managing the interest position of borrowers and depositors, and if management keeps track of changes in values. Given these conditions, funds gap measures are good indicators of the direction and possibly the size of interest margin for a given increase or decrease in interest rates. With this in mind, four potential management strategies utilizing gap management are considered-accepting margin fluctuations, managing the gap over rate cycles, seeking a zero or balanced gap position and covering the loss due to rise or fall of short-term interest rate by using artificial hedges or entering into futures transaction/s.[4]

The first strategy is to accept fluctuation in interest margins as one of the risks of banking and go on about a bank's business of filling depositor's and borrower's needs. The second strategy emphasizes managing the funds gap over the rate cycle, meaning to determine either to widen or to narrow the gap depending on the existing type of gap (positive or negative) and the movement of short-term rates (rise or fall). The third strategy is when a bank with limited staff and limited access to financial markets may decide not to take interest rate risk by seeking a zero or balanced gap position.

The fourth and final strategy is to use artificial hedges-i.e. financial futures. Hedging is the engaging in one transaction (i.e. sell or buy futures) that is expected to yield a profit in order to cover the loss expected to be incurred from another transaction. The profit and loss must be

offsetting or that they are of approximate amount. <u>Futures</u> are financial instruments which can be sold or bought today at a certain price but whose delivery and payment will be done and received at a certain future date.

Bank management may not apply only one strategy but may use a combination of strategies.

Illustrative Example

1) With Zero Gap or PERFECT MATCH in maturity of assets and liabilities, spread will be at the same regardless of whether short-term interest rate rises or falls.[5]

➢ Spread value when there is perfect match of assets and liabilities
Present Structure and Interest Rates
RSA   .20X.70   = 0.14
FRA   .15 X.30 = <u>0.045</u>
         0.185
RSL   .10X.70   = 0.07
FRL   .08 X.30 = <u>0.024</u>
         <u>0.094</u>
Spread   <u>0.091</u>
         = = = =

When there is perfect in match, spread will not be changed even when there is change in Short-term interest rate. <u>RSA</u> stands for rate sensitive assets, <u>FRA</u> for fixed rate assets, <u>RSL</u> for rate sensitive liabilities and <u>FRL</u> for fixed rate liabilities.

➢ Short term interest rises by 1%:
RSA   .21 X .70 = 0.147
FRA   .15 X .30 = 0.045
         0.192
RSL   .11 X .70 = 0.077
FRL   .08 X .30 = <u>0.024</u>
         <u>0.101</u>
Spread   <u>0.091</u>
         = = = =

➢ Short term interest rate falls by 1%:
RSA   .19 X .70 = 0.133
FRA   .15 X .30 = 0.045
         0.178
RSL   .09 X .70 = 0.063
FRL   .08 X .30 = <u>0.024</u>
         <u>0.087</u>
Spread   <u>0.091</u>
         = = = =

2) With Positive Gap or More Rate Sensitive Assets (RSA) financed by Fixed Rate Liabilities (FRL) [6]
Matrix:

More Rate Sensitive Assets (RSA) financed by Fixed Rate Liabilities (FRL)

	When Short-Term Interest Rate	
	Falls	Rises
Spread	Decreases	Increases
To maintain spread	Increase RSA	-
Futures Transaction	Buy	-

Present Structure and Interest Rates
RSA   .20 X .70 = 0.14
FRA   .15 X .30 = 0.045
                                    0.185
RSL   .10 X .20 = 0.02
FRL   .08 X .80 = 0.064
                                    0.084
Spread   0.101
                                  ====

Decrease (Increase) in Spread if short-term interest rate falls (rises) by 1%

$$\frac{RSA - RSL}{Earning\ Assets\ (EA)} \rightarrow \frac{.7 - .2}{1} = .5$$

$$.5\ (1)\ (.01) = .005$$

➢ Spread value if Interest Rate falls by 1%
RSA   .19 X .70   = 0.133
FRA   .15 X .30   = 0.045
                                    0.178
RSL   .09 X .20   = 0.018
FRL   .08 X .80   = 0.064
                                    0.082
Spread   0.096 or 0.101 - .005 = .096
                                  ====

➢ Spread value if Interest Rate rises by 1%
RSA   .21 X .70 = 0.147
FRA   .15 X .30 = 0.045
0.192
RSL   .11 X .20 = 0.022
FRL   .08 X .80 = 0.064
                                    0.086
Spread   0.106 or 0.101 + .005 = .106
                                  ====

* Spread decreases if short-term interest rate falls
  Spread increases if short-term interest rate rises

To maintain spread of 0.101, how much should RSA be when interest rate falls by 1%

$$[.19\ (X)+.15\ (1-X)] - [.09\ (.2)+.08(8)] = 0.101$$
$$.19\ X + .15 - .15X - .082 = 0.101$$
$$.04 = 0.033$$
$$X = 0.825$$
$$1 - X = 0.175$$

RSA	.825 X .19= 0.15675	
FRA	.175 X .15= <u>0.02625</u>	0.183
RSL	.2 X .09 = 0.018	
FRL	.8 X .08 = <u>0.064</u>	<u>0.082</u>
		<u>0.101</u>

* When interest rate falls by 1%, RSA should be increased from 0.7 to 0.825, a widening of the funds gap: from RSA of 0.70 and R5L of 0.20 to RSA of 0.825 and RSL of 0.20.

Futures Cover: The loss that would result when short-term interest rate falls can be covered by a buy future transaction. This is an alternative strategy.[7]

If earning assets are equal to P l00M, the loss to cover due to 1% change in short-term interest rate is: .005 x 100M = P500,000 or P0.5M

The amount of future to invest to cover loss if short-term interest rate changes by 1 % is: P500,000/ .01 = P50M

Interest rate is expected to fall from 10% to 9% 180 days later

Buy today 50M	@ 90: P50M x .90 = P45.0 M	
Sell 180 days later	@ 91: 50 x.91 = <u>45.5M</u>	
	P0.5M	

The gain of P0.5M from the buy future transaction will serve as cover for the decrease in spread of P0.5 M due to the 1% decrease in short-term interest rate.

Interest Rate is expected to fall, but it rises
- this will result in a loss of P0.5M
- from 10% to 11 %

Buy today P50M	@ 90: P50M x.90 = P45.0M	
Sell 180 days later	@ 89: 50 x.89 = <u>44.5M</u>	
Loss	P0.5M	

The loss in buy future transaction of P0.5M is offsetted by the unexpected increase in spread for the same amount of P0.5M due to the rise in short-term interest rate. Whichever way interest rate will go (rises or falls), loss can be avoided.[8]

3) With Negative Gap or More Fixed Rate Assets (FRA) Financed by Rate Sensitive Liabilities (RSL) [9]

Present Structure and Interest Rates
RSA   .2 X .30   = 0.06
FRA   .15 X .70 = <u>0.105</u>

                  0.165

RSL   .10 X .80 = 0.08
FRL   .08 X .20 = <u>0.016</u>

                  0.096
Spread   0.069

Matrix:
More Fixed Rate Assets (FRA) financed by Rate Sensitive Liabilities (RSL)

	When Short-Term Interest Rate	
	Falls	<u>Rises</u>
Spread	Increases	Decreases
To maintain spread	-	Increase RSA
Futures Transaction	-	Sell

Decrease (Increase) in Spread if Short-Term Interest Rate Rises (Falls) by 1%

$$\frac{RSL - RSA}{Earning\ Assets\ (EA)} \rightarrow \frac{.80 - 30}{1} = 0.5$$

            .5(1) (.0l) = .005
Spread if Interest Rate Rises by 1 %
RSA   .21 x .30 = .063
FRA   .15 x .70 = <u>.105</u>

                  .168
RSL   .11 x .80 = .088
FRL   .08 x .20 = <u>.016</u>

                  .104
Spread   .064 or .069 - .005 = .064

Spread if Interest Rate Falls by 1 %
RSA   .19 x .30 = .057
FRA   .15 x .70 = <u>.105</u>

                  .162
RSL   .19 x .80 = .072
FRL   .08 x .20 = <u>.016</u>

                  .088
Spread   .074 or .069 + .005 = .074
* Decrease in Spread, if Interest Rate Rises.
Increase in Spread, if Interest Rate Falls.
To maintain spread of 0.069, how much should RSA be when short term interest rate rises by 1%

$$[.21x+.l5(1-x)] - [.8(.11)+.2(.08)] = .069$$
$$.21X + .15 - 1s\ X - .104 = .069$$
$$.06X = .023$$
$$X = 0.3833 \quad 1 - X = .6166$$

RSA   .21x.3833= .0805
FRA   .15x.6166= <u>.0925</u>

                  .1730

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RSL    .11x.8      = .088
FRL    .08 x .2    = .016
                               .104
       Spread                  .069
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* When Short Term Interest Rate Rises by 1%, RSA should be Increased from .30 to .3833 a narrowing of the funds gap: from RSA of.30 and RSL of .8 to RSA of .3833 and RSL of .8.

Futures Cover:The loss that would result when short-term interest rate rises can be covered by a sell future transaction. This is an alternative strategy,

If earning assets equal to P100,000,000

Loss to cover due to 1 % change in interest rate: .005 x 100M = P500,000

Amount of futures to invest to cover loss (if ST Interest rate changes by 1%) P500,000/.01 = P50M

Interest Rate is expected to rise from 10% to 11% (180 days later)

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Sell today P50M       @ 90: P50M x .90 = P45.0M
Buy 180 days later    @ 89: 50 x.89    =  44.5M
            Gain                          P0.5M
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The gain of P0.5M from the sell future transaction will serve as cover for the decrease in spread of P0.5M due to the 1% increase in short-term interest.

Interest rate is expected to rise, but it falls
        - this will result in a loss of P0.5M
        - from 10% to 9%

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Sell today P50M       @ 90: P50M x.90 = P45.0M
Buy 180 days later    @ 91: P50M x.91 =  45.5M
            Loss                         P0.5M
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The loss in sell future transaction of P0.5M is offsetted by the unexpected increase in spread for the same amount of P0.5M due to the fall of short-term interest rate whichever way interest rate will go (rises or falls), loss can be avoided.

Conclusion

Bank management must be aware of whether there is zero, positive or negative gap between sensitive assets and sensitive liabilities. The effect of each the three gaps on the interest margin or spread be determined considering the movement of short-term rates. Management should be adept in determining the right strategy/ies to avoid decrease in spread.

Future interest rate movements are of vital concern to institutions. Profits can be favorably influenced through accurate projection of interest rates followed by appropriate policy decisions. Changes in the level of interest rates are a vital concern of portfolio management. Interest rate risk is the incurrence of a loss due to changes in interest rate. Interest rate risk can be avoided by four strategies that this paper has discussed.

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