The Difference GAP – The Main Instrument Used in the Management of Banking Assets and Liabilities

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Abstract

The analysis of the difference GAP is the main instrument used to manage bank assets and liabilities, to administer the net interest from income and to protect it against interest rate risk and to manage cash flow in the short term.

The information obtained from the analysis shall be used either to protect the net income from interest compared to the interest rate change by adjusting the sensitive assets / liabilities or to amend by means of the speculative operations the dimension of the difference GAP, while trying to increase the net income from interest. This is done by means of the speculative use of changes in interest rates which implies an interest rate forecast as close as possible to the market.

Key words: interest rate, liabilities, assets, liabilities sensitive to interest rate, risk exposure
J.E.L. classification: E00, G20, G21, G32

1. Introduction

A key feature of the contemporary world is the risk, uncertainty. The economic, monetary, financial and banking environment is constantly subjected to the action of a set of risk factors.

In the countries in transition, the monetary and financial-exchange markets are highly volatile, banks' exposure to risk significantly increases, giving greater attention to risk management.(Mititelu C., Mititelu Șt., 2006)

The interest rate risk is a central variable as they represent the direct costs of borrowing. (Kalirai, H., Scheicher, 2002) The interest rate risk occurs when short-term placements are financed by the Bank of resources on a shorter term, and interest rates increase above the level estimated by the bank, the interest expense corresponding to the deposits of a bank increase more than the income from interest corresponding to assets. If interest rates fall below the level anticipated by the bank, the difference between interest income and interest expense will be higher and the bank value will increase accordingly.

In addition, high real interest rates are in general associated with systemic problems of the banking sector.(Lopcu K., Cilic S.B, 2012)

This article aims to analyze the impact of interest rates progress on the financial results of commercial banks, with interest-bearing balance sheet items predominantly variable, applying the spread interest revaluation model, using estimates regarding the future developments in market interest rates.

2. Constructing the interest GAP model

In the sensitivity analysis on the change of the interest rate we calculated the impact of potential fluctuations of market interest on the interest margin for the following financial years available, depending on the date of changing / resetting of interest rates of balance sheet assets and liabilities as follows: assets and liabilities bearing interest were divided on these bands, depending on the date of restoration / modification of interest: 1 - 6 months, 6 - 12 months, 1 - 3 years, 3-5 years.

The assets and liabilities sensitive to interest rate will be divided according to their residual maturity in the following maturity bands:

(a) Up to 6 months;

(b) From 6 to 12 months;

(c) From 1 to 3 years;

(d) Between 3 to 5 years.

Starting from these maturity bands and from the typology of bank's assets and liabilities, we will identify how all components of interest rate risk can be included in the model.

The revaluation risk occurs primarily on the net income from interest of the credit institution. The interest gap model reflects the implications of rates change on the assets and liabilities of the bank, only in terms of the changes occurred at the level of the net income from interest.

The risk of the interest curve allows the assumption of changes that may occur in the structure of the interest rate curves. In determining the level of interest rate risk we will consider a parallel modification of the curve ,while subsequently, based on the model we will be able to create simulations regarding the changes that may occur in the structure of the interest curve slope.

The basis risk is taken into account, even if the theoretical shape of the gap model does not allow the inclusion of the effect of this risk component.

There is still a strong correlation between the level of money market interest and the interest rates on customer loans and deposits, and in terms of a rather complex relative portfolio, this fact largely eliminates the distortions that the non-inclusion of basis risk in the model might have on the final result.

Optionality, a source of increasingly important risk interest rate options has its roots embedded in more active passive or balance sheet items.(Moinescu Bogdan, Codîrlaşu Adrian, 2009). Optionality cannot be captured by the standard form of the interest gap model. By means of the typology of the bank's assets and liabilities, optionality can intervene in case of an increase of interest rates on loans with fixed interest.

Based on the comments made on customer behaviour of the analyzed bank, it was determined that on average, 4.27% of outstanding loans are repaid before maturity, upon the decrease by one percentage point of the interest rate on the money market.

It must be remembered that this occurs only in the case of interest rate cuts and only has meaning for a positive gap.

Thus, within the model we will introduce as assets sensitive to interest rate, on the maturity band between 3 and 6 months, corresponding percentage of fixed-rate loans considered to be reimbursed in advance.

Table no 1. Bank exposure in terms of net income from interest in case of a change in the interest rate on the market(ΔR assets = ΔR liabilities)

Thousand lei

	Up to 6 months	**6-12 months**	**1 - 3 years**	**3 - 5 years**
RON				
Assets	24,537,495	4,629,181	777,921	590,674
Liabilities	24,929,281	3,662,127	8,991	15,479
The GAP from interest	-391,786	967,054	768,930	575,195
Cumulative GAP	-391,786	575,268	1,344,198	1,919,393
□R assets	1.00%	1.00%	1.00%	1.00%
□R liabilities	1.00%	1.00%	1.00%	1.00%
NII_i	-3,918	9,670	7,689	5,752
Cumulative NII_i c	-3,918	5,753	13,442	19,194

Source: own calculations

By knowing the gap on each maturity band, you can easily calculate the bank's exposure in terms of income from interest given the interest rate changes on the market.

$\Delta NII_i = GAP_i * \Delta r = (SA_i - SL_i) * \Delta r$

where: ΔNII_i= change of the net income from interest for a maturity band i

Δr= interest rate change affecting the assets and liabilities for maturity i;
SA_i – assets sensitive for maturity i;
SL_i – liabilities sensitive for maturity i;

A positive gap indicates that sensitive assets are higher than sensitive liabilities and a negative gap means that sensitive assets are lower than sensitive liabilities.(Manolescu Ghe.,2006)

Also, the positive gap indicates that assets change their interest based on the market interest faster than liabilities.

In Table 2 we summarized the relationship between interest rate changes and the change of the net interest from income for a certain gap between assets and liabilities sensitive to interest rate.

Table no. 2 Relationship between interest rate changes and the change of the net income from interest

GAP	Interest rate	Income from interest		Interest expense	Net income from interest
Positive	Increases	Increases		Increases	Increases
Positive	Decreases	Decreases		Decreases	Decreases
Negative	Increases	Increases		Increases	Decreases
Negative	Decreases	Decreases		Decreases	Increases

Source: own calculations

The greater the gap, the higher the bank's exposure to interest rate risk.

When the gap is positive, the link between interest rate changes and the net income from interest is positive: when the interest rates increases, the net income from interest increases and when the interest rate decreases, the net income from interest decreases.

When the gap is negative, the link between interest rate changes and the net interest from income is negative: when the interest rates increases, the net interest from income decreases and when interest rates decreases, the net interest from income increases (the ***gap effect***[1]).

These correlations are valid if ***the interest rate changes by the same size as the liabilities and assets***, but this hypothesis is very unlikely plausible in reality. The interest rates for assets typically have a different evolution as compared to the interest rates in case of liabilities[2].

Thus, if the interest rate had increased by 1% in case of assets and by 1.1% in case of liabilities, then the change of the net interest from income would have been:

$\Delta NII_i = SA_i * \Delta r^{assets} - SL_i * \Delta r^{liabilities}$

where: ΔNII_i= change of the net income from interest for a maturity band i
Δr= interest rate change affecting the assets and liabilities for maturity i;
SA_i – assets sensitive for maturity i;
SL_i – liabilities sensitive for maturity i;

Table no. 3 Bank exposure in terms of net income from interest in case of a change in the interest rate on the market(ΔR assets ≠ ΔR liabilities)

thousand lei

	Up to 6 months	6-12 months	1 - 3 years	3 - 5 years
RON				
Assets	24,537,495	4,629,181	777,921	590,674
Liabilities	24,929,281	3,662,127	8,991	15,479
R assets	1.00%	1.00%	1.00%	1.00%
R liabilities	1.10%	1.10%	1.10%	1.10%
NII_i	-28,847	6,009	7,680	5,737

[1] The relationship between interest rate change and the net income from interest.
[2] This thing is a manifestation of risk basis – the assets and liabilities have as reference different market interest rates, they usually have the same tendency, but they are not perfectly correlated.

cumulative NII_i	-28,847	-22,838	-15,158	-9,421

Source: own calculations

From the analysis of data from the application of the interest gap model for operations in lei, according to Table 3 - Bank exposure in terms of net income from interest in case of a change in the interest rate on the market where ΔR assets = ΔR liabilities the following conclusions may be retained:

1. The bank analyzed has a positive interest gap, which means that in future years the impact of changes in interest on the profit is limited and sensitive assets are higher, and change their interest according to market income faster than sensitive liabilities.

When the interest margin between sensitive assets and sensitive liabilities increases and interest rates increase (decrease), the income from interest increases (decreases) more (less) than interest expense (*margin effect*). When the interest margin between sensitive assets and sensitive liabilities increases (decreases), the income from interest increases (decreases) less (more) than interest expense.

2. Regarding the risk associated with optionality, it does not manifest itself in an influential manner. The optionality in this case consists mainly of the risk associated with the repayment before the maturity of loans granted to customers.

3. Regarding the bank's exposure to the risk of interest rate change curve, the situation is presented in Table 4.

Table no. 4 Results summarized for the three standard interest rate developments

	Up to 6 months	**6-12 months**	**1 - 3 years**	**3 - 5 years**
Interest GAP	-391,786	967,054	768,930	575,195
Sharpening				
□R	1.00%	1.50%	1.75%	2.00%
Effect	-3,918	14,506	13,456	11,504
Flattening				
□R	2.00%	1.75%	1.50%	1.00%
Effect	-7,836	16,923	11,534	5,752
Deformation				
□R	1.00%	1.50%	2.00%	1.50%
Effect	-3,918	14,506	15,379	8,628

Source: own calculations

3. Conclusions

From the analysis of the result of the simulations made, we appreciate that the interest rate development risk associated with the *banking book* portfolio is reasonable. Moreover, in the predictable context of a flattening of the interest curve (higher growth for the first bands, and lower in case of more distant bands), the impact on net income from interest will be lower.

In conclusion, the strategy of the analyzed bank regarding the significant risk management aims to ensure the achievement of the budgetary indicators planned in case of controlled risk conditions, able to ensure both the continuity in the development of bank's activity on sound bases and the protection of the interests of shareholders and customers. The institution adopts a risk profile in line with the risk appetite and corresponding strategies and policies on managing significant risks are linked to the overall strategy, equity and bank experience in risk management.

4. References

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