

CONTEMPORARY CHALLENGES FOR THE DEVELOPMENT OF CREDIT INSTITUTIONS

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The 2008 financial crisis had underscored the importance of both external regulation and internal management for successful development of credit institutions. One of the most important parts of internal management system for credit institutions is a correctly chosen asset-liability management strategy against the background of changing environment. Formulating and choosing such a strategy involves formulating forecasts involving its goals, areas, scale and potential operational results in relation to the sources of funding and its likely costs. This paper considers some aspects of asset-liability management in credit institutions – especially interest rate risk management.

Keywords: Asset structure, Asset-liability management, Commercial banks, Interest rate risk.

I Introduction

The 2008 financial crisis and its ongoing repercussions, especially in the European Union, had dramatically illustrated the important role a healthy financial system plays in the economy. Dysfunction in the financial markets necessitated a large transfer of private sector liabilities to the public sector threatening debt sustainability of European sovereigns. Ongoing problems do not allow the financial system to intermediate lending to small and medium enterprises, preventing the transmission of the accommodative monetary policy stance by the European Central Bank. A healthy financial system necessitates healthy credit institutions, of which commercial banks are the most important ones in many countries. Therefore ensuring asset quality and profitability in the banking system in response to the changing environment remains crucial.

This paper first considers key developments in asset and liability structure of credit institutions both in Latvia and in the European Union as a whole. It then discusses the key problems for the banking system — the need to dynamically optimize asset and liability structure, to ensure profitability of operations and to minimize risks. These can be addressed by some of the techniques discussed in this paper, such as jointly structuring asset and liability portfolios, using the gap method for interest rate risk. More generally, these methods are part of the asset-liability management field in the literature.

Asset-liability management is the ongoing process of formulating, implementing, monitoring and revising strategies related to assets and liabilities to achieve an organization's financial objectives, given the organization's risk tolerances and other constraints (Society of Actuaries, 2003). Seshadri et. al. (1999) suggest that the strategic asset-liability management process has to: (i) uncover asset liability mismatches that could expose the bank to interest rate

risk, (ii) forecast earnings under multiple interest rate scenarios, and (iii) assess the relative impact on income from alternative investment and funding strategies.

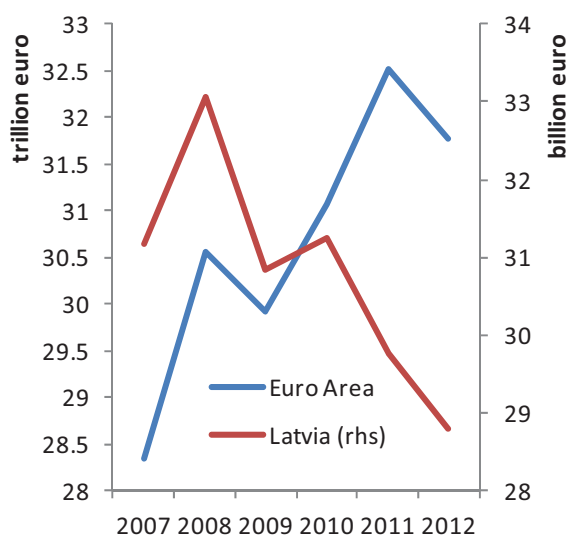
This paper focuses especially on the first and second goals. The management techniques outlined in this paper comprise a high level blueprint for a successful operation of a commercial bank. Underlying these management techniques, there has to be a high quality analysis of financial and macroeconomic indicators and their likely future paths. For example, Kosmidou and Zopounidis (2002) develop an optimization tool for interest rate scenarios helping to determine the optimal balance among profitability, risk, liquidity and other uncertainties by considering several goals, such as the maximization of returns, the minimization of risk, the maintenance of a desirable level of liquidity and solvency, the expansion of deposits and loans.

Section II of this paper considers some stylized facts on credit institutions in the euro area and Latvia. Section III considers the principles of formulating asset-liability management strategies with an emphasis on interest rate risk management. Finally, Section IV concludes.

II Stylized Facts on Credit Institutions in the Euro Area and Latvia

Figure 1 illustrates the dynamics of total assets of credit institutions in Latvia as well as the euro area since 2007. While for the euro area as a whole one can observe some deleveraging (resulting in a decrease in the amount of assets) in 2009, assets of the euro area credit institutions continued to rise in 2010 and 2011, rising by 8.7 percent relative to the 2009 level. Another episode of deleveraging began in 2012, when aggregate assets falls by 2.3 percent.

Figure 1. Assets of Credit Institutions.



Source: ECB, Bank of Latvia

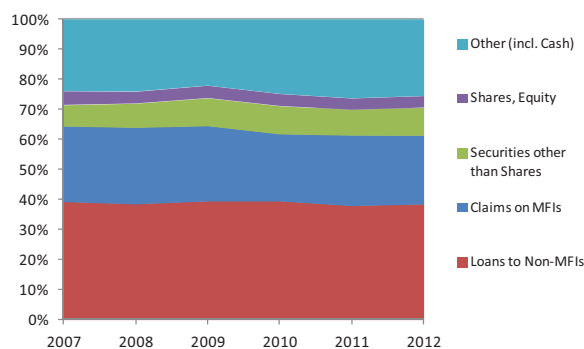
On the other hand, deleveraging in Latvia has, so far, been much more protracted and severe. After a brief increase in 2010, assets of Latvian credit institutions declined in 2011 and 2012 by a cumulative 7.9 percent. This was primarily driven by the write-off of bad loans and low demand for loans during the period of sharp contraction in external demand. Another possible reason is the outflow of non-resident deposits, prompting a more forceful deleveraging by Latvian banks. Of course, these trends cannot be unambiguously applied to all Latvian banks, because their strategy and clients (e.g. whether they are serving primarily residents or non-residents) can be substantially different. An even greater diversity is present at the euro area level as a whole.

Figure 2: Asset Structure of Credit Institutions in 2012.

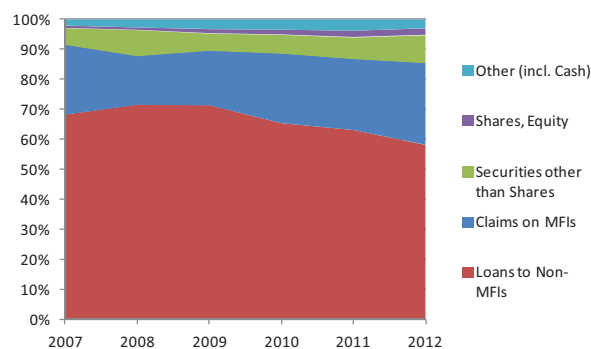
Source: ECB, Bank of Latvia, author's calculations

grouping of asset categories differs somewhat from the treatment prescribed by the monetary and financial statistics manual (IMF, 2000): one can separate claims on MFIs (monetary and financial institutions, which includes both central and commercial banks), both in the form of loans and holdings of other securities (e.g. bonds), loans to non-MFIs, holdings of securities other than shares, which would also form claims on non-MFIs, holdings of shares and equity, as well as other assets.

In many ways asset structures of Latvian and the euro area institutions are similar. Both claims on MFIs and especially loans to non-MFIs take up a larger proportion of assets in Latvia (27.4 relative to 22.9 percent and 58 to 38.4 percent respectively). On the other hand, euro area has a substantially larger proportion in the "other" category (23.2 relative to 7.8 percent). A significant proportion of these other assets are external assets, due to the greater presence and integration of the euro area banks on the global financial markets.

Figure 3. Asset Structure in Euro Area Credit Institutions

Source: ECB, author's calculations

Figure 4. Asset Structure in Latvian Credit Institutions.

Source: Bank of Latvia, author's calculations

Figures 3 and 4 show the dynamics of asset structure of euro area and Latvian credit institutions. The euro area structure appears more stable than Latvian structure, where the share of loans to non-MFIs has declined significantly from its peak of 71.4 percent in 2008 to 58 percent in 2012. In the euro area, on the other hand, the corresponding share of assets has remained unchanged at 38.4 percent.

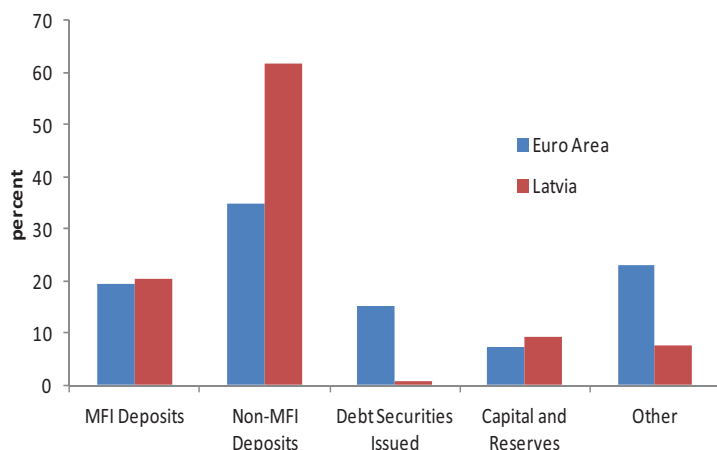


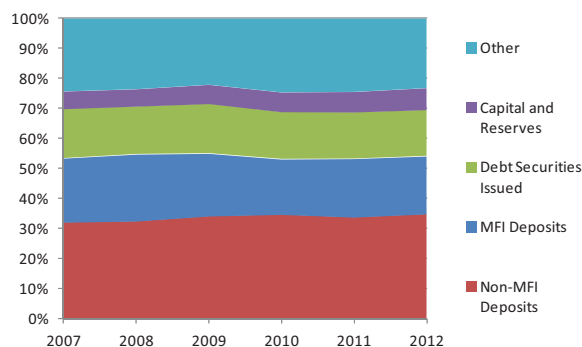
Figure 5. Liability Structure of Credit Institutions in 2012.

Source: ECB, Bank of Latvia, author's calculations

also larger for the euro area banks, 23.2 relative to 7.8 percent.

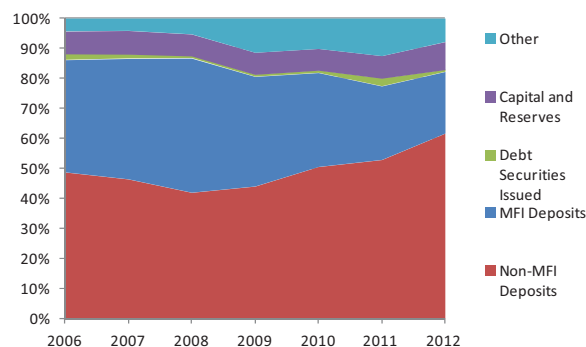
Figures 6 and 7 show the dynamics of the liability structure in the euro area and Latvian credit institutions. As before, the structure of liabilities in Latvian banks is much more volatile than for their euro area counterparts with the largest changes being the increase of non-MFI deposits mainly at the expense of MFI deposits from the low of 42 percent in 2008 to 61.8 percent in 2012.

Figure 6. Liability Structure in Euro Area Credit Institutions.



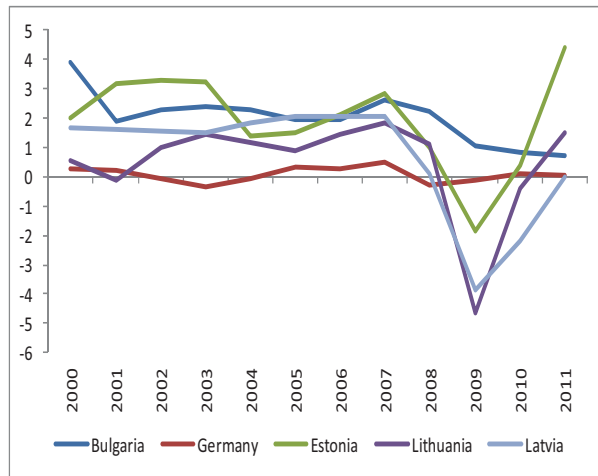
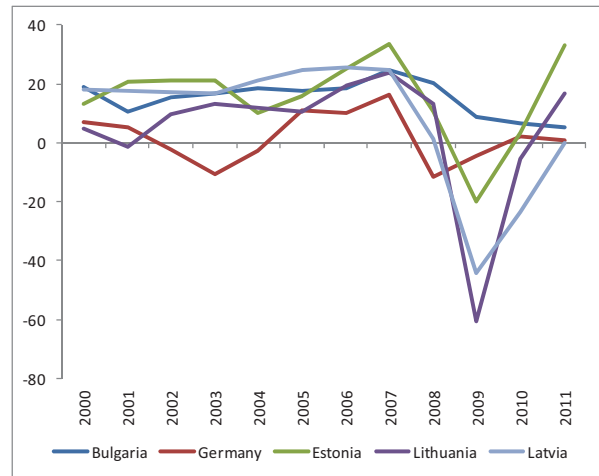
Source: ECB, author's calculations

Figure 7. Liability Structure in Latvian Credit Institutions.



Source: Bank of Latvia, author's calculations

Finally, **Figures 8 and 9** show the return on assets (ROA) and return on equity (ROE) in select European Union countries including Latvia. Return on assets declined in many countries during the 2008 crisis, but especially the Baltic countries. In most countries ROA is lower than the pre-crisis peak. Similarly, ROE declined dramatically during the crisis. The volatility of ROE is greater than ROA, because of leverage (the proportion between equity and borrowed funds). ROE also tends to remain lower than the pre-crisis peak.

Figure 8. Return on Assets in Selected EU countries, percent**Figure 9.** Return on Equity (ROE) in Selected EU countries, percent.

Source: World Bank

The analysis above allows identifying several stylized facts about the financial systems of Latvia and the euro area as a whole. First, Latvian credit institutions (primarily banks) had a much more pronounced trend towards reducing their assets than euro area banks. Second, Latvian banks experienced more pronounced structural changes in their assets and liabilities than euro area banks. Third, Latvian banks tend to rely more on a single category of assets (loans to non-MFIs) and a single category of liabilities (deposits from non-MFIs). Fourth, the volatility of profitability of Latvian banks has been much greater, than, for example, German banks. These differences manifest the implementation and the (sometimes suboptimal) outcome of different asset-liability management strategies devised to solve challenges facing these credit institutions in an uncertain macroeconomic environment.

III Formulating Asset Management Strategies

Formulating an asset management strategy for a bank means forecasting banks' goals, areas, scale and potential operational results in relation to the available resources and their costs. One of the objectives of such a strategy has to be ensuring asset quality and profitability, as measured by the return on assets and return on equity.

This paper suggests unifying banks' assets and liabilities under a single management strategy, which would aim to ensure a stable and high quality asset and liability structure. The quality of assets is, to a significant extent, determined the quality of liabilities. One possible way to characterize the quality of liabilities is by the stability of the resource base that forms these liabilities and the sensitivity of the cost of funding these liabilities to interest rate fluctuations.

One of the key questions of assessing the quality of liabilities is the probability that the funding stream they generate will remain stable for a given period of time (time stability). The assessment of this probability can be obtained on the basis of simple statistical models, for example, how likely are the balances on the current account to fall below a certain level, or how likely is the term deposit be withdrawn from a bank before term. The time stability of liabilities

determines the time stability of assets that can be funded with those without unduly exposing the bank to funding risks.

A sensible strategy for a bank is to separate its assets into groups such as based on the time stability of asset creating liabilities. Note that liability time stability is not dependent on their term per se, i.e. long-term liabilities (long-term deposits) can have high time stability, but so can stable outstanding amounts in current accounts (liabilities on demand) and short-term interbank loans obtained. Because maximizing profitability remains a goal of such an asset management strategy, every group needs to be assessed for the profitability of assets that it can sustain.

For example, liabilities with high time stability, e.g. those which are unlikely to need refinancing in the medium term, can be used to finance relatively longer term investments, e.g. long-term government bonds. On the other hand, liabilities with relatively low time stability can be used to finance more liquid parts of the asset portfolio, which can be turned into cash at no loss. Such a strategy is a simple way of managing liquidity risk with potentially important macroeconomic implications via changes in credit supply.

Cornett et. al. (2011), for example, study the behaviour of banks after liquidity became scarce in the financial crisis. They find that banks that relied more heavily on core deposit and equity capital financing, which are stable sources of financing (e.g. those with high time stability), continued to lend relative to other banks. Banks that held more illiquid assets on their balance sheets, in contrast, increased asset liquidity and reduced lending. Therefore the efforts to manage the liquidity crisis by banks led to a decline in credit supply, which, in turn, had serious adverse effects on growth.

The standard business model of a bank assumes that profits from assets are derived based on the differential between the interest paid to service liabilities financing those assets and the interest received from the assets themselves. The interest rates are subject to change following new macroeconomic or financial developments. The sensitivity of the asset and liability structure to such changes can be assessed with gap management method – based on sensitivity of operations to interest rate fluctuations and the comparison of the maturity terms of assets and liabilities.

If the gap between interest rate sensitive assets and liabilities is positive, then a bank can earn extra profit if the benchmark interest to which the costs of its funding and the returns on its assets are tied increases. On the other hand, with a negative gap, with more interest rate sensitive liabilities than interest rate sensitive assets, the bank will lose interest income. Because banks have assets and liabilities with different maturities, a gap has to be evaluated by specific maturities. Bank's interest rate risk increases if there is a mismatch (gap) between assets and liabilities in a specific term (for example, most of liabilities are short-term, while assets are long-term).

As an example consider one of the banks in Latvia with a comparatively low capital adequacy ratio. Low capital adequacy means that the bank is open to disruptions on the financial markets, which can be dangerous for the financial stability of an institution.

Table 1. Impact on Equity and Profit of an Interest Rate Increase by 1 Percentage Point.

	2007	2008	2009	2010	2011	2012
Pre-tax profit (loss)	-1.35	-5.11	-0.87	-1.83	2.80	2.31
Securities fair value revaluation reserve	-13.30	-2.03	-1.77	-1.62	-3.49	-5.71
Total pre-tax effect on equity	-14.65	-7.15	-2.64	-3.45	-0.69	-3.40
Estimated net effect on equity	-12.45	-6.08	-2.24	-2.93	-0.59	-2.89

Source: Annual report data

Table 2. Impact on Equity and Profit of an Interest Rate Decrease by 1 Percentage Point.

	2007	2008	2009	2010	2011	2012
Pre-tax profit (loss)	1.35	5.12	0.85	2.00	-2.80	-2.32
Securities fair value revaluation reserve	13.30	2.16	1.88	1.71	3.57	5.87
Total pre-tax effect on equity	14.65	7.28	2.72	3.71	0.77	3.55
Estimated net effect on equity	12.45	6.19	2.32	3.15	0.65	3.02

Source: Annual report data

Table 1 shows the effect of a simultaneous parallel shift in the yield curve by one percentage points on the pre-tax profit of the bank as well as on the securities fair value revaluation reserve. Similarly, **Table 2** shows the impacts of a one percentage point decrease in interest rates. Both tables reflect the two channels in which an interest rate shift can affect any bank. First, a change in the interest rate can affect the net interest margin – the difference between the costs of its liabilities (e.g. the interest it pays on deposits) and the revenues it gets from its assets (e.g. the fixed or variable interest it collects on its mortgage loans). This is reflected in the impact of the yield curve shift on pre-tax profit. Second, a change in interest rates can affect the net worth of the bank via the change in the value of securities it already holds. For example, the value of existing government bond holdings will fall if interest rates rise. This is reflected in the securities fair value revaluation reserve line. The change in the interest rates can also have an indirect effect on the financial position of a bank, for example, by making it harder for some clients to repay the loans they received at variable rates.

Memmel and Schertler (2013) use the principles outlined above to show that the change in banks' net interest margin can be decomposed into changes in market-wide bank rates and a change in balance-sheet composition. They also point to another avenue to minimize interest rate risk, showing that German banks employ interest rate derivatives to hedge balance sheet risk. Changes in market-wide rates affect the net interest margin less strongly for those who utilize this risk management strategy.

Tables 1 and **2** show that from 2007 to 2012 the bank in question would have suffered losses if interest rates increased, both via the net interest rate margin and securities' valuation channel, which would negatively affect equity. The clearest indications of that were in 2007 and 2008, when an interest rate increase by one percentage point would lower equity by 12.45 and 6.08 million lats (after taxes). Note that, while the largest part of a decrease in equity in 2007 would occur due to revaluation of securities, in 2008 the pre-tax losses would be the greater contributor. This suggests a change in the asset or liability composition, for example, being able to refinance some liabilities at a fixed interest rate. By 2011, the bank was able to position itself so that its profits actually increased in case of an interest rate increase if monetary policy were to become tighter.

Tables 1 and **2** also show that the overall impact of the interest rate changes is lower in 2011 and 2012, which can serve as indirect evidence of better interest rate risk management than in the period prior to the financial crisis. However, interest rate risk is not the only risk that bank needs to be concerned about. Credit risk is another important dimension that a bank needs to take into account when managing its assets in particular, in fact, according to industry reports it is considered to be the most important risk in determining the necessary amount of bank capital (IFRI-CRO, 2007). Alessandri and Drehmann (2010) point out that interest rate risk and credit risk can interact in a non-linear dynamic fashion, suggesting that from a risk management perspective there are strong incentives to move towards an integrated analysis of risks.

In managing their asset structure banks should pay sufficient attention to diversifying their asset portfolio and the range of financial operations, including by utilizing financial innovation. One such innovation, which had attracted particular attention in the literature, is securitization. Loutskina (2011) shows that, by allowing banks to convert illiquid loans into liquid funds, securitization reduces banks' holdings of liquid securities and increases their ability to lend. On the other hand, Delis and Kouretas (2011) show that the impact of interest rates on risk assets is diminished for banks with higher equity capital and is amplified for banks with higher off-balance sheet items.

Securitization also provides banks with an additional source of funding and makes bank lending less sensitive to cost of funds shocks. However, there also disadvantages to widespread application of securitization, especially on the systemic level. It weakens the ability of the monetary authority to affect banks' lending activity and makes banks more susceptible to liquidity and funding crisis when the securitization market is shut down as was the case during the 2008 financial crisis (Loutskina, 2011). Among the implementation risks are the dispersion of resources and not providing sufficient capital to traditional and profitable operations.

IV Conclusion

This paper identified the main developments in asset and liability structure, as well as asset profitability using the example of Latvian and euro area banks. These trends have been the result of the application of asset-liability management techniques. However, as indicated by the occasionally low and volatility asset profitability, these techniques could be improved.

The key problems of banks are the need to dynamically optimize asset and liability structure, to ensure profitability of operations and minimize risks. These can be addressed by jointly structuring asset portfolios while taking into account the time stability of liabilities funding those portfolios. In addition, one of the main risks facing banks is the interest rate risk, which can be managed using interest rate gap analysis. Derivatives can serve as a useful tool to reduce interest rate risk.

Ultimately, the circumstances in which banks currently find themselves, both in Latvia and, especially, in the euro area are unprecedented. In particular, the eventual unwinding of the unprecedented monetary accommodation will undoubtedly generate its own set of operating challenges. The macro-financial feedback loops currently dominating the development of the banking industry are new both to regulators and bank managers and much additional research is required in this area. The methods presented in this paper can serve as a useful first step.

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