FOR AGENDA

SM/08/331

November 13, 2008

To: Members of the Executive Board

From: The Secretary

Subject: **Former Yugoslav Republic of Macedonia—Financial System Stability Assessment**

This paper provides further background information to the staff report on the 2008 Article IV consultation discussions with the former Yugoslav Republic of Macedonia (SM/08/329, 11/12/08), which is tentatively scheduled for discussion on **Monday, December 1, 2008.** At the time of circulation of this paper to the Board, the Secretary's Department has not received a communication from the authorities of the former Yugoslav Republic of Macedonia indicating whether or not they consent to the Fund's publication of this paper.

Questions may be referred to Mr. Darbar, MCM (ext. 34252).

Unless the Documents Section (ext. 36760) is otherwise notified, the document will be transmitted, in accordance with the procedures approved by the Executive Board and with the appropriate deletions, to the European Central Bank and the WTO Secretariat on Friday, November 21, 2008; and to the European Bank for Reconstruction and Development following its consideration by the Executive Board.

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FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Financial System Stability Assessment—Update

Prepared by the Monetary and Capital Markets and European Departments

Approved by Jaime Caruana and Marek Belka

November 12, 2008

This Financial System Stability Assessment (FSSA) Update is based on work of the joint IMF-World Bank Financial Sector Assessment Program (FSAP) Update team, which visited Macedonia in March–April 2008. The FSAP Update findings were discussed with the authorities during the Article IV consultation discussions in September 2008.

The FSAP Update team comprised Sonja Brajovic-Bratanovic (Mission Chief, World Bank), Salim M. Darbar (Deputy Mission Chief, IMF), Alexander Pivovarsky, Stéphanie Stolz, David Parker (all IMF), Gregory Gordon Brunner (World Bank), Keith Bell (Banking Supervision—World Bank expert), Tyge Rasmussen (Securities market—World Bank expert), Martin Overbeek (Insurance Sector—World Bank expert) and Jasna Vukoje (World Bank, mission support). The FSAP team received excellent cooperation from the authorities and market participants. The main findings of the FSAP Update are:

- Macedonian banks have not been directly affected by the turmoil in global credit markets because credit growth has primarily been financed by customer deposits. Nevertheless, problems in foreign parent banks could adversely impact Macedonian subsidiaries.

- Maintaining confidence in the exchange rate peg is essential for financial stability because a significant amount of lending is indexed to or in foreign currency, and most borrowers are unhedged against foreign currency risk.

- Substantial progress has been achieved since the 2003 FSAP in strengthening the bank regulatory and supervisory framework. However, significant challenges remain in improving nonbank financial sector supervision.

The main author of this FSSA Update is Salim M. Darbar with contributions from the rest of the FSAP Update team.

FSAP assessments are designed to assess the stability of the financial system as a whole and not that of individual institutions. They have been developed to help countries identify and remedy weaknesses in their financial sector structure, thereby enhancing their resilience to macroeconomic shocks and cross-border contagion. FSAP assessments do not cover risks that are specific to individual institutions such as asset quality, operational or legal risks, or fraud.

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Appendix Tables

GLOSSARY

AML/CFT	Anti Money Laundering/Combating the Financing of Terrorism
BL	Banking Law
CAR	Capital Adequacy Ratio
CPI	Consumer Price Index
DIF	Deposit Insurance Fund
EIB	European Investment Bank
EU	European Union
FATF	Financial Action Task Force
FDI	Foreign Direct Investment
FIU	Financial Intelligence Unit
FSSA	Financial System Stability Assessment
FSAP	Financial Sector Assessment Program
FSI	Financial Soundness Indicator
GDP	Gross domestic product
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
ISA	Insurance Supervision Agency
LOLR	Lender of Last Resort
MAPAS	Macedonian Pension Supervisory Agency
MOF	Ministry of Finance
MONEYVAL	Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism
MOU	Memorandum of Understanding
MSE	Macedonian Stock Exchange
MSEC	Macedonian Securities Exchange Commission
MTPL	Motor Third-Party Liability
NBRM	National Bank of the Republic of Macedonia
NFA	Net Foreign Assets
NPL	Nonperforming Loans
OTC	Over-the-Counter
P&A	Purchase and Assumption
PDIF	Pension and Disability Insurance Fund
RTGS	Real-time Gross Settlement
UCITS	Undertakings for the Collective Investment of Transferable Securities

EXECUTIVE SUMMARY

Since the 2003 Financial Sector Assessment Program (FSAP), the Macedonian financial sector, particularly the banking sector, has strengthened and deepened. All key recommendations of the 2003 FSAP have been at least partially implemented.

Macedonian banks have not been directly affected by the global turmoil in credit markets. This is mainly because credit growth has primarily been financed by customer deposits rather than foreign borrowing. Nevertheless, problems in foreign banks could adversely impact their Macedonian subsidiaries. Moreover, macroeconomic risks have increased, particularly given the recent sharp deterioration in the external current account, and the economy is vulnerable to a protracted recession of major trading partners, worsening terms of trade, lower remittances, and regional instability.

The banking system appears broadly healthy, but rapid credit growth raises concerns. Financial soundness indicators are satisfactory, and although falling, capital adequacy ratios remain comfortably above the statutory minimum. Stress tests did not indicate major vulnerabilities for the banking system as a whole, but the three large banks are more vulnerable. Marginal reserve requirements introduced to slow credit growth do not appear to be effective, suggesting that the National Bank of the Republic of Macedonia (NBRM) should consider additional measures to slow credit growth, including further increases in interest rates and higher reserve requirements. Given the heightened risks of the current external environment prudential measures (e.g., stricter capital requirements for specific types of loans) may be warranted.

The maintenance of the exchange rate anchor is critical for financial stability. A large portion of lending is either indexed to or denominated in foreign currency with most borrowers unhedged against currency risk. Maintaining confidence in the peg will require supportive fiscal and monetary policies.

Good progress has been achieved since the 2003 FSAP in improving the quality of banking supervision. A sound legal and regulatory framework has been established. Supervisory independence exists in practice. Legal protection for supervisors is clearly addressed in the statute. Supervisory practices remain reasonably comprehensive and, with some minor exceptions, conform with the Basel Core Principles, as revised in October 2006.

Financial safety net arrangements need further refinement. The agencies responsible for the financial safety net need to develop contingency plans. A crisis simulation exercise should be undertaken to test various elements of the system (e.g., lender-of-last-resort) and cooperation arrangements, both domestically and cross-border. The new Banking Law provides adequate authority to resolve problem institutions, as demonstrated during the recent closure of Makedonska Banka.

However, the authorities need to quickly restore the supervisory powers of the NBRM that were weakened by recent Constitutional Court's rulings. The rulings on certain provisions of the Banking Law (BL) will restrict the NBRM's ability to apply a thorough "fit and proper" test to potential bank owners and individuals seeking positions of responsibility in the banking industry. In addition, potential court action could delay resolution of a problem bank at a time when speedy action is required.

Despite some recent growth, the securities markets are small and illiquid. Since the last FSAP, the legal and regulatory framework has been updated with a view to meeting European Union (EU) directives, and additional improvements are planned. The Macedonian Securities Exchange Commission (MSEC) needs to take further steps to improve supervision, including rectifying a lack of resources, strengthening capital requirements, improving transparency and financial reporting, establishing fit and proper standards, and addressing governance issues. Cooperation with NBRM should also be improved.

The lack of effective regulatory and supervisory authority in the insurance sector should be addressed quickly. While the enactment of the new Insurance Law in 2007 was a positive development the delay in establishing the new supervisory authority as per the law has resulted in a regulatory vacuum.

Challenges remain in the pension system. The second pillar of the pension system was introduced in 2006. Pension companies are licensed and supervised by Macedonian Pension Supervisory Agency, which has successfully started its operations. Pension funds will need to maintain returns above the rate of wage inflation, and this would require adjustments in their current investment and risk management practices and reduction in operating cost. Low participation in both pillars of the pension system needs to be addressed.

The financial sector infrastructure has also been significantly strengthened. The payment system architecture, which was favorably assessed in the 2003 FSAP, has seen further improvements particularly in strengthening the legal and regulatory framework. The NBRM is introducing major improvements to its credit registry, and a private credit bureau is being developed, which will contain much broader debt data.

Table 1. Macedonia: Key Recommendations

Recommendations	Timing
Banking Supervision	
• Ensure all banks upgrade risk management policies and processes in line with regulations including on financial risk management (liquidity, currency and credit risk) and information system security.	ST
• Revise reporting formats to implement IFRS-based accounting in 2009.	ST
Liquidity management	
• Include coordination with monetary policy among the objectives of the government's cash and debt management policy.	MT
• Improve forecasting of the government's cash balances and design a formal model to forecast currency in circulation.	MT
Financial sector stability and safety nets	
• Strengthen stress testing analyses, in particular by increasing the complexity of credit risk tests. Continue to encourage stress testing among commercial banks.	MT
• Develop contingency planning for crisis management, both domestically and cross-border, by agencies responsible for financial safety net (MOF, NBRM, and DIF).	ST
• Improve lender-of-last-resort process by (i) undertaking internal simulation exercises; and (ii) developing instructions regarding an assisted bank's collateral adequacy for third party banks.	ST
• Invest DIF assets in high-quality foreign instruments to better diversify and maximize returns.	MT
Capital markets	
• Develop government bond markets as a foundation for other bond products. Establish a yield curve with a few large benchmark-series that are likely to stimulate secondary market development.	MT
• Strengthen MSEC supervision and enforcement capacities. Introduce risk-based principles in prudential regulation and supervision, keeping in mind the cost of compliance and supervision.	MT
• Improve cooperation between NBRM and MSEC. Clarify responsibilities regarding oversight of the OTC market. Improve cooperation for supervision of brokerage/dealership functions in banks.	ST
Insurance supervision	
• Promptly establish the new Insurance Supervisory Agency.	ST
• Issue regulations and implement standards for the calculation of technical provisions.	ST
• Improve framework for setting MTPL premiums. Amend the insurance law to include guidelines for levels of non-material damages.	ST
• Create active Insurance Association as a platform to agree on product and service standards, consumer protection, dispute resolution and staff development aspects.	MT
• Increase the quality of insurance companies' financial accounts and improve financial reporting.	MT
Pension supervision	
• Continue with efforts to introduce risk-based supervision. Re-evaluate supervision methodologies to improve efficiency.	MT
• Re-evaluate limits on pension funds investments to allow higher returns.	MT
• Allow banks to provide custodian services to reduce cost.	ST
Payment systems	
• Complete remote back-up facilities for the RTGS.	ST
• Establish more effective reporting links for the RTGS oversight. Establish operating standards, beginning with oversight of payment infrastructure not operated by NBRM.	MT
• Introduce some form of collateral or loss coverage agreement for KIBS in order to improve management of the credit and liquidity risks.	ST
• Introduce a national net settlement service for card payments in domestic currency to reduce cost. Set standards for national e-payment infrastructure.	MT

I. INTRODUCTION

1. **All key recommendations of the 2003 FSAP, which focused on weaknesses of the regulatory framework and gaps in its implementation, have been at least partially implemented** (Appendix I). The regulatory framework has been recently improved, in order to address identified weaknesses as well as to start moving towards harmonization with the EU directives. The ownership structure of banks has improved. The central bank support functions have been strengthened, including the liquidity support and safety nets. The second pillar of the pension system has become operational, the payment systems infrastructure has been strengthened, and there were improvements in the legal framework for accounting and auditing practices. However, improving supervision remains a challenge, particularly in the nonbank sector.

II. MACROECONOMIC ENVIRONMENT AND RISKS

2. **The Macedonian economy has generally strengthened since the 2003 FSAP.** After the 2001 security crisis, output growth averaged in excess of 4 percent per annum, reaching 5 percent in 2007 and an expected 6 percent in 2008. Exports also increased strongly, but increased employment and real wages, and rapid credit growth are boosting domestic demand, leading to higher imports.

3. **Following years of relative price stability, inflation rose sharply in 2008.** Year-on-year CPI inflation reached 10 percent in March 2008, owing mainly to, higher food prices, as well as higher energy prices. While the food and energy price inflation largely reflects rising global commodity prices and a drought-related output decline, recent public sector wage and pension increases have added to domestic demand pressures.

4. **The external position through 2007 was comfortable, but has weakened sharply in 2008.**[1] In 2007, the trade deficit remained at around 20 percent of GDP, but was offset largely by remittances, so that the current account deficit is estimated to have reached only 3 percent of GDP. Gross international reserves increased by €400 million during 2005–07 and stood at €1.5 billion at end-2007, or about 3.4 months of imports. In 2008, international reserves continued to increase, albeit slightly, but the current account deteriorated rapidly and is projected to reach a deficit of 14 percent of GDP.

5. **Going forward, the widening current account deficit is the main risk to growth and macroeconomic stability.** The most important risks include:

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[1] See the 2008 Article IV Staff Report for details on external current account developments.

- *Plans for fiscal expansion could risk exacerbating external vulnerabilities*. Higher spending would result in domestic demand pressures and could continue to put pressure on the current account.

- *Worsening global economic environment may negatively affect the Macedonian economy*. Slackening output growth in the main trading partners would translate into slower export growth and lower workers' remittances.

- *Regional political instability and obstacles on the path to EU accession*. Key areas of uncertainty that could affect FDI inflows include: Kosovo's unilateral declaration of independence and the unresolved name issue with Greece.

III. THE BANKING SECTOR

6. **The financial system is bank dominated** (Table 2 and Appendix II). There are 18 banks but the top three (in terms of assets) represent the bulk of the system. Foreign participation in the banking sector has increased significantly since the initial FSAP, and two of the top three banks are part of regional groups from Greece and Slovenia. Since 2004, banking sector assets grew on average by 20 percent per annum with total assets amounting to denar 224 billion as of end-2007 (66.3 percent of GDP).

A. Performance and Soundness

7. **The capital adequacy ratio (CAR) for the banks as a whole has come down slightly, mostly owing to fast credit growth, but remains comfortably above the statutory minimum** (Table 3). Yet, the CARs show a large dispersion among banks. While small and medium-sized banks had in aggregate a CAR of 23.9 percent, large banks only held 11.9 percent reflecting their relatively larger loan portfolio. In order to maintain their CARs, large banks raised Tier 1 capital by new capital issues. Foreign banks have also raised Tier 2 capital by borrowing from their foreign parents in the form of subordinated loans.[2]

8. **Other financial soundness indicators (FSIs) are broadly satisfactory.** NPL ratios are on a declining trend, in part due to the downward bias owing to a large share of newly extended loans. Recently, though, the share of household NPLs (led by consumer loans) within total NPLs has risen (Figure 1). Profitability is high compared with the regional average and is still on the rise, reflecting high spreads (Table 3).[3] However, competition

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[2] The large banks are targeting a CAR of 12 percent owing to moral suasion from the central bank. One of the large bank's CAR has fallen below 12 percent and is in the process of raising additional capital by issuing new shares on the stock exchange.

[3] The average return on assets of the former Yugoslav countries was 1.3 percent in 2006 compared to 1.8 percent in Macedonia.

Table 2. Macedonia: Structure of the Financial System

	2003				2006				2007			
	Number	Assets			Number	Assets			Number	Assets		
		Denar million	EUR million	Percent of GDP		Denar million	EUR million	Percent of GDP		Denar million	EUR million	Percent of GDP
Banks	21	104,875	1,711	41.7	19	174,117	2,846	56.4	18	223,949	3,659	66.3
Foreign-majority owned	8	49,245	803	19.6	8	92,668	1,515	30.0	11	192,309	3,142	56.9
Domestic-majority owned	13	55,630	908	22.1	11	81,449	1,331	26.4	7	31,640	517	9.4
of which: majority state-owned	1	1,851	30	0.7	1	2,794	46	0.9	1	3,097	51	0.9
Branches of foreign banks	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Savings houses	16	1,264	21	0.5	12	2,327	38	0.8	12	2,912	48	0.9
Insurance companies	7	12,236	200	4.9	10	14,608	239	4.7	12	11,074	181	3.3
Life	n/a	695	11	0.3	1	752	12	0.2	2	627	10	0.2
Mixed	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
Non-life	6	11,541	188	4.6	8	13,856	227	4.5	9	10,447	171	3.1
Collective investment institutions	0	0	0	0.0	0	0	0	0.0	3	65	1	0.0
Private closed end equity funds 1/	0	0	0	0.0	0	0	0	0.0	9	…	…	…
Mandatory fully-funded pension funds	0	0	0	0.0	2	1,242	20	0.4	2	3,124	51	0.9
Leasing companies	5	36	1	0.0	9	3,256	53	1.1	11	5,579	91	1.7
Securities dealers and brokerage houses	0	0	0	0.0	11	615	10	0.2	15	1,083	18	0.3
Investment funds management companies	0	0	0	0.0	0	0	0	0.0	2	15	0	0.0
Private equity management companies 1/	0	…	…	0.0	0	…	…	0.0	4	…	…	0.0
Pension fund management companies	0	0	0	0.0	2	196	3	0.1	2	202	3	0.1
Total financial system assets		118,411	1,932	47.1		196,361	3,210	63.6		248,003	4,052	73.4

Sources: NBRM, Ministry of Finance, and MAPAS.

1/ Data on assets are not collected from private closed end equity funds and private equity management companies.

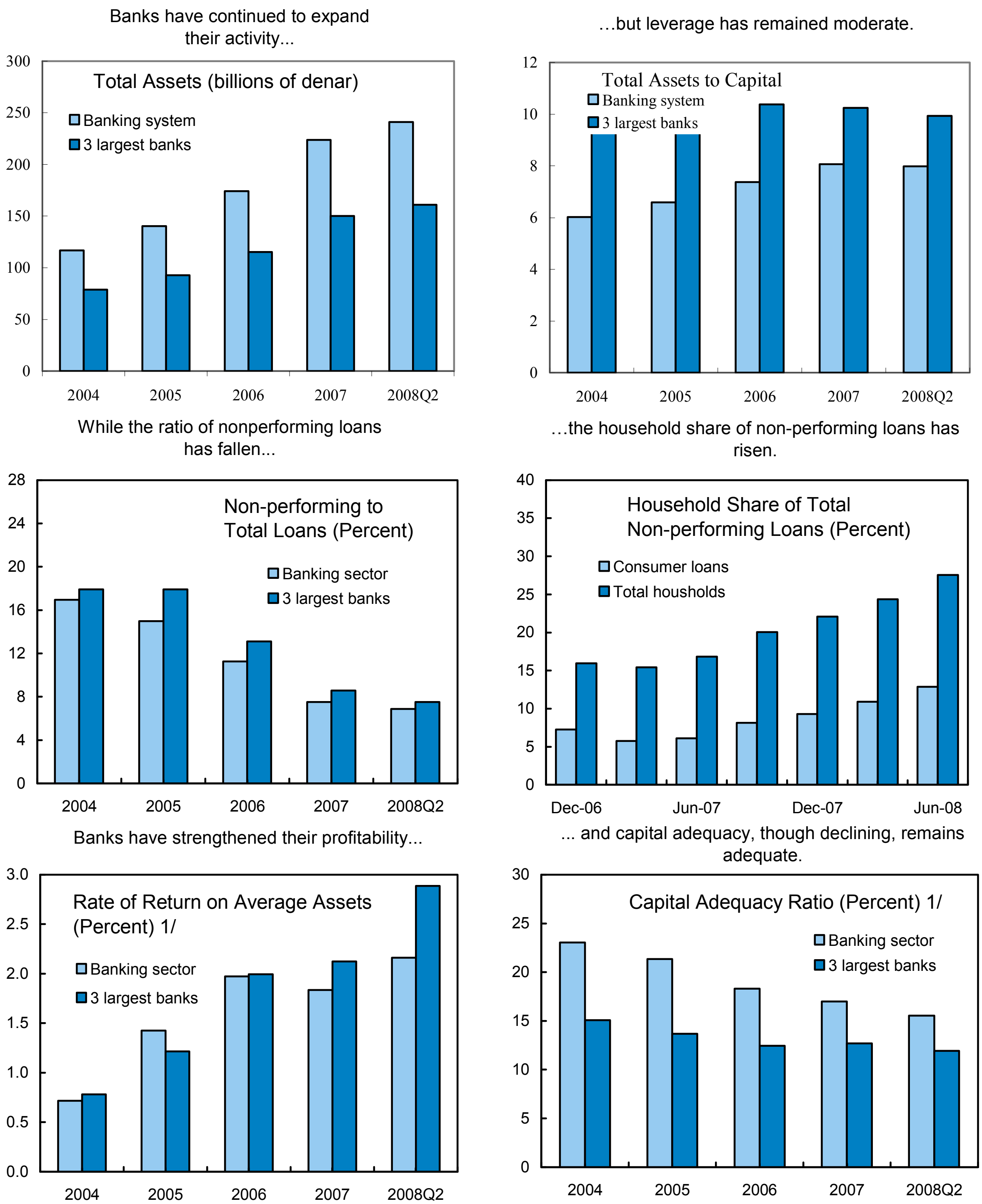
Table 3. Macedonia: Financial Soundness Indicators, 2004–08

	2004	2005	2006	2007	2008Q2
	(Percent unless indicated otherwise)				
Capital adequacy					
Regulatory capital/risk weighted assets	23.0	21.3	18.3	17.0	15.6
Tier I capital/risk weighted assets	27.4	24.3	18.9	15.7	14.0
Asset composition and quality					
Sectoral loans to nonfinancial enterprises/total loans 1/					
Enterprises	63.5	61.7	59.0	54.9	54.3
Households	26.1	30.6	33.4	37.7	38.5
Foreign currency lending					
Foreign currency lending/total credit to private sector	20.0	25.4	26.3	24.6	23.2
Foreign currency indexed lending/total credit to private sector	20.6	23.8	26.4	30.1	31.5
NPLs /gross loans 1/	17.0	15.0	11.2	7.5	6.9
NPLs net of provision /capital 1/	3.8	2.9	0.7	-5.0	-5.1
Large exposures/capital	219.0	189.7	194.7	181.4	121.0
Connected lending					
Banking system exposure to shareholders/own funds	7.4	4.3	5.2	5.6	3.2
Banking system equity participation/own funds	6.7	7.0	6.3	4.9	4.6
Earning and profitability					
ROAA 2/	0.6	1.2	1.8	1.8	2.2
ROAE 2/	3.1	7.5	12.3	15.0	19.1
Interest margin/gross income	49.6	53.8	57.1	57.0	59.4
Noninterest expenses/gross income	80.5	68.1	63.6	60.3	59.1
Personnel expenses/noninterest expenses	39.2	42.1	41.1	38.4	38.2
Interest rate spreads (in percentage points)					
Local currency	5.5	6.5	6.3	4.5	3.8
Foreign currency	5.6	6.5	6.7	6.5	5.9
Interbank market	6.9	8.7	4.9	3.1	4.6
Liquidity					
Highly liquid assets/total assets 3/	12.0	14.9	17.7	20.6	17.8
Highly liquid assets/total short-term liabilities 4/	17.8	22.0	25.6	28.7	25.1
Customer deposits/total (noninterbank) loans	143.4	142.3	137.1	128.3	118.5
Foreign currency deposits/total deposits (excluding deposits of banks)	54.4	55.7	51.8	44.5	45.3
Central bank credit to banks/bank liabilities 5/	0.9	0.7	1.3	2.0	0.5
Sensitivity to market risk					
Net open foreign exchange position /own funds	52.2	51.6	47.0	38.2	29.9

Source: NBRM's Financial Stability, Banking Regulations and Methodology Department.

1/ Includes only loans to nonfinancial sector.
2/ Adjusted for unallocated provisions for potential loan losses.
3/ Highly liquid assets are defined as cash and balances with the NBRM, NBRM bills, and accounts with foreign banks.
4/ Short-term liabilities are defined as deposits and other liabilities with a maturity of one year or less.
5/ The increase in 2006 is due to loans channeled through NBRM, not NBRM credit to banks.

Figure 1. Macedonia: Banking Sector Developments, 2004 – 08



Sources: NBRM; and Fund staff estimates.
1/ Total assets include off-balance sheet items.

among banks is increasingly putting pressure on margins. Furthermore, liquidity indicators have trended downward, owing to a shift from deposits in foreign banks to customer loans.

B. Vulnerabilities

9. **Credit growth picked up significantly in the last two years** (Figure 2)**.** Credit growth, especially to households, was facilitated by favorable domestic economic conditions. Rising incomes contributed to the demand for retail loans, and the banks lowered credit standards in a bid to increase market share in this area.[4] The share of household loans in total loans has increased to almost 40 percent at end-June 2008 from 26 percent at end-2004 (Table 3). Despite rapid recent growth, the Macedonian banking system remains small compared with the regional norm, with the stock of credit at only around 37 percent of GDP (Figure 2).

10. **More recently, there has been an upsurge in credit card exposures and the use of overdraft facilities.** Credit card exposures as a share of total household credit exposures increased to 32 percent at end-June 2008, from 6 percent at end-2004, and there has also been an increase in the use of overdraft facilities. Both of these forms of credits are mostly unsecured and are subject to less stringent approval process.

11. **Macedonia's rapid credit growth has been fueled mainly by domestic funding.** Unlike in some other countries in the region, where credit growth was fueled by capital inflows from parent institutions to their subsidiaries, in Macedonia, thus far, credit growth has primarily been financed by customer deposits, and more recently by drawing down their foreign assets (Figure 2). As a result, Macedonian banks have not been directly affected by the turmoil in global credit markets. Participation by the foreign parent of Macedonia's largest bank in its government's bank rescue plan should help to shield its subsidiary.[5] Nonetheless, the current global credit squeeze and the difficulties faced by many international banks could adversely affect Macedonian subsidiaries of foreign banks, including by weakening local depositor confidence or by restricting the foreign funding available to these subsidiaries.

12. **Like other countries in the region, a high share of credit is denominated in foreign currencies and/or indexed to a foreign currency.** The share of such loans in total

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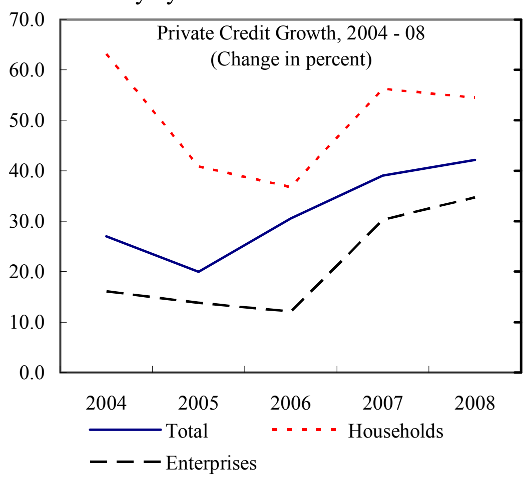
[4] Most banks are believed to have loosened lending standards toward households including through interest rate reductions, maturity structures, collateral obligations, and non-interest fees and charges (based on NBRM Surveys conducted quarterly). However, although not required, most banks limit debt service to a maximum of ⅓ of household income as part of their risk management practice.

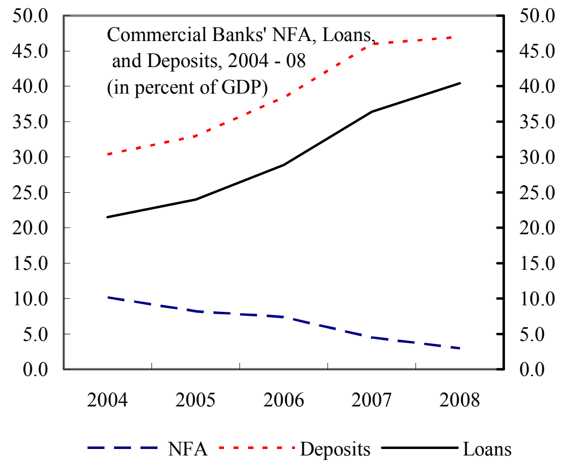
[5] The foreign parent bank, National Bank of Greece, is participating, along with other large Greek banks, in its government's bank rescue plan worth €28 billion.

Figure 2. Macedonia: Credit Growth and Interest Rates

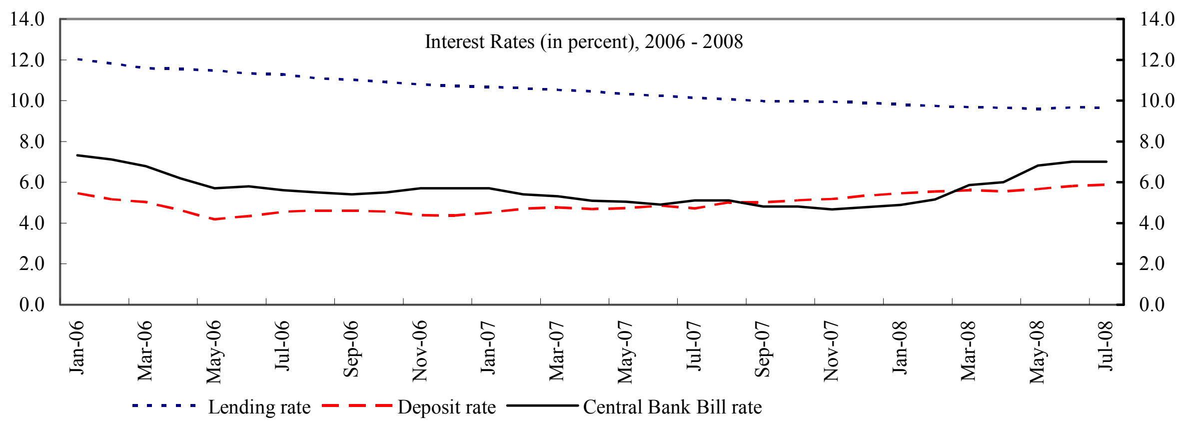
Rapid credit growth has been driven mainly by households...



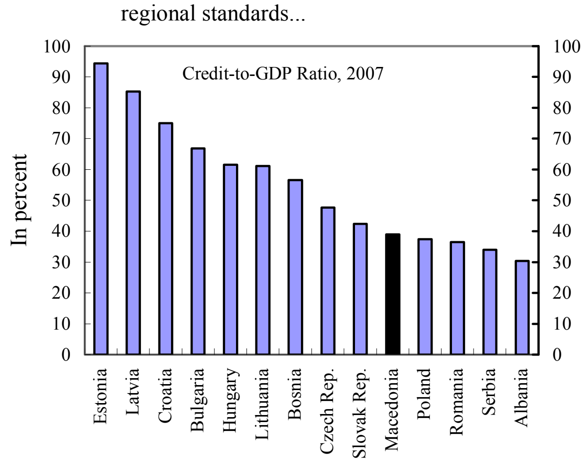
… and financed mostly by deposits and by drawing down net foreign assets.



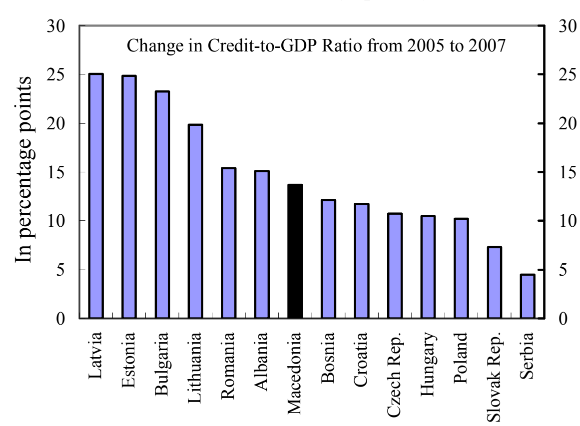
The NBRM increased rates but lending rates are yet to follow.



The stock of credit remains low by regional standards...



…but has been catching up lately.



Sources: IFS; NBRM; and staff estimates.

lending rose from 40 percent at end 2004 to 55 percent as of second quarter 2008. Banks transfer their currency risk into credit risk, as most borrowers are unhedged to a change in the denar-to-Euro exchange rate.[6] A significant change in the foreign exchange rate would significantly increase the debt burden for borrowers.

13. **Although, banks do not carry significant interest rate risk, their customers are vulnerable.** The interest rate on most credit products is adjustable. Almost all loans include a clause that allows the bank to reset the interest rate at any time. Lending rates for foreign currency loans (mostly denominated in Euros) are linked to the Euribor rate and were 8.5 percent at end 2007. The rates for the domestic loans (10.2 percent at end-2007) and foreign currency indexed loans (9.5 percent) are generally set taking into account NBRM-bill rates and local market conditions. Thus, any movement in interest rates is transferred to the borrower. An abrupt upturn in short-term rates could expose borrowers to a significant increase in repayment burden.

14. **Given that banks transfer interest rate risk and foreign exchange risk into credit risk, the credibility of the de-facto peg is critical for the stability of the financial system.** The authorities have thus far been successful in maintaining confidence in the peg, but with external current account deteriorating, supportive fiscal and monetary policies are essential.

15. **In response to continuing credit growth, the NBRM raised interest rates and introduced quantitative credit controls.** The NBRM has raised the central bank bill rates from 4.9 at the start of the year to 7 percent. However, as yet, the banks have not responded by raising lending rates owing to competition. The NBRM, therefore, introduced a marginal reserve requirement in July; if a bank exceeds the prescribed monthly growth in lending to households it is required to place a deposit at the NBRM equal to the excess lending which would earn only a 1 percent interest rate.

16. **However, this quantitative credit control does not appear to be binding.** Data for both July and August show 10 banks exceeded the indicative monthly limits. Banks are eager to preserve or increase their market share and are willing to pay the penalty imposed by the marginal reserve requirement. Even if banks adhere to the quantitative targets, end-year credit growth is projected to be about 40 percent.

17. **Furthermore, the credit controls could have unintended adverse effects.** Banks and households may attempt to circumvent the imposed restriction, in particular through leasing companies, which are not as well supervised. Leasing companies in Macedonia primarily engage in financial leasing rather than operational leasing and could potentially

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[6] At end-June 2008, 44 percent of (mostly unhedged) household loans were either foreign currency denominated or foreign currency indexed.

increase their exposure to households (e.g., through the financing of cars). Thus, while credit controls may successfully curtail bank credit growth, overall credit growth may continue. In addition, the credit control would also have an adverse effect on bank competition and resource allocation.

18. **NBRM also took steps to strengthen the prudential framework.** In particular, NBRM tightened the risk weight for exposures to credit cards and overdrafts from 100 percent to 125 percent starting March 31, 2008. The NBRM also introduced as of March 31, 2007 a mandatory provision equal to 1 percent of total loan exposure classified in category A.[7]

19. **The NBRM should consider taking additional measures to safeguard financial and macroeconomic stability.** If the deteriorating trend in the external current account continues and quantitative credit controls do not act as a binding constraint, sharper increases in interest rates may be needed. The NBRM should also consider raising general reserve requirements to slow the growth of credit. The NBRM should continue to monitor closely trends in asset quality, and consider stricter capital requirements for certain types of lending, particularly to households (e.g., consumer loans). The authorities will also need to watch closely the domestic banking system for signs of any spillovers from the global credit crunch, and prepare contingency plans for dealing with systemic stress (see Section IV for a discussion). Finally, it will be important to monitor the activity of the nonbank sector, especially leasing companies, to ensure that overall credit developments are taken fully into account.

C. Stress Tests

20. **Stress tests were conducted to analyze the resilience of the banking sector to a range of exceptional but plausible shocks (Appendix III).** Top-down stress tests were based on supervisory bank-by-bank data for end-September 2007. The tests comprised single factor shocks (sensitivity analysis)—credit, interest rate, exchange rate, liquidity and contagion risks—and combinations of these factors (scenarios). In addition, the three largest banks conducted bottom-up stress test for market and liquidity risks based on end-2007 data.

21. **The stress test results suggest that Macedonia's banking system is sufficiently capitalized to withstand a wide range of shocks, but the banks (especially the large ones) are vulnerable to credit risk.** The sensitivity analysis of various shocks to credit

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[7] According to the existing regulation, a bank's credit exposure is classified into five different risk categories, depending mostly on the length of repayment delays. The risk categories are A (delays of up to 15 days), B (delays of up to 30 and occasionally up to 90 days), C (delays of up to 90 and occasionally up to 180 days), D (delays of up to 180 days and occasionally up to 365 days), and E (delays of longer than 365 days).

quality indicates that the system-wide CAR would remain above the regulatory minimum of 8 percent (Appendix III). However, there is a high degree of heterogeneity in the impact of shocks. Small and medium-sized banks are very resilient to credit risk, while large banks are relatively vulnerable: they have the lowest capital-asset ratios and the largest exposures to the corporate and household sector. In two cases, the CARs of the large banks fall below the statutory minimum. The large banks also face greater concentration risk in their loan portfolios: however they were mostly resilient to the failure of the ten largest borrowers in the banking system. Only under the most severe shock to credit risk and credit concentration risk would one large bank become insolvent. While spill-over effects to other banks cannot be ruled out, interbank contagion seems a low risk given the limited interbank exposures.[8]

22. **Robustness checks helped address the usual caveats that apply to such stress tests.** These checks included: sensitivity analyses, adding a liquidity scenario, and assessing the possibility of contagious defaults through the interbank market. Furthermore, by calibrating the adverse macro scenario based on stress episodes in other countries, the analysis captured some second-round effects observed in these countries.

23. **The NBRM is working to make their stress tests more sophisticated.** Notwithstanding these improvements, as detailed in Appendix III, the stress testing framework could be further improved by (i) strengthening the stress testing analyses at the NBRM, in particular credit risk; (ii) making the scenario analyses more macro-consistent; and (iii) encouraging stress testing among commercial banks.

D. Supervision

24. **Since the 2003 FSAP the NBRM has made substantial progress in developing Macedonia's supervisory and legal framework for banking supervision.** This was mainly achieved through the new (BL) which was enacted in 2007 and the subsequent secondary legislations. Risk-based supervision has been adopted and is guided by a newly prepared Supervisory Policy Manual.[9]

25. **NBRM has the authority and independence to be able to effectively conduct its operations without undue interference.** The recent closure of Makedonska Banka provided a good demonstration of NBRM's independence. NBRM revoked Makedonska Banka's

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[8] Additional tests indicate that liquidity, market, and contagion risks are relatively low. Bottom-up stress test results support these findings. In addition, macro scenario tests also indicate that the system-wide CAR would remain above the required minimum. However, largely owing to their credit exposure, the large banks were the least resilient (Appendix III).

[9] The new Manual includes revamped, codified, detailed operating procedures for on-site inspections, which has undergone its first "field-tests" in early 2008.

license because the majority shareholder, who was considered "unfit" due to repeated violation of prudential regulations, refused to divest ownership control. The closure of Makedonska Banka was executed in line with the applicable legal framework and generally according to standard international practice.[10] There was also a very positive demonstration effect, as majority shareholders in three other small banks promptly divested their stocks and came into compliance with NBRM's ownership requirements.

26. **However, the recent Constitutional Court's rulings will limit the NBRM's supervisory powers vis-à-vis "fit-and-proper" testing.** The Court ruled that provisions in the Banking Law that disallowed persons sentenced to "imprisonment for crimes in the area of banking and finance" from acquiring shares in a bank or holding positions of responsibility in the banking industry were not valid. Another provision that authorized the NBRM to dismiss an administrator of a bank in the event the administrator is convicted of a crime was also deemed invalid. The NBRM, along with the Ministries of Finance and Justice need to move quickly to address this weakness in the NBRM's supervisory powers.[11]

27. **The NBRM and the banks face a major challenge in implementing the large volume of new secondary regulations.** Pursuant to the enactment of the 2007 BL, new secondary legislations have been issued concerning capital adequacy, as well as all major facets of risk management including credit, liquidity, and currency risks, information system security, and exposure limits. In addition, legislation was issued on corporate governance, audit scope, and financial reporting. Almost all of these secondary legislations are scheduled to become effective in mid-to-late 2008 or early in 2009.[12] In particular, implementation of the IFRS, beginning in 2009, will challenge the capacity at both NBRM and the banks as they prepare to adapt to major changes in accounting system and reporting format.

28. **Basel II implementation is still in the planning phase.** The NBRM plans to introduce elements of Basel II capital requirements gradually from 2009, starting with operational risk, followed by market risk, and credit risk by end-2010. By end-2009 it also plans to introduce Pillar 2 (the supervisory review process) and Pillar 3 (market discipline). The NBRM has not yet performed any quantitative impact study of the Basel II implementation (in the manner prescribed by the Basel Committee). A gradual introduction

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[10] Closure of Makedonska Banka did, however, prompt negative comment from segments of the political milieu and the media allied to the institution's stakeholders and, periodically, such comments resurface. An action before Parliament to give the Governor a vote of "no confidence" lapsed with new elections in July.

[11] The NBRM is preparing proposals to amend the Criminal Code to resolve this issue.

[12] It should be noted that the timing of implementation of some of the secondary legislations is closely related to the introduction of International Financial Reporting Standards (IFRS) in January 2009.

of the Basel II requirements is appropriate, given the structure of the banking sector and its market dynamics.

29. **Steps have been taken to enhance cross-border cooperation.** NBRM has executed Memorandums of Understanding (MOUs) with six foreign supervisors and negotiations are in progress with five more.[13] In addition, Macedonia is participating in a regional MOU designed to promote cooperation among supervisors.[14] Furthermore, NBRM has signed MOUs for cooperation and information sharing with other domestic supervisory agencies in the financial sector. Explicit consolidated supervision powers are now provided to NBRM to extend supervision to banking groups. It has full authority to supervise domestic banks' foreign subsidiaries. However, currently there are no foreign subsidiaries of Macedonian banks.

30. **NBRM human resources appear generally adequate in number.** However, a disproportionate number of supervisory resources are devoted to supervision of exchange bureaus. The overall experience level in the on-site unit is relatively modest. Externally sponsored training for personnel involved with on site supervision is expected to help in this regard.

IV. Systemic Liquidity Management and Financial Safety Net

A. Systemic Liquidity Management

31. **Monetary policy instruments remain adequate for liquidity management.** NBRM bills are the main monetary policy instrument used to sterilize the banking system's structural liquidity surpluses.[15] In 2006-07, NBRM also conducted open market operations using 3-month Treasury bills for monetary policy purposes, but the use of 3-month Treasury bills has been phased out in order to re-establish NBRM's operational independence.[16] Intra-day and Lombard repo operations were introduced in 2005, and repo auctions in 2006. Although the spread between NBRM-bill and Lombard rates has been reduced (presently at

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[13] Bilateral bank supervision MOUs are in effect with Greece, Slovenia, Montenegro, Albania, Bulgaria and Russia, and MOUs are being negotiated with Bosnia-Herzegovina, France, Italy, Serbia, and Turkey.

[14] NBRM is participating with Greece, Bulgaria, Romania, Albania, Serbia and Cyprus in a regional MOU concerning bank supervision—"On High-Level Principles Of Cooperation And Co-Ordination Among The Banking Supervisors Of South Eastern Europe."

[15] In February 2008, NBRM changed from multiple-price to volume tenders with a view to strengthening monetary policy transmission.

[16] NBRM is considering introducing longer term securities. But care should be taken that the introduction of the longer term NBRM securities does not crowd out the government securities market, and/or introduce un-necessary segmentation in a market that is only embryonic.

1.5 percentage points), banks have not utilized the Lombard facility since 2005 because they are quite liquid. A reserve requirement of 10 percent of banks' deposits is also in place.

32. **NBRM's liquidity forecasting procedures are well established, but better coordination with the Government is needed.** NBRM prepares liquidity forecasts with the weekly, monthly, and quarterly horizons, which are used for planning open market operations. However, difficulties remain in forecasting currency in circulation and Government deposits, largely due to irregular timing of important government transactions. Liquidity forecasting needs to be improved by introducing a formal model to forecast currency in circulation and improving forecasting of the Government's cash and debt management policy. Coordination with monetary policy should be included among the objectives of the government's cash and debt management policy, and collaboration between the NBRM and MOF should be further strengthened.

33. **Banks' ability to access short-term liquidity has improved with the increase in the stock of eligible collateral.** The stock of instruments eligible to serve as collateral for access to the Lombard and intra-day repo facilities reached 8 percent of GDP at end-2007 (equivalent to 17 percent of the banks' domestic liabilities).[17] In addition, under averaging provisions, banks can access 80 percent of required denar reserves on a given day (compared with 60 percent previously). Since averaging on foreign currency reserves is not permitted, banks maintain precautionary balances in foreign banks. In addition, foreign-owned banks have standing credit lines with their Euro area parent banks.

34. **Since 2003, the foreign exchange market has evolved into a continuously traded interbank market system**. NBRM meets excess demand and supply by intervening through its four market makers. The financial market infrastructure was upgraded to widen the dissemination of price and other information. The development of an electronic trading platform further increased pricing and trading efficiency.

B. Financial Safety Net

Lender-of-last-resort (LOLR)

35. **The LOLR facility is a recent development in Macedonia and has never been used.** The liquidity credit may be offered by NBRM on a short-term basis with an interest rate higher than the money market rate. The NBRM has not conducted any simulation exercises to determine how speedily the decision can be taken and credit granted. NBRM

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[17] Eligible collateral for the Lombard facility include: Macedonian Treasury securities, NBRM bills, gold (but only that which is tradable by international standards), and foreign government and financial institution securities that are rated in the two highest categories (by Moody's and Standard and Poor's).

should conduct such a simulation exercise(s) with a goal of developing more formal policies to streamline this process and allow for a speedy extension of credit.

36. **The LOLR arrangements also define eligible collateral, but further improvements are needed.**[18] The collateral must have a longer maturity than the extended credit and a market value of a minimum of 105 percent of the requested credit amount. To enlarge the safety margin, NBRM may wish to consider increasing the collateral value requirement in relation to the credit extended. If a bank needs liquidity assistance, but lacks sufficient eligible collateral, it may make arrangements with one or more other banks to put up the collateral for the assistance. However, this arrangement should be eliminated, or the NBRM should issue instructions regarding the quality and quantity of collateral that the assisted bank must provide to a third party bank(s) in order to preclude any collusive transactions or spillover effects that may pose risks to financial stability. Nonetheless, the NBRM should also consider amending the regulations to permit it to relax collateral requirements in crisis situations.

Problem Bank Supervision and Resolution

37. **The NBRM, with new legislation, has improved the effectiveness of its authority for progressive enforcement actions when a bank is facing financial difficulties or operating in an unsafe and unsound manner.** These remedial actions, quite properly, emphasize private solutions, and range from moral suasion, informal and formal corrective actions (including fines and removal of personnel), prompt corrective action, appointment of an Administrator, up to license revocation and placing a bank in bankruptcy for liquidation. Administration includes options for private resolution as well as the possibility for an assisted transaction such as a Purchase and Assumption (P&A) agreement.[19]

38. **Unfortunately, the recent Constitutional Court's ruling will restrict the NBRM's bank resolution powers.** The new BL had a provision which limited any successful appeal of NBRM's decisions to monetary damages. The Constitutional Court ruled that this provision was not valid. This means that, in theory, a successful appeal by a bank of a license revocation decision, for example, could result in an injunction blocking NBRM's action. This is contrary to best international practices in bank supervision and resolution and the authorities need to quickly agree and act on steps to reverse this outcome.[20]

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[18] See footnote 17 for a list of eligible collateral.

[19] A private resolution is one in which the bank's problems are resolved without using public funds (e.g., merger, take-over). A P&A would involve DIF funding the transfer of insured deposits along with "good" assets to a stronger bank that has agreed to take-over a problem bank.

[20] The NBRM is preparing proposals to amend the Law on Administrative Disputes to resolve this issue.

39. **Although the BL provides NBRM with adequate powers to take corrective action, the BL could be broadened further.** Article 139 of the Banking Law sets forth the conditions for appointing an Administrator, all of which concern the bank's solvency. The NBRM should consider amending the BL so as to expand the conditions to be able to appoint an Administrator. This would grant NBRM greater flexibility in dealing with problem banks. For example, the BL could include conditions so that NBRM could appoint an Administrator at banks that repeatedly violate laws or regulations and/or banks that are operating in an unsafe and unsound manner.

Deposit Insurance

40. **The Deposit Insurance Fund (DIF) is a narrow mandate scheme (pay-box), with no supervisory, risk minimization, or bank resolution authority.** DIF insures deposits of natural persons, including foreign currency deposits, in licensed commercial banks and savings houses, for which DIF membership is mandatory. The Deposit Insurance Law was drafted with close adherence to the EU Directive on deposit insurance and, consequently, provides relatively copious coverage: 100 percent of deposits up to €10,000 and 90 percent coinsurance of €10,001 to €20,000. Thus, the coverage ratio is about eight times GDP per capita with 70 percent of total deposits being covered.[21] In the event of a bank failure, DIF has up to three months to begin reimbursing insured depositors. Although this time-frame is in line with the EU Directive, more prompt payment could help to mitigate negative effects on public confidence in the DIF and the banking sector.

41. **DIF's reserve fund, currently at about denar 2.4 billion or 2.9 percent of total deposits, is targeted to achieve 4 percent of the deposit base.** Initially funded by a government capital contribution, the reserve fund is increased by member banks' premiums (currently a flat rate of 0.7 percent of total deposits) and investment returns. Since the coverage ratio is relatively high, consideration should be given to increasing the target reserve fund. Upon severe depletion of the reserve fund, emergency funding is provided for by allowing increased premiums from member banks or borrowing from domestic or foreign sources as well as from the government. Given

Deposit Insurance:
Selected Countries 1/

Country	Fund target (in percent of deposits)	Coverage ratio (GDP per capita)
Bosnia and Herzegovina	7.5	5.8
Bulgaria	5.0	5.4
Macedonia	**4.0**	**8.4**
Romania	8.0	2.3

Source: National authorities.
1/ As of June 2008.

[21] A sound practice in deposit insurance is to cover the overwhelming majority of depositors, but a relatively low amount per depositors so that the share of total deposits covered is contained. Notwithstanding recent increases in deposit insurance coverage, particularly in the Euro area, conditions in Macedonia would not presently seem to require an increase in coverage.

limited investment opportunities in Macedonia, part of the DIF should be invested in high-quality foreign instruments.

42. **DIF has taken adequate measures regarding public awareness and education.** When a bank fails, DIF publishes notices that detail the depositor claims payment procedures (as was done in the recent case of Makedonska Banka).

Contingency Planning for Crisis Management

43. **There is currently no formal contingency plan for crisis management in Macedonia.** As recent global events have demonstrated, the time to plan for adverse economic circumstances is better during stable times. The members of the financial safety net (MOF, NBRM, and DIF) should develop strategies to deal with crises situations that should determine which agency should take the lead and include a well-defined communications strategy that avoids conflicting and confusing public statements. There should be a contingency plan on how to deal with "too big to fail" (systemically important) banks.

44. **Planning, both domestically and internationally, should include legal, institutional, and operational aspects.** Coordination mechanisms usually involve: a Standing Committee (in Macedonia, it should include representatives of NBRM, DIF, and MOF); MOUs dealing with the authorities' powers and information exchanges; operational procedures for crisis management and authorities' cooperation and coordination; and simulation exercises based on hypothetical scenarios. Relevant financial sector legislation should be updated to ensure adequate authority exits to deal with a crisis.

45. **The MOU with other supervisory authorities should also refer to possible crisis situations.** NBRM has signed a large number of MOUs (see above), which mainly address cooperation among the supervisory authorities during normal times and do not address contingency planning for crisis management. The existing MOUs (particularly with Greece and Slovenia, which are home to parents of two of the larger banks in Macedonia) should be modified to include details for information sharing, emergency lending, cooperation, and the various roles and mandates of the authorities in a crisis situation.

46. **The Macedonian authorities should conduct crisis simulation exercises, both domestically and internationally.** In particular, crisis solutions for the major banks should be assessed (e.g., simulating the failure of a large bank). The emphasis of the exercise should be to identify policy weaknesses, communication problems, and information gaps.

V. Nonbank Financial Sector

47. **The nonbank financial sector is small and currently not systemically important.** However, the sector is growing modestly, particularly pension funds (see below), and going forward may merit closer attention. Cross-ownership is not currently an issue but should be

monitored as the market develops. At present there are no financial conglomerates. The strongest link is between banks and pension fund management companies (Appendix II).

A. Insurance Sector

48. **The insurance sector, although the largest of the nonbank financial market, is small and undeveloped** (assets amount to less than 5 percent of GDP). The insurance market is dominated by motor-third-party-liability (MTPL) insurance business, which is compulsory. The sector is mostly foreign-owned.

49. **The critical issue is the lack of effective regulatory and supervisory authority.** As per the new Insurance Law of 2007, a new Insurance Supervision Agency (ISA) was expected to start operations in September 2007, but is yet to be established. Following the enactment of the new law the MOF no longer has the authority to issue regulations or effectively impose sanctions. Sanctions imposed by the MOF have been challenged and subsequently rejected by the courts. Therefore, the government should urgently address the lack of oversight in the insurance sector.

50. **Supervisory practices in several areas need to be strengthened further.** The majority of insurance products are distributed by agents, who are not subject to licensing requirement. Standards for the calculation of technical reserves need to be introduced to ensure a consistent approach is followed by the industry. A framework for setting minimum and maximum premiums for the MTPL business and guiding criteria for non-material damages needs to be established. The quality of financial statements of insurance companies needs to improve as it varies widely owing to the lack of supervisory guidance. In addition, the government must ensure that the ISA (once established) has adequate resources to undertake effective supervision.

B. Securities Sector

51. **The equity market is small despite some recent growth.** Activity on the Macedonian Stock Exchange (MSE) grew in the strong bull market through mid 2007. The stock market index (MBI 10) increased about 10 fold from beginning of 2005 to autumn of 2007, following which it experienced a strong correction. Stock market capitalization and turnover in equities more than tripled in 2007.

52. **The evolution of the government securities' market has been uneven.** Following, the initial FSAP the MOF issued denar denominated securities that are tradable at the over-the-counter (OTC) market and at the MSE. The maturity structure included 3, 6, and 12 month Treasury bills as well as 2 and 3 year Treasury bonds. Treasury securities issued for fiscal purposes has declined to less than denar 5 billion (1.5 percent of GDP) and plans for introducing a system of primary dealers was put on hold.

53. **The legal and regulatory framework has been updated since the last FSAP and additional improvements are planned.** The Securities Law has been amended in 2005, 2007, and 2008 towards meeting the EU directives and additional amendments are planned. A draft of the new Investment Fund Law in line with the EU's UCITS standards has been submitted to the EU for review. Also, a law on Financial Collateral is in the pipeline.

54. **Nevertheless, steps to strengthened supervision further should include:** (i) implement plans to increase resources at the Macedonian Securities Exchange Commission (MSEC); (ii) address areas of immediate concern inter alia market risk related capital requirements, transparency and financial reporting, market abuses, fit and proper standards, governance, and investor protection schemes; (iii) work toward introducing risk based supervision; and (iv) improve cooperation between NBRM and MSEC by clarifying responsibilities regarding supervision of OTC market for NBRM and government securities, and for supervising brokerage and dealership activity conducted within banks.

C. Pension Sector

55. **The second pillar of the pension system has got off to a promising start in 2006 but challenges remain.** A key challenge will be to address the issue of low participation in both pillars of the pension system. Total membership of the pay-as-you-go Pension and Disability Insurance Fund (PDIF) is around 440,000 (out of a total labor force of 900,000). The existence of a large informal workforce and the employers' avoidance of social security contributions have resulted in a large number of people who remain outside the pension system. In addition, for the second pillar to be a success, investment returns will have to be above the rate of wage inflation.

56. **An autonomous pension supervisory agency is in place.** Macedonian Pension Supervisory Agency (MAPAS) was established in 2003 and is responsible for licensing and supervising pension companies. It undertakes a detailed compliance based supervision. MAPAS should continue its efforts to introduce risk based supervision, and improve efficiency and reduce cost, as the number of pension companies is expected to grow (particularly when the third pillar is introduced). In addition, for MAPAS to be effective it is important that the governing body of the supervisory authority remain independent of political influence.

VI. Financial Infrastructure

57. **Major improvements have been made to the payment system architecture since the 2003 FSAP.** All of the 2003 FSAP recommendations have been addressed except for the remote back-up system which is expected to be completed by the end of 2008. The NBRM owns and operates the interbank real time gross settlement system. The 2003 FSAP noted that this system generally meets the Basel core principles for systemically important payment

systems. The volume of transactions has grown strongly and the system processed over 2.8 million transactions with a total value over denar 1.5 billion in 2007.

58. **The most important advance was the further strengthening of the legal and regulatory framework.** All major laws were amended in 2007 and supported by secondary regulations. Nonetheless additional steps should be taken to improve oversight. These include, establishing standards and oversight for payment system not operated by NBRM (the clearing houses KIBS and CaSys), setting standards for national e-payments infrastructure, and introducing settlement in Macedonia for credit card payments in domestic currency to reduce transaction costs.

59. **The credit registry, operated by the NBRM, is being upgraded.** The improvement will include, data being updated more frequently (monthly data as opposed to quarterly); more detailed data (e.g., additional details on due claims, days overdue, type and value of collateral, currency, etc.); and reporting threshold being lowered. Leasing companies are also expected to participate unlike before. The new registry is expected to be fully operational by end-2008. Steps have also been taken to establish a parallel private credit bureau, which is expected to contain data on debt not only to the banking sector but to nonbanking financial entities as well as non-financial institutions (such as Public Revenue Office, telecommunication providers, and electricity providers).

VII. AML/CFT

60. **A 2007 assessment of Macedonia's anti-money laundering/combating the financing of terrorism (AML/CFT) regime found improvements since the system had been last evaluated in 2002.**[22] The assessors found the criminalization framework to be generally adequate, except for the absence of an autonomous terrorist financing offence and the existence of a value threshold for money laundering. However, they found weaknesses in the requirements for customer due diligence set forth in the 2004 AML law and in the supervision of non-bank and non financial reporting entities. The regime for freezing the assets of terrorists was also judged to be weak. The report raised questions about the effectiveness of AML/CFT implementation, noting that indictments were few and that only two convictions had ever been obtained. The assessors felt that the Financial Intelligence Unit (FIU) was inadequately staffed and that statistical collection should be improved. In January 2008, after the MONEYVAL assessment, a revised AML/CFT law was adopted,

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[22] The assessment was conducted, in March 2007, by the Council of Europe's Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism (MONEYVAL), the FATF-style regional body of which Macedonia is a member. It was adopted at the July 2008, MONEYVAL Plenary and a ROSC based on the assessment will be circulated to the Board separately.

aimed at implementing the Third EU AML/CFT Directive. Subsequently, the staff of the FIU augmented and it was re-organized within the Ministry of Finance as an independent body.

APPENDIX I . Implementation of Recommendations of the 2003 FSAP

2003 FSAP Key Recommendations	**Status of implementation**
Banking	
The quality of ownership and management in the banking system could be upgraded by attracting new strategic investors, which would help address low levels of financial intermediation, lack of competition and inefficiency in the banking system.	Progress has been made in improving the quality of ownership in the banking system. Banks with majority foreign ownership accounted for 85.9 percent of total assets in the banking system at end-2007 compared with 47.3 percent at end-2004. The increase in foreign ownership was mostly at small banks (those with assets of 5 percent or less in the system). Of the foreign entrants only one, Société Générale SA, has a global presence. The second largest bank, although now majority foreign owned, still lacks a strategic partner.
Bank Regulation and Supervision	
Additional steps could be taken to strengthen the legal framework for supervision and to improve the supervisory function through a more proactive approach to addressing banks under enhanced supervision. Supervisors should continue to search for reputable foreign strategic investors and a strategy should be developed to reduce the importance of non-financial corporate investors.	A new Banking Law (BL) was enacted in June 2007. It draws on European Directives 2006/48 and 2006/49, the Basel Committee's recommendations and principles and, as well, takes into account certain recommendations of the IMF and those made in the context of the 2003 FSAP. The revised BL sets out a more comprehensive supervisory approach to problem banks. Chapter XV details measures and corrective actions that NBRM could take against a bank, a banking group, a bank's shareholders and its governing bodies. Shareholders of certain systemically unimportant banks have been encouraged to seek out reputable strategic foreign investors, with some positive outcomes (see “Banking”, above).
Liquidity Management	
Liquidity management could be improved through expansion of the instruments available for collateral to access the central bank facility. Repo operations should be introduced and primary auctions decreased to develop the secondary market.	The stock of instruments eligible to serve as collateral for access to the Lombard facility reached 8 percent of GDP (or equivalent to 17 percent of the banks' domestic liabilities) at end-2007. Intraday and Lombard repo operations were introduced in October 2005, and repo auctions in December 2006. The frequency of NBRM bill auctions has been reduced to one per week.
Payment and Settlement Systems	
NBRM’s oversight role for the payments systems needs to be clarified, and a back-up facility established. NBRM’s obligation to execute payment guarantees between commercial bank clients should be moved outside the system.	NBRM oversight role has been more clearly defined in the new Law on Payment Systems and by the Decision on Criteria and Standards for Operations of the Payment Systems and the Decision on Process and Methodology for Oversight of Payment Systems. NBRM is in the process of establishment of the back-up facility, including optical fiber link with the main RTGS processing facility, but it is still not operational. The obligation of NBRM to provide guarantees has been cancelled.
Financial Safety Nets	
Establish framework for emergency lending for systemically important banks.	The Law on the National Bank of the Republic of Macedonia gives the legal basis for conducting lender of last resort operations by the National Bank. A related Decision details the criteria, terms and eligible collateral

2003 FSAP Key Recommendations	Status of implementation
	related to the LOLR function.
Securities Markets	
The capital markets should be further developed, particularly the government securities market. There is scope for further actions to strengthen the framework for securities regulation, particularly the enforcement capability of the SEC.	The government securities market is still small, dominated by short term bills (and non standard bonds) and suffers from lack of liquidity. The equity markets have shown improvements and have now more activity. Enforcement capabilities and particularly use of risk based methodologies are still challenges for SEC.
Pension System	
Before implementing the second pillar, the Government should reach consensus on key policy issues, demonstrate the viability of the government securities market, simplify the model for a transitional period, and ensure the institutional strengthening of the PSA.	Pillar II became operational on January 1, 2006. Following a public tender, two pension funds were provided with operating license. A new agency for regulation and supervision of the pension funds—MAPAS has been established. MAPAS has received significant technical assistance and is now operational. The viability of Government securities market, and of other options for pension funds' investments, is still unclear. This can undermine the performance and viability of the Pillar II.
Insurance Sector	
Insurance supervision should be strengthened though designation of an Insurance Commissioner in the MOF and related capacity building. The third party motor liability system should be fundamentally reformed.	The new Insurance Law was enacted in mid-2007. The Law envisages creation of an independent agency for supervision of the insurance sector, but the agency has not been created yet. There were some efforts to reform the MTPL system, but no major changes. An MTPL Commission has been established to set the minimum and maximum premium. However, the MTPL Commission set premiums only in 2006, and these have not been updated. There was an agreement to limit the non-material damages——in order to make the business more viable. The Constitutional Court ruled setting the limits on non-material damages as illegal. Proposals of the Ministry of the Interior to implement stronger enforcement, including a screen-sticker system, have not been implemented.
Legal and Judicial Framework	
The Government should move aggressively to reform and strengthen the judicial sector, and to strengthen the implementation and enforcement. Financial regulators should be provided legal authority to impose sanctions on financial institutions.	Judicial sector and the court system have not been addressed as part of the FSAP Update. The new set of regulations provides the legal basis for the regulatory and supervisory agencies to impose sanctions. However, further improvements are needed.
AML/CFT	
The MOF should enhance coordination with other agencies to implement the national AML strategy. It should coordinate activities closely with the Justice Ministry to ensure rapid adoption of International AML/CFT Conventions. Legal authority should be provided to supervisory agencies to monitor compliance with AML/CFT laws. Further capacity building is required.	The Office of Prevention of Money Laundering and Financing of Terrorism have been established at the MOF. It has signed a multilateral memorandum of understanding on cooperating with other agencies (e.g., Ministry of Interior; Public Revenue Office; Customs; Ministry of Justice; NBRM; etc) involved in dealing with AML/CFT. A new AML/CFT law was passed in January 2008 that takes into account the Third EU Directive and the 2004 FATF 40+9 Recommendations on AML/CFT.

APPENDIX II. STRUCTURE OF THE BANKING SYSTEM

61. **The banking system dominates the financial sector.** Banking sector assets accounted for 90 percent of total assets of the financial system at end-2007 (Table 2). Banking sector assets have increased significantly as a result of credit growth, as banks have expanded their lending to both the corporate and household sectors. In particular, large banks have focused on expanding their retail business and have introduced new products for the consumer. Nevertheless, banking sector assets and credit as a share of GDP in Macedonia are slightly below the averages of neighboring countries (Table 4).

Table 4. Macedonia: Banking Sector - Regional Comparison, 2006
(In percent, unless otherwise indicated)

	Macedonia	Bosnia & Herzegovina	Bulgaria	Croatia	Hungary	Moldova	Romania	Serbia	Slovenia
Number of banks	18	32	32	33	40	15	31	37	25
Foreign-owned banks	11	22	23	15	28	6	26	22	10
Total banking assets to GDP	66.3	82.5	78.5	120.3	86.7	49.6	29.9	53.7	113.4
Total credit to GDP ratio	36.4	52.1	47.4	68.7	55.4	26.0	26.3	24.2	67.2
Asset share of foreign-owned banks	85.9	94.0	80.1	90.8	82.9	22.9	87.9	78.7	29.5
Capital Adequacy Ratio	17.0	17.7	14.5	13.6	11.0	28.0	18.1	24.7	11.8
Non-performing to total loans	7.5	4.0	2.2	5.2	2.5	4.0	8.4	23.1	2.5
RoAA	1.8	0.9	2.2	1.5	1.8	3.0	1.3	1.7	1.3
RoAE	15.0	8.5	24.4	13.0	24.0	21.0	10.3	10.0	15.1

Sources: IFS; WEO; national authorities; and EBRD.
Note: Data for Macedonia is end-2007.

62. **Foreign participation in the banking sector has increased significantly.** Since 2004, the banking system has undergone significant change in ownership. Banks with majority foreign ownership accounted for 85.9 percent of total assets in the banking system at end-2007 compared with 47.3 percent at end-2004. The increase in foreign ownership occurred in the second largest bank and, otherwise, in banks accounting for 5 percent or less of banking sector assets. Of the new foreign entrants only one, Société Générale SA, has a global presence. There are no state-owned banks, except a development bank which does not accept deposits from the public.

63. **Three banks dominate the banking system.** The top three banks account for 67 percent of the banking sector assets, and the rest are small players (Table 5). All three have majority foreign ownership.[23] The Herfindahl-Hirschman index with respect to total assets

[23] The second largest bank is owned by many small investors and lacks a strategic partner. The other two are subsidiaries of large regional groups from Greece and Slovenia.

dropped from 1,720 at end-2004 to 1,625 at end-2007 reflecting the growing role of medium-sized banks partly as a result of consolidation of a few small banks through mergers and acquisition in 2005–06.[24]

Table 5. Macedonia: Banking Sector Structure, 2003–2007

	2003	2004	2005	2006	2007
Total assets (in billions of denar)					
All banks	103.5	116.8	140.4	174.1	223.9
Three largest banks	70.1	78.9	92.8	115.1	150.3
Three largest banks as percent of total assets	67.7	67.5	66.1	66.1	67.1
Year-on-year asset growth (in percent)					
All banks	13.3	12.8	20.3	24.0	28.6
Three largest banks	16.8	12.4	17.7	24.0	30.6

Sources: NBRM and IMF staff calculations.

64. **There is limited cross-ownership among banks and nonbank financial firms.** At present there are no financial conglomerates. The strongest link is between banks and pension fund management companies; two banks have a 49 percent share in the two pension fund management companies. In addition, two brokerage companies are fully owned by banks and one brokerage firm is partially owned by a bank and an insurance company.

[24] A Herfindahl-Hirschman index of above 1,800 would indicate a highly concentrated market.

APPENDIX III. STRESS TESTS OF THE BANKING SYSTEM

65. **The stress tests were aimed at assessing the resilience of the Macedonian banking sector to a set of hypothetical shocks that were considered extreme but with a positive, albeit small, probability of occurrence.** The main calculations presented here were undertaken in cooperation with the NBRM staff. The existing NBRM top-down stress tests were the starting point and extended in several ways. In particular, the shocks were recalibrated based on cross-country evidence. The tests comprised single factor shocks (sensitivity analysis) and combinations of these factors (scenarios; see Box 1). In addition, bottom-up stress tests run by the largest three banks were introduced.

Top-down stress tests

66. **The top-down stress tests were based on bank-by-bank data for September 2007.** The tests were performed individually for all 19 commercial banks operating in Macedonia.[25] To see the differences in impact on larger and smaller banks, banks were grouped according to their size, and the results for the three different size groups are reported separately. In addition, the number of banks falling into different CAR intervals and their share in total banking sector assets are reported.

67. **The available data were adequate for basic FSAP-style stress testing, even though the time series were too short to allow for a robust econometric analysis of the relationship between prudential variables and macroeconomic shocks.** This caveat applies to most countries in the region, but it is particularly relevant for data on nonperforming loans (NPLs) and classified exposures in Macedonia, which are available on a comparable basis only since 2002. Furthermore, owing to the pegged denar, the exchange rate was relatively stable over the observation period. The data sets also did not cover a full economic cycle. Hence, modeling the relationship between macro variables and banks' balance sheets had to be based on ad hoc assumptions and cross country evidence. Finally, as Macedonia has not experienced rapid deposit withdrawals, the analysis of liquidity risk had to involve mostly expert judgment and experience from other countries. While the interest rate and the exchange rate changes in the scenarios were direct inputs into the stress tests, the output shocks had to be translated into increases in classified loans. Thus, the FSAP team relied on cross-country evidence by using data on crisis episodes in Eastern Europe to translate a change in GDP in Macedonia to a corresponding change in NPLs.

68. **The results are expressed as a one-time and immediate charge to capital.** The methodology used consisted of estimating the present value of net losses or gains incurred as a result of certain shocks. In tests for credit quality shocks, the losses consisted of increases

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[25] Subsequently, Makedonska banka was closed, and 18 banks are at present operating in Macedonia.

Box 1. Macro Scenarios for Stress Tests

Four macroeconomic scenarios were considered. The scenarios were developed in cooperation with the NBRM Research Department and quantified shocks to economic growth, interest rates, and the denar exchange rate. Owing to the lack of a suitable macroeconomic model of the NBRM, the design of the scenarios was based on a combination of approaches: (i) a review of extreme historical events in Macedonia; (ii) a review of crisis events in other countries; and (iii) plausible scenarios based on an expert assessment. The impact of the following scenarios were assessed:

- **Scenario 1—global reassessment of emerging markets.** Under this mild scenario, the Macedonian economy is subject to global economic shocks with worsening terms of trade, lower remittances, slower capital inflows, and tighter liquidity conditions faced by large local banks in the international markets. Domestic demand slows down owing to tightening credit market conditions, decline of the stock market, and lower real wages. External demand also slows down owing to slower growth in Macedonia's main trading partners. As a result, real output growth is assumed to decelerate to 3.5 percent per year (compared to the baseline of 5 percent), balance of payments to deteriorate, and local interest rates to increase by 450 basis points, while the exchange rate of denar to euro remains unchanged.

- **Scenario 2—regional instability.** Under this severe scenario, the Macedonian economy is subject to a serious shock with regional trade flows, transportation routes, and energy imports disrupted, and lower remittances as fewer guest worker visit Macedonia. Industrial production declines, and the current account deteriorates. Domestic demand slows down as unemployment increases, households accumulate precautionary cash balances, credit growth slows down as bank deposits decline and foreign credit lines dry up. As a result, growth slows down to 2 percent (compared to the baseline of 5 percent), interest rates increase by 750 basis points, while the exchange rate of denar to euro remains unchanged.

- **Scenario 3—currency crisis.** Under this extreme scenario, the Macedonian economy is subject to a series of external and internal shocks. Domestic demand deteriorates dramatically as output and confidence decline. Banks' external credit lines dry up, domestic banks accumulate foreign assets, transfers decline, households accumulate foreign exchange balances and reduce deposits in the banking system, and the current account worsens. As a result, output declines by 5 percentage points of GDP (compared to the baseline of 5 percent growth), interest rates rise by 1,000 basis points, and the exchange rate vis-à-vis the euro is devalued by 50 percent.

- **Scenario 4—appreciation pressures.** Under this benign scenario, international and domestic market players positively reassess Macedonia's economic prospects (perhaps related to E.U. accession and pace of convergence). External capital inflows (for direct and portfolio investment) accelerate and are only partially sterilized by the NBRM. As a result, real output growth accelerates to 7 percent per year. The NBRM attempts to mitigate appreciation pressures by reducing the policy interest rate by 200 basis points, but ultimately, the authorities decide to switch to a more flexible exchange rate regime, and the denar appreciates vis-à-vis euro by 20 percent.

in provisions, in tests for foreign exchange shocks, they consisted of a revaluation gain or loss, and in tests for interest rate shocks, they consisted of net gains or losses in the interest income and expense from interest-bearing assets and liabilities, considered per re-pricing brackets. The impact of shocks to liquidity was evaluated on liquidity ratios that were defined according to the IMF Financial Soundness Indicators Compilation guide in the case of the top-down stress tests and on ad hoc definitions in the case of the bottom-up stress tests.[26] Losses are shown as an impact on aggregate CARs for the system as a whole and for subgroups of banks.[27] In all the calculations, the impacts are compared with (and deducted directly from) capital. This is a prudent approach, but it should be recognized that in practice, as shocks appear over a period of time, banks would be able to use profits as a first line of defense before the shocks would impact their capital.

Results

69. **The sensitivity analysis assumes single-factor shocks to credit risk as well as interest rate, exchange rate, liquidity, and contagion risk.** Given the importance of credit risk (as indicated by both the initial FSAP and also the subsequent analyses by the NBRM), most of the single-factor shocks focused on credit risk. The size of the various shocks used in the stress testing exercise was chosen based on both historical and hypothetical changes in the shocked key variables.

70. **Banks were most vulnerable to credit risk shocks.** In particular, the large banks were less resilient than the medium and small-sized banks. While, on an aggregate basis, the CAR did not fall below the required 8 percent minimum, in two cases the CAR of the large banks dipped below 8 percent (Table 6). An increase in loans classified B, C, D, and E by 140 percent (equivalent to non-performing assets (C, D, E) increasing from 6.35 percent at end-September to about 15.2 percent) resulted in all large banks' CAR falling below the minimum, and one bank becoming insolvent.[28]

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[26] The authorities plan to make the top-down and the bottom-up approaches consistent in future stress testing exercises.

[27] The aggregate CARs are calculated as aggregate capital divided by the sum of aggregate risk-weighted assets and aggregate open FX position. Hence, it is not the average CAR that is reported, but the CAR for the system.

[28] According to the existing regulation, a bank's credit exposure is classified into five different risk categories, depending mostly on the length of repayment delays. The risk categories are A (delays of up to 15 days), B (delays of up to 30 and occasionally up to 90 days), C (delays of up to 90 and occasionally up to 180 days), D (delays of up to 180 days and occasionally up to 365 days), and E (delays of longer than 365 days).

Table 6. Macedonia: Results of Top-Down Stress Test for Credit Risk and Market Risk, End-September 2007

	Total	CAR according to bank size 1/			Banks in different CAR buckets							
					Number				Systemic importance in percent of total banking system assets			
		Group 1	Group 2	Group 3	CAR > 12	8 < CAR < 12	0 < CAR < 8	CAR < 0	CAR > 12	8 < CAR < 12	0 < CAR < 8	CAR < 0
Actual	**17.2**	**12.2**	**22.0**	**60.5**	**17**	**2**	**0**	**0**	**73.2**	**26.8**	**0.0**	**0.0**
Sensitivity analysis												
Credit risk 2/												
Increase in loan exposure classified as B, C, D, and E by 40 percent	14.8	9.4	20.8	57.9	15	4	0	0	31.8	68.2	0.0	0.0
Increase in loan exposure classified as B, C, D, and E by 80 percent	12.2	6.5	19.6	55.1	15	0	4	0	31.8	0.0	68.2	0.0
Increase in loan exposure classified as B, C, D, and E by 140 percent	8.2	1.9	17.7	50.0	15	0	3	1	31.8	0.0	44.6	23.6
Decrease in loan exposure classified as B, C, D, and E by 60 percent	20.6	16.1	23.7	63.7	19	0	0	0	100.0	0.0	0.0	0.0
Decrease in loan exposure classified as A by 20 percent	9.0	3.8	15.8	50.5	13	3	3	0	22.3	28.7	49.0	0.0
Credit concentration risk												
10 largest borrowers are downgraded to C	15.9	10.4	21.9	60.5	16	2	1	0	51.0	25.4	23.6	0.0
10 largest borrowers in banking system are downgraded to D	14.6	8.3	21.8	60.5	15	3	1	0	31.8	44.6	23.6	0.0
10 largest borrowers in banking system are downgraded to E	11.7	3.9	21.6	60.5	15	2	1	1	31.8	22.4	22.2	23.6
Foreign exchange rate risk												
Depreciation of the denar by 50 percent	19.8	15.4	23.2	61.3	18	1	0	0	96.8	3.2	0.0	0.0
Appreciation of the denar by 20 percent	16.1	10.9	21.5	60.1	16	3	0	0	51.0	49.0	0.0	0.0
Interest rate risk												
Increase in domestic and foreign interest rates by 4.5 percentage points	17.0	12.1	21.7	60.3	17	2	0	0	73.2	26.8	0.0	0.0
Increase in domestic and foreign interest rates by 7.5 percentage points	17.0	12.1	21.6	60.2	17	2	0	0	73.2	26.8	0.0	0.0
Increase in domestic and foreign interest rates by 10 percentage points	16.9	12.0	21.4	60.1	16	3	0	0	51.0	49.0	0.0	0.0
Decrease in domestic and foreign interest rates by 2 percentage points	17.3	12.3	22.1	60.5	17	2	0	0	73.2	26.8	0.0	0.0
Scenario analysis												
Scenario 1: Increase in loan exposure classified as B, C, D, and E by 40 percent, depreciation of the denar by 0 percent, and increase in interest rates by 4.5 percentage points	14.6	9.3	20.5	57.8	15	3	1	0	31.8	44.6	23.6	0.0
Scenario 2: Increase in loan exposure classified as B, C, D, and E by 80 percent, depreciation of the denar by 0 percent, and increase in interest rates by 7.5 percentage points	11.9	6.3	19.2	54.8	15	0	4	0	31.8	0.0	68.2	0.0
Scenario 3: Increase in loan exposure classified as B, C, D, and E by 140 percent, depreciation of the denar by 50 percent, and increase in interest rates by 10 percentage points	11.0	5.6	18.5	51.1	15	1	3	0	31.8	22.2	46.0	0.0
Scenario 4: Decrease in loan exposure classified as B, C, D, and E by 60 percent, appreciation of the denar by 20 percent, and decrease in interest rates by 2 percentage points	19.7	14.9	23.3	63.5	19	0	0	0	100.0	0.0	0.0	0.0

1/ Group 1, 2, and 3 consists of banks with total assets of more than denar 15 mn (3 banks), between denar 4.5 to 15 mn (7 banks), and less than denar 4.5 mn (9 banks), respectively.
2/ The distribution of exposures classified as B, C, D, and E and the sum of A, B, C, D, and E are assumed to remain constant.

71. **Banks were largely resilient to credit concentration risk.** This test assumed a simultaneous bankruptcy of the banking sector's ten largest nonfinancial (and non-general government) borrowers. In the most severe shock, the large banks' CAR dropped below the minimum, and one institution became insolvent. Again, the small and medium sized institutions were able to withstand these shocks better.

72. **Banks were not sensitive to exchange rate shocks.** Given the de-facto peg of the denar to the euro, the assumed exchange rate shocks were large (covering for both depreciation and appreciation), but the banks' CAR were not strongly affected.

73. **Banks were least vulnerable to interest rate shocks.** This is not surprising, as the banks mostly extend adjustable interest rate loans. The tests simulated an increase/decrease in domestic and foreign interest rates. The test was set up as a gap analysis, which assessed the impact of interest rate changes on the interest income and expense of interest-bearing assets and liabilities. The impact on the value of securities was not assessed, as banks' trading books are basically nonexistent and the few securities they have are mostly held to maturity.

74. **Contagion risk was also negligible.** A test was run to assess whether a failure in a single bank can cause a substantial deterioration of capital adequacy in the system, through the matrix of net uncollateralized exposures among banks in the interbank market. Given the extremely limited interbank exposures, contagion seems a low risk.

75. **Liquidity risk was low.** This is due to the high share of NBRM bills and deposits placed in foreign bank accounts (8 and 17 percent of banks' assets, respectively). A withdrawal of 20 percent of household deposits reduced highly liquid assets by 46 percent and liquid assets by 25 percent (Table 7). Large banks were hit again more strongly than small banks. Bottom-up stress tests for the largest three banks confirmed this finding (see below).

Table 7. Macedonia: Results of Top-Down Stress Test for Liquidity Risk, End-September 2007

	Decrease in		Ratio of		Number of Banks With		Systemic Importance in Percent of Total Banking System Assets	
	Liquid Assets 1/	Highly Liquid Assets 2/	Liquid Assets 1/	Highly Liquid Assets 2/	Liquid Assets <0 1/	Highly Liquid Assets <0 2/	Liquid Assets <0 1/	Highly Liquid Assets <0 2/
	(In percent)							
Actual	**---**	**---**	**33.7**	**18.6**	**0**	**0**	**0.0**	**0.0**
Withdrawal of 20 % of household deposits	25.4	46.1	27.5	11.0	0	1	0.0	23.9
Withdrawal of deposits of 20 largest depositors	60.9	110.5	16.6	-2.4	2	9	25.5	63.6

1/ Liquid assets include highly liquid assets, short-term placed assets with foreign banks, and placements in other short-term debt securities.
2/ Highly liquid assets include cash and balances with the NBRM, securities with NBRM rediscount, short-term placements in securities issued by the government, and correspondent accounts with foreign banks.

76. **The large banks were also less resilient to combined shocks than the small- and medium-sized banks** (Box and Table 6)**.** Owing to their exposure to credit risk, they were again affected most. Yet, the fully fledged crisis scenario, which assumed a devaluation of the denar (Scenario 3), had a lower impact than the corresponding single-factor shock to credit risk, because the losses in the credit portfolio were offset partly by the large banks' gains on their revalued long open foreign exchange position.

Bottom-up stress tests

77. **Banks were asked to run bottom-up stress tests for market and liquidity risks based on end-December 2007 data.** The stress tests were designed as simple sensitivity analyses. The following shocks were assumed: effects of +/- 30 percent change in the denar exchange rate; and 35 percent decline of prices of all shares listed on domestic stock and all shares listed on foreign stock markets. Liquidity stress tests assumed an overnight withdrawal of 10 percent of liabilities to parent banks that are coming due within three months, an overnight withdrawal of 10 percent of all liabilities to parent banks (irrespective of the maturity of these liabilities), an overnight withdrawal of 50 percent of liabilities to parent banks that are coming due within three months, and an overnight withdrawals of deposits resulting in withdrawals of resident and nonresident deposits by 20 and 80 percent, respectively. In addition, exchange rate induced credit risk stemming from a depreciation of the denar which results in a 10, 30, and 50 percent increase in loan exposures classified as C, D, and E was analyzed.[29]

Results

78. **Bottom-up stress tests showed that the banks were resilient to the assumed shocks.** The results were also comparable to the top-down stress test results. The impact of the exchange rate and equity price stress test were negligible on the aggregate CARs (Table 8). The exchange rate induced credit risk had a slightly larger impact, but the CAR did not fall below the required minimum. Overall, the banks were fairly liquid and remained liquid for most of the shocks (Table 9). However, the stress tests also showed that accounting for the potential use of currently unused credit lines in a systemic liquidity crisis may have a severe negative impact on banks liquidity ratios.

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[29] The banks were unable to run bottom-up stress tests for interest rate risk (parallel shifts of the denar and euro yield curves) owing to lack of experience in the field of stress testing.

Table 8. Macedonia: Results of Bottom-Up Stress Test for Exchange Rate Induced Credit and Market Risk, End-December 2007

	Aggregate CAR 1/	Change in Aggregate CAR 1/
Actual	**12.9**	**-**
Exchange rate risk		
Scenario 1: Denar depreciates by 30 percent against all other currencies	12.9	0.0
Scenario 2: Denar appreciates by 30 percent against all other currencies	12.8	0.0
Exchange rate induced credit risk		
Scenario 1: Loan exposures classified as C, D, and E increase by 10 percent	11.4	-1.4
Scenario 2: Loan exposures classified as C, D, and E increase by 30 percent	11.1	-1.8
Scenario 3: Loan exposures classified as C, D, and E increase by 50 percent.	10.7	-2.2
Equity price risk		
Scenario 1: Prices of all shares listed on domestic stock markets decline by 35 percent	12.8	-0.1
Scenario 2: Prices of all shares listed on foreign stock markets decline by 35 percent.	12.8	0.0

1/ "Aggregate" refers to the three largest banks in Macedonia, which participated in the bottom-up stress tests.

Table 9. Macedonia: Results of Bottom-Up Stress Tests for Liquidity Risk 1/ End-December 2007

	Liquidity Ratio 1	Liquidity Ratio 2	Liquidity Ratio 3
		(in percent)	
Baseline	**35.7**	**28.0**	**53.2**
Scenario 1. Parent banks withdraw their deposits and loans to their subsidiaries and branches in Macedonia			
(i) An overnight withdrawal of 10 percent of liabilities to parent banks that are coming due within three months	35.4	27.7	53.0
(ii) An overnight withdrawal of 10 percent of all liabilities to parent banks (irrespective of the maturity of these liabilities)	35.3	27.5	52.9
(iii) An overnight withdrawal of 50 percent of liabilities to parent banks that are coming due within three months.	34.3	26.4	52.2
Scenario 2. Overnight withdrawals of resident and nonresident deposits by 20 and 80 percent respectively	13.6	3.3	37.1
Scenario 3. A combination of scenarios 1 and 2			
(i) Scenario 1.A and scenario 2	13.2	2.7	36.8
(ii) Scenario 1.B and scenario 2	12.9	2.4	36.5

1/ Liquidity ratios i are calculated as liquid assets i divided by short-term liabilities. Short-term liabilities include interbank liabilities and nonbank liabilities both with residual time to maturity of up to three months. Liquid assets 1 include cash reserves, debt instruments admitted for refinancing with the NBRM, listed bonds, and listed equities. Liquid assets 2 include liquid 1 plus overnight interbank assets and nonbank assets with residual time to maturity of one day minus credit lines. Liquid assets 3 include liquid assets 1 plus interbank assets with and 50 percent of nonbank assets both with residual time to maturity of up to three months minus credit lines. 50 percent reflect the fact that banks may want to have to roll over loans to customers owing to relationship lending.

Going forward

79. **There is a need to further improve stress testing both at the NBRM and at the commercial banks.** Possible areas for improvements to the stress testing framework include:

- **Strengthen stress testing analyses at the NBRM, in particular credit risk.** This calls for (i) increasing the complexity of credit risk stress tests by quantifying the expected and the unexpected losses; (ii) integrating scenario analyses into the NBRM's stress testing exercises; (iii) shifting from an ad hoc to a data-based calibration of shocks by using cross-country evidence and eventually Macedonian data as longer time series become available; (iv) compiling data series to facilitate quantitative assessment of exposures, including recovery rates, bankruptcy rates, and leverage ratios for households and corporates; and more detailed information on distribution of assets by repricing dates to facilitate interest rate risk stress tests; (v) incorporating the existing data on residual (contractual and expected) maturities into the liquidity risk analysis; and (vi) integration of cross-sector and cross-border analyses.

- **Make scenario analyses more macro-consistent.** The core macroeconomic structural model the NBRM is currently recalibrating could be used to test the sensitivity of various financial and macroeconomic variables to alternative shocks (e.g., to the exchange rate, interest rates, output, capital inflows in the form of bank borrowing, policy instruments). The results of such experiments could provide input for the macro scenarios used in stress testing.

- **Encourage stress testing among commercial banks.** The NBRM has started (or will start as of January 2009) to require banks to run stress tests for a wide range of risks including credit, interest rate, exchange rate, liquidity, and credit concentration risk. For the FSAP update, the NBRM also asked the three large banks to run bottom-up stress tests for interest rate, exchange rate, equity price, and liquidity risk. The responses of the participating banks were very positive. In particular, they valued the guidance of setting up stress tests. Hence, the NBRM should (i) further encourage banks to integrate stress testing in their risk management practices; and (ii) request banks to run bottom-up stress tests regularly based on scenarios that the NBRM determines, and to report to the NBRM the results of their analysis. The results of such tests could then be compared with the NBRM's own analyses.