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Former Yugoslav Republic of Macedonia: Selected Issues

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INTERNATIONAL MONETARY FUND
FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Selected Issues

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Approved by the European Department

January 4, 2011

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I. THE ROLE OF EXTERNAL SOVEREIGN DEBT IN THE MEDIUM-TERM FINANCING STRATEGY FOR MACEDONIA¹

A. Introduction

1. **Macedonia is planning to issue Eurobonds to cover its fiscal deficit in 2011 and 2012.** This paper asks 1) whether reliance on Eurobond financing over the medium term is consistent with sound debt management policy and 2) whether Macedonia can reasonably expect Eurobond borrowing costs to fall in the future. It draws on stylized facts about Eurobond financing by other countries and on panel estimates of interest rate spreads.

2. **The main conclusions are that Eurobond financing appears justified in the near term but over a longer horizon the country should seek to develop domestic debt markets as a complementary funding source.** Further, recent spreads are higher than predicted by fundamentals, suggesting that borrowing costs may decline in the future as external conditions normalize.

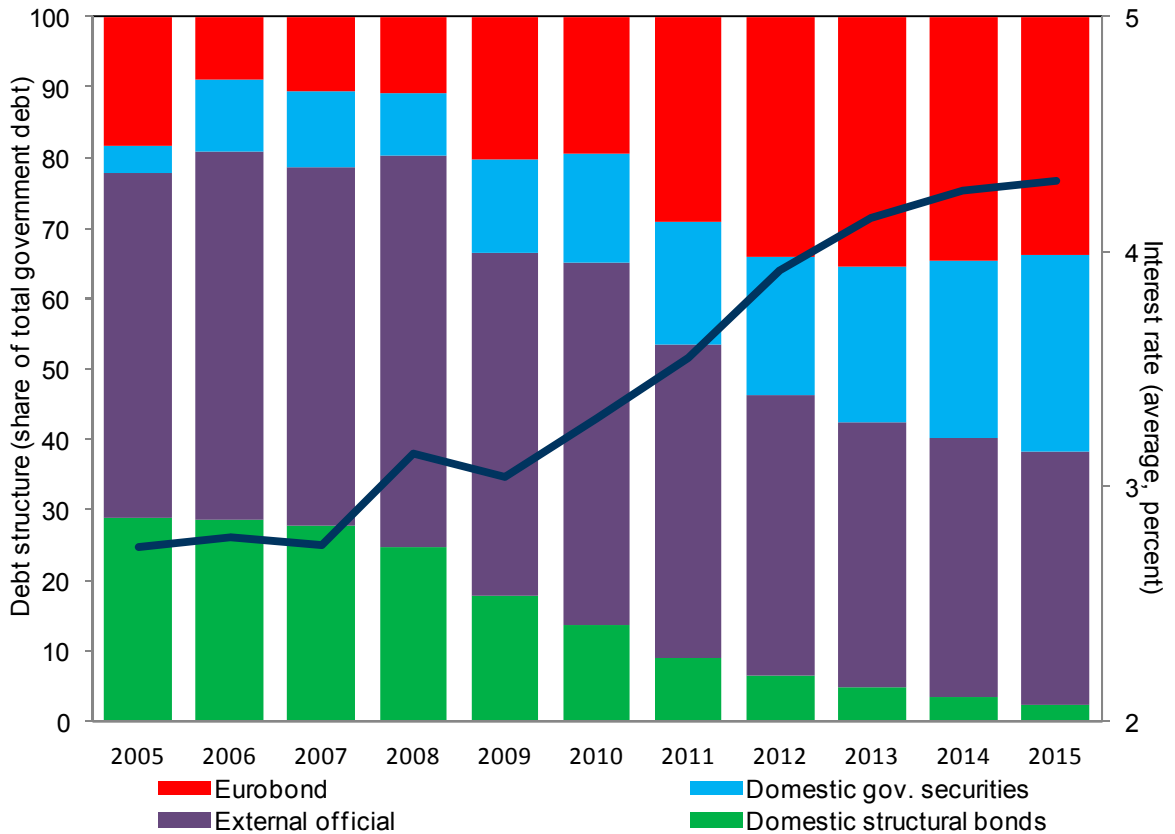
B. Medium-term Fiscal Financing Outlook

3. **Macedonia is in the process of a transition from low cost financing largely from official sources to higher-cost borrowing on private markets.** Market financing still accounts for a relatively small portion of total debt, which is dominated by official (multilateral and bilateral) loans and structural bonds issued at low interest rates to satisfy liabilities arising from independence and the transition to a market economy. As Macedonia graduates from official lending and structural bonds are paid off, market financing will account for a growing share of total outstanding debt. Market debt consists of T-bills, which are virtually all short-term, and two Eurobonds (with original maturities of 10 and 3.5 years).

4. **One consequence of the gradual replacement of non-market with market debt is higher interest rates, which will require higher primary surpluses to preserve stable debt ratios.** For example, if Macedonia were to meet projected fiscal deficits through 2015 only with Eurobonds issued at the present secondary market yield of 6 percent, interest payments would rise by 0.3 percent of GDP, implying an equal increase in the debt-stabilizing primary balance.

¹ Prepared by Gabriela Dobrescu (FAD).

Debt Structure and Average Interest Rates, 2005-2015



Sources: MoF and IMF Staff estimates.

C. Eurobond-Financing Trade-Offs

5. **For 2011–12 the government plans to fully finance its fiscal deficits through Eurobond issues, while its financing strategy for outer years is not yet defined.** As the authorities consider their debt management strategy over the medium-term, and in particular the relative emphasis to place on external (Eurobond) debt issuance and domestic debt, the following tradeoffs are relevant.

- Eurobond financing has several attractive features. First, it helps to build international reserves (provided it is at least partially sterilized by NBRM instruments, which is the current policy). Second, it lengthens debt maturities, which reduces rollover risks². Domestic market debt is virtually all short term, and the demand for longer-term

² As long-term structural bonds mature and are paid off over the next few years, financed by shorter-term T-bills (assuming Eurobond issues cover only the fiscal deficit), this will reduce the average maturity of domestic debt.

domestic debt is limited due to banks' need for shorter-term assets to match the maturity of their liabilities, which consist mostly of relatively short-term deposits. Third, there may be some reduction in crowding out, as external issuance boosts reserves and allows a more relaxed monetary stance (less than full sterilization by NBRM instruments). Finally, Eurobond financing helps establish a presence in international capital markets and broadens the investor base, with benefits for corporate access.

- Eurobond financing also carries risks. Sovereign debt markets are subject to volatility for external reasons, as seen in the spike in Eurobond yields after the onset of the global crisis in late 2008 and again during the Greek crisis. A cross-country panel model of the determinants of spreads shows that domestic factors explain only a small portion of the recent movements in Macedonia's borrowing costs (see below). This external volatility creates the risk that markets will be closed or demand a high premium for issuance needed to finance deficits or roll over maturing debt. This risk is most pronounced during periods when existing Eurobonds mature, which creates spikes in gross financing needs. Moreover, external debt exposes the country to foreign exchange risk if the exchange rate comes under pressure and makes the possible safety valve of exchange rate adjustment more expensive.
- Moreover, the medium-term debt management strategy should seek to develop a longer-term market for denar instruments to support the parallel creation of longer-term private debt markets needed to finance domestic investments. This objective should be facilitated by the process of financial deepening, including the growing size of assets of the second pillar pension fund, which should increase the demand for longer-term denar debt.

These considerations suggest that Eurobond financing has an important role to play in Macedonia's public finances but should be combined with development of long maturity domestic instruments over the medium term.

D. Cross-Country Stylized Facts on Eurobond Debt

6. **The experience of other countries in using external sovereign debt markets for fiscal financing may be instructive in assessing the appropriate degree of reliance on Eurobond financing.** Such cross-country experience can provide some guidance on issues such as the appropriate stock of sovereign external debt and size of individual issues. Cross-country stylized facts are presented in Figure 1 (see Data Appendix for details on comparator countries).

7. **Cross-country comparisons suggest that there is space for Macedonia to increase its access to international capital markets and that the size of past and future planned issues is not excessive.** Macedonia's outstanding Eurobond stock totals some 4½ percent of

GDP, which is a moderate in international comparison. The size of past and likely future issues (as a share of GDP) is also in line with experiences of other countries. Smaller countries and those with exchange rate pegs tend to have larger stocks of Eurobond debt as a share of GDP. A possible reason that pegged regimes favor external sovereign debt financing is that they place a higher value on accumulating reserves to protect their pegs. Another possibility is that they put a lower cost on the resulting foreign exchange risk, since they expect their pegs to persist indefinitely.

8. **However, if Macedonia were to finance its fiscal deficits in 2011–15 fully with Eurobonds, this would lead to a high level of access relative to other countries.** The stock of Eurobond debt would reach 11.6 percent of GDP, which would be high compared to (current levels) of the comparator group. Gross issuance for Macedonia over 2011–2015 would also be 13.2 percent of GDP, and net issuance 9.7 percent of GDP, both of which are similarly high relative to comparators over the past 5 years (2005–2009). Thus, a cross-country comparison lends support to the view that Macedonia should seek to develop domestic financing alternatives to Eurobond financing over the medium term.

E. Empirical Determinants of Eurobond Costs

9. **In light of the importance of Eurobond financing for Macedonia over the medium term, a relevant question is whether it can reasonably expect interest spreads on future issues to narrow relative to present levels of close to 400 basis points.** Two empirical models are used to address this question. One approach models spreads at issuance using cross-country panel data on emerging market issuers since the early 1990's. A second approach models

single-country monthly secondary market spreads over a shorter time horizon. The models seek to explain spreads on the basis of domestic economic variables (fiscal and external accounts, growth, and inflation); external conditions (the EMBI spread); and the market history of the issuer (Eurobond stock, size of issue, maturing amount in year of issue, and whether the issue was the country's first Eurobond). The two models are described below in the technical annex.

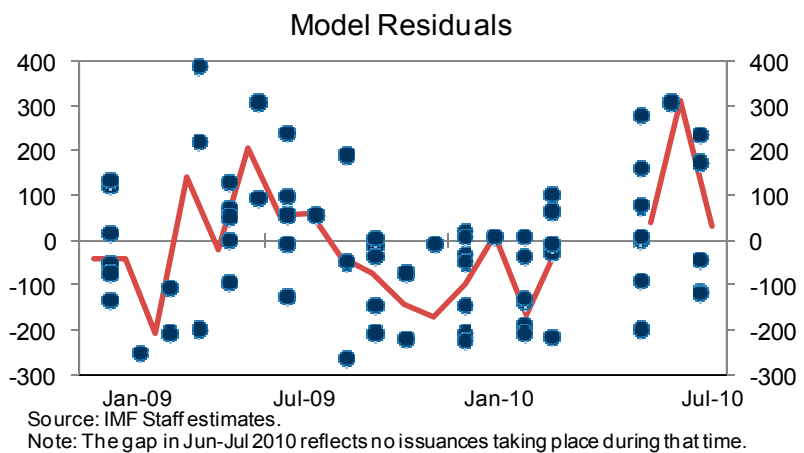
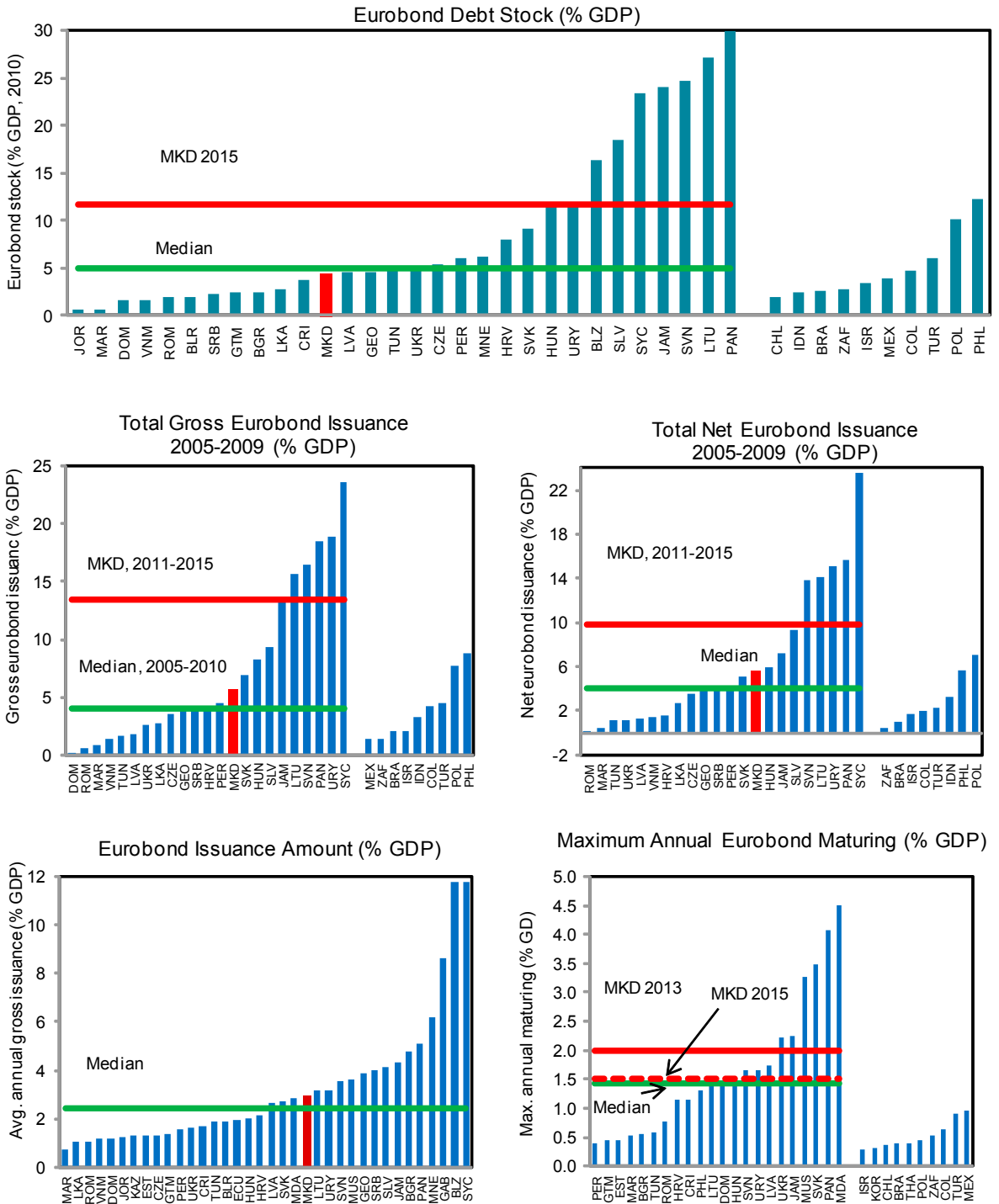


Figure 1. Cross-country Eurobond Stylized Facts 1/



Sources: Dealogic; WEO; and IMF Staff calculations.

1/ Eurobond refers to sovereign debt issued in foreign markets.

10. **The annual cross-country model finds that the 620 basis point spread at which Macedonia issued in 2009 was 300 basis points above predicted levels, and that Macedonia should be able to issue at present at a spread of 250–270 basis points over German Bunds—more than 100 basis points tighter than present secondary market yields. The unexplained 300 basis point premium in 2009 was likely due to the unsettled global financial conditions at the time.** This also affected to varying degrees several other countries that issued around the same time (such as Lithuania, Peru, Hungary, and Croatia). By the second half of 2010, spreads at issue had returned close to predicted levels for some countries in the region (e.g. Turkey) but remained above predicted levels for others (e.g., Croatia). In contrast to the 2009 experience, Macedonia’s inaugural 10-year Eurobond in 2005 was issued at a spread of 120 basis points, 90 basis points inside the spread predicted by the model.

Selected Sovereign Issuances, Jul-Sep 2010			
Country	Predicted spread	Actual Spread	Residual
Poland	273	122	-151
Czech Republic	231	125	-106
Mexico	251	166	-85
Lithuania	270	233	-37
Turkey	251	257	6
Chile	69	82	13
Brazil	102	233	131
Croatia	190	357	167
Ukraine	212	452	240
Belarus	289	586	298

Source: IMF Staff estimates.

11. **The second model of higher frequency secondary market spreads indicates that shocks in global credit conditions have a much stronger impact on Macedonia spreads in the short-run than the impact predicted by the annual model.** This suggests that Macedonia’s spreads are highly affected by external developments in the short term but that this effect may fade over a longer time frame.

12. **Both models thus suggest that Macedonia can reasonably expect Eurobond borrowing costs to decline as conditions normalize, while underscoring that market access is unpredictable and determined in large part by external factors.**

APPENDIX I. TECHNICAL ANNEX

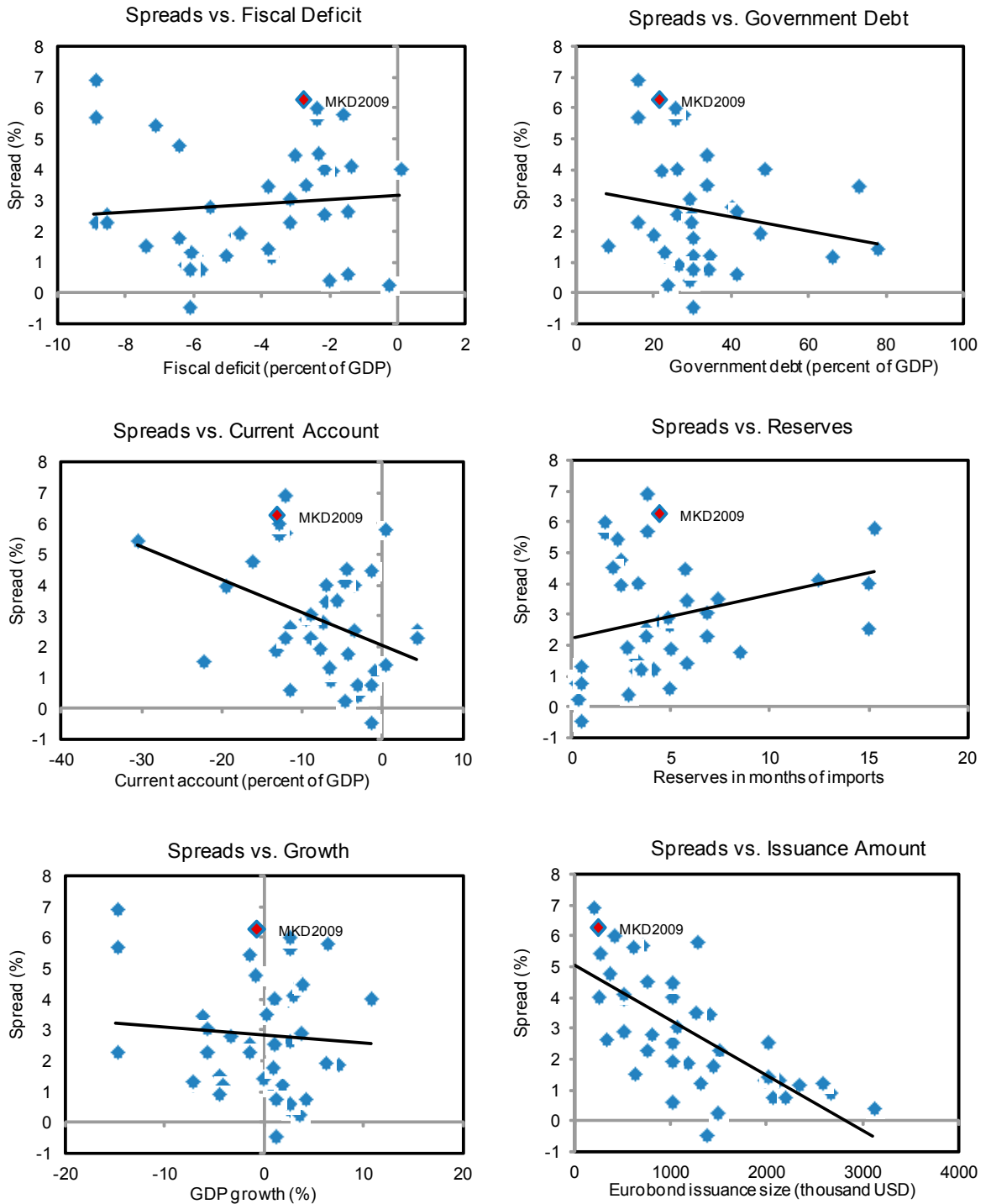
1. **The cost of the 2009 Macedonian issuance appears high both by comparison with the 2005 issuance and with other EM issuances during the period 2008–2010 and it does not seem to be explained by the country’s fundamentals.** The spread on the 2005 issuance was 1.2 percent relative to German yields, while in 2009 it jumped to 6.3 percent. The 2009 Macedonian issuance is in fact the second highest among the EM issuances during this period (highest being Lithuania during the same period, the summer of 2009). Fundamentals, captured by indicators of fiscal policy, growth, and external account performance, do not seem to explain why Macedonian spreads are so high by comparison to other countries, as its fiscal deficit and debt are low, reserves coverage is adequate (although the current account deficit was high), and growth was moderately high. Two factors that could possibly account for the high cost on Macedonian Eurobonds are the small issuance size, through a liquidity premium, and the unfortunate timing of the issuance in the summer of 2009, amid the most turbulent global credit conditions for EMs. The remainder of this section investigates empirically these various determinants of spreads.

Cross-Country Annual Panel Model

2. **The determinants of spreads at issuance are first estimated in a multivariate cross-country panel empirical model.** Spreads are modeled as a function of country fundamentals: fiscal variables (deficit and debt), external account variables (current account, reserves coverage), growth, and inflation; global conditions incorporated through the EMBI index; and also controlling for country fixed-effects. We use data on 41 EMs over the period 1990–2010. The EMBI spread is included at the month of issuance within the year, to capture within-year timing effects. The findings suggest the following conditions are associated with higher spreads:

- A higher government debt to GDP ratio of 1 percentage point is associated with higher spreads of 2–3 basis points. In addition to the overall government debt ratio, a higher Eurobond debt stock of 1 percentage point of GDP is associated with another 5 basis points higher spreads (specification (3) in Table 1).
- A one percent of GDP higher fiscal deficit is associated with higher spreads of 4–7 basis points.
- Weaker external accounts as indicated by reserves in months of imports and the current account balance as a share of GDP are associated with higher spreads.

Figure 2. Spreads at Issuance: Macedonia vs. Comparator Countries, 2008-2010



Sources: Dealogic, WEO and IMF Staff estimates.

- Lower reserves by 1 month of imports corresponds to higher spreads of 20 basis points and a higher current account deficit by 1 percentage point of GDP corresponds to higher spreads of 5 basis points.
- Lower economic growth by 1 percentage point is associated with higher spreads of 9 basis points. Higher inflation rate by 1 percentage point is associated with higher spreads of 5 basis points.
- The first issuance is generally associated with lower spreads of 70 basis points (specification (2) in Table 1). The interpretation for this finding could be that countries prepare for the first issuance much more carefully than other issuances, given that there is no track record and that investors are probably also scrutinizing the country more carefully. This is in accordance with findings in Grigorian (IMF, 2003).
- Lower issuance amounts are associated with significantly larger spreads through the liquidity premium associated (specification (5) in Table 1). Doubling the issue size is associated with a reduction in spreads of 30 basis points. The maturity of the issuance is not found to be associated with either higher or lower spreads.
- Worse global credit conditions lead to higher spreads. A higher EMBI spread of 1 percent is associated with higher spreads of 16–23 basis points.
- In addition, some of these effects can be non-linear (results not shown). In particular, each of the determinants discussed above significantly affects spreads when the EMBI spread is high (i.e. above 4 percent). These non-linearities are particularly strong for reserves coverage and growth.

3. **This model would predict a spread of just 300 basis points on the Macedonian Eurobond issued in 2009, leaving a very high unexplained residual.** The predicted spread represents an increase of 1.2 percent over the 2005 issuance, explained in part by weaker Macedonian fundamentals (0.2 percent), losing the advantage of the first issuance (0.7 percent) and poor global conditions (0.3 percent). However, this leaves a very high unexplained residual of 3.4 percent – based on model (2) (see Table 3). A further 0.3 percent can be explained by the issuance size, and another 0.1 percent can be accounted for by non-linear effects of global credit conditions. However, even with these extensions, the model is unable to explain around 300 basis points of the Macedonian spread in 2009. In contrast, the 2005 Eurobond was issued at 120 basis points over German bunds—90 basis points tighter than predicted by the model.

4. **These findings are confirmed through several robustness checks.** A similar model is estimated for secondary market spreads. A more restricted sample of 30 EMs over the

period 2005–2010 is used due to data availability constraints. This specification allows us to control for the possible endogeneity bias arising from looking only at yields at issuance when favorable conditions may need to be in place in order for countries to decide to access international capital markets. The findings and coefficients on this model (last column in Table 1) are similar to the baseline model above. Similarly, a random-effects model as well as a model controlling for both country and year fixed effects yield similar results (specifications (7) and (8) in Table 1).

5. **These results suggest that in the medium-term, as global conditions normalize and Macedonian fundamentals improve, spreads on Macedonian Eurobonds could be in the range of 2.5–2.7 percent, but significant uncertainties and risks exist.** Most determinants of spreads improve over the medium-term, with the exception of the higher Eurobond debt stock by 10 percentage points of GDP, which could add 50 basis points to spreads if Eurobonds were used to finance projected deficits in 2011–15. These predicted spreads would translate to yields of around 5 percent, based on current German rates of 2.4 percent. However, significant risks exist. A 1 standard deviation shock to EMBI spreads (2.4 percentage points, which has a probability 5 percent of occurring over 3 months) would increase the MKD spread by 40 basis points. German rates could also rise. Moreover, significant idiosyncratic shocks that are not captured by this model, as seen in the large unexplained residual for the 2009 issuance, could appear.

Table 1. Empirical Determinants of Spreads

Variables	Spread at issuance (percent)								Secondary spread (percent)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public debt (% GDP, lag)	0.03***	0.03***	0.02***	0.03***	0.03***	0.03***	0.02***	0.03***	0.03
Fiscal deficit (% GDP)	-0.06**	-0.06**	-0.03	-0.06**	-0.07***	-0.06***	-0.05**	-0.04	-0.05
Reserves in months of imports	-0.23***	-0.22***	-0.21***	-0.22***	-0.23***	-0.23***	-0.19***	-0.23***	-0.22**
Current account (% GDP, lag)	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.03*	-0.05**	-0.05
Real output growth	-0.09***	-0.09***	-0.08***	-0.09***	-0.10***	-0.09***	-0.09***	-0.10***	-0.16***
Inflation (% CPI)	0.05***	0.05***	0.06***	0.05***	0.05***	0.05***	0.06***	0.05***	0.05
EMBI Spread (%)	0.20***	0.21***	0.23***	0.20***	0.16***	0.20***	0.20***	0.20***	0.27***
first_issuance		-0.70*							
Eurobond stock (% GDP)			0.05***						
Annual eurobond maturing (% GDP)				-0.05					
Issuance amount (USD, log)					-0.29***				
Maturity (years)						0.01			
Model			Country fixed effects				Country Random Effects	Country and Year fixed effects	
Observations	429	429	429	429	429	429	429	429	154
R-squared	0.354	0.359	0.363	0.355	0.365	0.355		0.684	0.320
Number of countries	41	41	41	41	41	41	41	41	30
Number of years								15	

*** p<0.05, ** p<0.1, * p<0.15

Source: IMF Staff estimates.

Table 2. Model predictions for Macedonian issuances

MODEL	2005		2009	
	Predicted spread	Unexplained residual	Predicted spread	Unexplained residual
Baseline model, controlling for first issuance	1.6	-0.4	2.8	3.4
Controlling for first issuance and issuance amount	2.0	-0.8	3.1	3.1
Controlling for first issuance, issuance amount and non-linear effects of EMBI	2.1	-0.9	3.2	3.0

Source: IMF Staff estimates.

Single-Country Monthly Spreads Model

6. **Evidence from higher-frequency data shows that the impact of contagion is very high for Macedonia.** Higher-frequency data shed some light into the channels and magnitude of spillover effects over the shorter-term. The econometric specification uses monthly data in differences for each country over the period 2006 to present. The findings are:

- Changes in the EMBI index translate almost one-to-one into Macedonian spreads. This is much higher than the coefficients (at around 0.2) found in the annual regressions above. In addition, compared with the results for similar regressions for neighboring countries' spreads and with evidence from other studies in the literature, this transmission of global shocks for Macedonia is very high. Macedonia's spreads seem to have shot up most among this group and are also the slowest to come down.
- The spread on Greek bonds shows no statistically significant association with Macedonian spreads – this is in part because Macedonian spreads respond to the common EM trend, which embeds the effect of the Greek spread, rather than to any idiosyncratic movements in Greek spreads; it is also partially explained by the short history, especially since the recent Greek spreads shock is unique.
- The index of stock market volatility in advanced economies is negatively correlated with Macedonian spreads, as found in other studies on EMs, showing that markets differentiate EMs and partially substitute towards them when advanced economies are in worse shape.

Table 3. Determinants of Secondary-Market Spreads Using Monthly Data

Variable	Macedonian spread (percent, relative to		Romanian spread	Bulgarian spread	Croatian spread	Turkish spread	Greek spread
			(% , rel. to German yield)				
Greek spread	0.06	0.13	-0.06	0.04	-0.01	-0.01	
European VIX	-0.05***	-0.04**	-0.02*	-0.00	-0.00	-0.00**	-0.02
EMBI spread	1.18***	0.87***	0.29**	0.08	0.01	0.04***	0.44**
US rate	0.04	0.04	0.05	-0.04	0.00	0.00	0.12
Reserves (bn. USD, log)		-1.17					
REER (CPI-based, log)		14.74*					
Current account (12-month rolling, bn. USD)		-0.00					
SEE Industrial Production Index (mom growth)		-0.09*					
Observations	57	53	27	17	50	57	57
R-squared	0.421	0.543	0.229	0.207	0.034	0.126	0.090

*** p<0.01, ** p<0.05, * p<0.1

Note: All regressions are estimated in first-differences. Data frequency is monthly.

Source: IMF Staff estimates.

APPENDIX II. DATA SOURCES AND COUNTRY SAMPLE

1. Information on Eurobonds in the primary market was obtained from the Dealogic database. Only Eurobond issuances in US dollars or EUR/German Mark were considered for the analysis; issuances in local currencies were excluded. Secondary market Eurobond yields were obtained from Bloomberg. Indicators of international credit conditions (the EMBI index, US and German bond yields and the VIX) were obtained from Datastream. The macroeconomic indicators were all

2. The country sample considered for the analysis includes all emerging, non-oil exporting economies that have issued Eurobonds. For the cross-country comparison charts, the sample has been split in a “comparator group” for Macedonia and “other (see adjacent list). The comparator group has been determined based on the country size, sovereign credit rating (from Standard and Poor’s), while also expanding the list to include some relevant neighboring countries to Macedonia. The “other” group contains larger emerging markets, with deeper access to international markets, which can serve as an informative comparison.

Country	Size (2010 GDP, bn. USD)	Rating	Country	Size (2010 GDP, bn. USD)	Rating
MKD comparator group			MKD comparator group (cont.)		
Seychelles	1.0	n.a.	Belarus	52.3	B+
Belize	1.4	B	Ecuador	62.0	B-
Montenegro	4.1	BB	Croatia	63.7	BBB
Moldova	5.2	n.a.	Slovak Republic	92.4	A+
Macedonia	9.4	BB	Morocco	94.0	BBB-
Mauritius	9.8	n.a.	Vietnam	103.0	BB
Georgia	10.9	B+	Kazakhstan	126.0	BB+
Jamaica	13.1	B-	Ukraine	127.0	B+
Gabon	13.4	BB-	Hungary	146.0	BBB-
Estonia	18.6	A	Peru	146.0	BBB-
El Salvador	21.8	BB	Romania	169.0	BB+
Latvia	24.0	BB	Czech Republic	199.0	A
Jordan	24.9	BB	Other		
Panama	26.7	BBB-	Philippines	182.0	BB-
Costa Rica	33.2	BB	Chile	196.0	A+
Lithuania	35.2	BBB	Israel	199.0	A
Sri Lanka	36.9	B+	Colombia	268.0	BB+
Guatemala	39.8	BB	South Africa	330.0	BBB+
Uruguay	40.6	BB	Poland	479.0	A-
Tunisia	41.8	BBB	Indonesia	670.0	BB
Serbia	43.6	BB-	Turkey	711.0	BB
Slovenia	49.1	AA	Mexico	996.0	BBB
Dominican Republic	50.1	B	Russian Federation	1510.0	BBB
Bulgaria	50.6	BBB	Brazil	1910.0	BBB-

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II. ELECTRICITY SECTOR IN MACEDONIA

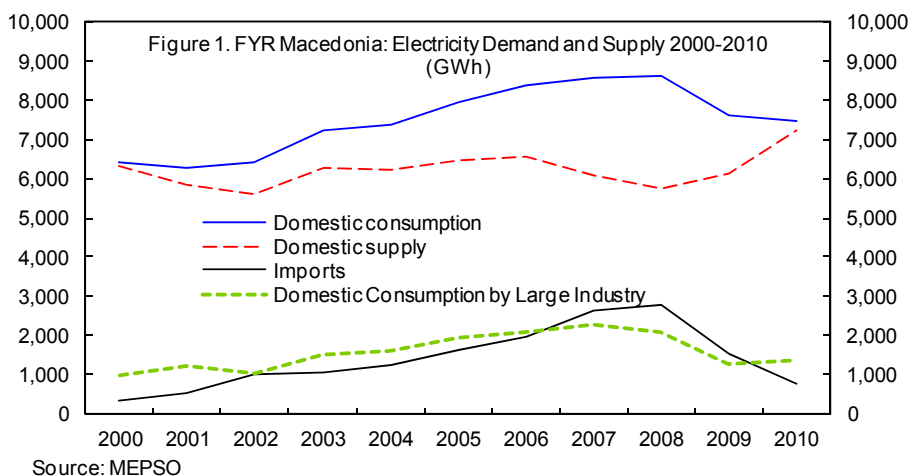
A. Introduction and Summary¹

- 1. The Macedonian energy sector is in a transitional phase from centrally planned and managed to a decentralized regulated free market.** Like in many of its peers in the region, the energy sector is still working to overcome its collectivist legacy. On the demand side, the key challenge is to improve the efficiency of energy usage, which has been held back by below-market pricing for all but the largest users. On the supply side, challenges include the limited range of options for energy supply, due to Macedonia's lack of oil, gas or high quality coal reserves, and ageing generation facilities. These factors have resulted in a shortage of domestic generation capacity, as well as relatively dirty generation facilities.
- 2. Recent reforms are helping to address these issues, and the country is committed to further reforms that will bring about full liberalization of the energy market.** Macedonia has signed the Energy Community Treaty (ECT), which commits the signatories to implement the relevant parts of the EU *acquis communautaire* (the *acquis*). The government has recently drafted a new Energy Law, which, once fully implemented, is expected to bring the country in compliance with its Treaty obligations. At the same time, implicit electricity pricing subsidies have decreased, from an estimated 3.8 percent of GDP in 2008 to 0.7 percent of GDP in 2010. This is mainly on the back of lower regional energy prices, increases in the domestic price for subsidized end-users, and the full liberalization of the market for the 10 largest users. In addition, the privatization of distribution in 2006, and the subsequent substantial investment by the new owner, has reduced distribution losses and collection shortfalls.
- 3. Going forward, Macedonia's challenge will be to implement fully its reform plans, which are needed to boost supply while containing demand.** Implementing the Energy Law will result in full electricity market liberalization by 2015, which, together with providing a stable and predictable legal and regulatory environment, is essential for attracting long-term private sector investment in generation capacity. Market-based pricing, the promotion of energy awareness among users, and gasification of the country will also improve efficiency and contain increases in demand. Taken together, these energy policies should ensure the security of supply, and hence provide a necessary precondition for economic growth over the medium- to long-term.
- 4. Energy reform will also have a favorable macroeconomic impact.** Liberalized prices and private investment will help ensure the sector does not become a fiscal burden or a source of balance of payments pressures (as in 2008, when a spike in import prices coupled with a drop in domestic output caused imports to surge).

¹ Prepared by Alexander Tieman, IMF Resident Representative to Macedonia, atieman@imf.org. This work has benefitted from discussion with many stakeholders in Macedonia, as well as comments from World Bank staff and Daniel-Alexander Schroth of the EU Delegation in Skopje. The author would like to thank them all.

B. Structure of Electricity Supply and Demand

5. **Over the past decade, supply has failed to keep up with demand, despite modest improvements in energy efficiency.** Between 2000 and 2008, consumption rose 34 percent (Figure 1 and Table 1) before decreasing by 12 percent in 2009 on the back of a collapse of (electricity-intensive) exports from heavy industry. Over the 2000–09 period, demand growth averaged 1.9 percent per year, below average real GDP growth of 2.7 percent, indicating a decrease in energy intensity of output. Over the same period, domestic supply actually decreased. The shortfall was met from imports, which cost an average of €95 million in the years 2003–09, and peaked at €235 million (3.6 percent of GDP) in 2008, adding substantially to the country’s current account deficit.



6. **Electricity demand is dominated by large industrial users and households, while supply is mainly from thermal and hydro generation.** The 10 largest industrial customers are mainly found in the metals and mining sectors, who accounted for some 25 percent of total electricity consumption in 2005–08. Households, meanwhile, consumed around 50 percent of total, while small industry and SMEs, transmission and technical losses, and electricity theft accounted for the remainder. The main domestic generation facilities, providing some 80 percent of domestic supply, are lignite-fired thermal power plants, owned

Table 1. FYR Macedonia: Electricity Consumption and Generation 2000-2010 (Gwh)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 5/
Demand											
Domestic consumption	6433	6283	6399	7216	7372	7955	8364	8581	8609	7597	7458
Large Industry	976	1198	1046	1531	1622	1937	2072	2281	2084	1284	1359
Households and SMEs	5246	4885	5170	5461	5571	5755	6062	6064	6251	6140	5913
of which: Technical Losses and Theft 1/ 2/	820	870	1053	1083	1199	1316					
Grid losses 3/	211	200	183	224	179	263	231	236	224	172	191
Exports	301	121	212	99	44	37	153	109	38	80	441
Supply											
Domestic supply	6326	5863	5619	6273	6208	6474	6568	6071	5764	6152	7241
ELEM 4/	5973	5807	5468	6273	6208	6474	6334	5651	5586	5973	7241
Negotino	353	56	150	0	0	0	234	421	119	178	0
Imports	355	540	1010	1053	1228	1651	1950	2618	2757	1518	776

source: MEPSO

1/ information not available beyond 2005

2/ technical losses refer to transmission losses on the low-voltage distribution network

3/ Grid losses refer to transmission losses on the high-voltage network

4/ ESM before 2006, when the company was split up into separate generation, transmission, and distribution companies.

5/ 2010 full-year estimate based on Jan-Jul data and 2009 monthly pattern

and operated by the state-owned ELEM. Hydroelectric power plant generated about 20 percent of domestic supply, with most facilities also owned and run by ELEM.

7. **Domestic generation capacity does not suffice to meet demand and falls short of EU environmental standards.** Domestic generation facilities do not suffice to match peak demand. The difference is made up by electricity imports, which averaged 20 percent of demand between 2000 and 2009, peaking at 32 percent in 2008. The main domestic thermal generation facility operates on lignite, a dirty fuel which emits CO₂, NO_x, and SO_x exceeding European norms (as laid out in the Large Combustion Plants Directive) several times over. Emissions (expressed in terms of total CO₂-equivalent) are 60 percent higher per unit of GDP than the OECD average.²

8. **In the medium to long-term, the authorities are planning to expand hydro generation capacity, and are also seeking to lower costs by improving regional interconnections.** According to the Strategy for Energy Development (MANU, 2010), renewables could contribute up to 4,600 GWh by 2030, 90 percent of which would come from hydro. While some of the proposed hydro projects would clearly be economically viable, others would depend on higher carbon prices or lower discount rates to become competitive with gas or lignite-fired thermal power plants. Less competitive projects could be justified to meet Macedonia's renewable energy target of 21 percent of total consumption by 2020 (in line with EU commitments). The government is also seeking to alleviate bottlenecks in the high-voltage transmission lines by building international interconnection capacity, which could reduce costs of imported power.

C. European Integration is Driving Electricity Reform

9. **Macedonia has committed to gradual adoption of the EU energy policy.** The goal of this policy is to secure reliable and affordable supply of energy for countries in Southeastern Europe, while safeguarding the environment. It was formalized in the Energy Community Treaty (ECT), which commits the signatories to implement the relevant EU acquis. In particular, they are to establish an integrated market in natural gas and electricity, including setting up a stable regional regulatory and market framework capable of attracting investment in transmission networks and generation capacity, and fostering competition and interconnectivity, thus ensuring supply and realizing economies of scale. A fixed time frame (2015) is set for the adoption of the acquis, and the implementation process is backed up by a dispute settlement procedure.

10. **Since signing the ECT, the authorities have advanced steadily towards meeting their commitments, and are currently remedying several remaining shortcomings.** On the institutional side, energy legislation was adopted in 2006, and amended in 2008. This created a liberalized market for the ten largest industrial electricity users, and provided the legal framework for the establishment and operation of the market regulator. However, on

² Source: IEA (2009), based on the amount of CO₂ emissions per unit of GDP, measured at purchasing power parity. Measured at market exchange rates, Macedonian emissions are 5 times as high as the OECD average.

the issues of market structure, cost reflectivity, and implementation deadlines, Macedonia has yet to conform fully with its treaty obligations (ECT, 2009). To remedy these shortcomings, the Ministry of Economy has prepared a new Energy Law. A preliminary analysis of the new proposed law, and discussions with the authorities, indicate that the law would bring Macedonia into compliance with most of its treaty obligations. Specifically, the legislative package will address the three outstanding issues of market structure (by addressing the monopoly position of ELEM), cost reflectivity (by clarifying provisions on accepted losses), and liberalization deadlines (by setting clear deadlines for liberalization of the SME and household markets). Furthermore, the energy law includes measures for social protection of vulnerable households in a liberalized market, by providing lump-sum heating subsidies.

D. Subsidies are Declining

11. **The current market structure implies substantial implicit subsidization of electricity supply for tariff customers.** First, the electricity price for tariff customers (all consumers except the 10 largest users who purchase on the liberalized market) is regulated at a level below the regional market price. Although the price is above the short-run marginal cost of generation, selling below the market price implies an opportunity cost. This market price is used to calculate implicit subsidies³. Second, whenever tariff customers' demand is larger than supply, ELEM imports power and sells it domestically at the regulated price, which is normally below the import price.

12. **These implicit subsidies are inefficient, and the authorities are committed to phasing them out.** By distorting incentives, electricity subsidies stimulate inefficient usage. As a social policy, electricity subsidies are wasteful, since most electricity is used by the richer households. In addition, keeping electricity tariffs below market clearing levels discourages domestic or foreign investment in the sector. Through the ECT, the government has committed to fully liberalize the market by 2015, implying a gradual phasing out of subsidies and rising end-user prices. At current tariff and market prices, this would require an almost 40 percent tariff increase over the next five years.

13. **The total amounts involved in these implicit subsidies are estimated at about 2.3 percent of GDP in 2009 and 0.7 percent of GDP in 2010 (Table 2).** These estimates are based on a regional market price of €63 and €46 per MWh respectively in 2009 and 2010, while the price at which ELEM sells its supply for tariff customers was equivalent to some

³ This paper uses the average regional market price at which Macedonia buys and sells electricity to calculate implicit subsidies. This methodology assumes the country could buy or sell large amounts to the regional market at this price. This assumption is an approximation, due to lack of liquidity and variation in prices across the demand cycle in the regional market.

€30 and €33 per MWh in 2009 and 2010 respectively.⁴ Out of this total subsidy, providing subsidized imports to customers costs some 0.2 percent of GDP or €12 million in 2009. This import subsidy shows up in state-owned ELEM's accounts as a loss and is cross-subsidized by other activities. The main contributing factors to the decrease in subsidies between 2009 and 2010 lie in the lower regional market price used to calculate subsidies and the increase in the regulated domestic electricity price. In addition, favorable hydrological conditions have enabled ELEM to generate significantly more hydro electricity in 2010 and hence cut imports. As rainfall reverts to historic averages, this could cause subsidies to increase again in the future, unless offset by price liberalization.

Table 2. FYR Macedonia: Subsidies and Losses in the Electricity Sector, 2008 - 2010

	Quantity (MWh)		Price (euro per MWh) 4/		Cost (percent of GDP)		
	2009	2010	2009	2010	2008	2009	2010
Pricing subsidies 1/	5,230,050	5,334,651	63-30-4 = 29	46-33-4 = 9	3.8	2.3	0.7
<i>of which: subsidized imports</i>	370,166	-	63-30 = 33	46-33 = 13	<i>n/a</i>	0.2	0.0
Excess distribution losses 2/	754,334	583,842	30	33	0.3	0.4	0.3
Collection shortfall 3/	784,507	533,465	30	33	0.6	0.4	0.3
Total Losses					4.7	3.1	1.3

Sources: ELEM, MEPSO, Domestic Regulation, and Staff Estimates

1/ The import price differential is applied to distribution consumers and excess distribution losses.

The import price is ELEM's 2009 average import price, which is assumed to be representative for the regional market.

2/ Assumes a 24, 20, and 18 percent distribution loss for for 2008, 2009, and 2010 respectively, and 11 percent distribution losses as the international standard (as per Regulatory Commission formula).

3/ Assuming EVN's collection rate improved from 75 percent in 2008 to 85 percent in 2009 and 90 percent in 2010.

4/ The regulated domestic price at which ELEM sells its production remained at €30/MWh in 2009 and increased to €33/MWh in 2010.

14. These implicit subsidies in 2009 and 2010 are considerably below estimated subsidies for 2008, due to structural reform and lower energy prices. In IMF (2009), total pricing subsidies were estimated at 3.8 percent of GDP in 2008, without distinguishing between the direct and indirect subsidies. Estimated subsidies in 2009–10 are lower for several reasons. First, as of September 2008, the government has obliged the ten largest electricity customers to secure their own supplies on the regional market at the regional market price (plus a transmission and service fee). Hence, subsidies to these large users have been eliminated. Second, the regional market price for electricity has come down considerably, from an average of €82 per MWh in 2008 to €46 in 2010. Third, tariff prices were raised 13 percent in late 2008 and 10 percent at the start of 2010.

15. In addition to these subsidies, there are further losses in the system, which, however, no longer accrue (indirectly) to the state. Since the privatization of the distribution network and its sale to EVN of Austria, the unrecognized distribution losses and the collection shortfalls accrue to EVN. These unrecognized distribution and

⁴ Calculation of the implicit subsidy takes account of the average transmission price of € 4 per MWh, which is included in the import price but should not be included when calculating the opportunity costs, as this revenue would not accrue to the generator, and hence should not be considered an opportunity cost. Assuming that the regional market price includes the full cost of generation, i.e., including the full cost of mining and depreciation, the cost estimates reflect the full implicit subsidy.

