UDC 336.71.078.3(497)

THE ASSESSMENT OF THE FINANCIAL SOUNDNESS OF THE BANKING SECTORS IN BALKAN COUNTRIES USING "EARLY WARNING INDICATORS" - A COMPARATIVE STUDY WITH POLICY IMPLICATIONS

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Abstract

This paper uses an early warning model that calculates the Probability of Distress of the banking sectors of seven Western Balkan countries. The application of the model on a country level has revealed that the riskiest country in Western Balkan is Montenegro whereas the healthiest one is Serbia. Albania, Kosovo and Macedonia are characterized by moderate risk levels. We recommend that the efforts of the supervisory authorities in each country should be focused on capitalization in the log run and on the profitability and managerial quality in the short run. The enhancement of the supervisory practices integration beyond the existing Memorandum of Understanding and the creation of a centralized dataset for Balkan banking institutions are recommended.

Keywords: *early warning system; banking sector assessment; supervisory framework.*
JEL classification: *G21, G01*

We acknowledge the support of the Center for Study of Global Governance - CsGG, London School of Economics through its Open Society Institute program that funded this project. Part of research presented in this paper has been conducted while visiting the CsGG in October-November 2009. Comments from the Center staff are gratefully recognized.
The data used in this study are taken from the publications of the Central and National Banks of respective Balkan countries as made available through their websites. Any mistake remains the author's responsibility.
"The problem is that supervisors have a general tendency to interfere too much when the banks are well run and intervene too less when the banks have problems."

Jean Claude Rochet.

Exactly when and how much should the supervisors be involved with supervising the banking system? Unfortunately this is not a straightforward question and cannot have a straightforward answer. It all depends on the stage of the banking sector development, the timing of the supervision activity and the interrelations that the supervisory, regulatory and other financial stability authorities have established among themselves in a certain financial environment.

The organization and functioning of the banking supervision, as many other areas of banking regulation has recently come under strict scrutiny after its failure to perform during the latest financial crises. How to identify a potentially distressed bank? Which are the pieces of information that could tell if and when a bank is under stress? What is the responsibility of the supervisory authorities when difficulties arise? What are the measures they have to undertake once a bank is ill-diagnosed? Can these measures alone prevent the crises or should they be combined with other measures in the market or macroeconomic dimension before the effects of contagion are not spread beyond the no-turning-back point? While the crisis is certainly still ongoing, the answer to these questions hopefully will not come too late for the supervisory authorities worldwide that are trying to redesign their practices and policies while expecting for guidance from their main international supervisory framework, the New Capital Accord, otherwise known as Basel Accord.

Employing a comparative study this paper attempts to address the issue of banking supervision in the Balkan countries during the financial crisis and the implications for possible enhancements. While these countries are moving toward full implementation of Basel II, being each of them in a different stage of adoption of this framework, the inconsistencies between the supervisory practices among these countries and between them and the supervisory practices of the home countries of their main foreign banks remain a source of potential risk shift and delegation. Assessing the financial soundness of banking sectors in the Balkan countries[10] through the Probability of Distress model presented in the study of Poghosyan and Cihak, (2009) we identify the main sources of risks for each country and propose that the attention and efforts of the supervisory authorities should be directed toward some specific pinpointed indicators. We also use the same model to calculate a probability of distress for the Balkan countries banking sectors in years 2007 and 2008. Based on the results of this comparative analysis, Montenegro seems to be riskiest banking sector while Serbia the healthiest. The same comparative analysis allows us to identify the weakest areas for each of the Balkan countries that logically represent the focal point of respective supervisory attention and efforts. We recommend also that an integrated approach should be undertaken by the supervisory authorities in the Balkan region, so as to ease the impact of the latest crises and to facilitate their integration in the European banking system.

The rest of this paper is organized as follows. In section one a review of the most important predictors that have emerged in the literature of the bank early warning systems is presented. In section two, we give an overview of the banking sectors in the Balkan countries with its most important features and developments. In section three, we present the results of the application of the Probability of Distress model of Poghosyan and Cihak, (2009) in the banking sectors in Balkan countries. In section four we conclude by outlining several policy implications for supervisory authorities in Balkans countries.

1. Literature review on early warning systems.

A lot of studies have been devoted to answer the question: which are the pieces that carry information about the likely future distress of a bank? Focusing usually on published and easily accessible information, the objective of these studies has been to identify which were those indicators that better than any other could distinguish a distressed bank from a sound one.

The potential benefits of establishing a pool of important bank distress predictors with associated thresholds and trigger points are numerous. Use by the supervisory authorities, credit ranking institutions, financial

10) The Balkan countries in the focus of this study are Albania, Bosnia, Croatia, Kosovo, Macedonia, Montenegro and Serbia. We have excluded from the study those Balkan countries that already have become part of the EU.

analysts and general public are just a few. The banking supervision authorities could use them to guide the allocation of limited supervision resources toward those institutions that meet the thresholds levels. In practice there are already a lot of supervisory authorities that have made use of these bank distress predictors (Federal Reserve in US would be an excellent example) and call them by the name "early warning systems". Financial analysts and credit ranking institutions could use them to assess the riskiness associated with each bank. Given the fact that these early warning systems are usually based on publicly available information, the general public could also use them, thus helping in the overseeing and disciplining of the banking market.[11)]

In the past literature the main streams of research with regard to early warning systems may be classified into two broad categories: (i) peer group analysis systems utilizing the financial ratios; and (ii) statistical models. The first category focuses on the financial ratios which if exceed or fall below a predetermined critical level entail that the performance of the underlying institution should be carefully examined. Furthermore a peer group analysis is carried out based on financial ratios to assess whether the performance of a certain institution is significantly different from that of its peers. With regard to the second stream of research, there are several statistical models that have been developed which mainly take the following forms: (a) rating estimation models, (b) failure or survival prediction models, and (c) expected loss models. While the first two classes of statistical models require extensive data to be applied, the third class could be applied even in those countries that do not have a rich history in banking institutions failures or that have had sporadic cases of banking failures.

In the existing studies on "early warning systems" three main categories of the indicators that predict the bank distress have emerged:

1. The standard ratios from financial statements which are often known as CAMEL variables (standing for Capital, Assets quality, Management, Earnings, Liquidity). These ratios are mainly used in the early warning systems employed by the supervisory authorities. Among the CAMEL indicators, the profitability, liquidity and solvency variable are helpful in the short-run while the asset quality variables are very important in the long-run (Poghosyan and Cihak, 2009). Sometimes researchers and practitioners even aggregate the CAMEL variables to form certain grading scores, but there is no clear agreement about the basis on which such an aggregation is made, and no consistency can be observed in their use in the literature. This ambiguity over the CAMEL variables application in practice has lead to the usage of other indicators to measure the bank distress.

2. Market variables observed in the capital markets such as stock and debt prices. Assuming efficiency in the financial markets one would not expect the market variables to add any value to the prediction of bank failure beyond that already contained in the CAMEL variables. Research has instead shown that market variables do enhance the predictive ability of the bank distress models, especially in the U.S markets, whereas in the non-US markets there is no clear conclusion about this, (Poghosyan and Cihak, 2009).

3. Measures of bank risk and financial strength such as deposit rates and rating agencies assessments. This third class is relatively rare but concerning the focus of this study it is especially of importance given that a study in Croatia in 2007 (Kraft and Galac, 2007) concluded that the deposit rates are informative concerning the bank failure.

One of the most obvious characteristics of the early warning models presented above is that they are based primarily on statistical quantitative analysis (peer group analysis is mostly used in practice from the supervisory authorities but not so much in academic research). Hence some rationally important qualitative factors in assessing soundness of a banking institution, such as management quality, internal control or bank

11) There is empirical evidence from the emerging or developing countries that in non-crisis time it is difficult for investors to distinguish between "good" and "bad" firms, bur during a crisis time they can do this, thus enforcing the market discipline tool of third pillar of Basel II. (cited from Jean Charles Rochet, 2008).

governance, fail to be included in these studies, implying low robustness levels for the models they generate.

Another feature of these studies is that most of them being empirical are characterized by dependency from the characteristics of the sample used to develop them and a high amortization rate over time. There is not reached any consensus yet about a commonly agreed set of early warning indicators that would be independent from sample inherent characteristics such as timing, territory, and categories of variables included.

As this is the case, not every model could be used to assess the soundness of the banking sectors in Balkan countries. Instead a model built upon a sample similar with the targeted country/ies in which it will be applied should be employed. The best approximation is the model developed by Poghosyan and Cihak, (2009) to calculate the Probability of Distress using the logistic regression technique. This model was generated based on data from the EU-25 countries for years 1996-2007 and is one of the few models that incorporates quantitative as well as qualitative indicators. Both the timing and the country of origin of observations in this model represent the best proximity for a comparative study of the Balkan countries in years 2007-2008.

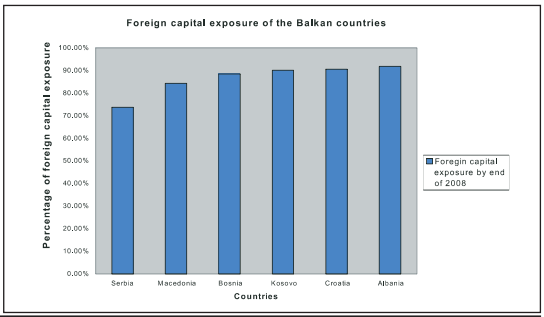
2. Overview of banking sectors in the Balkan countries.

One of the most obvious features of the Balkan countries when it comes to the financial sector is the banking institutions prevalence instead of financial markets dominance. This distinctive characteristic is mainly imposed by the economic development stage and by the structure of industrial sectors. As Lin et. al (World Bank WP, 2009) argue there should be a positive relation between the stage of economic development and the complexity of the financial systems; that is the most developed countries would benefit from market-based financial systems whereas the developing countries would fulfill their needs for capital by relying on a bank-based financial system. Thus, being mainly dominated by small and medium enterprises that cannot qualify to be listed in capital markets, the Balkan countries have been concentrated in the development of the banking sector to fuel credit in the economy. Another dimension of the financial system is the size of banks. Berger et, al (2005) argue that the large banks tend to concentrate their activities on large corporations thus structuring the market by a close matching between the bank size and its client size. This explains the non-presence of large universal banks in the Balkan region, where, as previously mentioned, the SME are dominant and crucial to the economic development. It is exactly the proper implementation of the desired banking structure that has allowed the economies in the Balkan countries to grow and develop by providing credit to the companies.

The banking system as it looks today began to be shaped after the 90s when the previously planned economies of the Balkan countries first reformed their financial systems by transforming the mono-level system into a two-level system.[12)] Then during late 90s and early 2000s, in what may be called their second stage of reform the Balkan countries began to open to foreign capital entry mainly through massive privatization programs. By the end of 2008, there are 150 banks in the region, with assets totaling 97 billion Euro, which in average represent more than 60 percent of their GDP. The banking sector in the Balkan countries is characterized by a high exposure to foreign capital. For the whole SEE region the foreign banks account for over 70 percent of total SEE bank assets. For the Balkan countries, this figure varies from minimally 73.7 percent in Serbia up to maximally 91.8 percent in Albania. Chart 1 shows the foreign capital exposure of Balkan countries.

12) Except for countries of the former Yugoslavia that used to have two-level banking system long before the start of the transition.

Chart 1:
Foreign capital exposure of Balkan banking sector as of end 2008.
No data available for Montenegro.



Foreign banks participation in the Balkan banking market has contributed remarkably to the development and growth during the transition period and if it wouldn't be for the latest financial crises none would have possibly considered any drawback of these foreign banks presence in the region. But it was exactly when the news and effects of the financial crises began to emerge that the banking sector in the region also felt the first waves of shock mainly through connections with the multinational banks present in the region. This was lagged in time though because it was only during the last quarter of 2008 that the banking sector in the Balkans began to experience the first symptoms of distress mainly in the form of public confidence decline, large deposit withdrawals and credit restrictions. As concluded in Sorsa, et al, (2009) the dependency upon a few large foreign banks is one of the biggest risks for the Balkan banks.

This phenomenon has a two-way effect. Not only is the Balkan banking system excessively exposed toward the foreign capital and vulnerable to distress in the banking systems of the home countries of its hosted banks,[13] but also a shock or failure in the Balkan banking system would contribute a lot of distress in those big multinational banks that have been exposed a lot in this region. For example according to EBRD estimations, the amount of bad debts in the region may mount up to 10 percent and sometimes 20 percent; only a 10 percent rate of failure of the banking system in eastern and central European countries would lead the entire Austrian financial sector to collapse, given that by the end of 2008 the exposure of Austria toward the CEE countries banking sector was approximately 74.8 percent of its GDP (this comment is made by Der Standard, an Austrian periodic paper). On the other side the Balkan countries have also a high level of dependency upon Austria, like Bosnia and Croatia, where 60% of the foreign capital present in the sector is due to Austria. This two-way exposure represents risks for both home and host countries of the banks. Greece and Italy also have high exposure levels in Balkans.

The supervision of the banking sectors in the Western Balkan countries is performed mainly by the respective Central banks. Such is the case of Albania, Croatia, Kosovo, Macedonia, Montenegro and Serbia. The only exception is Bosnia & Herzegovina where the responsibility for banking supervision is with the Entity Banking Agency of Supervision, an independent body that cooperates closely with the Central Bank of Bosnia & Herzegovina.

All the Balkan countries are currently moving toward full compliancy with Basel II requirements regarding its three pillars, namely the credit risk measurement, supervision regulation and market discipline mechanisms. The majority of these countries are already applying the standard method of calculating the required capital adequacy ratio (pillar one). They are also gradually moving toward adoption of a risk-based regulatory framework, thus abolishing the old rules-based frameworks. Almost all the countries are also expanding their legal frameworks so as to converge their legislation with the European banking legislation. The most common supervision instruments employed by the supervisory authorities are: (1) detailed on site

13) Sorsa et al, 2009, argue that the regional concentration of foreign banks in the SEE region increases the contagion risks coming by the concentration of a few large banking groups raises the currency risk and increases the likelihood that the foreign banks during periods of shock will decrease lending more in their subsidiaries than in their home countries.

supervision of operations, procedures and IT systems; (2) off-site analysis based on financial statements indicators (basically the CAMEL indicators) as well as on market risk and bank management quality; (3) pre-defined risk matrices (the approach of the Central Bank of Republic of Macedonia) which are used as banks ranking devices after determining the risk exposure level for each of them. As far as we are concerned none of the supervisory authorities in the Balkan countries employ any statistical or other quantitative method to determine the extension of the supervising procedures for specific banking institutions.

In general the banking supervision quality of the emerging European countries (including the Balkans) is considered high (Sirtaine and Skamnelos, 2007). This is probably because of the more stringent rules which are sometimes criticized but that have ultimately paid off exactly during the financial crises.

We observe that even though the banking market in the Balkan countries is a highly integrated and interconnected one, the supervisory authorities still undertake separate and distinct supervision procedures which are not an effective approach to control for the risks emerging in this sector. A Memorandum of Understanding has been signed by almost all the central banks of the countries in the Balkans since 2007 aiming to overcome the weaknesses from this limited approach to supervision that does not guarantee that risks are correctly assessed especially when concerning foreign banks that are hosting in the Balkan countries. This M.o.U was initiated by Greece, which has a high banking presence in the Balkans.[14)]

The M.o.U has promoted a higher level of movement and cooperation between supervision authorities, with bilateral or multilateral meetings, workshops and conferences where the involved parties discuss and exchange information, methodologies and even supervision schedules. Nevertheless this effort, as much being good, does not yield the desired results because it does not enforce or oblige the creation of a centralized center of data which would be available for all the parties involved to draw information from. Maybe a unified and centralized database across the region and an integrative approach to analyze bank at risk at a cross-border level would perform better than a non-binding M.o.U. A similar idea can be that of having a centralized regulator for all EU which could be ECB or any other institution, which would replace the individual national regulators. This would facilitate the regulation and supervision enhancing their quality and on the other hand would help the cross-border banks to have a more efficient capital allocation thus increasing their value.[15)]

3. Assessment of financial soundness of the Balkan banking sectors through a Probability of Distress model.

Instead of performing a comparative analysis of the banking sectors in Balkans based on certain unrelated indicators we have chosen to apply a model which combines several CAMEL variables and other ratios into one meaningful score, a Probability of Distress. This model was introduced in the study by Poghosyan and Cihak, in 2009 and represents one of the most comprehensive statistical studies in the field of early warning systems. Applying a unified model to appraise the banking systems in the Balkan countries on top of the methodologies that the supervisory authorities are currently employing in this region is justified at least under two arguments. First, the one methodology extensively used by supervisors to test their respective banking systems, the stress-testing models, have been subject to large criticisms recently; and second, the on-site or off-site supervision procedures employed for different banks at different countries vary substantially and do not offer the desired comparability.

With regard to the first argument: the supervisory authorities in the Balkan countries have more or less all started to apply the stress-testing models either during 2008 or 2009, after the crises breakout. The results generally reported by these stress tests were satisfying being proof of having healthy banking systems in

14) It is estimated that Greek banks position in the CEE region mounts up to 22 percent of Greek GDP.

15) According to a study by UniCredit Group, 2009, it was exactly the inadequate regulatory oversight one of the contributory factors in the lower market valuation of cross border banking groups during the latest crisis.

place. But we argue that the application of the stress-testing methodology alone is not enough to appraise the stability of the banking institution. These models were especially criticized (Haldane, 2009) at most, because right in the middle of the ongoing crises they failed to capture the full density of problems that the banks in the Western world[16] were undergoing. This is why analysts argue that the current even most-elaborated stress-testing methodologies suffer from being both very precise and very wrong thus violating one of the Keynes' test - which is 'better to be roughly right than precisely wrong'. Hence after 2008, the authorities in the developed countries are trying to revise the stress-testing methods so as they could better identify the ailing banks. The failure of the stress-testing on those big institutions that "invented" them in the first place raises serious concerns about the reliability of their results when applied in the developing countries. The void that stress tests leave behind justifies the use of an early warning model.

Turning upon the second argument the supervision approach and the measures that the supervisory authorities are taking toward the weak banks represent major differences in each different country in the Balkans. While this can be an acceptable treatment for those small banks that operate locally, it is not considered such for the cross-border big banks which are increasingly extending their presence in the Balkans. Under these circumstances, applying the same model to identify banks weaknesses and to initiate corrective measures toward these cross-border banks would contribute to greater comparability and efficiency. This would also prevent the dangerous flows of capital toward the weakest supervisory environments. Currently there is no supervisory authority in Balkans that is using any quantitative technique to identify the distressed institutions, unlike central banks in USA, UK, France or Italy have employed such models for a long time now.

Considering it crucially important to offer an analysis built upon the same foundation that encompasses all the banking sectors in the Balkans regardless their macroeconomic or financial differences, we propose and apply a statistical model which takes into account a vast pool of quantitative as well as qualitative variables. The model will be applied for the aggregate and consolidated data of the banking sector in each individual Balkan country thus trying to measure the financial soundness of each banking sector as a whole. Even though the Poghosyan and Cihak model was initially generated on a bank institution level and in a different region, applying its results in a country level for the Balkan region has at least two grounds:

(i) Almost all the banking systems in Balkans (except Serbia) are characterized by significant asset concentration levels. This means that dominance by some certain banking institutions is observed inside these countries and the aggregate figures of the banking sector are most likely representative of few several big banks that dominate in each respective country. On the other hand, the level of integration inside the banking sector is considerably higher than the level of integration inside all other economic sectors, (mostly due to inter-bank loans), thus justifying the use of consolidated figures in a country banking sector level.

(ii) The model of Poghosyan and Cihak was based on data observed from European Union banks in years 1996-2007, some of which, as mentioned in detail in section two above, have a strong presence and exposure in the Balkan countries (IntesaSanPaolo Bank, Italy; Raifeissen Bank, Austria; Alpha Bank, Greece just to mention a few of them). Except these specific large banks, in general the level of foreign exposure in Balkans is particularly high, mainly toward EU banking groups. This implies that the banks operating in the Balkans region are indirectly included in the model generation itself by being branches or subsidiaries of big multinational European banks thus justifying its application in the Balkans.

Poghosyan and Cihak, (2009) used the logistic regression technique to derive a function which would measure the Probability of Distress of a banking institution. This model was generated based on a unique dataset of distressed and non-distressed banks (in total 5708 banks and 29862 observations) from the EU-25 countries for years 1996-2007. They derived several logit estimation results that confirmed the robustness of the baseline model. Below we are presenting their VII estimation result which includes the indicator of the market concentration.

16) For instance while Goldman Sacks in U.S was experiencing extreme shocks of its market value back in 2007, the model generated by the stress-testing methodology would regard the actual market conditions as likely to happen only once in 6 x 10124 lives of the universe. Obviously this was happening in reality and it wasn't for one day only but several in a row!

$$\log \frac{PD}{1-PD} = - 5.709^{***} - 28.551\, X_1^{**} + 18.950\, X_2^{**} - 0.107\, X_3 - 2.377\, X_4^{***} - 0.246\, X_5 + 4.649\, X_6^{***} + 5.136\, X_7^{**} + 5.956\, X_8^{***}$$

** and *** in the function above indicate statistical significance at 5 and 1 percent levels, respectively

Where:

PD represents the Probability of Distress dependant upon several variables.

X_1 represents the level of capitalization of a bank measured by the ratio Total Equity / Total Assets. Even though the coefficients in the logit function are not linearly related to the dependant variable, their sign is important to understand the impact of a certain independent variable. The negative sign of the capitalization variable means that capitalization and probability of distress have a negative relation - the higher capitalized banks generally have lower probability of distress.

X_2 represents the quality of bank assets measured by Loan Loss Provisions / Total Loans ratio. This ratio is a proxy for the quality of bank assets and its positive sign means that the higher this ratio is the higher the probability of distress will be. Notice that a high X_2 ratio namely implies non-quality of assets rather than quality, given its form Loan Loss Provision / Total Loans.

X_3 is a proxy for the managerial quality/non-quality which is measured by Total Costs / Total Income ratio with lower values assuming to suggest better managerial quality. Actually it has a negative sign which proves the opposite, but nevertheless this variable, along with the liquidity measure, X_5, were not statistically significant in the model.

X_4 measures bank profitability through Profit before Taxes / Total Equity ratio. Its negative sign implies that the more profitable banks are less likely to experience distress.

X_5 measures bank liquidity through Liquid Assets / Total Assets ratio and having a negative sign it means that the higher the level of a bank's liquidity the less probable it is for this bank to be subject to distress.

X_6 measures market discipline through Interest Expenses / Deposits ratio. The positive sign of this variable is in accordance with other previous studies (Kraft and Galac, 2007), implying that the more a bank raises its deposit rates, thus increasing its interest expenses, the more likely it is that it is experiencing distress. Another way of interpreting this ratio would be that a certain investor would require higher returns for a deposit in a distressed bank compared to a deposit in a non-distressed bank, hence its name "market discipline".

X_7 represents the Herfindahl index measured on banking sector assets. This indicator captures the market concentration level. Based on previous literature findings (Boyd et. al, 2005), a positive relationship is expected between the Herfindahl index and the banking risk, and what is materialized with the positive sign of the coefficient this variable takes in the model.

X_8 is a contagion dummy which is equal to 1 for a bank if there was a failure in another similar bank in its region and 0 if there is no distress in the banking sector as a whole. This variable tries to capture the spill-over effects in a market and its positive sign implies that a bank is inclined to experience distress if another bank in its environment has recently failed.

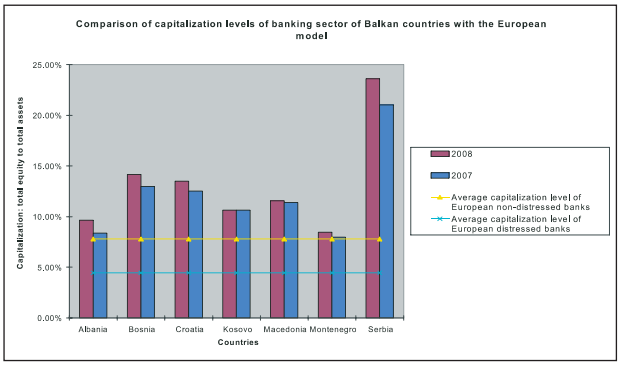
We may notice that the logit function of Poghosyan and Cihak, (2009) model does not include only traditional CAMEL ratios. Insertion of variables that measure the market discipline and spill-over effects has proven valuable because these two (along with the profitability variable) are the most important variables in the model (statistically significant at 1 percent level). Also the inclusion of the Herfindahl index that measures the market concentration is proven to be statistically important at 5 percent level. Poghosyan and Cihak, (2009) report that the inclusion in the model of the Herfindahl index has made the impact of the macroeco-

nomic variables insignificant, thus allowing performing a comparative analysis between the countries despite their macroeconomic differences, which nonetheless are quite minor.

The data used in this analysis is obtained from the official websites of the national and central banks of the respective Western Balkans countries. With a few exceptions these websites provide the consolidated financial statements and other consolidated information of their banking sectors. If otherwise, we have calculated the data by combining information published in the supervisory reports of respective supervisory authorities of each country.

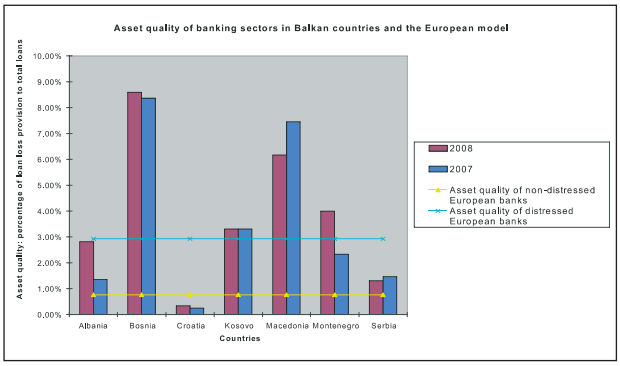
On the first stage of our comparative analysis we focus on the variation of each separate variable among the Balkan banking sectors using as extreme thresholds respectively the average values that this variable takes for the non-distressed European banks group and for the distressed group as reported in Poghosyan and Cihak, (2009). By comparing the performance of the Balkan countries with the average value of each group of European banks we aim to draw the supervisors' attention toward the specific vulnerability that each country represents.

Chart 2:
Comparison of capitalization levels of banking sectors in Balkan countries with those of the European model.



We find that the all the Balkan banking sectors are highly capitalized (chart 2) with all countries above the average value of the European sample where Serbia is the leading country with a value of above 20% while Montenegro slightly surpasses the level of non-distressed European banks but still remains the least capitalized banking sector in Balkan. High level of capitalization in the Balkan countries could be explained by the higher minimum capital levels than those specified in the Basel Accord required by the central banks of each country (most likely to compensate for the poor quality of the internal bank governance). Another point worth to mention is that each country shows an increasing trend of capitalization ratio from 2007 to 2008, reflecting their prompt response to the global crises as a movement toward capital reinforcement.

Chart 3:
Comparison of asset quality of banking sectors in Balkan countries with that of the European distressed and non-distressed banks groups.

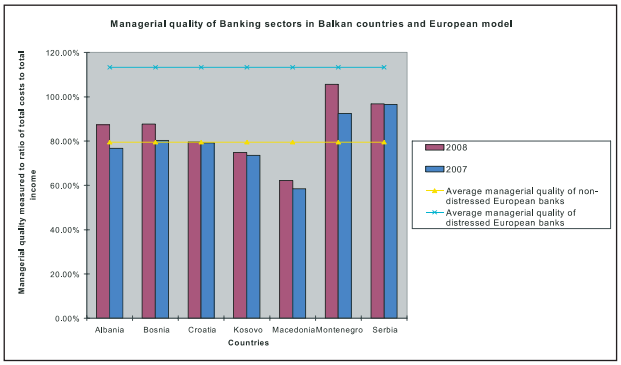


Asset quality is measured by Loan loss provision to Total Loans ratio. The higher it is the less qualitative the banking sector assets are. We may notice in chart 3 that except Macedonia and Serbia, all the other

countries[17] are characterized by an increase in this ratio from 2007 to 2008. The worst performing country with regard to assets quality is Bosnia followed by Macedonia. Their levels of asset quality/non-quality are more than double the average value of distressed European banks. The best performing country is Croatia, followed by Serbia, with satisfying levels, which in case of Croatia is even lower than the average value of non-distressed European banks.

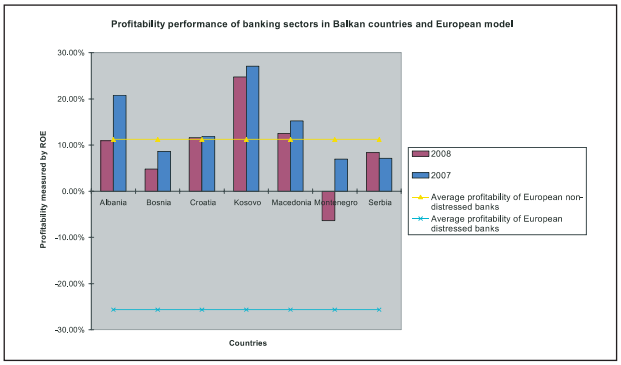
Managerial quality/non-quality variable is characterized by an increasing trend for all the Balkan countries (look chart 4), thus implying that the total costs of all the banks during 2008 were higher in proportion to total income compared to previous year. Only Macedonia and Kosovo maintain for both years a lower level than the average value of non-distressed European banks, showing superior performance, whereas other countries fall somewhere within the range of average values of two groups. The worst performers regarding this variable are Montenegro and Serbia, but as the latter shows a consistency of the ratio in two year-frame, the first one is characterized by a considerable increase of the ratio.

Chart 4:
Comparison of managerial quality of banking sectors in Balkan countries with that of the European distressed and non-distressed banks groups.



Regarding the profitability of the banking sector (chart 5), all the countries show a decrease in profits, with Montenegro being the only one to have recorded aggregate net losses for 2008. Nevertheless, it remains high enough from the lower threshold, which is the average profitability of distressed European banks. Kosovo seems to be the most profitable banking sector in the region with a level as much as double the non-distressed European banks. Bosnia also seems to be particularly on the verge of breaking even. Recalling that profitability is one of the most important variables in this model, Montenegro, Bosnia and Serbia seem to be especially vulnerable sectors.

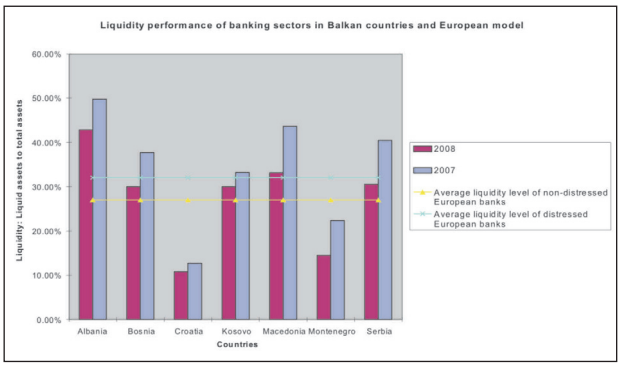
Chart 5:
Comparison of profitability of banking sectors in Balkan countries with the average profitability level of the European distressed and non-distressed banks groups.



17) We could not obtain data about the Loan loss provision in case of Kosovo, so we used the percentage of non-performing loans to total loans as a proxy for asset quality ratio. This approximate estimation was made to attempt the calculation of Probability of Distress for Kosovo. This should be kept in mind while discussing about the PD of Kosovo banking sector in comparison with the other countries.

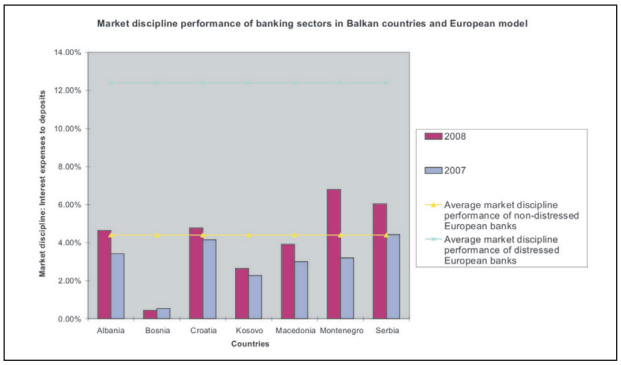
Liquidity on the other hand demonstrates a much wider variation among countries exceeding both thresholds of non-distressed and distressed bank in Europe (chart 6). Liquidity levels have decreased for all countries, despite the efforts of the central banks to impose stricter requirements. Albania remains the most liquid country, while Croatia and Montenegro show troublesome low liquidity levels in both years, far below their peer countries and the average value of non-distressed European countries. However, we have to keep in mind that this variable is statistically insignificant in the ultimate Probability of Distress indicator.

Chart 6:
Comparison of liquidity performance of banking sectors in Balkan countries with that of the European distressed and non-distressed banks groups.



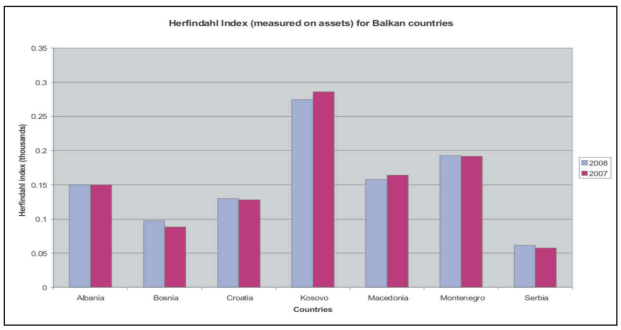
Market discipline (chart 7) represents an indicator where almost all the Balkan countries excel by having most of them lower levels than the non-distressed European banks. Nevertheless, during 2008, this ratio has increased for all countries, except for Bosnia, but still remaining far from the level of non-distressed banks in Europe.

Chart 7:
Comparison of market discipline indicator of banking sectors in Balkan countries with that of the European distressed and non-distressed banks groups.



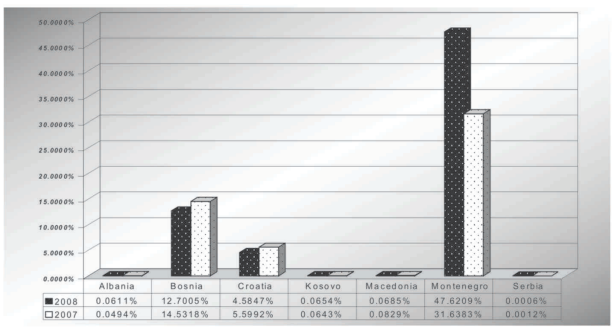
The Herfindahl index (chart 8) that captures information regarding the banking market concentration varies from 0.06 in case of Serbia up to 0.28 in case of Kosovo. The higher this ratio the more risky the banking sector appears. Usually a level between 0.10 to 0.18 is considered to show a moderate level of concentration, with levels below 0.10 considered to show non-concentration, and levels in excess of 0.18 considered to show dangerous high concentration of assets in a certain banking sector. Under the consideration of the Herfindahl index, the riskiest country is Kosovo because it exceeds the acceptable levels while the other countries are positioned inside the moderate-concentration zone. Serbia may be the only country where the banking sector is characterized by complete non-concentration.

Chart 8:
Comparison of Herfindahl index of market concentration among the banking sectors in Balkan countries.



Regarding the contagion dummy, we have applied the model under two different assumptions. The first assumption was to put a value of 1 for Bosnia, Croatia and Montenegro and 0 for the other countries. This distinction among the countries was based in other previous studies that have reported banking crises, namely for Bosnia (Cihak and Schaek, 2007) and for Croatia (Kraft and Galac, 2007), whereas Montenegro has received a value 1 for its contagion dummy due to its current situation in the banking sector where there is at least one bank in bankruptcy proceeding. Even though this certain bank has not declared bankruptcy during the timeframe that we focus in our study for the Balkans (2007-2008), this choice is consistent with the methodology followed in the model of Poghosyan and Cihak, (2009). In the second assessment we assume that none of the countries has experienced distress before or that these failures have not yield their impact in years 2007 or 2008. Thus in the second attempt we try to position each country on a same level before calculating the respective Probabilities of Distress.

Chart 9:
Overview of Probability of Distress for the banking sectors in the Balkan countries. Assumption 1: Bosnia, Croatia and Montenegro are considered to be affected by the crises and are given a value of "1" for the contagion dummy; other countries are given a "0" value.

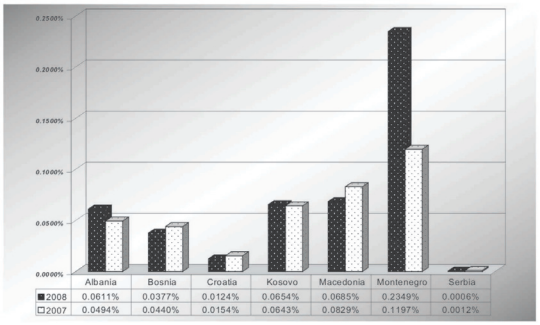


After having compared each Balkan country trend over 2007 and 2008 among them as well as with the two European banking groups we calculate the Probability of Distress indicator under the two different contagion dummy assumptions explained above. For the first assumption (Bosnia, Croatia and Montenegro, under contagion effects from within the banking sector), the results are given in chart 9. Based on the PD value, Montenegro, Bosnia and Croatia appear to be the most vulnerable banking sectors in the region showing as high a value as 48 percent probability of distress (Montenegro in 2008). Serbia emerges as the healthiest banking sector probably due to its superior performance in capitalization level and asset quality.

As we said we recalculate the probability of distress of each country by dropping the assumption of the contagion dummy to check whether Bosnia, Croatia and Montenegro are indeed the most distressed banking sectors in the region or this is instead only the impact of the contagion dummy. Putting all the countries in the same level and not discriminating by the contagion dummy choice that we made, we still find Montenegro (chart 10), to perform persistently worse than its peers, even though with a considerably lower PD of only 23 percent in 2008 compared to 48 percent under the first assumption. One of the differences is that the results of PD for Croatia and Bosnia are much lower than under the first assumption and even better than that of other countries like Albania, Kosovo and Macedonia. Three countries, Macedonia, Kosovo

and Albania, show moderate risk levels. The country with the lowest level of Probability of Distress is Serbia under both assumptions.

Chart 10:
Overview of Probability of Distress for the banking sectors in the Balkan countries. Assumption 2: all the countries are assumed to be not-affected by the crises, thus having all a value of 0 for the contagion dummy.



4. Main findings and the resulting implications for the supervisory bodies.

In this study we have adopted a Probability of Distress model to make a comparative study among the Balkan banking sectors putting them in the context of the average performance of distressed and non-distressed European banks. This model makes use of five different CAMEL ratios, which are mainly drawn from the financial statements as well as of three other variables that try to capture other-than-financial important information such as the market discipline, market concentration and contagion effects. The model is based on the Poghosyan and Cihak, (2009) study and is applied for seven Balkan countries, (Albania, Bosnia, Croatia, Kosovo, Macedonia, Montenegro and Serbia), in years 2007-2008.

We calculate the Probability of Distress under two different assumptions: (1) previous crises in Bosnia, Croatia and Montenegro, and; (2) all the countries assumed free of impact of any previous crises. We consistently find Montenegro, under both assumptions, as the riskiest country in the region, with regard to its banking sector, whereas Serbia emerges as the healthiest banking sector. Albania, Kosovo and Macedonia also show several vulnerabilities in their individual variables of the model that when combined together results in moderately high levels of PD. Bosnia and Croatia show reasonable levels of banking sector soundness only if they are considered not to be effected by their prior crises (as reported in Cihak and Schaek, 2007; and Kraft and Galac, 2007).

In the light of this study there are several implications that arise for roles and actions that the supervisory authorities in respective countries may consider.

First, recalling that not all the variables in the model are equally significant in the PD we propose that the supervisory authorities should redirect their focus toward the most sensible factors. Devoting more attention and supervision resources to such areas as capitalization, deposits interest rates in the long run, and to areas such as profitability, liquidity and managerial quality in the short run is perfectly consistent with the findings of this study. Moreover the supervisory authorities may assign threshold values to each of the variables so as when a bank exceeds a certain minimum or maximum that will represent a trigger point calling for specific pre-defined actions within a carefully structured supervision procedure platform. Average or historic values from the region or from the country may constitute such thresholds values. Consequently, this enhanced regulatory framework based on specific triggers would lead the supervisory authorities toward a systematic revision of the risky banks, and risky areas of certain banks providing a better allocation of supervisory resources.

To elaborate more on the specific risk dimensions of each individual country, we recommend that the supervisory authorities should in this time period focus on:

(i) regarding the CAMEL indicators: (a) monitoring the capitalization ratio levels, which is satisfactory for the Balkan countries in 2007 and 2008, but should be kept under strict follow up; (b) taking actions with

respect to the asset quality ratio, particularly the supervisory authorities of Bosnia, Macedonia and Montenegro, because the average level for the above mentioned countries has far exceeded the average value for the European distressed banks suggesting that there are certain banks representing a very high risk of failure to cover the loan losses with the actual provisions that they are accumulating; (c) the profitability ratio, especially the supervisory authorities in Montenegro and Bosnia, where the value of this ratio is far below the average value of the non-distressed European banks thus implying that certain banks in these sectors are experiencing huge losses that may affect them as well as other banks in the region.

(ii) regarding other variables: (1) deposit rates of the banks especially in Montenegro, Serbia and Albania that have shown tendency to increase these rates from 2007 to 2008 thus reflecting an inside need for attracting liquidity, which in turn may imply for distressed banks; (2) the banking sector concentration level, especially in case of Kosovo but also Montenegro.

Secondly, as the contagion dummy proves to be extremely important in calculating the Probability of Distress of a country (recall that putting all the countries in an equal base, changed almost completely their ranking with respect of PD), even a single bank failure can cause much turmoil in the whole banking sector of a specific country, and across Balkans, given the high level of interconnectedness and exposure that is present. Therefore, the supervisory bodies of Balkan countries should consider undertaking integrated approaches to tackle the risks of the banking systems. Given the high reliance upon the foreign capital, each supervisory authority should assess the main sources of foreign dependency and try to establish common or similar supervisory procedures so as to avoid the delegation of risks from the home country to the host country or vice-versa. A high level of cooperation should also be established among the Balkan countries supervisory bodies themselves. Given the similarities of the overall financial and banking regimes as well as the high level of integration and spread of the banking groups across this region we recommend that a common approach to supervision practices would be beneficial for all the countries, especially for the youngest (Kosovo and Montenegro) that might lack the necessary expertise and experience.

Acknowledging the importance of the common Memorandum of Understanding initiated by Greece and signed by almost all the Balkan countries, we still insist that this only is not enough to guarantee the desired level of cooperation, especially in the light of the common aspiration of the Balkan countries - the EU integration. For this reason we recommend that the Balkan banking supervisory authorities should aim toward a deeper coordinated approach of the banking regulation integration among themselves and with strategic EU countries. This action would be in line with what has been lately proposed for the EU supervisory framework itself in the De Larosiere Report, (2009). Coordinated supervision in the Balkans is also beneficial to the banks because it will allow them to allocate the capital in a more efficient manner.

We also recommend that by creating a unified database for the Balkan banks the supervisory authorities in this region would benefit from using the quantitative and qualitative information to model the behavior of the banks. The availability and usability of this centralized information could also help to identify in due time the ailing banks and to coordinate a common supervisory approach especially in cases where it is a cross-border bank that is experiencing difficulties.

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