Financial Stability Map in Kosovo

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Abstract

Systemic monitoring of financial stability is one of the key functions of central banks. Its importance has increased especially after the 2008 financial crises, due to the increased complexity of the sector and the severe effects of the financial crises in the real sector. This working paper develops a ‘cobweb model’ of financial stability for Kosovo, as an additional analytic tool for monitoring and assessing risks to financial stability. The aim of the cobweb model, hereafter referred to as the Financial Stability Map (FSM), is to communicate in a simple and graphical manner the main external and internal risk sources to financial stability and their change over certain time periods. The main contribution of FSM stands at enabling the simultaneous analysis of different aspects of risks and vulnerabilities to financial stability, while also ensuring an overall comprehensive risk assessment. The FSM for Kosovo measures risk across eight dimensions, each of which is composed of a set of quantitative sub-indicators complemented by expert judgment. The main results suggest a declining trend of the overall risk to the banking sector in Kosovo, driven mainly by the good capitalization position and profitability of the sector, structural improvements, and more favorable external macroeconomic conditions.

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Key words: financial stability, banking sector, banking sector risk assessment, financial stability map, Kosovo.

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2 The views expressed in this paper are those of the authors and do not necessarily reflect views of the Central Bank of the Republic of Kosovo.

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I. Introduction

Systemic monitoring of financial stability is one of the key functions of central banks, whose importance has increased especially after the 2008 financial crises, due to the increasing complexity of the financial sector and the effects of the financial crises in the economy. Almost all central banks continuously monitor risks to financial stability and publish different periodic reports on these developments.

Various qualitative and quantitative approaches and methods were used by banks to assess risks and vulnerabilities to financial stability. In 2007, the International Monetary Fund (IMF) developed a new assessment tool which was motivated primarily by the increased focus on global level concerning financial stability risks. The focus on financial stability increased as a consequence of the increasing complexity of underlying factors that contribute to instability, the severe consequences of instability in economic activity, and lack of appropriate methods for monitoring these risks (Dattels et al., 2010). The Global Financial Stability Map model was developed as a tool to communicate the risks and conditions that have an impact on global financial stability in a graphical manner. The range of risks analyzed is broad, including interrelated sectors and markets. The IMF's Global Financial Stability Map has the advantage of being flexible, thus enabling the extension to different sectors and risk dimensions. The model can easily be adapted to country-specific circumstances to assess risks on state level. Many countries have already developed their own Financial Stability Map models (FSM), placing it among key instruments for assessing risks and conditions to financial stability and communicating them to the public. The model of Financial Stability Map for Kosovo, which is presented in this paper, has been developed based on the base model of the IMF, driving also from the experiences and methodologies used by other central banks.

The paper is structured in seven sections: Section II provides a literature review of models used to assess financial stability and the rationale for developing the Financial Stability Map. Section III elaborates on the methodology used to develop FSM in Kosovo. Section IV explains the indicators and sub-indicators of FSM. Section V discusses the performance of indicators in signaling risk. Section VI presents the FSM cobweb diagram covering the latest periods and those of global financial crises. Section VII provides concluding remarks and emphasizes the limitations and recommendations for future work.

3 Central Bank of New Zealand (Bedford and Bloor, 2009); Bank of Norway (Dahl et al., 2011); Bank of Albania (Saçe et al., 2015); Bank of Latvia (Lieliškāne and Sinenko, 2015).
II. Literature Review

The assessment of financial stability is a challenging process due to the complexity of interactions of different elements of financial sector among one another and with other external elements of the real economy. The experience of many countries of the world has proved the complexity of these interactions, and has emphasized the importance of monitoring and assessing systemic risks to financial stability due to the negative consequences which can be transmitted from the financial sector to the real economy and vice versa.

For over two decades, academics and researchers from central banks of different countries have worked in developing various quantitative methods and indicators that present the risks and conditions to financial stability through various quantitative indicators, alongside with the narrative assessment of different risk factors. Among the earliest methods are those which have assessed special segments of the financial sector, based on balance sheet and income statement data of financial institutions. Financial Soundness Indicators (FSI), developed by the IMF in 2001, belong to this category of methods. The FSI's include 40 indicators that aim to assess the financial sector soundness of a given country through assessment of sustainability of its financial institutions, enterprise and household sector. Despite of being very popular to date for assessing the developments of the sector, the FSI's in general are not considered to be sufficient and comprehensive in assessing financial stability, primarily because of the large number of indicators that often give contradicting signals, and also due to the lack of thresholds against which to assess risk levels (Lielkalne and Sinenko, 2015; Dahl et al., 2011).

Financial stress assessment for certain financial market segments was performed also through the so-called methods of Early Warning Systems. Through econometric specifications, various variables were used in numerous studies, classified as early-warning indicators, to forecast bank crises, currency crises or debt crises. Goldstein, Kaminsky and Reinhart (2000) developed the early warning system for currency and bank crises for emerging economies. The role of various indicators in warning crisis was tested in other studies, where loan growth trend and asset prices resulted to best perform in warning the accumulation of risks for financial sectors of certain countries (Borio and Drehman, 2009; Rüiser, 2012). Models of early-warning indicators were also applied by the private sector, which used these systems to monitor the risk of sharp changes in asset and real estate prices (Dattels et al., 2010). Despite the contribution given by these methods in warning about risks to financial stability, Dattels et al. (2010) argue that their contribution is limited in signaling crises for a number of reasons: they simplify the problem by focusing only on specific individual segments and give limited information because they often focus on indicators which tend to lag crises.

In recent years, especially after the latest financial crises, the importance of macro-prudential supervision approach for monitoring and assessing financial stability has increased. Macro-prudential supervision is being considered as an effective policy in supplementing micro-prudential supervision approach. This development paved the way for changes in methods for financial stability assessment, whereby the trend moved from methods concentrated on individual aspects of the system and risk of failure of individual institutions, towards more comprehensive methods of system-wide risk assessment. These methods include the risk assessment of financial markets, financial institutions and infrastructure, the assessment of the dynamics of the behavior of different factors, the risk of gradual accumulation of risks in various

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4 The official website of International Monetary Fund: www.imf.org
fragile aspects of the sector, and various shock transmitting mechanisms (Gadanecz and Jayaram, 2009).

Most of the analyses of the financial sector focus on assessing and monitoring the key macroeconomic variables, developments in sectors to which the financial sector is highly exposed and financial sustainability indicators, which according to both economic literature and financial experience reflect the main sources of risks and vulnerabilities of the financial sector. These analyses are rather descriptive in nature and focus on past developments, reducing the effectiveness of financial stability risks communication and comparability with previous periods.

Quantitative methods which are broadly used in assessing financial sector risks and sustainability include sensitivity analysis to negative shocks and adverse scenarios of different sectors and markets, and the shock transmitting effect to the banking sector (stress tests) and vice versa from the banking sector to other sectors of the economy. Models assessing the systemic importance of financial institutions, and behavioral estimation models of financial sector variables have become integral part of financial stability assessment process (Worrell, 2004).

Consistent attempts have been made in developing aggregate quantitative measures that encompass a broader view of financial stability risks. According to Gadanez and Jayaram (2009), aggregate measures of financial stability assessment are attractive for policymakers and other stakeholders for the following reasons: a) they enable easier monitoring of financial stability risks, b) make it possible to assess and predict the sources of financial stability stress, and c) enable easier and more effective communication of risk factors and their implication.

Among the most common composite quantitative measures are financial stability indices. These indices in general aim at encompassing a broader aspect of financial stability and at the same time reflect the risk to the financial stability in a summarized and measurable manner. Earlier examples of financial stability indices include: An Index of financial stress for Canada by Illing and Liu (2003), which encompasses the developments in the banking sector, stock exchanges, and in debt and capital markets; An index of financial stress for the banking sector of Switzerland by Hanschel and Monnin (2005) which draws from banks’ financial statements data, interbank market and banking supervision data; A financial stability index for the Netherlands and six other OECD countries by Van den End (2006), which includes financial market indicators and macroeconomic variables, and compares them with predetermined instability thresholds; An index of banking risk for Norway by Andersen (2008), which is constructed by banks’ financial statements data only. International Monetary Fund has developed several financial stress indices which combine banking sector developments and other financial and macroeconomic developments (Dattels, et al., 2011). European Central Bank has also developed a composite indicator of systemic financial stress which has been applied within the euro area (Hollo et al., 2012). Most of the central banks have already in place a certain variation of financial stability indices to assess and communicate the risks to the financial sector as a whole or the banking sector in particular. The Central Bank of the Republic of Kosovo has recently developed the “Banking Sector Stability Index” which assesses banking sector risks based on the data from banks’ financial statements.5

The indices are useful methods of simple presentation of the overall risk to financial stability. Nevertheless, it is argued that the complexity and multifaceted nature of financial stability risks

are hardly summarized in a single indicator since the information on the sources of the financial stability risk is lost. Therefore, in order to fill in the gap in financial stability assessment methods, the International Monetary Fund has developed the model of Financial Stability Map (IMF, 2007) which enables simultaneous analysis of different aspects of risks and vulnerabilities of financial stability, maintaining at the same time the characteristic of comprehensiveness and composite presentation of financial stability risks. Financial Stability Map, also called the risk diagram of the financial sector, through a cobweb diagram, represents graphically the main categories of risks and vulnerabilities of the financial stability, enabling the presentation of changes in certain time periods.
1. Application of Financial stability map models: international experience

The development of Global Financial Stability Map (GFSM) by IMF and the advantages it offered in communicating the sources of risks and conditions in one hand, and the increased focus in assessing financial stability risks after the global crisis in 2008 on the other hand, have urged the development of cobweb-style diagram models for assessing financial stability in different countries.

The Global Financial Stability Map (Dattels et al., 2011) graphically presents financial stability risks and conditions across six dimensions of the cobweb diagram. Four out of the six rays of the cobweb diagram represents risks to financial stability (macroeconomic risk, the risk from emerging markets, credit risk and funding and liquidity risk). The two other remaining dimensions reflect global monetary and financial conditions and the risk appetite of financial markets. Each of the map’s six rays is composed of equally-weighted sub-indicators. The cobweb diagram represents risk in an increasing rate from the center of the diagram towards the periphery. The further from the center the indicator is located, the higher the risk is. The scores for risk dimensions range in a scale from 0 to 10. Each sub-indicators ranking is set by converting the values of the sub-indicators in eleven categories of percentiles depending on their historic values, where a notch of 5 represents the long-term average value of the respective sub-indicator. The assigning of risk score is complemented by expert judgment whenever deemed necessary.

Motivated by the GMFS, the European Central Bank developed a new methodology on visually presenting the state of financial stability and the sources of systemic risks for its member countries. Unlike the GMFS, the ECB’s Self-Organizing Financial Stability Map (SOFSM) not only enables a two-dimensional representation of a multidimensional financial stability space that allows disentangling the individual sources impacting on systemic risk, but it also uses econometric methods to predict out-of-sample financial crises. The SOFSM can be used to monitor macro-financial vulnerabilities of different countries by locating them in the financial stability cycle of the map being divided into four periods: either in the pre-crisis, crisis, post-crisis or tranquil state. The model has also performed well as an early warning indicator of global financial crises (Sarlin and Peltonen, 2011).

Numerous central banks have developed their own models of financial stability maps, tailoring them to the specifics of their country economies. The Bank of New Zealand (Bedford and Bloor, 2009) employs a similar methodology as the IMF does, presenting risk across five dimensions: three dimensions linked to macroeconomic and financial conditions (domestic macroeconomic environment, financial markets conditions and external macroeconomic environment), and two other dimensions representing the soundness of the sector (capital and profitability, and liquidity and financing position). Unlike the IMF, the Bank of New Zealand standardizes the indicators and uses unequal weights for the sub-indicators. The Bank of Norway (Dahl et al., 2011) has developed a seven-dimensional financial stability map for the banking sector only, as the largest and most important sector within the financial system. Its represents changes in vulnerabilities and external sources of risks to the banking sector. The sources of vulnerabilities, which represent the indicators that assess the ability of the sector to withstand possible external shocks, are presented in three dimensions: capital and earnings, funding, and the structure of the banking sector. The external risk sources include the risk from macroeconomic conditions, money

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The 2011 version of IMF’s GMFS presents a more advanced model compared to the base model developed in 2007.
and credit markets, enterprises and households. The development and scoring methodology is similar to the GFSM of the IMF. Also, Bank of Albania (Saqe et al., 2015) develops the FSM for the banking sector only. The methodology is largely based on the IMF’s GFSM principles, and it presents risks through the following eight dimensions: Domestic economy, individuals, businesses, government, external economic environment, capitalization and profitability, liquidity and financing, and the structure of the banking sector. Bank of Latvia (Lielkalne and Sinenko, 2015) develops the FSM with six risk dimensions: external and internal macroeconomic risk, credit risk from nonfinancial corporations and households, liquidity risk, and solvency and profitability of credit institutions. The sub-indicators have equal weights, with the exception of one sub-indicator which was judged to bear a higher risk.

Common characteristic of FSM’s in all these countries include the graphical presentation through a cobweb diagram of the main sources of risks and vulnerabilities to their financial stability. The risk scores range from 0 to 10, where the closer position to the center represents lower risk. The diagram depicts the risk for certain time periods, mainly for 2 to 3 time periods, which enables the assessment of risk movement across these time periods. The risks tend to be grouped into external and internal macroeconomic risk factors, credit risk from the enterprise and household sectors, and internal risks such as credit, solvency and liquidity risks. Nevertheless, the selection of risk categories and their sub-components is determined by distinctive features of each country’s financial sectors, and the availability of data.

Main differences among the various financial stability maps presented are in the assessment methodology. IMF, the Bank of Norway and the Bank of Albania mainly use the percentile approach for determining the risk scores for sub-indicators. The data is initially ordered into an increasing numerical sequence. It is then classified into 11 percentile categories depending on their historical values. Each percentile corresponds to a score from 0 to 10, with the middle interval (score 5) containing the median of the series. The score-risk relation is either direct or inversely proportional: direct relation, when the rise in the sub-indicator’s value represents an increase of risk or inversely related, when the rise in sub-indicator’s value implies a risk decline. The IMF uses fixed data samples to construct the percentile rankings, thus the percentiles do not change when new data observations are added to update the model. The use of fixed data samples approach is good in determining whether the effect of change is due to the change in risk or a change in the average value of data. However, Bank of Norway applies the approach of adding new observations to the data sample as it argues that in case of fixed samples, important information may get lost when the recent observations differ significantly from historical values. When the percentile method is not suitable for adequate risk presentation, e.g. the data are not distributed normally or the time series is too short, or in cases when tail event are important such as for market data, the Bank of Norway employs an alternative scoring method based on the standardization of indicators and determining of risk borderlines according to experts’ judgment. The Bank of New Zealand standardizes the indicators by dividing the difference of the value of the indicator from the average of the time series with the standard deviation of the data series. Expert judgment was often used to determine the average and the standard deviation when it was assessed that the sample of the data does not reflect properly the distribution of the population. Expert judgment was also used to determine the weights of sub-indicators when extracting the score of the risk categories. Bank of Latvia combines three scoring methods, depending on data distribution of sub-indicators and their economic interpretation. The so-called ‘standard method’ of classification of data into 11 equal data subsets (percentile intervals) is used in cases when the distribution of data approximates the normal distribution. If the data are asymmetric, an alternative method based on the median of the data series is used. The middle
interval contains the median, whereas other intervals are equally divided. The third method is based on expert judgment to appropriately determine the risk categories.

Despite of the advantages of composite quantitative measures of financial stability in assessing and communicating the sources of risks and vulnerabilities, no quantitative method alone, including the financial stability map, should be considered sufficient in assessing risks to financial stability without being supplemented by other quantitative and qualitative assessments that reflect expert judgment (Gadanez and Jayaram, 2009). The Financial Stability Map approach should be viewed only as one of the tools to simply and efficiently communicate risks to financial stability, serving also as a platform for raising discussions on the sources of these risks (Dattels et al., 2011).
III. The development methodology of FSM for Kosovo

The Financial Stability Map for Kosovo aims at serving as an analytical tool for assessing and communicating the changes in Kosovo’s financial stability risks and vulnerabilities representing them also in a graphical manner through the cobweb diagram. Given the high weight of the banking sector in Kosovo’s financial sector, FSM has been designed for the banking sector only.

The basic principles of the methodology of the map were based on the principles of the GFSM by the IMF, and the methodologies by the Bank of Albania (Saqe et al., 2015) and Bank of Norway (Dahl et al., 2011). The factors affecting the banking sector are divided into two categories: vulnerabilities of the banking sector and the external sources of the risks to the banking sector (figure 1). Due to similarities of Kosovo’s economic and financial sector structure with that of Albania, the selection of risk categories and their subcomponents was based on the model of the Bank of Albania (Saqe et al., 2015), adopting it to Kosovo’s economic and financial circumstances. The map includes the indicators that measure the risk within the banking sector (presented on the left-hand side of figure 1), whose deterioration negatively impacts the ability of banks to withstand possible external shocks. Other indicators (represented at the middle rays and those on the right-hand side of the cobweb diagram in figure 1) represent the external factors, or external sources of risks to the banking sector such as internal and external macroeconomic environment, enterprise and household sectors, and the government.

The IMF, through practical experience, suggests that the optimal number of sub-indicators in order to properly represent each indicator (located at each ray of the map) should be from 4 to 8. Sub-indicators within this range provide sufficient information that minimize the risks of overlapping information or over/under weighting certain sub-indicators. Therefore, each of the indicators of the FSM for Kosovo is constructed by a number of sub-indicators within this range. The information submitted by certain sub-indicators was encompassed simultaneously in different risk categories. However, it is suggested that some overlap among the various sub-indicators is inevitable, especially because the same sub-indicators are used to assess the risk in different ways. The importance of the information they provide for the assessment of certain risk categories justifies their inclusion (Dattels et al., 2011).

The risk scores for the Kosovo FSM were assigned through the standard assessment method or the percentile method, and the alternative method in cases when the standard method was not appropriate for the nature of the underlying data. Certain variations of the alternative method have been used, some of which based on statistical principles (the method of the series average and standard deviation), while others relying on expert judgment to reflect the risk more accurately.

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7 The criteria of including 4-8 sub-indicators is not met for all time periods (which is relevant in analyzing the performance of the sub-indicators in signaling crises), since the data for some sub-indicators are not available for earlier periods of sector development. However, as of 2010, the data for almost all the sub-indicators are available and the indicators have sufficient information.

8 The statistical distribution of data time series and their economic interpretation, similar to the studies of the Bank of Norway and the Bank of Latvia, has determined which method was used to assess/assign risk scores to the sub-indicators.
appropriately. The sub-indicators were given the values from 0 up to 10, where the lower values represent lower risk and vice versa. The direction of movement of the values of sub-indicator relative to the movement of risk scores was taken into account in order to assign the risk scores. When the increase in the value of the sub-indicator implied an increase in risk, the relationship was defined as “direct”, whereas when contrary, the relationship was deemed as “inverse”. The scores of the indicators were constructed as simple averages of the scores of the respective sub-indicators. The rational for using the simple average as opposed to weighing the sub-indicators is based on the arguments by other FSM studies, most of which preferred the former method. The arguments suggest that the use of the simple average limits subjectivity related to the determination of weights which entails a lot of arbitraries, and makes it easier to compare results over time since it is not subject to changes in weights.

The data used in constructing sub-indicators is quarterly, starting from 2000 which marks the beginning of banking sector development. However, for numerous sub-indicators, the data became available after 2000 or only recently, thus the earliest available data were used. The data which were not available on quarterly basis have been transformed to the quarter frequency through the method of simple interpolation, cubic spline method, or by subtracting the historical average weights of certain quarters and applying them through the series. Updating the map in “real time” is problematic because a underlying data takes several months to publish. Therefore, in order to develop the map for the recent period, June 2016, the latest available data is used. In updating the map, the method used by the Bank of Norway will be considered, according to which the percentile intervals are reassessed to include the latest observations. It should be noted, however, that the performance through time of the sub-indicators was assessed based on fixed percentile intervals which were constructed based on the entire time series of the sub-indicators.

The sub-indicators will be subject to improvements, as they will be continuously monitored and tested for their performance and contribution in reflecting risks to financial stability. Attempts will be made in reducing the overlap of information, and increasing the overall quality of the data (improving data time series, seasonally adjusting relevant data, removing trends not linked to financial stability, etc.).

The adequate interpretation of the map is of high importance. It should be noted that because the sub-indicators are assessed against their historical values, the risk score of 5 implies the median of the time series and not “normal” risk level of the sub-indicator. Consequently, the FSM does not assess the absolute level of the risk to financial stability at a given time, but it rather assesses how risk changes relative to its history, and hence it should be viewed as a tool to assess the change in risk related to the previous periods (e.g. previous quarters or years). The assessment of risk scores relative to their historical values makes risk levels across different risk indicators incomparable. Same risk scores in different risk indicators do not represent the same risk level, as the long-term equilibrium risk level of an indicator may be at a higher risk score.

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5 Appendix 1 depicts the detailed description of sub-indicators, the sources of data and the methodology of their development.
6 It is of importance that the time series are long enough and include certain economic cycles, in order for the median to be more representative.
IV. The development of risk indicators and their respective sub-components

The map of Kosovo’s financial stability consists of eight indicators, which reflect the main sectors and risks that Kosovo’s banking sector is exposed to. The selection of indicators and their sub-indicators has been done with respect to the criteria suggested by the relevant literature, which was elaborated in the section on methodology. Given the relatively short historic of Kosovo’s banking sector and the limitations in the historic data for other economic sectors, some of the sub-indicators have short time series and may not reflect several crises periods or financial stress periods as recommended by literature. Despite the fact that Kosovo’s banking sector was not directly affected by financial crises nor it has undergone periods of financial stress11, international crises such as the financial crises of 2007-2008 and the debt crises which started in 2009, have had an indirect impact on certain economic and financial indicators. Consequently, these crises are taken into account in the interpretation of the results.

1. External economy

Developments in the external economy represent important factors which may have implications for the domestic economy and Kosovo’s financial stability. Amongst the main channels through which problems could be transmitted to the domestic economy are remittances, foreign investments and trade balance. A possible drop in remittances and foreign investments, and an increased trade deficit would impact on the financial sector through impacting the repayment capacity of households and businesses, and through increased deleveraging pressures. Another risk source may be that parent bank strategies affect their subsidiaries without taking into account the local circumstances, as well as reputation risk of parent banks which impacts the perception of their subsidiaries or their branches in Kosovo. Despite the fact that Kosovo's banking sector has proved relatively insensitive to shocks to the external economy during the recent crises, risk transmission mechanisms do exist, thus it is of importance to consistently monitor them. The external economy indicator consists of five following sub-indicators:

1.1. Real GDP growth rate of main trading partners

The economic growth of main trading partners has an important impact in Kosovo’s economic growth, as it affects the activity and repayment capacity of the main economic agents. This sub-indicator was constructed as a weighted average of the real GDP growth of eight main trading partners of Kosovo12, where the weighting factor includes the share of Kosovo’s exports to these respective economies. An increase in the sub-indicator values is considered to signal an increase in the demand for Kosovo exports in the upcoming period, hence this sub-indicator is considered to have a forecasting nature. The sub-indicator is inversed, since an increase in the growth rate of GDP of the main trading partners suggests increased demand for Kosovo exports and hence lower risk to Kosovo’s economy and financial stability.

1.2. Unemployment rate of countries with the highest share of Kosovar diaspora

This sub-indicator is a proxy of labor conditions in countries with the highest concentration of Kosovar diaspora. The assumption for this sub-indicator is that the higher the unemployment

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11 Financial crises or financial stress periods are considered the periods in which problems with liquidity or capitalization result measures by the government to overcome these problems.

12 Eight main trading partners, which account for 67% of total Kosovo’s exports, are: Germany, Italy, Albania, Macedonia, Montenegro, Serbia, Turkey and India.
rate in these countries, the lower the remittances coming from them\textsuperscript{13}, and consequently the repayment capacity of the citizens will be lower. The sub-indicator is constructed as a weighted average of the unemployment rate of four countries with the largest Kosovar diaspora\textsuperscript{14}, weighted by the share of remittances from these countries. The relationship of the risk scoring and the sub-indicator values is direct, since an increase in the weighted unemployment rate of the countries from where the majority of remittances come from implies lower remittances and hence an increase in financial stability risks in financial sector.

1.3. Oil prices in international markets

Changes in international oil prices has a direct impact on Kosovo’s economy since it is an oil importing country. Changes in oil prices impact Kosovo’s economy through other indirect channels also, through the impact in the prices of other imported goods. The assumption for this sub-indicator is that a decline in the price of oil leads to a decline in the prices of imported products and manufacturing costs, which reflect positively on the budget of economic agents. The sub-indicator is constructed as the annual change of the three-month average rate of the monthly Crude oil price index. The relationship between the risk score and the sub-indicator is direct: the increase in oil prices implies increased risk to financial stability.

1.4. OECD Composite Leading Indicators: OECD Europe

The OECD composite leading indicators are internationally known for signaling the returning points in the business cycle, through measuring the deviation of the economic activity from its potential long-term level. The CLI is developed by merging several sub-components which exhibit leading relationship with the reference series (GDP) at turning points. The component series for individual countries are chosen based on various criteria, aiming at best representing the main sectors of the economy, such as: prices of goods, observations and surveys on the business and economic activity, labour market data, and other monetary and financial data. CLI for Europe has been considered for the purpose of this study, taken as a proxy for the economic activity in Europe. The sub-indicator was constructed as a quarter average of monthly values of the index\textsuperscript{15}. The risk scores are inversed: a decline in the value of the sub-indicator implies a slowdown of the economic activity and an increase of the risk for Kosovo’s economy and financial sector.

1.5. Three-month Libor and Euribor rates

The cost of funds in international markets is an important development which may impact the domestic financial sector directly, through the parent banks and the increase in the cost of borrowing from abroad, but also indirectly through the impact on the activity of economic agents of partner countries, namely the demand for funds and investments. Given that Kosovo is mainly exposed to the European fund market, the quarter average of 3-month LIBOR and EURIBOR rates in EUR have been used as a proxy of funds in these markets. The risk scoring – subindicator relationship is direct: higher cost of funds implies higher risk for financial stability.

\textsuperscript{13} Results of an unpublished study of the International Monetary Fund in 2013 show that Kosovo’s economy was largely dependent on the Kosovar diaspora in Germany and Switzerland, and the GDP growth rate in Kosovo is significantly impacted by the economic growth in these two countries.

\textsuperscript{14} An average of 70% of total remittances received in Kosovo come from Germany, Switzerland, Italy, and Austria.

\textsuperscript{15} Scoring was performed based on an alternative method of dividing equal intervals among the values of the index, similar to the working papers of the Bank of Albania (Saq et al., 2015) and of the Bank of Norway (Dahl et al., 2011). The reason for choosing this method is that data is not normally distributed (fat tail distribution) and the standard method of percentiles is not appropriate as it yields different risk scores for very small changes of the index value.
2. Domestic economy

Macroeconomic developments in the country impact directly on the income and expenses of economic agents, therefore affecting their debt servicing capacity. The economic growth and its prospects also shape risk perceptions of market participants and impact their behavior, including the behavior of financial market participants. In order to effectively assess the risk of macroeconomic developments, Dahl et al. (2011) suggest that the selected sub-indicators within this risk category should reflect both cyclical short-term as well as structural longer-term developments. Taking this consideration into account, the selected set of sub-indicators includes:

2.1. Output gap

The output gap represents the difference between the actual GDP level of Kosovo and its potential output level. The sub-indicator intends to assess the capacity utilization of its resources, measuring whether the economy is producing above or below its long-term potential (the long term potential output is the level of output produced at full capacity, when the economy is most efficient). A positive output gap is associated with high demand and effective utilization of production capacities, while the negative gap suggests a low demand in the economy and under-utilization of resources. Unlike the economic growth rate, the output gap assesses the actual economic activity taking into account also the developments in the past, thus it is a more favorable measure of economic performance for the purpose of this study (Saqee et al., 2015). The risk scoring is inversed: a higher value of the sub-indicators implies more efficiency and, consequently, lower risk for the financial sector.

2.2. The size of external debt

The external debt to GDP ratio presents Kosovo’s private and public sector debt burden to non-residents relative to its GDP. The sub-indicator has a structural long-term character, signaling the accumulation of debt of the economy. Excessively high debt is considered harmful for a country’s economy; hence countries should be cautious not to accumulate debt beyond sustainable levels. High debt levels increase a country’s dependence to external sources of financing and expose it to changes in global market conditions, increasing the overall risk of financing for the economy in general and the financial sector in particular. High debt to GDP ratio is a metric that influences the risk perception of countries, impacting on the cost of external financing for all the borrowing sectors, including the private and financial sector. The relationship of risk scores and sub-indicators values are direct: the increase of the debt to GDP ratio implies a risk increase for the economy and the financial stability.

2.3. Current account balance

The current account balance shows the trade balance - the difference of exports and imports of goods and services of a country, hence it is considered as a measurer of a country’s competitiveness. It also captures the net income position (compensation of employees, interest income and dividends), and transfers from abroad, therefore it is considered as an indicator of the ratio between savings and investments of a country. The judgment as to what a current account

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16 Output gap calculation was conducted through the Hodrick-Prescott filter.
17 According to the World Bank and IMF, the sustainable level of external debt is suggested to be “the level on which the country can meet its current and future external debt service obligations in full, without recourse to debt rescheduling or the accumulation of arrears, and without compromising the economic growth”.
18 The risk interval was limited to the score range of 3-6 due to the concentrated distribution of data, which in case of the full interval, the produces extreme risk scores for peripheral observations which differ very little from the average of the series.
balance represents, i.e. whether a surplus or a deficit represent risks for the economy, depends on the sources which impact on it, namely on the structure of the economy and of the current account balance itself. When the negative current account balance stems from consistent trade deficit of consumption products (excluding intermediate goods such as raw materials which suggest for higher manufacturing capacities in the future), it signals competitiveness problems of an economy which is heavily based on consumption. However, a negative balance may also be indicative of a growing economy in cases when the level of foreign investments is high. In Kosovo’s case, the negative current account balance accrues mostly from the high trade deficit for consumer goods, which partly is covered by income from transfers for households (remittances). Therefore, the assumption is that the higher the deficit, the weaker the economy, i.e. lower competitiveness and higher dependence on consumption financing from abroad. The sub-indicator is constructed as a ratio of the current account balance to the annual GDP. The risk scoring is inversed: lower current account to GDP ratio (negative ratio) implies higher risk to the economy and financial stability.

2.4. Exchange rate fluctuations

Fluctuations of EUR exchange rate relative to other currencies may pose a direct risk for the stability of the financial sector by impacting on net open position of banks in foreign currency. Exchange rate fluctuations can also impact the income levels of the trade sector and of the citizens who rely on financing from abroad (remittances in foreign currency). In order to capture the changes of EUR exchange rate in relation to foreign currencies, the index of Real Effective Exchange Rate (REER) published by the CBK has been used. The sub-indicator is constructed as a y-o-y change of quarterly average of the index. The specific impact of exchange rate changes in the banking sector and on the economy depends on the net open exposure in each of the currencies. However, the general assumption made here is that EUR appreciation is indicative of increased payment ability and vice versa. Risk scoring is inversed: an increase in sub-indicator’s value corresponds with decreased risk to financial stability.

2.5. Consumer Price Index - inflation

Fluctuations in inflation rate pose challenges in the effective planning and allocation of resources of economic and financial agents. The base interest rates are closely linked with inflation rate, hence changes in inflation rate imply changes in the cost of financing for banks. Inflation also impacts on the payment ability of economic agents when the income is fixed. The sub-indicator is constructed as the annual change of the quarterly average of Consumer Price Index. The risk score – sub-indicator relationship is direct: increased inflation negatively impacts repayment capacity and increases uncertainty among economic agents and banks, thus increasing the risk to financial stability.

2.6. The quality of judicial institutions

The independence and efficiency of judicial institutions is of great importance for the functioning of the financial sector. A developed and independent judicial sector is more efficient in enforcing contracts, whereas the cost and efficiency of contract enforcement is a key determinant of credit market performance. The quality of judicial institutions is proxied by the Freedom House index
for Judicial Framework and Independence. Risk scoring- sub-indicator relationship is direct: higher index value implies lower quality of judicial institutions, and consequently higher risk to financial stability.

3. Households

Household conditions are an important indicator for assessing the financial stability in Kosovo, since households represent the second most credited sector by banks, following enterprises. Changes in household consumption are also indirectly reflected on banks’ profitability and solvency through their impact on aggregate demand and thus corporate profits and their debt servicing capacity. Therefore, the assessment of household financial conditions concerning their indebtedness levels, their repayment capacity and their consumption propensity is crucial for credit risk assessment. In Kosovo’s case, the household sector suffers significantly from data availability (no sufficient data on households’ income and the real estate prices). However, drawing on the available data for the sector, five sub-indicators have been constructed with the aim of best approximating the various aspects of households’ conditions:

3.1. Household borrowing

This sub-indicator is defined as current lending to households compared to its long-term potential. It is constructed as the gap between the ratio of the current and potential level of household loans to GDP. A high positive gap may suggest an accumulation of credit risk under the assumption that lending increase did not follow prudent practices. Nevertheless, households lending to GDP ratio in Kosovo stands at a relatively low level, and there is a possibility of further increase taking into account the average of this ratio in other countries. It should be noted that in this paper, the focus is on the short-term effect of changes of the household loans to GDP gap indicator, where a positive gap implies increased financing for households and further development of the financial sector. Consequently, the sub-indicator is inversed: higher positive gap implies lower risk for the financial stability.

3.2 Household credit portfolio quality

Credit portfolio quality is one of the key indicators in the assessment of banking sector credit risk. Deterioration in the quality of household loans implies lower repayment capacity of households, which directly impacts the profitability and the balance sheet of the banking sector, and its capability to further increase lending. The sub-indicator is constructed as a ratio of household nonperforming loans to total gross loans to households. The relationship between the sub-indicator value and risk score is positive: a higher value of this sub-indicator represents higher risk to financial stability stemming from the households sector.

3.3. Unemployment rate

Unemployment rate is an important indicator of country’s economic activity and an important factor in explaining the financial conditions of households. Changes in unemployment rate may be a good source of information of the household demand conditions, household debt servicing

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19 The Freedom House index scores range from 1 to 7, whereby lower grades correspond to higher development and vice versa. Scoring for the purpose of FSM was performed through transformation of the index into a score range of 0 to 10.
20 The calculation of the Household credit to GDP gap was carried out through the Hodrick-Prescott filter.
21 Based on the data of the Bank for International Settlements and GlobalEconomy.com, the average ratio of household loans to GDP for European countries in 2014 was 65.45%, with the lowest ratio marking 19.8% and the highest 126.5%. In Kosovo, the ratio of household loans to GDP, in 2014, stood at 11.2%, while in Q2 2016 it was 12.5%.
22 The risk interval is restricted to scores 4 to 6 due to short time series and further expert judgment for more adequate risk representation.
capacity and their capacity to absorb new loans. The sub-indicator scoring is direct: higher unemployment rate implies higher risk to the financial stability.\(^{23}\)

### 3.4. Remittances

Remittances represent an important source of income for Kosovo. For the purpose of this paper, remittances are used as a proxy of households’ financial conditions, under the assumption that remittances contribute to the increase of household budget, thus impacting domestic demand and household debt absorption and repayment capacity. The sub-indicator is constructed as a y-o-y change of quarterly amount of remittances. The scoring of the sub-indicator is inversed: a higher growth rate of quarterly remittances implies lower risk to financial stability.

### 3.5. Household indebtedness

The household indebtedness sub-indicator represents the household payment capacity of utilities and other monthly regular expenses. Delays or defaults in monthly payments signal over-indebtedness of households, which represents a risk to financial stability. More specifically, this sub-indicator\(^{24}\) presents the number of households which twice or more were not able to pay for the above mentioned monthly expenses. The risk scoring of the sub-indicator is direct: the increase of the value of the sub-indicator suggests increased debt burden and, consequently, higher risk to financial stability.\(^{25}\)

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\(^{23}\) The standard method for risk assessment is not appropriate as the time series has an overall declining trend with data highly concentrated around the average. In this case, risk categories vary only slightly hence very small movements in the rate yield different scores. Moreover, the last observation corresponds to a very low risk score because of the specifics of the declining trend. Therefore, an alternative risk assessment method was used, which intends to capture both, the short-term cyclical and structural aspects of unemployment. In this case, the maximum risk score has been assigned to the highest level of unemployment rate marked in Kosovo (61\%), whereas the rest of the intervals were determined by deducting a standard deviation from the previous interval.

\(^{24}\) The Household Budget Survey, Kosovo Agency of Statistics

\(^{25}\) The risk interval is restricted to scores 5 to 8 due to the short time series which is available yearly as of 2013.
4. Enterprises

Loans to enterprises (nonfinancial corporations) account for 65 percent of total loans of the banking sector; hence the assessment of the soundness and developments of enterprise sector is a key aspect of financial stability assessment. The data on enterprise sector are limited; consequently, the risk assessment of this sector becomes harder. However, same as in the case of households, five enterprise sub-indicators have been constructed, aiming to best approximate the various aspects of the performance of the enterprise sector.

4.1. Enterprise borrowing

This sub-indicator represents the current lending to enterprises sector compared with its potential level. Similar to the households borrowing, the sub-indicator is constructed as the gap between the ratio of current and potential enterprise loans to the GDP. A high positive enterprise loans to GDP gap may suggest an accumulation of credit risk under the assumption that lending increased due to loose lending standards and conditions. Nevertheless, enterprise lending to GDP ratio in Kosovo stands at a relatively low level compared to its regional peers, leaving room for further increase. In this paper, the focus will be to assess the short-term effect of changes in the enterprise to GDP gap, where an increase in the positive gap implies an increase of financing for enterprise sector and further development of the financial sector and vice-versa. Consequently, the risk scoring is inversed: high positive gap implies lower risk to financial stability.

4.2. Enterprise credit portfolio quality

The credit portfolio quality of enterprises is amongst key indicators of credit risk of the banking sector as a result of the high exposure to enterprise sector. Deterioration of enterprise credit portfolio quality may suggest deteriorated conditions of enterprise sector and lower repayment capacity, which has a direct impact on the profitability and capitalization level of the banking sector. The sub-indicator is constructed as a ratio of enterprise nonperforming loans to total loans for this sector. The relationship between the risk scores and the sub-indicator is positive: an increase in enterprise nonperforming loans ratio corresponds to an increased risk for financial stability.

4.3. Industrial turnover index

This sub-indicator aims at measuring economic activity or manufacturing turnover in the main four segments of the industrial sector, namely in mining industry, processing industry, supply with electricity, gas, steam and conditioned air, as well as water supply and waste management. The assessment of economic activity of these segments of the industrial sector is important for credit risk assessment due to the importance of industrial sector performance to the overall economy, as well as due to the credit exposure to these sectors. The source for the industrial indices is Kosovo Statistics Agency. The sub-indicator has been constructed as a simple average of indices of the four industrial sectors listed above. The risk scoring is inversed: higher average value the industrial indices correspond to higher industrial turnover, and lower credit risk of the banking sector.

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26 Based on World Bank data, average ratio of private sector credit (enterprises and households) to GDP for regional countries in 2015 stood at 47%, while Europe and Central Asia had a ratio of 95.9%. This ratio for Kosovo was for 36.8% representing a lower average than the low middle income countries of 45.6%.

27 The risk interval is restricted to scores from 4 to 8 due to the short time series.

28 Based on June 2016 data, the share of enterprise loans to the mining sector is 2%, energy, gas, etc. is 1.5%, whereas loans to manufacturing marked a rate of 20%.

29 Based on 2015 data, the share of enterprise loans to the mining sector is 2%, energy, gas, etc. is 1.5%, whereas loans to manufacturing marked a rate of 20%.

30 The risk interval is restricted to scores 4-8 due to the short time series.
4.4. Trade sector performance

Trade sector represents the sector with the highest share of loans to enterprises (52% of total loans to enterprises) therefore the performance of this sector is important for credit risk assessment. The added value to GDP from trade sector activity has been taken as a proxy for trade sector performance. The assumption is that the higher the added value to GDP from trade, the better the performance of trade enterprises and, consequently, their repayment capacity. The risk scoring of the sub-indicator is inversed: Increased added value from the trade sector implies better sector performance and lower risk to financial stability.\(^3\)

4.5. The balance of registered and closed enterprises

This sub-indicator represents the difference of the newly registered and closed enterprises with the Kosovo business registry, with the aim of proxing the soundness of the enterprise sector. The assumption is that enterprises which are not profitable cease to exist and close their account with the business registry, while promising enterprise initiatives with feasible business plans get registered officially as enterprise entities. Despite the fact that the official closure and registration process of enterprises may not represent actual business performance situation but are rather a consequence of past difficulties and future expectations, the net difference is assumed to signal the soundness of enterprises for the period ahead. The risk scoring of the sub-indicator is inversed: a higher positive enterprise balance (more enterprises get registered than closed during the reference quarter) implies lower risk to the financial sector from enterprises.

\(^3\) The risk interval is limited within the scores from 3-7 due to the above mentioned reasons.
5. Government

Fiscal sector developments have direct implications for the real and financial sectors. The government, through its fiscal policy management, impacts on the level and structure of the overall demand in the economy, as well as on the budget of both households and enterprises, which in turn impact the credit performance of these sectors. In addition, the sustainability of the fiscal sector impacts banking sector through the direct channel of credit exposure to public debt and through the role of the government in the management and resolution of possible systemic banking crises. Moreover, the close connection among banks and public finances creates a possibility of risk transmitting from one sector to the other, in which case a possible increase in sovereign risk leads to the increase of the actual and perception risk for the financial sector, and vice versa (BIS, 2016). The sub-indicators included in this category capture different aspects of the government sector which reflect the sustainability of its debt, budget sustainability and sovereign risk.

5.1. The size of public debt

This sub-indicator reflects the ratio of public debt to annual GDP. Public debt management has an important impact on country’s macroeconomic and financial stability. High public debt limits government’s capacity to efficiently exercise countercyclical fiscal policy and support economic growth. Moreover, high public debt impacts on the perception of the sovereign risk by investors, which could lead to increases in the cost of the public debt and added pressures on the balance sheet and income statement of banks holding investments in public debt instruments. The risk scoring – sub-indicator relationship is positive: higher public debt ratio represents higher risks to financial stability from the government sector.

5.2. The cost of public debt

The cost of public debt impacts on government budget and its capacity for servicing outstanding debt and new debt absorption. Higher cost of public debt increases indebtedness level and debt servicing burden thus possibly leading to government debt restructuring. This, in turn, affects the income levels of economic agents and increases pressures for timely collection of payments for holders of government treasury bonds and securities. Such situations present obstacles for the development of the financial sector and increase its credit risk. The sub-indicator of the cost of the public debt is constructed as a ratio of government expenditures for interest payments to total public debt. Risk scoring is direct: an increase of this ratio implies increased debt costs and risk to financial stability.

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32 The time series of public debt to GDP ratio is relatively short and has an overall increasing trend; hence the standard assessment method is not appropriate. The alternative assessment method uses discretion at setting the maximum ceiling level of public debt to GDP ratio at 40%, corresponding with referent maximum rate of the public debt to GDP as allowed by the Law on the Public Debt. The 40% level corresponds to a risk score of 10, given the direct relationship between risk and the variable, while the rest of the intervals were determined by dividing the range from 0-40% into 9 equal parts.
5.3. Sovereign risk

Sovereign risk implies the risk that the government fails to make debt repayments in time or is unable to honor its loan agreements. Possible public debt servicing problems represent direct risk to the banking sector which is the main investor in government debt instruments. In the case of Kosovo, sovereign risk is proxied with the yield spread between Kosovo government quarterly treasury bills and German government three-month bills, the latter being the most stable economy of the euro area. The assumption made in this case is that changes in yield spreads reflect changes in Kosovo government sovereign risk since German government treasury bills are considered risk-free with relatively low yield fluctuations. The risk scoring – sub-indicator relationship is positive: increases in sovereign risk imply higher risk to financial stability.33

5.4. Government budget balance

This sub-indicator assesses the financial soundness of the government concerning the coverage of its expenditures with the revenues it generates. The sub-indicator is constructed as the difference between government revenues and spending to the annual GDP. When government revenues are lower than expenditures within a period, the budget balance is negative. Persistent budget deficits may result in structural problems such as accumulation of the public debt, higher cost of new debt, and crowding out of private investments. High budget deficits may also result in tax increases and reduction of expenditures, which could lead to macroeconomic and financial sector fragility. The scoring of the sub-indicator is inversed: higher value of the sub-indicator (budget surplus to GDP ratio) reflects lower risk to financial stability.

5.5. Tax income

Tax income is the main source of government budget revenues in Kosovo; hence, the tax income sub-indicator aims at assessing governments’ capacity for income collection. The sub-indicator is constructed as a ratio of tax income to annual GDP, in order to control for the base expansion effect of tax revenues. The scoring of the sub-indicator is inversed: increased tax income to GDP ratio reflects enhanced capacity for tax collection - also increased share of the formal economy, which in turn represent lower risk for the economy and financial stability.

33 Due to the short time series (the time series presents the data as of 2012 when Kosovo’s Government started issuing securities for the first time), the risk interval was restricted to scores 2 to 6.
6. Banking Sector Structure

Large banks which have systemic importance for the sector represent potential risk sources for financial stability since their distress or disorderly failure has spillover effects and severe negative consequences for the wider financial system and the economy of the country. The indicator of banking sector structure aims at assessing possible risks arising from the structure of the sector or the systemic importance of banks (the size and substitutability criteria of systemically important financial institutions) and capitalization levels for withstanding possible shock to the sector. The selected sub-indicators within this category reflect banking sector concentration, diversification of investments and sources of funds, as well as capitalization levels.

6.1. Banking sector market concentration

This sub-indicator aims at measuring the concentration rate in banking sector and is expressed as a ratio of three largest banks’ assets to total sector assets. The literature concerning the relationship between banking sector concentration and financial stability is grouped around two opposing viewpoints. One group thinks that higher banking concentration contributes to financial stability because banks with higher market concentration tend to generate higher profits which enable them to increase capital and thus the ability to effectively cope with possible shocks; more concentrated banks do not engage in risky activities as they already have good sources of income, but even if they do, the increased credit risk is well-covered by the good capital position of these banks (Berger et al., 2009). Conversely, the other stand of researchers argue that banking concentration represents risk to the financial stability mainly referring to the “too big to fail” hypothesis. High market concentration enables banks to undertake higher risk due to the implicit and explicit bail-out guarantees (Mishkin, 1999). Consequently, there is no consensus related to the effect of competition in financial stability. After the 2008 financial crises, the “too big to fail” hypothesis has gained momentum due to the systemic importance of large financial institutions to the overall functioning of the financial system The focus in this paper is to assess the effect of banking sector structure (systemic importance of banks accruing from size) and their effect on financial stability, hence the expectations are that the higher the concentration ratio of the three largest banks, the higher the sensitivity of the sector to distress in these banks. Risk scoring relationship to sub-indicator’s values is positive: higher banking concentration is associated with higher systemic importance and higher risk to financial stability.34

6.2. Concentration of lending to enterprise sector

In Kosovo’s credit market, the largest share of bank loans accounts for loans to enterprises. Also, lending products issued for enterprises are more diverse in terms of loan type, purpose and maturity, which enables the positioning or profiling of banks in specific products within this loan segment. The sub-indicator of lending concentration to enterprise sector aims at measuring the concentration level of lending to enterprises, based on the assumption that concentration increases risk due to the difficulties and costs associated with the substitution of lending to these segments in case of distress or failure of these institutions. Concentration of lending to enterprises was expressed as a ratio of lending to enterprises by the bank with the highest share of loans in this segment to the sum of lending to enterprises from four following banks with the

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34 The standard assessment method is not appropriate for this sub-indicator since data distribution is concentrated around the mean and a small movement in data suggests a significant change in risk scores. Therefore, risk intervals were determined based on expert judgment which assigned a score of zero to the concentration ratio of 0 to 20%, while the maximum risk score of 10 to the concentration ratio above 80%. Intermediary intervals were divided equally.
largest share of loans to enterprises. Risk scoring relationship to sub-indicator’s values is positive: higher lending to enterprises concentration ratio represent higher systemic importance risk and thus higher risk to financial stability.36

6.3. Bank lending deviation from loan market portfolio

Banks with similar lending portfolio characteristics are exposed to same borrowers therefore are similarly impacted from economic shocks. Low lending diversification would result in higher sensitivity of the banking sector to possible shocks. Therefore, this sub-indicator has been constructed to assess differences in lending exposures of individual banks, calculated as the variance between individual bank’s exposures and the average exposure of the entire banking sector. The construction of this sub-indicator is based on the studies by Dahl et al. (2011) and Saqe et al. (2015). Initially, credit portfolio was divided into three subgroups: 1) loans to private sector; 2) loans to public sector; and 3) loans to households. Following the difference between the sector loan portfolio and individual bank portfolio was calculated. In the end, the variance was calculated using the weights of each individual’s bank lending market share. The risk scoring for this sub-indicator is inversed: the higher the variance, the more diversified the lending portfolio of the banking sector, and the lower the risk to financial stability.36

6.4. Bank funding structure deviation from market funding structure

This sub-indicator aims at assessing bank diversification in terms of its funding sources. It is constructed similarly to the sub-indicator of loan portfolio diversification. Funding sources, excluding own resources, are divided into six subgroups: 1) balance with commercial banks; 2) transferable deposits; 3) time deposits; 4) saving deposits; 5) subordinated debt and 6) other borrowings. The difference between funding structure of each individual bank and banking sector is calculated afterwards, while the variance of these differences is calculated based on the share of funds of each bank to the total financing of the banking sector. The risk scoring for the sub-indicator is inversed: The higher the variance, the more diversified the financing structure of the sector, and lower risk to financial stability.37

6.5. Negative deviation of bank’s capitalization ratio from sector average ratio

The aim of this sub-indicator is to measure the negative dispersion of each bank’s capital adequacy ratio from the average capitalization ratio of the banking sector, with the aim of assessing the quality of capitalization and sustainability of the sector. Banks in Kosovo are required to keep the level of regulatory capital to risk weighted assets above 12%. However, banks may stand closer to the minimum threshold and further from the average level of the sector as the sector average may be driven by capitalization levels of certain large banks. In this case, the higher the negative deviations between the level of the capital of individual banks and the sector average, the more vulnerable the capital position and its capacity to withstand possible shocks. The sub-indicator is calculated as the variance of the differences among the capitalization rate of the individual banks and the sector average only for banks that stood below the sector

36 The standard assessment method is not appropriate for this sub-indicator since data distribution is concentrated around the mean and a small movement in data leads to a significant change in risk scores. Therefore, risk intervals were determined based on expert judgment: the minimal risk score was assigned to a value below 10%, while maximum risk score to the level of 100% (when lending of the bank with the highest share is higher than the total lending of four following banks with the largest loan share).

37 Due to the relatively short time series of the sub-indicator, risk interval was restricted to values 4 to 6.

Due to relatively short time series, risk scores were restricted to the range of 4 to 6.
The variance is weighted with the asset shares of banks in total banking sector assets on the assumption that negative capital deviations for larger banks represents higher risk compared to smaller banks. The risk scoring relationship to the sub-indicator values is positive: higher variance implies higher negative deviation from the sector average capitalization level, and higher risk for financial stability.

7. Capitalization and profitability of the banking sector

Capitalization and profitability of banks are key indicators in the assessment of the banking sector sustainability. Profitability demonstrates banks’ capacity to generate profit and increase its capital base, while capitalization expresses the ability of banks to withstand shocks and absorb possible losses. The capitalization and profitability indicator is composed of six sub-indicators which are widely used in the assessment of banking sector sensitivity to external shocks for their reflection of the capitalization position of banks, the quality of their credit portfolio and profitability.

7.1. Capital adequacy

The capital adequacy ratio is one of the main financial soundness indicators of banks. The CBK regulation for capital adequacy determines the minimal capital requirements that banks should hold at any time in order to be able to absorb possible losses. The sub-indicator of the capital adequacy is constructed as the difference between the current capital adequacy ratio and the minimum rate required by the regulation. A lower difference implies lower coverage of risk weighted assets with capital, which consequently implies higher vulnerability of the sector to possible shocks and vice versa. The risk scoring of the sub-indicator is inversed: lower difference between minimum required and actual capital of banks signals higher risk for the banking sector.

7.2. Shareholder equity

Shareholders capital to assets ratio represents the share of banking assets financed by shareholders’ capital. This ratio is used to assess the leverage level of the sector, namely the part of the assets that is financed through debt and deposits. Even though financing from debt and deposits is desirable, certain shares of financing from own resources are necessary to ensure confidence and sustainability of the sector. This is due to the fact that shareholder capital is a more sustainable source of financing and it represents the first category to cover possible losses. Therefore, a higher shareholders’ capital ratio to assets implies a better quality of capital and higher capacity of banks to cover possible losses. The risk scoring of the sub-indicator is inversed: a higher ratio signals lower risk for the banking sector.

7.3. Nonperforming loans of the sector

The credit portfolio quality of banks is one of the most important credit risk indicators. The credit portfolio quality is predominantly measured through nonperforming loans to total loans ratio. Deterioration of credit quality is reflected through increases in nonperforming loans to total loans ratio, implying that banks need to set aside more provisions to cover expected loan losses. This would directly impact banks’ balance sheet, in which case more capital is locked up in the form of

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38 This sub-indicator was constructed based on the methodology by Dahl et al. (2011) and Saqe et al. (2015)
39 The capital adequacy rate is calculated as a ratio of the regulatory capital to risk weighted assets.
40 According to the CBK regulation on the capital adequacy, banks are obliged to have a rate of at least 12 percent of Total Regulatory Capital to Risk Weighted Assets and a rate of at least 8 percent of Tier 1 capital to RWA.
provisions. The risk scoring relationship to sub-indicator’s value is positive: a higher nonperforming loans ratio represents higher credit risk and higher risk to financial stability.

7.4. Net interest income

This sub-indicator aims at assessing banking capacity for net interest income generation, as net interest income is the main income component of Kosovo’s banking sector. The sub-indicator is constructed as a ratio of net interest income to total sector assets. A higher ratio implies either increased interest revenues or increased interest cost efficiency. The risk scoring of the sub-indicator is inversed: higher indicator value implies higher income and lower risk for the banking sector.

7.5. Profitability of the sector

High profitability enables banks to increase their capital and their shock-absorbing capacity. Therefore, profitability assessment is an important indicator in the assessment of risks to financial stability. The profitability sub-indicator is expressed as the ratio of pre-tax profit to total assets. Pre-tax profit has been taken under consideration as it is not impacted by tax rules and bank tax planning policies. The risk scoring of the sub-indicator is inversed: a lower profit ratio implies higher vulnerability of the banking sector and higher risk to financial stability.

7.6. Large exposures

The diversification of credit exposures is a quite important aspect of credit risk management, with implications to the overall financial stability. In case of high concentration of credit exposures to individual borrowers or a related group of borrowers, the unexpected failure of these parties would increase bank credit risk considerably due to the large share of large exposures in total bank portfolio. This would have a direct impact on the profitability and capital position of the sector. The assessment of large credit exposures is treated by the CBK regulation on Large Exposures\(^4\), which limits exposures relative to regulatory capital; hence this sub-indicator is constructed as a ratio of large exposures to tier 1 capital. The risk score relationship to the sub-indicator’s value is positive: higher exposure ratio implies higher credit concentration and consequently higher credit risk.

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4\(^{4}\) Based on the regulations for Large Exposures, article 3, paragraph 3 the limitation of three hundred percent (300%) of the tier 1 capital for large accumulated credit exposures, will be implemented for all the exposures to a person or group of persons, when each of them overcomes ten percent (10%) of bank’s tier 1 capital.
8. Liquidity and Financing

The liquidity and financing indicator aims at assessing the risks to the banking sector that may arise from bank funding structure and liquidity position. The more sensitive the financing sources of a bank to changes in domestic and international markets, the higher the financing risk to a bank. Also, adequate liquidity is essential in ensuring functioning of the sector and fulfilling of short-term client obligations, hence the maturity of the financing sources is an important aspect and a possible risk source for the bank. Long-term financing sources are less sensitive to market shocks, and contribute as a balancing factor in banks’ liquidity gap as a consequence of the bank business structure which finances long-term investments (loans) with short-term financing sources. Liquidity and financing indicator is composed of five sub-indicators which aim at assessing the sustainability of bank financing sources and liquidity position in terms of its the adequacy of liquid assets in respect to its short-term liabilities.

8.1. Loan-to-deposit ratio

Loan coverage by deposits, expressed through the ratio of total sector loans to total sector deposits, aims to assess the overall bank liquidity level and the potential for further lending increases. High loan-to-deposit ratio implies a lower proportion of loans is financed through deposits, which are considered as the most sustainable source of financing for banks. High loan-to-deposit ratio also signals liquidity problems and hence lower bank capacity to further expand lending. Therefore, the risk scoring relationship with sub-indicator's values is positive: higher loan-to-deposit ratio signals lower liquidity, hence higher risk to financial stability.

8.2. Household deposits

Household deposits represent the main financing source of banks in Kosovo. Household deposits are considered as a more sustainable source of financing for banks since they present smaller amounts from a large pool of individuals whose probability to withdraw their deposits at the same time is very low. However, in times of financial uncertainty or instability, household deposits are amongst the most sensitive financing source due to the effect of confidence loss. Therefore, the development trend of household deposits may be considered as both as a proxy for banks' liquidity position and as a measure of public confidence in the banking sector. The sub-indicator is expressed as the annual change of household deposits, where an increase in the growth rate implies increased liquidity, and hence increased confidence and sustainability of the banking sector. The risk scoring of the sub-indicator is inversed: the higher the household deposit growth rate, the lower the liquidity risk of the banking sector.

8.3. Liabilities to non-residents

Kosovo's banking sector also relies, to some extent, in external financing sources for financing a part of its activity. Nevertheless, liabilities to non-residents represent a highly sensitive financing source to both internal and external developments and shocks. Non-resident financing is, in general, considered highly sensitive to market conditions as non-residents may respond quickly to non-favorable conditions by withdrawing their funding. Hence reliance in non-resident funding poses risk for the banking sector especially when exposure to these funding sources is high. The sub-indicator is constructed as a ratio of total financing from non-residents (deposits, loans and other) to total liabilities of the banking sector. The risk score – sub-indicator

\[ \frac{\text{Total liabilities of the banking sector, including own resources}}{\text{Liabilities to non-residents}} \]

[^42]: Total liabilities of the banking sector, including own resources.
relationship is positive: higher share of non-resident funding implies higher dependence of the banking sector in sensitive financing sources, and hence higher risk to financial stability.⁴³

8.4. Liquidity ratio

Liquidity ratio, expressed as ratio of liquid assets to short-term liabilities aims at assessing the risk of short-term financing of the banking sector. Liquid assets in this case include liquid assets with a maturity up to three months, while short-term liabilities include borrowings with a maturity up to one year. The liquid assets to short-term liabilities ratio is used to assess the ability of banks to meet immediate liquidity needs which may arise as a consequence of possible but plausible short-term liquidity shocks. A higher liquidity ratio implies that the bank poses enough available assets to cover immediate withdrawal requests from depositors and/or other creditors. The risk scoring for the sub-indicator is inverted: lower liquidity ratio implies lower coverage of short-term liabilities with liquid assets, hence higher risk to financial stability.⁴⁴

8.5. Liquidity gap

Liquidity gap is another indicator which aims at assessing the liquidity risk that may materialize as a consequence of maturity mismatch of bank assets and liabilities. This sub-indicator is constructed as the absolute value of the difference between short-term assets and short-term liabilities with a maturity of up to 3 months. Banking business model relies on maturity transformation of assets and liabilities, where short-term sources of funds are used for longer-term investments; hence a negative maturity gap is expected in short-term periods. However, high negative gap may suggest a more sensitive liquidity position since it implies the banking sector has 'insufficient’ short-term assets for fulfilling short-term liquidity requirements. Consequently, an increase in lending, which mainly has long-term maturity, is constrained as it would further decrease the coverage of short-term liabilities with liquid assets. The risk score-sub-indicator relationship is positive: larger maturity gap implies lower liquidity and higher risk to financial stability.

⁴³ The standard assessment method is not appropriate for this sub-indicator as the dissemination of data is not normal (Peripheral data’s lead to changes in risk scores for very small changes in sub-indicator values. Hence, an alternative assessment method, based in the paper by Dahl et al. (2011), was used in assessing this sub-indicator. According to this method, the initial phase was to extract the mean and standard deviation of the data series. The mean of time series was assigned with a score of 5, while each interval above and below their mean was scored adding/subtracting the standard deviation.

⁴⁴ According to CBK regulation, the liquidity ratio is recommended not to fall below 25 percent. An alternative assessment method is used for scoring this sub-indicator due to the short time series as well as due to the pre-set minimum level of the ratio by the regulator. The lower boundary corresponding to a risk score of 10 was set at 25% in accordance with the CBK regulation, while the upper boundary was set at 50% (assessed with a risk score 0). The in-between intervals were divided equally.
V. Performance of risk indicators

To analyze separate developments in each risk category of the map, averaged indicators have been constructed as a simple average of risk values of each sub-indicator. The lack of historic data for many sub-indicators makes it impossible for some of the indicators to meet the criteria of consisting of values of at least four sub-indicators, especially in the periods between 2000 and 2008. However, this criterion is fulfilled for the period after 2008, where all the averaged indicators are composed as simple averages of at least four sub-indicators. The subject of analysis in this section is the trend of the averaged indicators and, subject to data availability, the performance of these indicators in signaling crises.

The external economy risk indicator shows a declining trend in the period prior to the global financial crises (figure 2). The risk starts increasing in Q4 2007, which coincides with the beginning of the crises, and peaks in Q4 2009. After a sharp risk decline in 2010 as a consequence of austerity measures of governments and stimulus measures of central banks, the risk increases again as a consequence of euro area debt crises and its spillover effects. All the sub-indicators contributed to the risk increase in this period. After a considerable risk decline in the period between 2012-2015, with risk dropping to a very low level in Q4 2015, the year 2016 marked a slight risk increase as a result of risk increases in all the sub-indicators with the exception of base interest rates which continued their declining trend.

The risk from domestic economy is generally characterized with a slight increasing trend and fluctuations above the average risk level (figure 3). The financial crises period of 2007-2008 shows a risk increase in the domestic economy, mainly as result of the increases in inflation and current account deficit. After a slight drop in 2009, risk peaked in 2010 mainly driven by the increase in output gap. Year 2014 is also characterized with higher risk in the domestic economy as a result of growth slowdown, widening of current account deficit and euro depreciation, while higher economic growth in 2015 and positive prospects for 2016 lead the domestic economy risk for these years to fall close to the average historical level.

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45 The averaged indicator of the external economy reflects the performance of five sub-indicators dating from 2005, hence enabling the performance analysis of this indicator in signaling financial stress and crises situations.

46 The latest GDP and unemployment data of trading partners and countries with the highest number of diaspora, respectively, are for Q1 2016.

47 The indicator of the domestic economy is composed of the average values of six sub-indicators. The period 2003-2004 represents only the performance of the inflation sub-indicator. From 2006, two sub-indicators are added: output gap and the current account balance. The three other sub-indicators (external debt, the quality of judicial institutions and exchange rate fluctuations) are added in 2007 and 2008 respectively.
The risk from household sector stands above the average risk level (figure 4). Risk from portfolio quality and remittances show a general increasing trend, while unemployment and household indebtedness follow a general declining trend. The risk from household borrowing shows a general declining trend as a result of increased financial depth, namely increased ratio of household lending to GDP and its positive tendency of convergence towards the regional average levels. The risk from remittances has marked a considerable increase in the latest periods, as of Q4 2015, as result of the annual decline in remittances. In the latest period, the overall risk from household sector stands slightly above the historical average level.49

The enterprise risk indicator is characterized with certain cycles of risk above the average risk level (figure 5).50 The lowest risk level corresponds to year 2004 which reflects a more optimistic business climate as suggested by the best balance of newly registered and closed businesses for the period. On the contrary, risk peaked at the end of year 2006 due to the worst balance of newly registered and closed enterprises. Lending to enterprises in this period was below its long-term potential, suggesting lower sector development and higher perceived risk from banks as regards the enterprise capacity to absorb funds. The financial crises period of 2008-2009 corresponds with low risk levels, which reflects the fact that Kosovo’s economy was protected from immediate crises effects, only to experience its indirect effects in later periods. As of 2010, the risk was characterized with oscillations around the average risk level with a slight increasing

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48 The households’ indicator is composed of five sub-indicators. The data for 2000-2005 represent the performance of unemployment only. Since 2005, the household borrowing sub-indicator is added. The data on all the sub-indicators are represented only as of 2012.

49 The latest available data on unemployment and the household indebtedness are for Q4 2015.

50 The enterprise indicator is composed from five sub-indicators. The period until 2010 reflects developments in only two indicators (enterprise borrowings and the balance of newly registered and closed enterprises). Other sub-indicators are captured as of 2011.
trend as a result of the increase in nonperforming loans and a decline in the balance of newly opened and closed enterprises. In the latest years, 2015-2016 namely, the enterprise risk level has shown declining tendencies standing below the average risk level of the period captured in the analysis. This is mainly as a result of the positive enterprise lending to GDP gap and the improvement of the enterprise credit portfolio quality, while the added value to GDP from the trade sector, on the other hand, has marked a risk increase as a consequence of the significant slowdown of trade activity. The risk from the government sector generally stands below the average level and has a slight declining trend (figure 6).\(^5\) In the period Q4 2007 and Q2 2008, which corresponds with the onset of the global financial crises, risk drops to minimum values as a result tax income increases. In Q4 2008, the risk increases slightly above the average level due to increased fiscal deficit, but shortly hereafter marks a decline. In the period 2009-2015, the risk from the government has shown a slight increasing trend as a result of the increasing trend of government debt and its servicing costs. However, in Q2 2016 the risk from the government drops due to risk decline in almost all its constituent sub-indicators, with a special focus on fiscal deficit and tax income to GDP ratio.

The risk from the structure of the banking sector has an overall declining trend. The highest risk level was marked in 2008 (figure 7).\(^6\) In the period 2008-2010 market concentration in the banking sector was at its highest, where assets of the three largest banks comprised around 90 percent of total assets of the banking sector. Later on, concentration risk showed a declining trend due to the penetration of new banks which increased competition in this sector. In general, the risk from this indicator shows an overall declining trend as a result of risk declining in all the constituent sub-indicators (increased competition, diversification of credit portfolio, the expansion of sources of funding, and profitability increases which have consequently improved the quality of banking capital). The period 2008-2012 was characterized with risk above the average risk level due to the high market concentration, lower diversification of lending to businesses, as well as lower capital position. Risk from the capital position peaked at the end of 2011 and in the first six months of 2012, which corresponds to the period of lower regulatory capitalization ratios in the sector due to the lower profitability and regulatory changes in the methodology of regulatory capital calculation. In 2013, risk from the structure of the banking sector dropped below the

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\(^5\) The government indicator is composed of five sub-indicators. The period 2005-2008 reflects only developments in the government budget balance and ratio of tax income to GDP. Since 2009, two other sub-indicators are added, while the sovereign risk premium is captured only as of 2012.

\(^6\) The indicator of the banking sector structure is composed of five sub-indicators. The data on banking concentration (assets of three largest banks to total assets of the sector) and on the negative deviation of banks’ capitalization ratio from the sector average capitalization ratio are available as of 2008, while three other sub-indicators are included as of 2010.
average level, while year 2016 marks the lowest risk level mainly as a result of lower negative deviation of individual banks capital position from the sector average. More specifically, banks with lower capitalization rates increased their regulatory capital by converging towards the sector average capitalization rate.

The capitalization and profitability indicator is characterized with more pronounced movements above and below the average risk level (figure 8). Risk is high in the initial phase of the functioning of the sector, as expected given that profitability and capitalization levels were also lower. Risk dropped to minimum levels in the period prior, as well as during the global financial crises of 2007-2008, in which period almost all sub-indicators signal low risk level. This shows Kosovo’s banking sector reliance on sound fundamentals and its sustainability against crises shocks due to its global limited exposure. However, risk started increasing in Q4 2008, reflecting the indirect global financial crises effects which were reflected in the growing trend of nonperforming loans and income generation. The capitalization and profitability indicator signals higher risk in the period 2012-2013, corresponding with the increase of nonperforming loans, increase of large exposures and the decline of capitalization rates, where the latter was impacted by lower profitability of banks in that period and methodological changes in the calculation of regulatory capital, undertaken by the CBK.4 Risk started declining in year 2014, dropping quite below the average risk level in the year 2016 as a result of the high profitability of the sector and improvements in credit portfolio quality.

The liquidity and financing indicator is in general characterized with several fluctuations of risk around the historical average risk level (figure 9). The lowest risk level was marked in the second quarter of 2005, which corresponds with a high growth rate of household deposits that reflected on increased banking liquidity and funding availability for household lending. Whereas, the risk reached its peak level in of the second quarter of 2016, mainly driven by three sub-indicators which signal increased risk in this period. However, the overall liquidity position of the sector remains satisfactory judging from the comparison of values of these sub-indicators with the regulatory reference rates. The increased risk above the average risk level was impacted primarily by the increased risk from the household deposits sub-indicator, which corresponds with a slower growth pace of household deposits since 2012. Loans to deposits ratio also contributed to the risk increase above the average level due to the higher growth rate of loans compared to deposits. The widening of the negative liquidity gap for assets and liabilities with a

$\text{Figure 9. Liquidity and financing}$

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53 The Capitalization and Profitability indicator, which is compounded from six sub-indicators, starts in year 2000, which marks the beginning of compilation of Kosovo’s banking sector statistics. Until 2007, the indicator includes only partial data of limited sub-indicators, while as of 2008 the indicator reflects the data of all the sub-indicators.

54 The CBK changed the Capital Adequacy Regulation on Banks in 2012, according to which the methodology of regulatory capital classification changed (certain categories were excluded/deducted from regulatory capital, such as related exposures, etc.) alongside some changes in the structure of Risk Weighted Assets (the position of “Operational Risk” was added to Risk Weighted Assets).

55 The Liquidity and Financing indicator is constructed from five constituent sub-indicators, and starts from 2001. The indicator in the beginning of the period reflects partial developments due to the lack of the data for certain sub-indicators, whereas some sub-indicators with extreme values were excluded since they reflected the consolidation process of the sector rather than real risks facing the sector. The period 2001-2003 reflects developments in financing from nonresidents only. As of 2003, development trend of household deposits and loans to deposits ratio are included. The reflection of risks from all the sub-indicators starts only as of 2010.
maturity of 3 months has also weakened the liquidity position. The negative gap increased as a result of more significant growth in lending that lead to the shifting of assets to longer maturity assets on the one hand, whereas at the same time liabilities shifted on the opposite direction, namely shorter-term liabilities. This came as a result of low interest rates environment, which lead to the growth of transferable deposits against the decline of time deposits.
V.I. Compounding of FSM indicators

In order to analyze the overall risk to financial stability, the risk indicators representing the various risk dimensions to financial stability have been compounded (figure 10). The compounding was performed through a simple average of the eight risk indicators.

The overall risk to financial stability is characterized with fluctuations in the middle risk interval of risk scores from 4 to 6, with the exception of the inception phase of banking sector operation which reflects higher overall risk. The year 2008 corresponding to the financial crises period is characterized with a slight risk increase above the median risk level. The period covering years 2011-2014 was also characterized with above median risk, corresponding with subdued economic growth, lower lending activity and a deterioration of credit portfolio quality and capitalization rates of the sector. Overall risk marked a declining trend in the recent years of 2015-2016, however, dropping to some of the lowest historical risk values. The overall risk decline was mainly impacted by developments in the internal risk indicators, respectively the good capitalization and profitability position and the improvements in banking sector structure, adding to it also the low risk from the external macroeconomic environment.
VI. Financial Stability Map - graphical representation

This section represents the graphical representation of Kosovo’s Financial Stability map in the form of a cobweb risk diagram. The risk diagram enables a clear communication of risk scores for the various risk sources to financial stability and their change over time.

Figure 11A. depicts Financial Stability Map for the last two years, and the historical average which reflects the average score for the overall risk over the entire period covered.\(^{56}\) The risk diagram suggests that risk to financial stability from the external economy has marked a slight decline in 2016 as a result of higher GDP growth of Kosovo’s main trading partners in Q1 2016 and the further reduction of base interest rates. Oil prices slowed down their decline, hence marked a risk increase compared to the previous year. In general, the risk to Kosovo’s financial stability from the external macroeconomic environment remains at low levels, standing far below the historical average level.

Risk from the domestic economy has shifted towards the center in Q2 2016, marking a decline. Lower risk is attributed to the lower GDP gap compared to Q2 2015. Exchange rate developments were less volatile, thus also contributing to lower risk. On the contrary, Kosovo’s external debt and current account deficit marked an increase during this period negatively affecting on the overall risk. Risk from inflation increased in Q2 2016 compared to the same period of the previous year, whereas the risk from the legal environment remained at similar levels. Despite the improvement of overall domestic macroeconomic conditions in the last year, risk still remains above the historical average level.

Financial stability risks from economic agents, namely from households, marked a slight increase in 2016, but remained below the historical average. On the other hand, the risk from enterprise sector and the government sector shifted towards the center, thus marking a decline. Overall risk from households increased mainly as a result of remittances which have been declining since Q4 2015, meanwhile lending to households’ sector and credit portfolio quality marked improvements. Enterprise sector marked a risk decline mainly as a result of significant improvements in credit portfolio quality and in the net position of registered and closed enterprises, while the added value to GDP from the trade sector deteriorated as a consequence of reduced activity in the wholesale and retail trade sector in 2016. Risk from the government sector dropped, reflecting positive developments such as sovereign risk decline, fiscal deficit contraction and increased tax revenues relative to GDP. On the contrary, government debt to GDP and debt servicing costs increased.

The internal risk sources of the banking sector associated to the structure of the banking sector and the capitalization and profitability position marked a significant decline. The risk related to

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\(^{56}\) Historical average includes the simple average of risk scores for all the risk indicators throughout the entire period, from year 2000 respectively, subject to data availability.
banking sector's structure declined as a result of positive developments in almost all its constituent risk sub-indicators, with a specific emphasis on the negative deviation of bank's capitalization ratio from the sector average, implying that banks with lower capital ratios increased their regulatory capital thus converging towards the sector average capital ratio. The diversification of credit portfolio and banks' financing sources increased, also contributing to the overall risk decline. Marked concentration decreased during this period, while private sector lending concentration stood at similar level. The risk associated with the capitalization and profitability position of the sector dropped in Q2 2016 compared to the previous year, reflecting improvements in credit portfolio quality, reduction of large credit exposures and the increase of shareholders' capital. The other sub-indicators in this risk dimension, such as interest income, pre-tax profit and the capital adequacy ratio marked a slight risk increase, the latter being a consequence of the reduction of Tier 2 capital.

The internal risk associated with liquidity and financing position of the sector has marked the highest increase due to risk increases in all the sub-indicators. Loans to deposits ratio increased as a result of accelerated lending growth. Risk increased also as a result of the slowdown in household deposit growth, increased non-resident liabilities, widening of maturity mismatch for assets and liabilities up to 3 months, and the decline in liquid assets ratio. However, it should be emphasized that despite the increase of the risk to financial stability linked to liquidity and financing relative to its historic trend, the liquidity position of Kosovo's banking sector remains satisfactory judged by the values of main liquidity indicators which stand within the reference liquidity rates and far above the minimum regulatory requirements.57

Figure 11.B represents the FSM over the years corresponding to the latest global financial crises. The external economy indicator seems to reflect quite well the crises period, as risk increase in 2008 as a result of significant performance deterioration of almost all the constituent sub-indicators. The domestic economy risk indicator also increased in 2008 mainly as result of the economic growth slowdown to levels below the long term potential.

The households and enterprise sector marked a risk decline in the crises period, mainly as a result of a narrowed credit to GDP gap ratio for these sectors which was a consequence of higher credit growth in years previous to the crises, as well as the GDP growth slowdown that followed. Nevertheless, the risk from these sectors increased immediately in the following period suggesting lagged crises effects. Risk from the government sector showed a more significant increase in this period, namely in 2008, as a result of widened fiscal deficit. It should be noted that risk assessment from economic agents during years 2008-2009 is based on limited number of risk sub-indicators (two sub-indicators on average), hence it is difficult to analyze their interconnection with the effects of global financial crises.

57The liquid assets to short-term liabilities ratio in Q2 2016 was 41.5 percent compared to the regulatory minimum level of 25 percent. Loans to deposits ratio stood at 80 percent, which is the recommended level from the CBK.
The internal risk indicators are also based on limited data for the period of the crises. The capitalization and profitability as well as the liquidity and financing indicators showed a slight risk increase in 2008. The capital adequacy ratio dropped, while loans to deposits ratio increased as a result of high credit growth. In year 2009, however, credit growth dropped significantly, and risk decreased for both capital and liquidity indicators. These developments may be attributed to the indirect effects of crises which may have affected the risk perceptions and the propensity to lend.

As a conclusion, financial stability map shows a tendency of moving further from the center in the period of crises, reflecting mostly increased risks to financial stability from macroeconomic developments. Upon the end of the crisis, in 2009, FSM moved back towards the center as a consequence of declining risks. However, the FSM changes in both cases were relatively low, implying that there was no significant change of the risks from their initial position prior to the crisis. This suggests of the limited transmitting channels of the global financial crises to Kosovo’s economy and banking sector. Kosovo’s main trading partners and countries with higher concentration of Kosovar diaspora were less affected by the global financial crises, thus the macroeconomic risk indicators did not experience excessive changes. Another factor contributing to Kosovo’s banking sector stability during the global financial crises was the fact that banking sector’s direct exposures abroad, despite being low, involved relatively safe investments, mainly deposits and securities of foreign governments. Therefore, the capitalization and profitability position of Kosovo’s banking sector remained almost unchanged during this period, thus reflecting the sustainability of the Kosovo’s banking.

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VII. Conclusion

Kosovo’s Financial Stability Map (FSM) aims at providing a summary graphical representation of main external and internal risks and vulnerabilities to the banking sector and Kosovo’s financial stability, and the direction of their change over time. The contribution of FSM stands at enabling the simultaneous analysis of the broad set of diverse risk sources to financial stability in a comprehensive manner.

The FSM model will be incorporated into the periodic Financial Stability Report as of its tenth edition, serving as an analytical tool for assessing the main risk sources and vulnerabilities to the stability of the banking sector. The regular updating of the FSM aims at advancing the analysis and communication of systemic risks to Kosovo’s financial stability. The FSM analysis for Kosovo suggests a declining trend of the overall risk to financial sector (the average of risk scores of all risk dimensions). The overall risk moves around the average risk level, with the exception of the periods corresponding to the initial years of banking sector operation where risk seems to be higher. The global financial crises period of 2007-2008 is characterized with a slight risk increase above the average risk level. Overall risk stood above the average level in the period of 2012-2014 also, while, as of Q4 2012 it shows a declining tendency leading to a risk drop in 2016 to almost lowest risk levels. Low risk in 2016 was attributed mainly to the lower internal risks and vulnerabilities of the sector namely lower risk from banking sector structure and capitalization and profitability indicator. The external economy risk indicator, which stood way below its historical average level, also contributed to the risk dropdown. The risk from domestic economy, besides standing slightly above the historical average, has marked a further decline.

The overall FSM performance in signaling crises is limited due to the short time series of many indicators. However, the performance of risk indicators which capture the period prior to the global financial crisis of 2008 seem to reflect well the moment of this crisis and its marginal impact in Kosovo’s financial and real sector. The FSM performance in signaling risks in real time is also limited due to data availability issues, namely monthly delays of publication of some data or because certain data are published solely on annual basis. Other data limitations include the heavy reliance on data entailing past developments while the aim should be to include more ‘forecasting type’ data which contribute in identifying the accumulation of risks overtime.

The FSM performance in adequately reflecting risks is also subject to the appropriate selection of sub-indicators, not just the quality of the data. In this context, the presentation of the first FSM model for Kosovo’s banking sector aims at encouraging discussions which may result in possible improvements in the quality of the sub-indicators and their contribution in signaling risks. Moreover, the FSM needs continuous advancement and modifications to keep pace with the dynamic nature of financial environment, and hence reflect its dynamics.

Further attempts in improving the FSM quality in the future, among others, may be directed towards the inclusion of longer-term indicators that may signal accumulation of risks to the banking sector. Another aspect that could be considered is setting referent values for the risk indicators, in order to enable an “absolute” assessment of risks in a given time period rather than assessing only the relative change of risk compared to its historical development.
11. References


OECD, Composite Leading Indicators (MEI), www.stats.oecd.org


CBK Financial Stability Map in Kosovo
Appendix A. Risk sub-indicators and their construction methodology
# Table 1. A. Risk sub-indicators and their construction methodology

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<td>1.1. Growth rate of the Real Gross Domestic Product of main trading partners</td>
<td>Weighted average of GDP of 6 countries which account for 70% of total Kosovo exports. The indicator is constructed by summing the product between the GDP of each trading partner with the share of Kosovo exports to the corresponding country.</td>
<td>International Monetary Fund (IMF), Kosovo Agency of Statistics (KAS)</td>
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<td>Industrial turnover index captures: mining industry, processing industry, supply of electricity, gas, steam, and air management. The simple average of the four industrial indices has been used for the purpose of this study as a proxy of an overall industrial turnover index</td>
<td>KAS</td>
<td>Q4 2012</td>
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<td>4.4. Trade sector</td>
<td>The real annual growth rate of added value to GDP by trade sector</td>
<td>KAS</td>
<td>Q1 2014</td>
</tr>
<tr>
<td>4.5. The net balance of newly registered and closed enterprises</td>
<td>The difference between the number of registered and closed enterprises</td>
<td>KAS</td>
<td>Q1 2004</td>
</tr>
</tbody>
</table>

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### Table 1. B. Risk sub-indicators and their construction methodology

<table>
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<th>Indicators</th>
<th>Description</th>
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<th>Initial date of time series</th>
<th>Method of calculation</th>
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<td>Assets of the three largest banks to total sector assets</td>
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<td>6.1. Concentration of lending to enterprise sector</td>
<td>Loans to enterprises from the bank with the highest market share to the sector divided by the sum of lending to enterprises from all banks with the highest market share</td>
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<tr>
<td>6.2. Concentration of lending to large customers</td>
<td>The credit portfolio of each bank and of the total banking sector are divided into three main groups: 1. Loans to households, expressed as a percentage share. The variance between the exposure of each bank from the market exposure is calculated. The lending share of each bank to total sector loans is used as a weight in variance calculation</td>
<td>CBK</td>
<td>Q1 2012</td>
<td>ALTERNATIVE METHOD: expert judgment</td>
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<td>Q1 2010</td>
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