

pregledni
naučni
članak

UDK 336.774.3 ; 005.334:336.71(497.11)

DETERMINANTE KRETANJA NIVOOA PROBLEMATIČNIH KREDITA U BANKARSKOM SEKTORU U SRBIJI



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Rad je pripremljen u okviru projekta Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije (Br. 47004): "Unapređenje javnih politika u Srbiji u funkciji poboljšanja socijalne sigurnosti građana i održivog privrednog rasta".

Rezime

U radu se analiziraju regulatorne i ekonomske varijable u bankarskom sektoru koje, u manjoj ili većoj meri, mogu da utiču na nivo problematičnih kredita u Srbiji. Iako bankarski sektor, za razliku od ostatka privrede ostvaruje pozitivne rezultate, istovremeno je prisutan i rastući trend problematičnih kredita koji prethodi da ugrozi celokupnu stabilnost finansijskog sistema. U tom smislu, u statističkoj i ekonometrijskoj analizi pošlo se od determinanti kao što su: kapitalna adekvatnost, iznos rezervisanja za potencijalne gubitke, profitabilnost, vlasnička struktura i koncentracija u bankarskom sektoru, kao i stopa rasta realnog bruto društvenog proizvoda. Koristeći definisane varijable, ispitana je stacionarnost posmatranih serija podataka pomoću proširenog Diki-Fulerovog (*ADF*) testa jediničnog korena, za period od poslednjeg kvartala 2008. godine do trećeg kvartala 2013. godine. Prema metodologiji Narodne banke Srbije, korišćeni su kvartalni podaci sa ukupno 20 opservacija. Osnovni izvor podataka predstavljaju različiti statistički izveštaji koje objavljuje Narodna banka Srbije.

Ključne reči: problematični krediti, bankarski sektor, finansijska stabilnost, regulatorne i makroekonomske varijable

JEL: C22, C51, G21, L11

Rad primljen: 03.01.2014.

Odobren za štampu: 13.06.2014.

UDC 336.774.3 ; 005.334:336.71(497.11)

scientific
review
article

DETERMINANTS OF THE NONPERFORMING LOANS LEVEL MOVEMENT IN THE BANKING SECTOR OF SERBIA

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This paper was prepared within the framework of the project of the Ministry of Education, Sciences and Technological Development of the Republic of Serbia (No. 47004): "Promotion of public policies in Serbia in the function of enhancing social security of citizens and sustainable economic growth".

Summary

This paper offers an analysis of the regulatory and economic variables in the banking sector which may impact, to a greater or lesser extent, the level of nonperforming loans in Serbia. Although the banking sector, contrary to the rest of the economy, is recording positive results, there is also a simultaneously present and growing trend of nonperforming loans which is threatening to endanger the entire stability of the financial system. To that end, in the statistical and econometric analysis the point of departure were the following determinants: capital adequacy, the amount of loan loss provisions, profitability, ownership structure, and concentration in the banking sector, but also the growth rate of the real GDP. Using defined variables, what was examined was the stationary position of the observed series of data by means of an Augmented Dickey-Fuller (ADF) test of unit root, for the period from the last quarter of 2008 and up to the third quarter of 2013. According to the methodology of the National Bank of Serbia, quarterly data were used with the total of 20 observations. The main data sources were different statistical reports published by the National Bank of Serbia.

Key words: nonperforming loans, banking sector, financial stability, regulatory and macro-economic variables

JEL: C22, C51, G21, L11

Paper received: 03.01.2014

Approved for publishing: 13.06.2014

Uvod

Najznačajniji problem sa kojim se suočava ne samo domaći bankarski sektor, već celokupan finansijski sistem u Srbiji, jeste visok procenat problematičnih kredita u ukupnoj kreditnoj aktivnosti. Problematici krediti (u nastavku NPL - non performing loans) predstavljaju dužničko-poverilački odnos u kojem dužnik ne uspeva da izmiri svoju kreditnu obavezu prema poveriocu u periodu dužem od 90 dana od definisanog termina. Ukupni bruto NPL su u decembru 2012. godine iznosili 367,1 milijardi dinara, što čini 18,6% ukupno odobrenih kredita (NBS, 2013, str. 81). Tako visoko učešće jedna je od tipičnih posledica finansijske i ekonomske krize. Usporavanje ekonomije (pogoršanje finansijske situacije korisnika kredita) i deprecijacija domaće valute (rast obaveza korisnika kredita koji nisu zaštićeni od deviznog rizika) elementi su koji prate finansijsku krizu i negativno utiču na sposobnost korisnika da redovno izmiruju svoje obaveze.

I pored visokog učešća NPL, stabilnost bankarskog sektora u Srbiji ni u jednom trenutku (do sada) nije bila ugrožena, s obzirom na visoke iznose rezervisanja banaka za te namene, i prema međunarodnim standardima i prema domaćim propisima. Tako su NPL bili u potpunosti pokriveni iznosom rezervi za pokriće potencijalnih gubitaka po tom osnovu, po čemu je Srbija rekorder u regionu. Regulatorna rezervisanja za bilansnu izloženost (tzv. loan loss reserve) u decembru 2012. godine su i dalje u potpunosti pokrivala iznos bruto NPL; na kraju tog meseca pokriva je iznosilo 123,3%. Za Srbiju je specifično da je u krizu ušla s već visokim nivoom NPL-a, koji je krajem 2008. godine iznosio bruto 11,3% (Grafikon 1). U ostalim posmatranim zemljama regiona centralne i jugoistočne Evrope to učešće se kretalo u rasponu između 2,1% i 7,2% (NBS, 2013, str. 24).

Osnovni pokretač rasta NPL u Srbiji je privreda, čiji se bruto pokazatelj povećao sa 14,5% na kraju 2008. godine na 19,5% u decembru 2012. S druge strane, učešće kredita stanovništvu u docnji kretalo se znatno ispod proseka ukupnih NPL. Od kraja 2008. ono je povećano za svega 1,3% i u decembru 2012. je iznosilo 8,6%, pri čemu je najveći deo tog rasta zabeležen u 2009. godini.

Ako se pitanje problematičnih kredita ne rešava blagovremeno, ono može produbiti ozbiljnost i trajanje krize. To se ogleda u vezivanju resursa (sve do likvidacije problematičnog kredita) i ograničavanju njihove efikasne alokacije i produžavanju ekonomske stagnacije koja prati finansijsku krizu (Woo, 2000, str. 3).

Narodna banka Srbije je krajem 2012. godine izvršila izmene regulative kako bi obezbedila uslove za smanjenje NPL u bankarskom sektoru Srbije. Eliminirana su određena ograničenja koja se odnose na prenos potraživanja od pravnih lica. Za razliku od ranije važećih propisa, pravno lice kome se ustupa potraživanje sada ne mora imati sedište u Srbiji, ne mora pretežno da se bavi finansijskom delatnošću i može biti lice koje je povezano s bankom. Izmene su u skladu s međunarodnom praksom i standardima, gde se razrešavanjem NPL bave specijalizovane institucije, a ne banke. Takođe, bankama je pružen dodatni podsticaj da restrukturiranje potraživanja od privrednih društava vrše prema postojećem zakonskom okviru - Zakonu o sporazumnom finansijskom restrukturiranju privrednih društava i Zakonu o stečaju. Naime, omogućeno im je da izvrše još jedno, dodatno, restrukturiranje potraživanja onih preduzeća koja imaju izgleda za oporavak. Istovremeno, dozvoljeno je priznavanje hipoteke kao adekvatnog sredstva obezbeđenja ukoliko je dužnik u docnji do 720 dana (period docnje je pre bio ograničen na 360 dana).

Izmenjeni su i kriterijumi za klasifikaciju potraživanja od fizičkih lica na osnovu njihove kreditne sposobnosti. Ranije je Narodna banka Srbije propisivala načine za utvrđivanje stepena kreditne zaduženosti i odgovarajuće limite kroz odnos duga i prihoda, dok će sada banke samostalno moći da, prema svojim internim procedurama, određuju kreditnu sposobnost dužnika. Banke će tako imati mogućnost da fleksibilnije procenjuju rizik, uvažavajući različitost klijenata. Takvim izmenama regulative stvaraju se preduslovi za rešavanje problema NPL čije višegodišnje kumuliranje opterećuje bilanse banaka i umanjuje potencijal za rast kreditne aktivnosti. Smanjenjem iznosa NPL bio bi smanjen i iznos sredstva koje banke izdvajaju na ime rezervisanja za pokriće tih plasmana. Na taj način omogućuje se rast kreditne aktivnosti, čija će stvarna realizacija

Introduction

The most important problem facing not only the domestic banking sector but also the entire financial system in Serbia is a high percentage of nonperforming loans in the total crediting activity. Nonperforming loans (hereinafter: NPL - nonperforming loans) are a debtor-creditor relationship in which the debtor fails to service his credit liabilities towards the creditor within a period longer than 90 days from the defined due maturity date. Total gross NPLs in December 2012 amounted to 367.1 billion dinars, which makes up for a total of 18.6% of the total granted loans (NBS, 2013, p. 81). Such a high share is one of the typical consequences of the financial and economic crisis. Slowing down of the economy (deterioration of financial situation of the credit beneficiaries) and the depreciation of the domestic currency (growth of liabilities of credit beneficiaries who are not protected from the foreign exchange risk) are the elements that are following financial crisis and have a negative impact on the capability of beneficiaries to service regularly their liabilities.

In spite of the high share of the NPLs, stability of the banking sector in Serbia has not been endangered, not for a single minute (so far), in view of high amounts of provisioning funds allocated by the banks for this purpose, both in compliance with the international standards and with the domestic regulations. Hence the NPLs have been fully covered by the amount of provisions allocated for covering potential loan losses to that end, where Serbia stands as a recorder in the region. Regulatory provisioning for the so-called loan loss reserve, in December 2012 has still completely covered the amount of the gross NPLs; by the end of that month, coverage amounted to 123.3%. What is specific for Serbia is that it has entered the crisis with an already high level of the NPLs, which amounted, by the end of 2008, to a gross 11.3% (Graph 1). In the other countries under observation in the region of Central and South East Europe, this share was ranging from 2.1% to 7.2% (NBS, 2013, p. 24).

The main driving force of the NPLs growth in Serbia is the economy whose gross indicator grew from 14.5%, by the end of 2008, to 19.5% in December 2012. On the other hand, the share

of retail loans in default ranged substantially below the average of the total NPLs. From the end of 2008, this had grown for only 1.3%, and in December 2012 amounted to 8.6% where the major part of that growth was recorded inear 2009.

If the issue of nonperforming loans is not resolved timely it may aggravate the serious implications and duration of the crisis. This is reflected in immobilized resources (all the way up to the liquidation of the nonperforming loan) and limitation of their efficient allocation and prolongation of economic stagnation that is accompanying financial crisis (Woo, 2000, p. 3).

National Bank of Serbia, by the end of 2012, introduced changes in the regulatory framework in order to secure terms for reduction of the NPLs in the banking sector of Serbia. Certain limitations have been eliminated those that pertain to the transfer of claims from corporate entities. The difference in respect to the previously prevailing regulation is that the legal entity that receives the right to collect the claim, under the new provisions, does not necessarily has to have its seat in Serbia, and neither be necessarily engaged primarily in financial activities, and can be a person connected with a bank. The amendments made are compliant with the international practice and standards where the solution of the NPL issue is in the hands of specialized institutions, not the banks. In addition, banks have been offered an additional impetus to perform restructuring of claims from corporate companies according to the existing legal framework - i.e. under provisions of the Law on consensual financial restructuring of corporate entities, and the Bankruptcy Law. Namely, they were allowed to carry out yet another, additional, restructuring of receivables of those companies that are having prospects for recovery. Concurrently, what was allowed was recognition of mortgage as an adequate means of security in case the debtor would be in default up to 720 days (defaulting period was previously limited to 360 days).

Criteria were also amended for classification of receivables from physical persons on the basis of their credit rating. Previously, the National Bank of Serbia was prescribing the manner for determining the degree of credit indebtedness

zavisiti od postojanja dovoljno kvalitetnih projekata i klijenata.

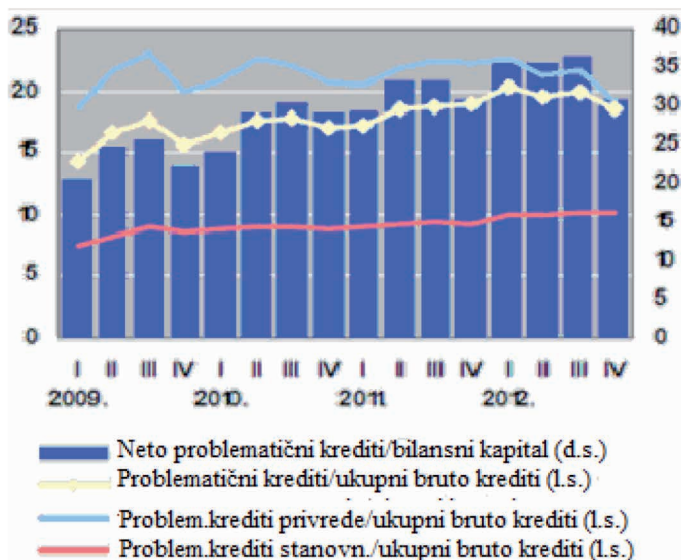
Vreme će pokazati koliko će adekvatne mere biti delotvorne. Prema najnovijim podacima, prognoze nisu optimistične. U oktobru 2013. godine, procenat nenaplativih kredita popeo se na 24,5%, a za pravna lica čak 31,5%. Pored opadajućeg kvaliteta portfolija banaka, kao posledice problematičnih kredita, pred bankarskim sektorom u Srbiji, kao i drugim zemljama jugoistočne Evrope, javljaju se sledeći izazovi (Business Info Group, <http://www.big.co.rs>):

- slabi ekonomski izgledi;
- pritisci razduživanja prema inostranstvu;
- visok nivo javnog duga i shodno tome potreba za fiskalnom konsolidacijom;
- izbegavanje dodatnih pritisaka sa deviznog tržišta;
- adekvatna priprema za primenu Bazela III; kao i
- izazovi u vezi sa procesom EU integracija i usvajanjem pravnih tekovina Evropske unije.

Uprkos naporima da se kontroliše kreditna aktivnost banaka, problematični krediti su jedan od najvažnijih problema savremenog bankarstva i glavna briga za domaće i međunarodne regulatore. U tom smislu, agregatna stopa problematičnih kredita se često koristi od strane međunarodnih institucija (MMF, Svetska banka i BIS) kao indikator snage bankarskog sektora u svakoj zemlji. Bankarski sektor u Srbiji, uprkos dobrim poslovnim rezultatima, suočen je sa gorućim problemom nenaplativosti problematičnih kredita. To je naročito prisutno u kreditnoj aktivnosti prema privrednom sektoru, sa izraženim rastućim trendom (Grafikon 1). Uprkos takvim tendencijama, stabilnost bankarskog sistema ne dovodi se u pitanje, s obzirom na visok nivo kapitalne adekvatnosti i rezervisanja banaka za pokriće eventualnih gubitaka. Apsorpcija gubitaka, koja je posledica isuviše ekspanzivne kreditne politike, utiće na nemogućnost smanjivanja kamatnih stopa i

slabe agregatne tražnje, kao glavnog katalizatora ekonomskog rasta.

Grafikon 1. Stanje problematičnih kredita u Srbiji (u %)



Izvor: NBS, (2013), str. 51.

U brojnim akademskim istraživanjima problematični krediti se uzimaju kao nezavisna (egzogena) varijabla kojom se objašnjavaju bankarske performanse, neuspesi i krize. Neveliki broj radova bavi se istraživanjem problematičnih kredita kao zavisne (endogene) varijable, koja je objašnjena specifičnim bankarskim ili makroekonomskim faktorima. S obzirom na bolju dostupnost podataka i informacija, dolazi i do većeg interesovanja za istraživanje značaja i uticaja determinanti na problematične kredite. Između ostalih, Breuer (2006) koristi Banscope bazu podataka kako bi analizirao uticaj pravnih, političkih, ekonomskih i bankarskih institucija na nivo problematičnih kredita; Babihuga (2007) analizira povezanost makroekonomskih varijabli i pokazatelja finansijskih performansi (kapitalna adekvatnost, profitabilnost i kvalitet aktive); Barth (2004) istražuje uticaj prudencionalnih i regulatornih faktora na bankarsko poslovanje.

U analizi su korišćene serije podataka za koje se pretpostavlja da mogu imati manji ili veći uticaj na nivo problematičnih kredita u Srbiji. Analiza je rađena za period od četvrtog tromesečja 2008. do trećeg tromesečja 2013. godine. Prema metodologiji Narodne banke

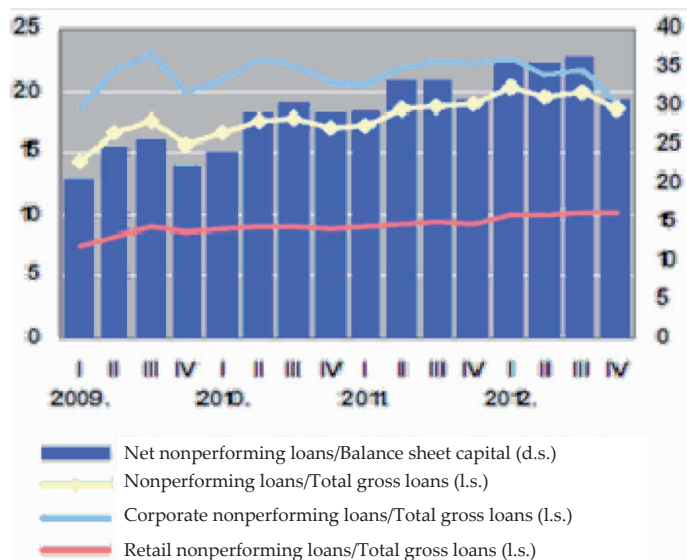
and corresponding limits through the debt/revenue ratio, while now the banks would be able to decide, independently and according to their internal procedures, on the credit worthiness of the debtor. The banks will thus have an opportunity for a more flexible risk assessment, respecting the diversity of clients in question. Such amendments to the regulatory framework are creating prerequisites for solution of the NPLs problem whose multi-year accumulation is burdening the banks' balance sheets and is lowering their potential for growth of credit activities. When reducing the amount of the NPL what would also be reflected in lowering the amount of funds that the banks are allocating for provisioning in order to cover such placements. In this way the growth of credit activities would be made possible whose real implementation will depend on the presence of sufficiently high quality projects and clients.

Time will show just how much the adequate measures will prove to be beneficial. According to the latest data, prognostics are not very optimistic. In October 2013, the percentage of nonperforming loans grew to 24.5%, and for the corporate even to as high as 31.5%. In addition to the falling quality of the banks' portfolios as the consequence of the nonperforming loans, the banking sector of Serbia, as well as those of the other countries of South East Europe, came about to face the following challenges (Business Info Group, <http://www.big.co.rs>):

- Poor economic prospects;
- Pressures of foreign debt repayment;
- High level of public debt and hence the need for fiscal consolidation;
- Evasion of additional pressure from the foreign exchange market;
- Adequate preparation for the implementation of the Basel III Accord; and
- Challenges in connection with the process of EU integrations and adoption of the European Union acquis.

In spite of the efforts to control credit activities of banks, nonperforming loans have surfaced as one of the most important problems of contemporary banking and the main concern for both national and international regulators. To that end, aggregate nonperforming loans rate is often been used by the international institutions (IMF, World Bank, and the BIS) as an indicator of the banking sector viability in any given country. Banking sector in Serbia, in spite of good business results, is faced with an urgent problem of irrecoverable nonperforming loans. This is especially present in the crediting activity of the corporate sector, with an emphatic growing trend (Graph 1). In spite of such tendencies, stability of the banking sector is not been placed under a question mark, in view of the high level of capital adequacy and the banks loan loss provisioning. The loss absorption which is the consequence of an excessive expansionist crediting policy will have an impact on the inability to lower interest rates and remedy poor aggregate demand, as the main catalyst of the economic growth.

Graph 1 - The state of nonperforming loans in Serbia (in %)



Source: NBS, (2013), p. 51.

In many academic research works nonperforming loans are treated as an independent (exogenous) variable which serves to explain banking performances, failures and crisis. Not a very large number of works is engaged in the research of nonperforming loans

Srbije, korišćeni su kvartalni podaci sa ukupno 20 opservacija. Osnovni izvor podataka predstavljaju različiti statistički izveštaji koje objavljuje Narodna banka Srbije.

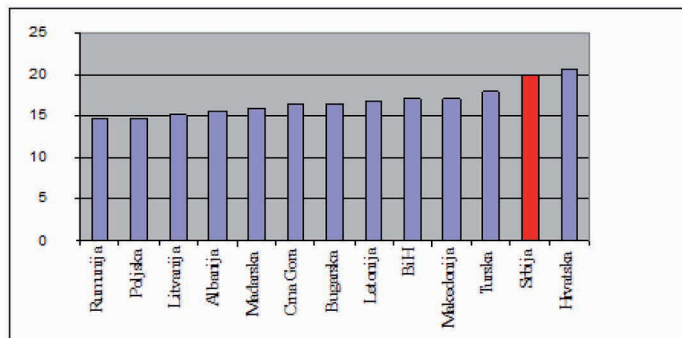
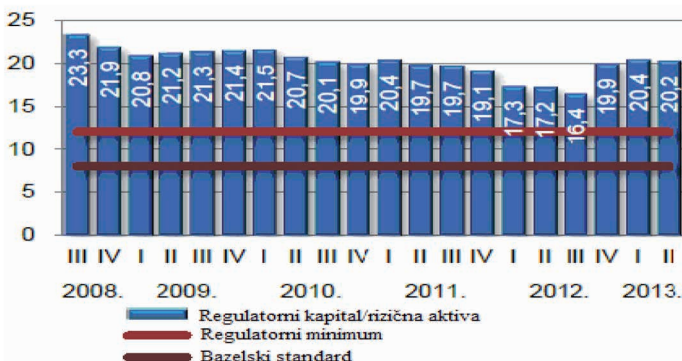
Definisanje varijabli modela

Kako bi se utvrdile determinante kretanja udela problematičnih kredita u ukupnim kreditima u Srbiji, u istraživanju se pošlo od sledećih varijabli:

1. Pokazatelj adekvatnosti kapitala - CAR (capital adequacy ratio) - može se koristiti u funkciji kontrole preuzimanja prekomernog rizika od strane banaka i zaštite od insolventnosti. Banke koje imaju niži CAR od minimuma, u obavezi su da prilagode svoje bilansne pozicije regulatornim zahtevima (Bazelski standardi) ili dokapitalizacijom ili smanjivanjem svoje rizične aktive, što u oba slučaja pozitivno utiče na njihove performanse i bonitet. Empirijski, ne postoji konsenzus oko odnosa između kapitalne adekvatnosti i problematičnih kredita. S jedne strane, postoje istraživanja koja pokazuju da se banke, koje imaju adekvatan CAR tokom tri godine (pre godine samog istraživanja), suočavaju sa manjim procentom problematičnih kredita (Sinkey, 1991, str. 43-59). S druge strane, postoje argumenti koji govore o činjenici da banke sa visokim CAR ulaze u rizičnije aktivnosti, stvarajući rizičniji kreditni portfolio (Rime, 2001, str. 789-805). Bankarski sektor u Srbiji je u kontinuitetu adekvatno kapitalizovan. Na kraju 2012. godine CAR je iznosio 19,87%, da bi taj iznos, posle određenih variranja, ostao na istom nivou do trećeg kvartala 2013. godine. Agregatni CAR za bankarski sektor je na više nego dovoljnom nivou -

preko 65% iznad regulatornog minimuma. Ukoliko se posmatra adekvatnost kapitala u međunarodnom kontekstu, bankarski sektor Srbije se, zahvaljujući konzervativnoj prudencijalnoj regulativi, nalazi na drugom mestu među zemljama centralne i istočne Evrope (Grafikon 2a i 2b).

Grafikon 2a i 2b. Adekvatnost kapitala bankarskog sektora u Srbiji i poređenje sa zemljama centralne i istočne Evrope



Izvor: NBS, (2013), str. 47-49.

2. Rezervisanja za potencijalne gubitke (LLP - loan loss provisions) - vrsta kontrolnog mehanizma kada su u pitanju očekivani gubici. Obično je u direktnoj korelaciji sa nivoom problematičnih kredita. Predviđajući visok nivo kapitalnih gubitaka, banke odvajaju veća rezervisanja kako bi, istovremeno smanjile i neizvesnost profitabilnosti i ojačale srednjoročnu likvidnost. Menadžeri mogu koristiti rezervisanja kako bi signalizirali finansijsku snagu banke, s obzirom da se spremnost odvajanja većih rezervi može povezati sa snažnim verovanjem u buduće performanse banke. Ukupna stopa rezervisanja govori o generalnom stavu i pristupu bankarskog sektora kontroli rizika.

Radi zaštite interesa deponenata i ostalih

as a dependable (endogenous) variable which is explained by specific banking or macro-economic factors. As a much better accessibility to data and information now prevails, the interest grows for research into significance and impact of determinants on the nonperforming loans. Among others, Breuer (2006) is using Banscope data base in order to analyse the impact of legal, political, economic and banking institutions on the level of nonperforming loans; Babihuga (2007) analyzes the connection between macro-economic variables and the indicators of financial performances (capital adequacy, profitability, and the assets quality); Barth (2004) investigates the impact of prudential and regulatory factors on the banking business.

In this analysis, series of data were used which are assumed to have a lesser or greater impact on the level of nonperforming loans in Serbia. The analysis was made for the period from the fourth quarter of 2008 up to the third quarter of 2013. According to the methodology of the National Bank of Serbia, quarterly data were used for the total of 20 observations. The main data source is the different statistical reports that are being published by the National Bank of Serbia.

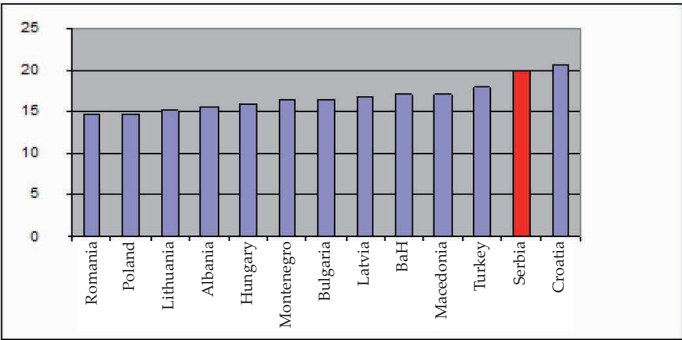
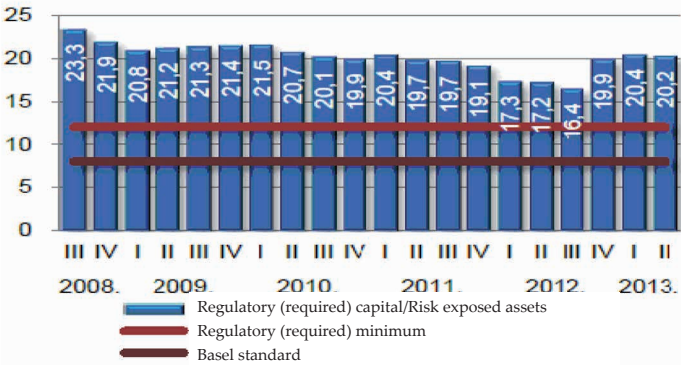
Model variables definition

In order to assess determinants in the movement of nonperforming loans share in the total credits in Serbia, the following variables were taken as a starting point in our research:

- 1. Capital Adequacy Ratio - CAR that can be used in the function of control in the excessive risk exposure by the banks and a protection against insolvency. Banks with a lower CAR than the minimum prescribed, must adjust their balance sheet positions to the regulatory requirements (Basel standard), or through recapitalisation, or either by lowering their risky assets, which in both cases has a positive effect on their

performances and credit rating. Empirically speaking, there is no consensus on the capital adequacy/nonperforming loans ratio. On the one hand, there are investigations showing that the banks, those with an adequate CAR over a period of three years (prior to the year of research itself) are faced with a lower percentage of nonperforming loans (Sinkey, 1991, p. 43-59). On the other hand, there are arguments in favour of the fact that banks with the higher CAR are venturing into higher risk-taking activities, thus creating a more risk exposed credit portfolio (Rime, 2001, p. 789-805). Banking sector in Serbia has been continuously adequately capitalised. By the end of 2012, CAR amounted to 19.87%, and this amount after certain variations, remained on the same level up to the third quarter of 2013. The aggregate CAR for the banking sector was at a more than an adequate level, over 65% above the regulatory minimum. If the capital adequacy is to be observed within an international context, banking sector of Serbia, thanks to its conservative prudential regulatory framework, finds itself ranking on the second position amongst the countries of Central and East Europe (Graph 2a and 2b).

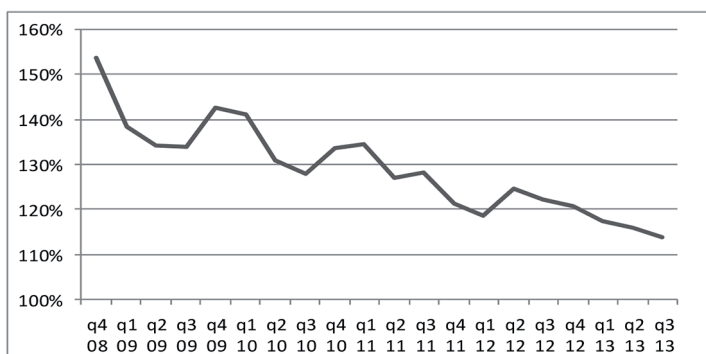
Graph 2a and 2b - Capital adequacy of the banking sector of Serbia in comparison with the countries of Central and East Europe



Source: NBS, (2013), p. 47-49.

poverilaca i očuvanja finansijske stabilnosti, Narodna banka Srbije zahteva, pored rezervi propisanih međunarodnim standardima finansijskog izveštavanja, i formiranje tzv. regulatornih rezervi tj. rezervi za potencijalne gubitke. Krajem 2012. godine, obračunata rezerva za pokriće bilansnih i vanbilansnih gubitaka bila je dovoljna za pokriće 121% bruto problematičnih kredita. Zahvaljujući visokoj pokrivenosti rezervama za procenjene gubitke, problematični krediti, iako visoki, ne ugrožavaju finansijsku stabilnost, mada je uočljiv opadajući trend pokrivenosti od 2008. godine (Grafikon 3).

Grafikon 3. Pokrivenost problematičnih kredita rezervama za potencijalne gubitke (u %)



Izvor: NBS

- Profitabilnost, kao osnovni kvalitativni pokazatelj, utiče na ponašanje menadžera kada je u pitanju prihvatanje rizika. Banke sa većom stopom profitabilnosti imaju manji pritisak za stvaranjem profita, samim

tim i manju zavisnost od ulaženja u rizične plasmane. U isto vreme, neefikasne i manje profitabilne banke u najvećoj meri imaju problema sa visokom stopom problematičnih kredita. Ne postoji empirijski dokaz o uticaju profitabilnosti na nivo problematičnih kredita. Godlewski (2004) je u svom radu ukazao na negativnu korelaciju ove dve varijable dok su Garcíya i Fernandez (2007) u svom istraživanju, koje je obuhvatilo 129 španskih banaka u periodu 1993-2000. godina, pokazali da su visoke stope prinosa na aktivu i akcijski kapital (ROA i ROE) praćene većim rizikom u budućnosti (Garcíya, Robles-Fernández, 2007, str. 332-354).

Uprkos brojnim kako interno, tako i eksterno generisanim izazovima s kojima se suočava, bankarski sektor u Srbiji je profitabilan, iako je krajem 2012. godine njegova profitabilnost opala u odnosu na prethodnu godinu. Sa ostvarenim prinosom na aktivu od 1,0% i prinosom na kapital od 4,7%, profitabilnost bankarskog sektora Srbije ne odstupa mnogo od proseka regiona (Grafikon 4). Smanjenje profitabilnosti rezultat je visokog

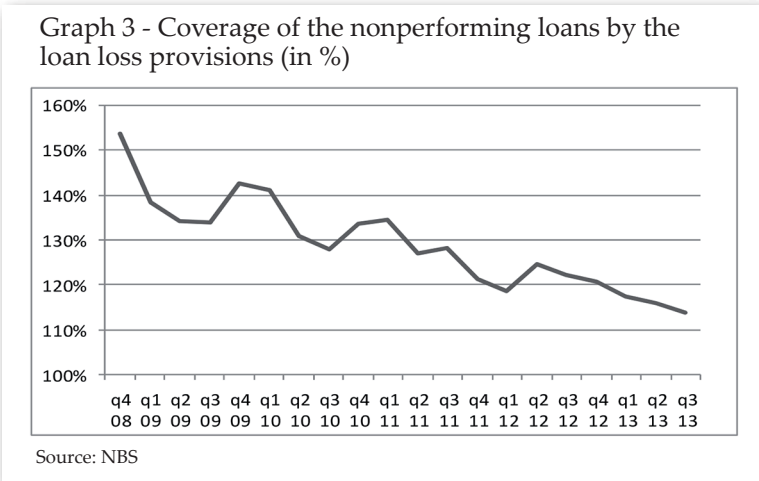
nivoa problematičnih kredita, odnosno visokih otpisa nenaplativih potraživanja na teret rezultata, ali i usporenog kreditnog rasta.

2. Loan Loss Provisions - LLP is a type of control mechanism when speaking of the expected losses. Usually it stands in direct correlation with the level of nonperforming loans. When predicting the high level of capital losses banks are allocating higher provisioning in order to reduce simultaneously the unpredictability of profitability and strengthen their medium-term liquidity. Managers are free to use provisioning in order to signalize financial strength of the bank, in view of the fact that readiness to allocate higher reserves may be linked with a robust belief in the bank's future performances. The total provisioning rate speaks of the general attitude and approach of the banking sector to the risk control issues.

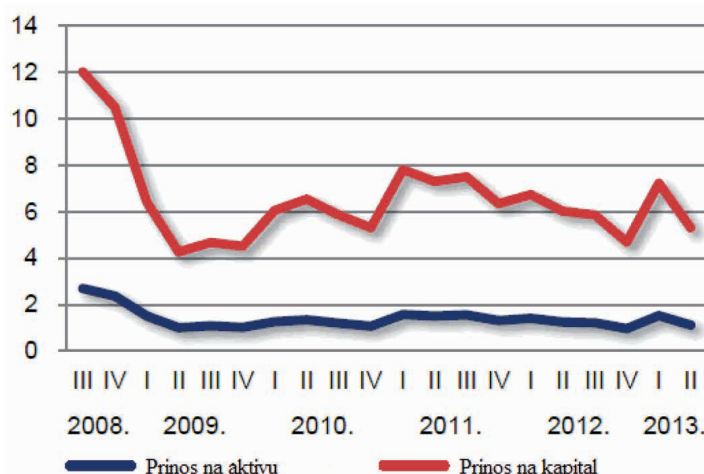
In order to protect interests of depositors and other creditors and for purpose of safeguarding financial stability, National Bank of Serbia requires, in addition to the provisions prescribed under international standards for financial reporting, also the establishment of the so-called regulatory reserves, i.e. the loan loss provisions. By the end of 2012, calculated provisions for covering balance sheet and off-balance sheet losses were sufficient to cover 121% of the gross nonperforming loans. Thanks to the high rate of provisions by reserves for potential losses, nonperforming loans, although high, have not caused a danger to the financial stability, although there was a noticeable falling trend in provisioning from 2008 onwards (Graph 3).

3. Profitability, as the basic qualitative indicator, impacts behaviour of managers when speaking of the risk exposure acceptance. Banks with a higher rate of profitability have a lesser pressure regarding profit making, hence also a lower dependency on venturing into the risk exposed placements. At the same time, non-efficient and less profitable banks are having a higher degree of problems with a high rate of nonperforming loans. There is no empirical proof on the impact that profitability has on the level of nonperforming loans. Godlewski (2004) in his work pointed out at the negative correlation between these two variables, while Garcíya and Fernández (2007), in their research which covered 129 Spanish banks over a period from 1993 to 2000, showed that high return on assets and return on equity (ROA and ROE) are followed by a higher risk exposure in future (Garcíya, Robles-Fernández, 2007, p. 332-354).

In spite of many both internally and externally generated challenges facing the banking sector, it remains a profitable one in Serbia, although by the end of 2012 its profitability experienced a fall in comparison with the previous year. With the returns gained on assets of 1.0% and return on equity of 4.7% profitability of the banking sector of Serbia is not digressing much from the average achieved in the region (Graph 4). Lower profitability is the result of the high level of nonperforming loans, i.e. of the high writing-offs of the nonperforming claims charged on the results, but also of the slowed down credit growth.



Grafikon 4. Pokazatelji profitabilnosti bankarskog sektora u Srbiji (u %)



Napomena: ne uzimaju se u obzir Agrobanka, Nova Agrobanka i RBV
Izvor: NBS, (2013), str. 53.

Tabela 1. Osnovni i prilagođeni prinos na aktivu

Godina	ROA	ROA prilagođeni
2008	2.08	2.08
2009	1.02	1.02
2010	1.08	1.08
2011	0.05	1.23
2012	0.43	0.97
2013	0.79	0.79

Izvor: NBS

Važno je naglasiti da se prilikom konstruisanja modela koriste ROA i tzv. prilagođeni ROA (Tabela 1), zbog otpisa loše aktive i problema u bankarskom sektoru, vezanih za poslovanje Agrobanke i Razvojne banke Vojvodine (kraj 2011. i druga polovina 2012. godine).

4. Udeo državnih banaka u vlasništvu (STATE) - varijabla koja može objasniti ponašanje banaka u domenu politike preuzimanja rizika i, konsekvntno, nivoa problematičnih kredita. Salas i Saurina (2002) naglašavaju veću potrebu državnih banaka da finansiraju rizičnije projekte i alociraju sredstva ka SME sektoru, kako bi uticale na ekonomski razvoj zemlje. Takva politika dovodi i do većeg nivoa problematičnih kredita. Micco i ostali autori

(2004) konstatuju veću stopu NPL kod državnih banaka, usled slabijeg kapaciteta kreditnog oporavka u odnosu na banke u privatnom vlasništvu. Na kraju drugog kvartala 2013. godine, u Srbiji je poslovalo 7 državnih banaka, od ukupno 31 banke, sa učešćem u aktivi od 18.2% i 14,5% učešća u kapitalu. Dok je odnos aktive i kapitala prema poreklu vlasništva u bankarskom sektoru približno isti, državne banke i dalje imaju dosta razvijeniju poslovnu mrežu, kao i veći broj zaposlenih - 25,5% organizacione mreže i 23,3% zaposlenih (NBS, 2013, str. 1).

5. Udeo inostranih (privatnih) banaka u vlasništvu (FOREIGN) - nedvosmisleno pokazuje pozitivan uticaj na bankarsko poslovanje, pre svega kroz povećanu ekspertizu u menadžmentu, širu paletu finansijskih usluga, veću kompetitivnost i privlačenje stranih direktnih investicija u nefinansijski sektor. Barth i ostali autori (2002) konstatuju negativan odnos između inostranih banaka i povećanja NPL, naglašavajući njihov uticaj na podizanje ukupnog kvaliteta zajmova i poboljšanje kvaliteta zajmova domaćih banaka. Inostrane banke i dalje imaju dominantan udeo u bankarskom sektoru od približno 75% aktive i kapitala bankarskog sektora. Preovlađujući udeo imaju banke poreklom iz zemalja Evropske unije 71,0% (69,7% iz zemalja zone evra), uz banke poreklom iz Rusije i SAD koje imaju udele od 3,7% i 0,3%, respektivno.
6. Koncentracija (CONC) - varijabla koja takođe može uticati na kreditni rizik i nivo problematičnih kredita. Na monopolističkim bankarskim tržištima, finansijske institucije su spremne da naplaćuju više kamatne stope u budućnosti kako bi se oporavile od gubitaka nastalih u sadašnjosti. U takvoj situaciji, manje bonitetne kompanije će se kreditirati i dovesti do rasta NPL-a u budućnosti, što se, s druge strane, ne dešava na konkurentskim tržištima, s obzirom da kompanije ne prihvataju kreditiranje po kamatnim stopama višim od onih tržišnih.

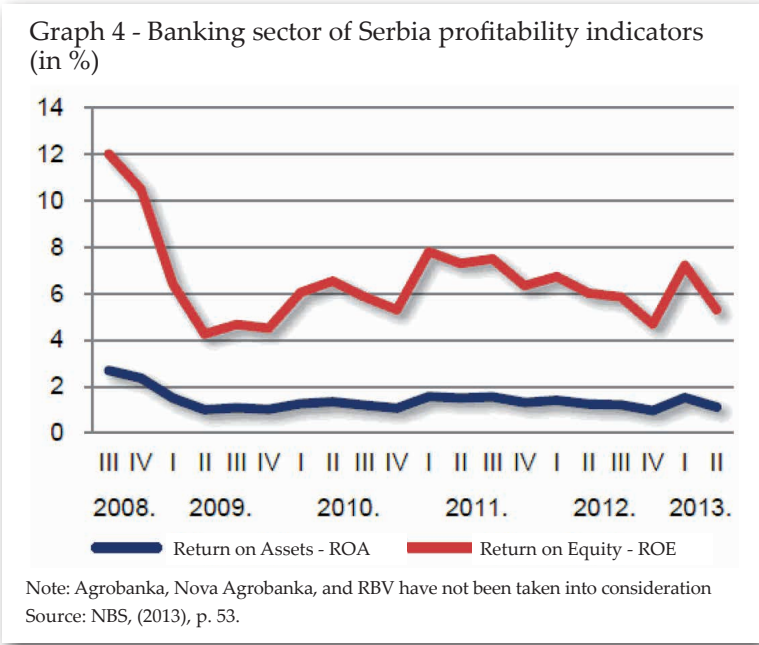


Table 1 - Basic and adjusted Return on Assets - ROA

Year	ROA	ROA adjusted
2008	2.08	2.08
2009	1.02	1.02
2010	1.08	1.08
2011	0.05	1.23
2012	0.43	0.97
2013	0.79	0.79

Source: NBS

It is important to note that when constructing the model what is used is ROA and the so-called adjusted ROA (Table 1) because of writing-offs of the poor assets and problems in the banking sector, those connected with the performances of the Agrobanka and Razvojna banka Vojvodina business operations (end of 2011 and the second half of the year 2012).

4. The share of state-owned banks in the total ownership of banks (STATE) is the variable that can serve to explain the behaviour of banks in the domain of risk exposure and, consequently, the level of nonperforming loans. Salas and Saurina (2002) are underlining the higher need for the state-owned banks to finance risk exposed

projects and channel allocation of funds towards the SME sector, in order to impact the economic development of the country. Yet such a policy would lead also to a higher level of nonperforming loans. Micco and other authors (2004) are finding also a high rate of NPL in the state owned banks, because of poorer capacity for credit recovery in comparison with the privately owned banks. By the end of the second quarter of 2013, there were 7 state-owned banks operating in Serbia, from the total of 31 banks, with the share in assets of 18.2% and 14.5% share in equity.

While the assets/equity ratio according to the origin of ownership in the banking sector was approximately equal, the state-owned banks still continued to have a rather well developed business network and a higher number of employees - 25.5% of the organisational network, and 23.3% of employees (NBS, 2013, p. 1).

5. The share of foreign (privately owned) banks (FOREIGN) unambiguously shows the positive impact on the banking business primarily through an enhanced expertise in management matters, a broader scope of financial services, higher competitiveness and attraction of foreign direct investments in the non-financial sector. Barth and other authors (2002) find that there is a negative ratio between foreign banks and the growth of NPL, stressing their impact on the growth of the total quality of loans and an improvement in the loan quality of the domestic banks. Foreign banks still retain a predominant share in the banking sector, with approximately 75% of assets and equity in the banking sector. The prevailing share is held by banks mostly originating from the European Union countries, 71.0% (69.7% are from the euro-zone countries), together with the banks originating from Russia and the U.S.A. that are having a share of 3.7% and 0.3% respectively.

6. Concentration (CONC) variable is the one that can also have an influence on the credit

Breuer (2006) pronalazi slabu, ali značajnu korelaciju između koncentracije u bankarskoj industriji i nivoa problematičnih kredita.

Analiza nivoa koncentracije banaka i konkurencije na srpskom tržištu i reprezentativnim tržištima Centralne i Jugoistočne Evrope ukazuje na nekoliko nalaza (Marinković, 2012, str. 39):

- nizak nivo koncentracije srpskog bankarskog tržišta;
- pet najvećih banaka nema dominaciju u najznačajnijim bilansnim kategorijama;
- registruje se odsustvo korelacije između nivoa koncentracije najvećih banaka i nivoa profitabilnosti;
- registruje se znatan broj potencijalnih transakcija promene vlasništva, ali i mali broj stvarno realizovanih.

Kao reprezentativna mera nivoa koncentracije bankarskog sektora najčešće se koristi Hiršman-Herfindalov indeks (HHI). Ovaj pokazatelj predstavlja sumu kvadrata tržišnih učešća pojedinačnih banaka u nekoj od bilansnih kategorija (aktiva, krediti, depoziti). Prema regulatornim propisima Sistema federalnih rezervi (FED), kao opšteprihvaćenog kriterijuma, vrednost indeksa do 1.000 ukazuje na nizak nivo koncentracije, vrednosti između 1.000 i 1.800 ukazuju na srednji (umeren) nivo koncentracije, dok vrednost indeksa preko 1.800 ukazuje na visoko koncentrisano tržište. Prema poslednjim podacima, koncentracija je najizraženija u kategorijama depozita stanovništva i ukupnih prihoda, dok je prema kriterijumu kredita stanovništvu i prihoda od kamata bankarski sektor najviše fragmentisan (Tabela 2).

Poslednja varijabla, koja nije direktno vezana za bankarsku industriju ali može uticati na predmet istraživanja jeste realni bruto društveni proizvod u Srbiji, kao osnovni makroekonomski pokazatelj.

Statistička analiza podataka

Navedeno istraživanje uzima u razmatranje agregatne podatke o problematičnim kreditima iz razloga nepostojanja dostupnih podataka koji se odnose na individualne banke. S obzirom na različite poslovne performanse banaka u Srbiji, reprezentativniji uzorak se može dobiti ukoliko se uzme u obzir celokupan bankarski sektor. Podaci se odnose na period od poslednjeg kvartala 2008. do trećeg kvartala 2013. godine, i predstavljaju zvanične podatke koji se nalaze u okviru različitih statističkih analiza i izveštaja Narodne banke Srbije. Vremenski opseg istraživanja je definisan na način da najmerodavnije objasni i analizira uticaj globalne ekonomske krize na bankarski sektor u Srbiji, uporedo sa prisustvom regulatornih promena i zahteva kao odgovora na istu. Pored toga, stariji istorijski podaci nisu bili dostupni tako da nije mogući izvršiti analizu za duži vremenski period. Za konstrukciju modela uzeto je u obzir osam varijabli, s tim što će se uraditi dve varijante modela, jedan sa osnovnim i drugi sa prilagođenim ROA. Naime, s obzirom na okolnosti koje se su dešavale u bankarskom sektoru tj. veliki otpis Agrobanke i prelaz u Novu agrobanku, stečaj Razvojne banke Vojvodine i gašenje Nove agrobanke i prenos loše aktive na Agenciju za osiguranje depozita, urađen

je i modifikovani pokazatelj ROA2. Spisak skraćenica mogu se videti u Tabeli 3.

Tabela 2. Pokazatelji koncentracije bankarskog sektora u Srbiji

	Prvih 5 banaka (učešće u %)	Prvih 10 banaka (učešće u %)	HHI*
Aktiva	49,2	73,2	702
Kredit	52,2	74,0	742
Kredit stanovništva	47,4	75,0	687
Kredit privredi	55,0	75,4	763
Depoziti (ukupni)	48,8	74,0	754
Depoziti stanovništva	53,4	79,0	825
Prihodi (ukupni)	53,1	76,2	817
Prihodi od kamata	48,0	71,7	687
Prihodi od naknada	55,5	77,2	807

* Hiršman-Herfindalov indeks
Izvor: NBS, (2013), str. 2.

risk and the level of nonperforming loans. On the monopolistic banking markets, financial institutions are ready to charge higher interest rates in future in order to recover from the losses incurred at present times. In such a situation, lower credit rated companies will be credited and will bring about the growth of NPL in the future, while this, on the other hand, is not happening on the competitive markets, in view of the fact that companies are not accepting borrowing at the interest rates higher than the market ones. Breuer (2006) finds a rather weak yet significant correlation between the concentration in the banking industry and the level of nonperforming loans.

The analysis of the level of banking concentration and competition on the Serbian market and on the representative markets of Central and South East Europe points out at several findings (Marinkovic, 2012, p. 39):

- Low level of concentration on the Serbian banking market;
- Five largest banks have no domination in the most significant balance sheet categories;
- The absence of correlation between the level of concentration of the largest banks and the level of profitability is registered;
- Significant number of potential transactions in the change of ownership but a small number of really realised ones is recorded.

As a representative measure of the level of concentration in the banking sector, what is most often used is the Hirschman-Herfindahl Index (HHI). This indicator represents a sum of squares of market share of individual banks in some of the given banking categories (assets, credits, deposits). According to the regulatory provisions of the Federal Reserve System

(FED), as a generally recognised criterion, the index value of 1.000 indicates a low level of concentration, value ranging between 1.000 and 1.800 indicate at the medium (average) level of concentration, while the index value of over 1.800 points out at a highly concentrated market. According to the latest data, concentration is the most emphatic in the categories of retail deposits and in the total revenues, while according to the criteria of the retail crediting and the interest earnings banking sector is the most fragmented (Table 2).

Table 2 - Banking sector concentration indicators in Serbia

	The first 5 banks (share in %)	The first 10 banks (share in %)	HHI*
Assets	49.2	73.2	702
Loans (total)	52.2	74.0	742
Retail loans	47.4	75.0	687
Corporate loans	55.0	75.4	763
Deposits (total)	48.8	74.0	754
Retail deposits	53.4	79.0	825
Revenues (total)	53.1	76.2	817
Interest revenues	48.0	71.7	687
Earnings from fees and charges	55.5	77.2	807

* Hirschman-Herfindahl Index
Source: NBS, (2013), p. 2.

The last variable, which is not directly linked with the banking industry but may impact the subject of research, is the real gross social product in Serbia as the basic macro-economic indicator.

Statistical data analysis

The above mentioned research takes into consideration aggregate data on the nonperforming loans for the reason of absence of accessible data pertaining to the individual banks. In view of different business performances of banks in Serbia, the most representative sample may be obtained if taking into consideration the entire banking sector. Data pertain to the period from the last quarter of 2008 to the third quarter of 2013, and it is the official data to be found within the scope of various statistical analyses and reports

of the National Bank of Serbia. The time frame of research is defined in the manner explaining and analysing in the most credible manner the impact of the global economic crisis on the banking sector in Serbia, together with the presence of regulatory amendments made and requirements imposed in response to the same. In addition, the older historical data were not accessible so that it is not possible to make an analysis over a longer period of time. Eight variables have been taken into consideration in the construction of the model, and two variants of the model were to be made, one with the basic and the other with the adjusted ROA. Namely, in view of the circumstances prevailing in the banking sector, i.e. a large scale writing off of the Agrobanka and its transition into a New Agrobanka, bankruptcy of Razvojna banka Vojvodine, and the closing of the New Agrobanka with the transfer of the nonperforming assets on to the Deposit Insurance Agency, a modified ROA2 indicator was created. The list of abbreviations can be found in Table 3.

Descriptive statistics (Table 4) presents, among other, the most indicative data - percentage of average NPLs in the examined period in the value of 17.84%. This is a very high degree which stresses the need for future prudence in conducting crediting policy, in order to avoid mistakes from the past. Maximum value of the NPL, which is a point of concern, pertains actually to the last observation, i.e. to the third quarter of 2013. Average return on assets, if we are to exclude nonperforming cases in the two state-owned banks, amounts to 1.27% which is more than a satisfactory result from the aspect of profitability. Similar case is with the different regulatory measures and a more conservative form of banking activities that have brought about high capitalisation of the banking sector, rendering it more resilient to the external shocks and macro-economic instabilities, with 19.76% of capital in respect to the total balance sheet assets, which is substantially higher than the required regulatory capital of 12%. What is also observed is a high standard deviation in the nonperforming loans and the gross social product, which points out at the emphatic oscillations in the economic activity, primarily in the corporate sector.

Table 3 - Variables abbreviations and definitions

NPL	Percentage of net nonperforming loans as a ratio of total gross loans
CAR	Capital adequacy requirement indicator
PROV	Provisioning for potential loan loss in respect to total loans
ROA1	Return on Assets - basic, with indicators of the two state-owned banks in distress
ROA2	Return on Assets - adjusted for exemption of assets of the said banks
STATE	State-owned banks share
FOREIGN	Foreign-owned banks share
CONC	Degree of concentration in the banking sector (5 largest banks)
REALGDP	Real Gross Domestic Product

Ako pogledamo korelacionu matricu posmatranih serija (Tabela 5), uočljiv je visok nivo pozitivne korelisanosti NPL sa udelom domaćih banaka na tržištu (0.86), kao i iznosom rezervisanja (0.89). To nedvosmisleno govori o uticaju državnih banaka na finansijsku stabilnost, pre svega kroz viši stepen neefikasnosti u poslovanju. Neadekvatne ocene boniteta zajmotražioca, slabo korporativno upravljanje i arbitrarno vođenje kreditne politike, uz uticaj političkih struktura, dovode do većeg moralnog hazarda i češćih državnih intervencija iz sredstava javnih prihoda. Najmanji stepen korelisanosti NPL je zabeležen sa udelom stranih banaka kao i realnom stopom rasta društvenog proizvoda. Osrednji nivo negativne korelisanosti (-0.54) javlja se kod odnosa bankarskih performansi i NPL, što pretpostavlja manji prinos na aktivu usled većih rezervisanja za otpise problematičnih kredita. Analogno tome, postoji osrednja negativna korelisanost između kapitalne adekvatnosti i nivoa NPL (-0.59).

Koncentrisanost bankarskog sektora je osrednje pozitivno korelisan sa nivoom NPL (0.51). Nedostatak konkurencije dovodi do nepovoljnijih kreditnih uslova na finansijskom tržištu, u kojem postoji rigidnost cene kapitala

na dole. Od ukupnog operativnog dobitka, približno 80% zarade je po osnovu kamatne marže, sa prosečnim kamatnim stopama na kredite u evrima od 6,5% i kamatnim stopama na štedne depozite u evrima u iznosu od 3%. Visoke kamatne stope utiču i na veći kreditni rizik, čime se uvećava verovatnoća neizvršavanja preuzetih obaveza, naročito u periodu privredne stagnacije i recesije.

Ekonometrijska analiza podataka

Koristeći definisane varijable, ispitana je stacionarnost posmatranih serija podataka pomoću proširenog Diki-Fulerovog (ADF) testa jediničnog korena. Rezultati su prikazani u Tabeli 6. Pokazalo se da je većina serija stacionarna, nultog reda integrisanosti. Pod stacionarnim podrazumevamo serije podataka čije su statističke osobine poput aritmetičke sredine, varijanse itd. konstantne tokom vremena. Pri oceni modela važno je da se koriste stacionarne serije, jer se tako lakše i bolje vrši prognoza na osnovu modela. Kao nestacionarne su se pokazale serije CAR, FOREIGN i CONC. Diferenciranjem su dovedene na stacionarni nivo.

Tabela 5. Korelaciona matrica varijabli modela

	NPL	CAR	PROV	ROA1	ROA2	STATE	FOREIGN	CONC	REALGDP
NPL	1.00	-0.59	0.89	-0.53	-0.54	0.86	-0.10	0.51	0.23
CAR	-0.59	1.00	-0.56	0.32	0.07	-0.64	0.26	-0.06	-0.03
PROV	0.89	-0.56	1.00	-0.49	-0.58	0.85	-0.35	0.18	0.14
ROA1	-0.53	0.32	-0.49	1.00	0.72	-0.27	-0.20	-0.41	0.18
ROA2	-0.54	0.07	-0.58	0.72	1.00	-0.26	-0.12	-0.39	0.20
STATE	0.86	-0.64	0.85	-0.27	-0.26	1.00	-0.44	0.14	0.34
FOREIGN	-0.10	0.26	-0.35	-0.20	-0.12	-0.44	1.00	0.72	-0.33
CONC	0.51	-0.06	0.18	-0.41	-0.39	0.14	0.72	1.00	0.00
REALGDP	0.23	-0.03	0.14	0.18	0.20	0.34	-0.33	0.00	1.00

Table 4 - Descriptive statistics of the model variables

	NPL	CAR	PROV	ROA1	ROA2	STATE	FOREIGN	CONC	REAL GDP
Arithmetic mean	17.84	19.76	22.81	1.12	1.27	1.80	74.09	46.69	-0.19
Median	18.19	20.18	23.10	1.16	1.25	1.82	74.14	46.39	0.42
Maximum	21.06	21.89	24.30	2.08	2.08	1.91	75.35	50.03	3.20
Minimum	11.28	15.73	17.32	0.05	0.79	16.00	72.50	44.39	-4.03
Standard deviation	2.31	1.76	1.65	0.45	0.28	0.78	0.74	1.39	2.33
Skewness, Asymetry coefficient	-1.15	-1.05	-2.19	-0.40	0.98	-1.00	-0.32	0.71	-0.27
Kurtosis, Compression coefficient	4.41	3.02	7.63	3.40	4.74	3.62	2.57	3.25	1.76
Jarque-Bera Probability	6.06	3.69	33.83	0.67	5.71	3.65	0.00	1.71	1.53
	0.05	0.16	0.00	0.72	0.06	0.16	0.78	0.42	0.46
Number of opservations	20	20	20	20	20	20	20	20	20

If we are to look at the correlation matrix of the observed series (Table 5) what is noticeable is a high level of positive correlation between the NPL and the share of domestic banks on the market (0.86), and also between the sums of provisioning (0.89). This unambiguously speaks of the impact that the state-owned banks have on the financial stability primarily through a higher degree of inefficiency in their business operations. Inadequate credit rating of the borrowers, the banks’ poor corporate governance and arbitrary management of credit policies, together with the influence

of political structures have all brought about a higher moral hazard to prevail and more frequent state interventions from the public revenue funds. The lowest degree of NPL correlation was recorded in the share of foreign banks, but also in the real GDP growth rate. The average level of negative correlation (-0.54) appears in the ratio of banking performances and the NPL, which assumes a lower return on assets due to higher loan loss provisions. As an analogy, what appears is the average negative correlation between capital adequacy and the NPL level (-0.59).

Table 5 - Model variables correlation matrix

	NPL	CAR	PROV	ROA1	ROA2	STATE	FOREIGN	CONC	REALGDP
NPL	1.00	-0.59	0.89	-0.53	-0.54	0.86	-0.10	0.51	0.23
CAR	-0.59	1.00	-0.56	0.32	0.07	-0.64	0.26	-0.06	-0.03
PROV	0.89	-0.56	1.00	-0.49	-0.58	0.85	-0.35	0.18	0.14
ROA1	-0.53	0.32	-0.49	1.00	0.72	-0.27	-0.20	-0.41	0.18
ROA2	-0.54	0.07	-0.58	0.72	1.00	-0.26	-0.12	-0.39	0.20
STATE	0.86	-0.64	0.85	-0.27	-0.26	1.00	-0.44	0.14	0.34
FOREIGN	-0.10	0.26	-0.35	-0.20	-0.12	-0.44	1.00	0.72	-0.33
CONC	0.51	-0.06	0.18	-0.41	-0.39	0.14	0.72	1.00	0.00
REALGDP	0.23	-0.03	0.14	0.18	0.20	0.34	-0.33	0.00	1.00

Tabela 6. Diki-Fulerov test jediničnog korena

Naziv serije	Nivo		Prva diferencna	
	Probability (P) vrednost	Vrednost statistike	Probability (P) vrednost	Vrednost statistike
NPL	0.005	-4.899		
CAR	0.174	-2.327	0.000	-6.099
PROV	0.001	-5.250		
ROA1	0.003	-4.414		
ROA2	0.003	-4.349		
STATE	0.038	-3.179		
FOREIGN	0.239	-2.120	0.000	-5.452
CONC	0.982	0.503	0.031	-3.289
REALGDP	0.002	-4.757		

* Test jediničnog korena urađen je bez konstante (C), za koju se pokazalo da nije značajna

minimuma. U tom smislu, kreditna aktivnost banaka se usmerava i prema manje solventnim dužnicima čiji je kreditni rizik daleko izraženiji. Pokazatelj ROA2 je značajan i ima negativni predznak. To možemo protumačiti na način da je smanjenje prinosa na aktivu povezano sa rastom udela problematičnih kredita. Varijabla CONC u modelu ima pozitivan predznak što nam govori da se rast udela problematičnih kredita može objasniti rastom stepena

Ekonometrijska analiza izvršena je korišćenje OLS (Ordinary Least Squares) - metodom najmanjih kvadrata. Kao zavisna varijabla korišćena je kategorija udela problematičnih kredita u ukupnim kreditima, dok su sve ostale varijable korišćene kao nezavisne. Ispitana je analiza sa dve serije ROA, jedna je originalna, a druga je modifikovana u periodu od četvrtog kvartala 2011. do prvog kvartala 2013. godine usled stečaja Agrobanke i Razvojne banke Vojvodine i otpisa velikog iznosa loše aktive, dok je kvalitetna aktiva prebačena u banku Poštanska štedionica.

Prikazan je rezultat ekonometrijske analize, osnovni model. Kao značajne, pokazale su se sledeće varijable: CAR, ROA2, CONC i STATE. Varijabla CAR ima pozitivan predznak, što nam govori da povećanje kapitalne adekvatnosti utiče na rast udela problematičnih kredita u ukupnim kreditima. Ovakvi rezultati su podudarni sa određenim istraživanjima (Rime, 2001) koja govore o odnosu banaka prema rizičnim aktivnostima u slučajevima povoljne kapitalne adekvatnosti. Naime, podstaknute profitnim mogućnostima, banke svesno ulaze u rizične aktivnosti sa istovremeno kapitalnim nivoom koji je znatno iznad regulatornog

koncentracije u bankarskom sektoru. Još jedna od varijabli koja se pokazala značajna u prikazanom modelu je STATE. Njen uticaj na problematične kredite je pozitivan što nam kazuje da rast udela državnih banaka utiče i na porast udela problematičnih kredita.

Sveukupno model ima zadovoljavajuće karakteristike. Koeficijent determinacije R² iznosi 0,87 što kazuje da je 87% kretanja zavisne varijable objašnjeno modelom. I korigovani R²

Tabela 7. Osnovni model

Dependent Variable: NPL				
Method: Least Squares				
Date: 11/14/13 Time: 22:31				
Sample (adjusted): 2009Q2 2013Q3				
Included observations: 18 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAR(-1))	0.263	0.135	1.955	0.079
ROA2	-2.562	1.104	-2.321	0.043
D(CONC)	1.166	0.384	3.037	0.013
C	-18.186	7.502	-2.424	0.036
STATE	1.945	0.589	3.302	0.008
D(FOREIGN)	0.080	0.573	0.140	0.891
REALGDP(-1)	-0.001	0.099	-0.012	0.991
PROV	0.175	0.439	0.400	0.698
R-squared	0.866	Mean dependent var		1.841
Adjusted R-squared	0.773	S,D, dependent var		1.524
S.E. of regression	0.726	Akaike info criterion		2.499
Sum squared resid	5.275	Schwarz criterion		2.895
Log likelihood	-1.449	F-statistic		9.261
Durbin-Watson stat	1.480	Prob(F-statistic)		0.001

Concentration of the banking sector is moderately positively correlated with the level of NPL (0.51). The absence of competition brings about unfavorable crediting conditions on the financial market where there is a rigidity of capital downward price. From the total operative gain, approximately 80% of profit is made on the basis of the interest margin, with average interest rates on EURO denominated loans of 6.5%, and the interest rates on savings deposits in EURO in the amount of 3%. High interest rates are impacting also a higher credit risk, enhancing the probability of default in undertaken liabilities, and this especially in the period of economic stagnation and recession.

Econometric data analysis

When using the defined variables, stationary position of the observed data series was examined by means of Augmented Dickey-Fuller (ADF) unit root test. The results are shown in Table 6. It showed that the majority of series was stationary, of the zero order of integration. Under the term stationary we assume data series whose statistic features like the arithmetic mean, variances, etc., are constant through time. In evaluating the model it is important to use stationary series as this is

Table 6 - Dickey-Fuller unit root test

Naziv serije	Level		First differentiation	
	Probability (P) value	Statistical value	Probability (P) value	Statistical value
NPL	0.005	-4.899		
CAR	0.174	-2.327	0.000	-6.099
PROV	0.001	-5.250		
ROA1	0.003	-4.414		
ROA2	0.003	-4.349		
STATE	0.038	-3.179		
FOREIGN	0.239	-2.120	0.000	-5.452
CONC	0.982	0.503	0.031	-3.289
REALGDP	0.002	-4.757		

*Unit root test was done without the constant (C) for which it was found that it was not significant

Table 7 - Basic model

Dependent Variable: NPL				
Method: Least Squares				
Date: 11/14/13 Time: 22:31				
Sample (adjusted): 2009Q2 2013Q3				
Included observations: 18 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAR(-1))	0.263	0.135	1.955	0.079
ROA2	-2.562	1.104	-2.321	0.043
D(CONC)	1.166	0.384	3.037	0.013
C	-18.186	7.502	-2.424	0.036
STATE	1.945	0.589	3.302	0.008
D(FOREIGN)	0.080	0.573	0.140	0.891
REALGDP(-1)	-0.001	0.099	-0.012	0.991
PROV	0.175	0.439	0.400	0.698
R-squared	0.866	Mean dependent var		1.841
Adjusted R-squared	0.773	S,D, dependent var		1.524
S.E. of regression	0.726	Akaike info criterion		2.499
Sum squared resid	5.275	Schwarz criterion		2.895
Log likelihood	-1.449	F-statistic		9.261
Durbin-Watson stat	1.480	Prob(F-statistic)		0.001

a way to an easier and better prognostication on the basis of the model. The series that showed to be non-stationary were the series CAR, FOREIGN, and CONC. Through differentiation, they were brought down to the stationary level.

Econometric analysis was done by using OLS (Ordinary Least Squares) - through the least squares method. As a dependent variable the category of NPL share in the total credits was used, while all the other variables were used as independent. The analysis was examined with

two ROA series, one of them the original one, and the other a modified one in the period from the fourth quarter of 2011. and up to the first quarter of 2013, due to the bankruptcy of Agrobanka and Razvojna banka Vojvodine, and the writing off of a large amount of nonperforming assets, while the high quality assets were transferred on to the Postal Savings Bank.

The result of econometric analysis is presented as the basic model. The following variables appeared to be significant: CAR,

prikazuje dobru specifikaciju modela. Grafikon 5 prikazuje kretanje originalne i ocenjene serije problematičnih kredita. Može se zaključiti da ocenjena serija problematičnih ne odstupa puno od originalne, što pokazuju kretanje i iznosi (desna skala) reziduala.

Grafikon 5. Originalna i ocenjena serija NPL-a



Zaključak

Iako je geneza finansijska krize povezana sa univerzalnim bankarstvom i složenim oblicima finansijskih instrumenata na razvijenim finansijskim tržištima, njen uticaj i posledice na finansijsko tržište Srbije je itekako vidljiv. Porast stope nezaposlenosti, pad privredne aktivnosti, povećane budžetskog deficita i javnog duga, kao i sve manja agregatna tražnja osnovne su makroekonomske posledice koje utiču na sve učesnike u finansijskom sistemu jedne zemlje. S obzirom na izraženu bankocentričnost domaćeg

finansijskog sistema, u kojem preovladavaju tradicionalni bankarski poslovi, i nerazvijenog tržišta kapitala, pitanje finansijske stabilnosti u najvećoj meri odnosi se na finansijsko zdravlje banaka i njihovu sposobnost da vrše svoju osnovnu funkciju finansijskog posredovanja,

osiguravajući na taj način podršku domaćem ekonomskom rastu. U tom kontekstu, najznačajnije su regulatorne mere za smanjenje sistemskog rizika u bankarskom sektoru. Najveći problem sa kojim se suočava domaći bankarski sektor jeste visok nivo problematičnih kredita, koji onemogućava snižavanje troška zajmovnog kapitala i veću dostupnost kvalitetnih, dugoročnih kredita.

Zbog svog značaja, pitanju problematičnih kredita se posvetila naročita pažnja, i to sa aspekta definisanja varijabli koje bi mogle približnije objasniti ovu negativnu pojavu. U tom smislu, izvršena je statistička i ekonometrijska analiza koja je konstruisala model i pokazala različiti značaj regulatornih i opšte-ekonomskih varijabli. Uprkos visokom stepenu adekvatnosti modela, važno je naglasiti da se pitanje problematičnih kredita ne može rešiti bez povećanja domaćih kapaciteta u realnoj privredi, s jedne strane, kao i povoljnijim kreditnim uslovima od strane domaćeg bankarskog sektora.

ROA2, CONC, and STATE. Variable CAR has a positive prefix which tells us that the increase in capital activity is impacting the growth of share of nonperforming loans in the total loans. Such results are concurrent with certain research works (Rime, 2001) which speak of the attitude of banks towards risk-taking activities in cases of favorable capital adequacy. Namely, instigated by profit-making prospects, banks are conscientiously venturing into risk activities, simultaneously with the capital adequacy which is substantially above the regulatory required minimum. In that sense, credit activity of banks is streamlined also towards less solvent debtors whose credit risk is far more emphatic. ROA2 indicator is a significant one and it has a negative prefix. We can interpret this in the manner that lowering of the Return on Assets is linked with the growth of share of nonperforming loans. CONC variable in the model is having a positive prefix which tells us that the growth in share of nonperforming loans can be explained by the growth in the degree of concentration in the banking sector. Yet another variable that had appeared to be significant in the presented model is STATE. Its impact on nonperforming loans is positive which indicates that the growth in share of state-owned banks is impacting also the growth in share of nonperforming loans.

Generally speaking, the model has satisfactory characteristics. Determination coefficient R^2 amounts to 0.87 which indicates that 0.87% of dependent variable movement is explained by the model. The corrected R^2 also shows good specification of the model. Graph 5 shows the movement of the actual and evaluated series of nonperforming loans. It may be concluded that the fitted nonperforming series does not digress much from the actual

one, which is illustrated by the movement and the amounts of residual (right hand scale).

Conclusion

Although the genesis of financial crisis is linked with universal banking and complex forms of financial instruments on the developed financial markets, its impact and consequences on the financial market of Serbia were very much visible. The growth of unemployment rate, fall in economic activities, higher budgetary deficit and public debt, as well as constantly falling aggregate demand are the basic macro-economic consequences which are impacting all the stakeholders in the financial system of any given country. In view of an emphatic bank-centric phenomenon present in the domestic financial system where the traditional banking business prevails, together with the absence of a well developed capital market, the issue of financial stability to a greatest degree pertains to the financial soundness of banks and their ability to perform their basic function of financial intermediation, providing thus support to the domestic economic growth. In this context, the most important regulatory measures are the ones dealing with lowering of systemic risk in the banking sector. The major problem facing domestic banking sector is the high level of the nonperforming loans, which is obstructing lowering of the capital borrowing cost and higher accessibility of good quality and long-term credit facilities. Because of its importance, the issue of nonperforming loans was given particular attention and this from the aspect of defining variables that could more closely explain this negative phenomenon. In this sense, statistical

and econometric analysis was made which had constructed a model and had shown different significance of regulatory and general-economic variables. In spite of a high degree of model adequacy, it is important to note that the issue of nonperforming loans can not be resolved without a boost to the domestic capacities in the real economy, on the one hand, and more favorable credit facilities offered by the domestic banking sector.

Graph 5 - Actual and fitted NPL series



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