

UDK 338.32:336.7(497.6)  
DOI: 10.7251/FIN1902055R  
Perica Rajčević\*  
Siniša Kurteš\*\*  
Srđan Amidžić\*\*\*

PREGLEDNI RAD

# Obavezna rezerva kao instrument monetarnog regulisanja – iskustvo Bosne i Hercegovine

## Reserve requirement as a monetary regulation instrument – Bosnia and Herzegovina experience

### Rezime

Bosna i Hercegovina, kao mala i otvorena ekonomija sa ratnim nasljeđem, opredijelila se, uz sugestije međunarodne zajednice, za vođenje diskrecione monetarne politike zasnovane na principu valutnog odbora. Sistem valutnog odbora počiva na monetarnoj/deviznoj instituciji kod koje, pri permanentno fiksnom deviznom kursu, postoji puna konvertibilnost domaće valute. Čini se da je ovaj izbor bio pravilan, imajući u vidu prošlost ovih prostora sa monetarnim institucijama, odnosno sa znanjem upravljanja novčanom masom koja je vrlo često dovodila do hiperinflacije, što je dodatno osiromašilo stanovništvo cijele Bosne i Hercegovine. Kod ovog tipa monetarnog aranžmana, jedini instrument monetarne politike predstavlja stopa obavezne rezerve. Pojavom posljednje svjetske ekonomske krize Upravno vijeće CBBiH pokušalo je relativno čestim mijenjanjem stopa obavezne rezerve da utiče kako na likvidnost finansijskog sektora tako i da podešava ponudu kredita. Stoga cilj ovog rada jeste utvrditi koliko je stopa obavezne rezerve efikasan instrument transmisije i koliko ona zapravo utiče na obim kreditiranja privrede i stanovništva, tj. povećanje i smanjenje likvidnosti bankarskog sistema? Rezultati naše analize upućuju na to da se obavezna rezerva nije pokazala kao efikasan instrument monetarnog regulisanja, osim u domenu poboljšanja likvidnosti bankarskog sektora.

**Ključne riječi:** obavezna rezerva, monetarni sistem, mala otvorena ekonomija

### Abstract

As a young and open economy with a war burden, Bosnia and Herzegovina, encouraged by the international community, opted for a monetary policy based on the currency board principle. The currency board system is established on a monetary/foreign currency institution which, at a permanently fixed exchange rate, maintains full convertibility of the local currency. This choice seems to be correct having in mind the past of this region in terms of monetary institutions and the money management which often caused hyperinflation, which further impoverished the whole population of Bosnia and Herzegovina. In this type of monetary organization, the only instrument of the monetary policy is the cash reserve ratio. With the emergence of the global crisis, the Managing Board of the Central Bank of Bosnia and Herzegovina tried, by frequently changing the cash reserve ratio, to influence the financial sector liquidity and adjust the loan supply. Therefore, this paper aims to ascertain to which extent the cash reserve ratio is an efficient instrument of transmission and how much it can influence the lending to the economy and population i.e. the increase or decrease in the banking system liquidity. The results of our analysis demonstrate that reserve requirements have not proven an efficient instrument of monetary regulation except in terms of improving the banking sector liquidity.

**Keywords:** reserve requirement, monetary sistem, small open economy

\* Vodovod a.d. Banja Luka, e-mail: prajcevic@yahoo.com

\*\* Vanredni profesor na Univerzitetu Banja Luka, Ekonomski fakultet, e-mail: sinisa.kurtes@ef.unibl.org

\*\*\* Vanredni profesor na Univerzitetu Banja Luka, Ekonomski fakultet, e-mail: srdjan.amidzic@ef.unibl.org

## UVOD

U skladu sa Ustavom – Aneksom 4 Opšteg okvirnog sporazuma za mir u Bosni i Hercegovini, Centralna banka Bosne i Hercegovine je institucija Bosne i Hercegovine, osnovana Zakonom o Centralnoj banci Bosne i Hercegovine, koji je usvojio Parlament Bosne i Hercegovine 20. juna 1997. i počela je s radom 11. avgusta 1997.

Centralna banka Bosne i Hercegovine svoju djelatnost obavlja preko Upravnog vijeća Centralne banke Bosne i Hercegovine, Uprave CBBiH i osoblja. Upravno vijeće Centralne banke Bosne i Hercegovine je organ Centralne banke Bosne i Hercegovine nadležan za utvrđivanje monetarne politike i kontrolu njenog provođenja, organizaciju i strategiju Centralne banke Bosne i Hercegovine, u skladu sa ovlaštenjima utvrđenim Zakonom o Centralnoj banci Bosne i Hercegovine.

Zašto CBBiH sa modelom valutnog odbora, a ne i ostalim funkcijama, kao kod drugih centralnih banaka u zemljama tržišne privrede? Za ovakvo rješenje postoji više razloga, od kojih su od posebne važnosti sljedeći razlozi:

- Za zemlju koja je krenula putem tranzicije ka tržišnom modelu, zasnovanom na privatnoj svojini, veoma je važno ostvarivanje makroekonomske stabilnosti, a unutar toga ključni preduslov je imati stabilan domaći novac, utemeljen na realnoj podlozi i sa čvrstom osnovom za realne kalkulacije i provjeru ideja u privatnom biznisu, naročito u investiranju u privredni razvoj;
- Sa velikim ratnim razaranjima i postratnim traumama, posebno entitetskim i nacionalnim podjelama i međusobnim nepovjerenjem unutar zemlje, uspostavljanjem međusobnog povjerenja i izgradnje ukupne stabilnosti bh. društva, bilo bi veoma rizično uspostaviti CBBiH i sa ostalim funkcijama, npr., da vodi i vlastitu „diskrecionu“ monetarnu politiku;
- „Diskreciona“ monetarna politika, u uslovima ekonomski i socijalno razorene zemlje i sa velikim potrebama za finansiranje obnove i rekonstrukcije zemlje i veoma izraženim socijalnim potrebama, stavila bi CBBiH pred nesavladive teškoće, kako u definisanju takve monetarne politike, tako i u njenom provođenju. Veliki pritisci u pravcu finansiranja ovako naraslih potreba putem (nepokrivene) emisije novca sigurno bi proizveli visoku stopu inflacije i ukupnu makroekonomsku nestabilnost, a posebno bi otežali uslove za potencijalne strane investitore da ulažu u ekonomski i socijalni oporavak BiH.

Imajući na umu navedeno, model valutnog odbora predstavljao je najprikladnije rješenje za BiH na putu integracije ekonomskog prostora u monetarnu sferu, pa i izgradnje jedinstvenog ekonomskog sistema u cjelini, ostvarivanja makroekonomske stabilnosti, pored ostalog i putem stabilnog novca i izbjegavanja svih potencijalnih konflikata, političke, nacionalne, entitetske, stranačke prirode, mogućeg uticaja izvršne na monetarnu vlast i sl., te uzimajući u obzir razloge koji se tiču regionalnih ili privrednosektorskih faktora razvoja. Polazeći od činjenice da u Bosni i Hercegovini imamo ortodoksnu tip valutnog odbora koji podrazumijeva maksimalno ograničenje monetarnog suvereniteta, naša analiza obuhvata dvije najvažnije aktivnosti CBBiH, a to je upravljanje deviznim rezervama i politika stope obavezne rezerve kao jedinog pravog instrumenta monetarnog regulisanja.

## 1. PREGLED LITERATURE

### 1.1. Uloga obavezne rezerve kao instrumenta monetarne politike

Obavezna rezerva ima dvije osnovne uloge. Prva je prudencijalnog karaktera, budući da kroz regulisanje likvidnosti banaka pomaže stabilnosti finansijskog sistema, a druga je da djeluje kao instrument transmisije mjera monetarne politike na ekonomsku aktivnost i inflaciju. U ekonomskoj teoriji, najčešće se pominju dva osnovna pravca djelovanja stope obavezne rezerve na ekonomsku aktivnost i inflaciju, i to preko uticaja na ponudu kredita i kontrolu priliva inostranog kapitala. Kada je u pitanju prvi pravac djelovanja, uglavnom se polazi od teorije kreditnog kanala. Prema ovoj teoriji, obavezna rezerva djeluje na ekonomsku aktivnost i inflaciju putem uticaja na kreditni potencijal banaka, tj. kroz kreditni kanal (Berrnanke i Blinder, 1988). Naime, povećanje stope obavezne rezerve utiče na smanjenje ponude bankarskih kredita i za rezultat ima usporavanje ekonomske aktivnosti i pad inflacije.

Na primjer, ako se stopa obavezne rezerve poveća sa 5% na 6%, a ponuda rezervi ostane ista, depoziti će morati da se smanje za 20%. Ovo je potez koji ne samo da kontrahuje kredite već čak može dovesti do toga da banke budu prisiljene da povuku neke postojeće kredite. Pošto ovakav potez za banke može biti veoma skup, promjene stope obaveznih rezervi su po pravilu male i rjeđe se koriste (Burda i Vilpos, 2004).

Koncept djelovanja obavezne rezerve na ponudu bankarskih kredita Burda i Viploš su objasnili na primjeru reprezentativne banke čija se aktivna strana bilansa stanja sastoji od plasmana u kredite (K), hartije od vrijednosti (HOV) i obavezne rezerve (OR), a pasivna od depozita (D).

Polazeći od toga da je stopa obavezne rezerve fiksna, rr, tražnja za rezervama definisana je sa:

$$OR = rr * D.$$

Kako u svakom bilansu važi jednakost aktive i pasive, dobija se:

$$K = (1 - rr) * D - HOV,$$

što ukazuje na to da svaka promjena stope obavezne rezerve direktno utiče na ponudu kredita i samim tim i na monetarne uslove.

Dakle, stopa obavezne rezerve predstavlja „porez“ koji su banke u obavezi da plate za svoju aktivnost. Zbog toga će one nastojati da ovaj trošak prebace na svoje klijente, tako što će povećati kamatnu maržu.

Povećanje stope obavezne rezerve, preko smanjenja ponude bankarskih kredita, međutim, ne mora nužno pozitivno da djeluje na makroekonomska kretanja. Sa jedne strane, rast kamatne marže utiče na rast troškova proizvodnje finansirane iz kredita i to za posljedicu može imati pad proizvodnje, ali istovremeno porast inflacije u kratkom roku, zbog troškovnih efekata, kao i pogoršanje platnobilansne pozicije zbog rasta tražnje za jeftinijim uvoznim proizvodima. Sa druge strane, banke na razne načine mogu izbjeći izdvajanje obavezne rezerve, tako da to nema željeni uticaj na makroekonomska kretanja. Empirijski rad Reinharta i Reinharta je samo jedan od primjera u kome je na bazi 20 zemalja u razvoju potvrđeno da povećanje obavezne rezerve povećava kamatne marže i dovodi do izbjegavanja plaćanja obavezne rezerve od strane banaka.

Kada je u pitanju pravac djelovanja obavezne rezerve na ograničavanje priliva kapitala iz inostranstva, u literaturi se najčešće

## INTRODUCTION

Pursuant to Article 4 – Annex 4 of the General Framework Agreement for Peace in Bosnia and Herzegovina, the Central Bank of Bosnia and Herzegovina is an institution of Bosnia and Herzegovina established by the Law on Central Bank of Bosnia and Herzegovina, which was adopted by the Council of Ministers of Bosnia and Herzegovina on 20 June 1997 and became operational on 11 August 1997.

The Central Bank of Bosnia and Herzegovina operated through the Managing Board of the Central Bank of Bosnia and Herzegovina, CBBH Administration and its staff. The CBBH Managing Board is the CBBH body in charge of establishing the monetary policy and control of CBBH implementation, organisation and strategy under authorizations laid down by the Law on the Central Bank of Bosnia and Herzegovina.

Why the CBBH with the currency board model rather than other functions as is the case with other central banks in market economy countries? There are several reasons for such a solution, the following ones being of particular importance:

- For a country that has begun a transition to a market model based on private ownership, it is very important to achieve macroeconomic stability, the key precondition of which is to have stable domestic money based on real grounds and with a solid basis for realistic calculations and checking ideas in private business, especially in investing in economic development;
- After the devastation caused by the war and with post-war traumas, especially with the division into entities and ethnic divisions as well as mutual distrust within the country in the period of establishing mutual trust and building the overall stability of BH society, it would be very risky to establish the CBBH with other functions as well, such as enforcing its own ‘discretionary’ monetary policy.
- In an economically and socially devastated country in need for financing and reconstruction and with considerable social needs, the ‘discretionary’ monetary policy would pose insurmountable difficulties to CBBH in defining such monetary policy and its implementation. Considerable pressures in terms of financing such great needs by currency issuance would cause a high inflation rate and overall macroeconomic instability and especially make it difficult for potential foreign investors to invest in the social and economic recovery of Bosnia and Herzegovina.

Having this in mind, the currency board model was the most suitable solution for Bosnia and Herzegovina in its way to integration of the economic area in the monetary domain, and even the building of a unified economic system as a whole, achieving of the macroeconomic stability, inter alia, by stable money and avoiding any potential conflicts of political, ethnic, entity or political party affiliation nature, possible influence on monetary authorities etc. and taking into account the reasons with respect of regional or commercial and sectorial development factors. Given that Bosnia and Herzegovina has an orthodox type of the currency board, which means a maximum limit to the monetary sovereignty, our analysis includes two most important CBBH activities, which is foreign currency reserves management and the policy of the reserve requirement as the only functional instrument of the monetary regulation.

## 1. LITERATURE REVIEW

### 1.1. The role of reserve requirements as a monetary policy instrument

Reserve requirements have two basic roles. The first one is prudential as it supports the financial system stability using the regulation of liquidity of banks, and the second one is acting as an instrument of transmission of monetary policy measures to the economic activity and inflation. The economic theory mostly refers to two basic directions of the effect of cash reserve ratio on economic activity and inflation exerted by the influence on the supply of lending and foreign capital inflow control. As for the first effect, the starting point is mostly the credit channel theory. According to this theory, the reserve requirements have an effect on the economic activity and inflation through the influence on lending capacity of banks i.e. credit channel used (Berrnanke and Blinder, 1988).

Namely, an increase in cash reserve ratio affects the reduction of bank loans supply and results in a slowdown in economic activity and a drop in inflation.

For example, if the cash reserve ratio jumps from 5% to 6% and the reserve supply remains the same, deposits will have to be reduced by 20%. Not only does this reduce loans, but also may force banks to withdraw some of the existing loans. Since such a move may be very costly to banks, a change in cash reserve ratio is, by a rule, minor and seldom used (Burda and Vilpos, 2004).

The concept of the effect of reserve requirements on bank loans supply is explained by Burda and Viplos using the example of a representative bank whose asset side of the balance sheet consists of investments in loans (L), securities (S) and reserve requirements (RR), while liabilities consist of deposits (D).

Starting with the premise that the cash reserve ratio is fixed, reserve demand (rd) is defined as:

$$RR = rd * D.$$

As any balance is based on the equality between assets and liabilities, the result is:

$$L = (1 - rd) * D - S,$$

which shows that any change in the cash reserve ratio directly influences the supply of lending and, accordingly, monetary requirements.

Therefore, the cash reserve ratio is a ‘tax’ that banks are required to pay for their activities. For that reason, the banks will try to shift this cost onto their clients by increasing the interest margin.

However, an increase in the cash reserve ratio through a decrease in bank lending supply does not necessarily have a positive effect on macroeconomic trends. On one hand, the rise in the interest margin affects the increase in the cost of production financed from the loan, which can result in a decline in production but, at the same time, may cause the rise in inflation in the short term due to cost effects as well as the deterioration of the balance of payments position due to the increase in demand for less expensive import products. On the other hand, banks can avoid the allocation of the reserve requirements in various ways, so that it does not have the desired impact on macroeconomic developments. The empirical work of Reinhart & Reinhart is just an example in which, based on the experience of 20 developing countries, it is confirmed that an increase in the reserve requirement increases interest margins and leads to the avoidance of the required reserve requirement by banks.

In terms of the effects of reserve requirements on limiting foreign capital inflow, the literature most often refers to the Chilean experi-

pominje iskustvo Čilea (Gregorio, Edwards and Valdes, 2000). Osnovna uloga obavezne rezerve na kredite iz inostranstva tokom devedesetih u Čileu je bila da utiče na redukovanje kapitalnog priliva, naročito priliva spekulativnog karaktera, kako bi se spriječila realna apresijacija domaće valute i povećao stepen monetarne kontrole. Naime, 1991. godine uvedena je stopa obavezne rezerve na inokredite sa rokom dospjeća od tri mjeseca i godinu dana na nivou od 20%. Kasnije je ova stopa povećavana na 30%, da bi u 1998. nakon značajnih pritisaka na domaću valutu bila smanjena na 10%, a zatim ukinuta. Iskustvo, kao i rezultati brojnih empirijskih analiza su, međutim, pokazali da ova mjera nije imala dugoročni efekat, već je samo privremeno dovela do porasta kamatne stope. Ipak, ova mjera je značajno uticala na strukturu kapitalnog priliva u korist dugoročnog zaduživanja, dok agregatni nivo zaduženosti nije značajnije promijenjen.

Pored Čilea, veliki broj centralnih banaka je tokom 80-ih i 90-ih intenzivno koristio stopu obavezne rezerve kao instrument monetarne politike. To je karakterisalo zemlje u tranziciji tokom 90-ih, budući da su imale nerazvijeno finansijsko tržište i neadekvatne institucije koje nisu obezbjeđivale efikasno korišćenje tržišnih instrumenata. Međutim, danas se i tranzicione privrede sve više okreću tržišnim instrumentima, kamatnoj stopi na operacije na otvorenom tržištu (ukoliko su u režimu inflatornog targetiranja) ili intervencijama na deviznom tržištu (ukoliko vode politiku fiksnog kursa). U većini zemalja, sa izuzetkom Hrvatske, Srbije i Rumunije do 2015, stopa obavezne rezerve iznosi ispod 10% i ne koristi se aktivno. U zemljama koje su u režimu inflatornog targetiranja ta stopa je niža i od 5% (npr. Češka, Slovenija, Poljska, i dr.).

## 2. REZULTATI ISTRAŽIVANJA

### 2.1. Iskustva upotrebe obavezne rezerve u Bosni i Hercegovini

Ovaj kratki pregled ciljeva i mjera Centralne banke BiH ukazuje na to da je do sada ova institucija ispunila prvi uslov sa aspekta konzistentnosti monetarnog okvira, tj. čvrste vezanosti za fiksni devizni kurs, ponašanja kao pasivnog posrednika u ispunjavanju ciljeva monetarne politike i neiskorištavanja diskrecionih ovlaštenja, osim onih koje su dopuštene prema konceptu valutnog odbora.

Međutim, CBBiH je pokazala jasnu tendenciju da evoluirala ka većim diskrecionim ovlaštenjima, a tu se postavlja pitanje uspostavljanja odgovarajuće ravnoteže između očuvanja kredibilitnosti valutnog odbora i većeg obima diskrecionih ovlaštenja kao kod klasičnih centralnih banaka. Koncept valutnog odbora u njegovom osnovnom obliku iziskuje određenu konzervativnost u smislu korištenja ovlaštenja i najveću moguću transparentnost, budući da je iskustvo pokazalo da povećanja diskrecionih ovlaštenja mogu da dovedu do smanjenja kredibilitnosti, što često može dovesti i do neodrživosti samog monetarnog sistema zemlje.<sup>1</sup>

Zakonom o Centralnoj banci BiH predviđeno je da ova banka ima nadležnost da „utvrđuje i kontrolise monetarnu politiku BiH” i da je njen izričit cilj da „postigne i održi stabilnost domaće valute”. Premda jedini instrument koji je prema zakonu na raspolaganju CBBiH jeste nivo obaveznih rezervi, CBBiH se ne pojavljuje ni u ulozi „zajmodavca u krajnjoj instanci” (engl. *lender of the last resort*) niti kao supervizor bankarskog sistema čiju ulogu imaju agencije za bankarstvo, koje imaju blisku saradnju sa Bankom (Kondić, 2004).

Međutim, u istoriji postojanja i funkcionisanja CBBiH bilo je mnogo sekundarnih (implicitnih) ciljeva koje je ona nastojala postići s ciljem da zaštiti svoj krajnji cilj, tj. stabilnost pariteta evro–KM. Stoga su prema hronološkom redoslijedu zapaženi sljedeći ciljevi CBBiH. Sve ih se pokušalo ispuniti korištenjem jedinog raspoloživog instrumenta, obavezne rezerve (Krstić, 2007):

Stopa inflacije ograničena je na 4% godišnje u 1999. godini, kao posljedica provedbe monetarne politike CBBiH (Centralna banka BiH, Godišnji izvještaj za 1999. godinu);

- Juna 2003. godine po prvi put preduzeta je mjera od strane CBBiH tako što se redukovala stopa obavezne rezerve sa 10% na 5%, te je depozitna baza na koju se izdvaja obavezna rezerva proširena s ciljem da se uspori ubrzani rast bankovnih kredita, naročito prema sektoru domaćinstava u 2002. i 2003. Ovim se ilustruju dvije veoma važne činjenice. Kao prvo, ukazuje se da je bankarski sektor bio unaprijeđen tako da su njegove operacije za sobom povlačile makroekonomske posljedice po BiH. Drugo, pokazuje se da CBBiH nije više samo „valutni odbor”, nego se ponaša kao „centralna banka”. Ovaj prirodni razvoj događaja će se nastaviti. Međutim, CBBiH će se pobrinuti da nijedna od proširenih funkcija ne bude u sukobu sa svojom temeljnom ulogom, to jest, ulogom održavanja integriteta valutnog odbora CBBiH (Centralna banka BiH, Godišnji izvještaj za 2003);

- Stanovništvo i poslovni ambijent mogu i dalje planirati svoju budućnost uz puno povjerenje da će CBBiH biti u mogućnosti da održava stabilan devizni kurs *vis à vis* evra i da će nastaviti sa niskom stopom inflacije (Centralna banka BiH, Godišnji izvještaj za 2003);

- Od 1. septembra 2004. godine CBBiH je uvećala stopu obavezne rezerve sa 5% na 7,5% i od 1. decembra na 10%. Ova promjena pojavila se kao posljedica visoke stope kreditnog rasta, te istim slijedom i visokog deficita tekućeg računa (Centralna banka BiH, Godišnji izvještaj za 2004);

- Nakon analize kreditnog rasta i njegovih efekata na deficit vanjske trgovine (70% kredita posvećeno je finansiranju uvoza), CBBiH povećala je stopu obavezne rezerve sa 10% na 15%, od 1. decembra 2005. godine (Centralna banka BiH, Godišnji izvještaj za 2005. godinu);

- Početkom 2008. stopa je podignuta na 18%, sa željom da se poveća likvidnost sektora u osvit krize koja se pomaljalo kroz problem Bear Sterns itd.

U ovom dijelu ćemo posebno posmatrati ponašanje CBBiH u uslovima globalne finansijske krize. Posljedice globalne finansijske krize krajem 2008. godine i početkom 2009. godine manifestovale su se u bankarskom sektoru bosanskohercegovačke ekonomije kroz povlačenje depozita u stranim valutama i kroz konverziju gotovine i depozita u domaćoj valuti u gotovinu u stranim valutama. Ovo je u znatnoj mjeri ugrozilo likvidnost bankarskog sektora, tako da je Centralna banka BiH preduzela odgovarajuće mjere u nastojanju da pomogne bankama u prevazilaženju problema vezanih za likvidnost. Pored preduzetih operativno-tehničkih mjera, koje su se ogledale u obezbjeđenju potrebne gotovine u stranim valutama (prije svega evru), Upravno vijeće Centralne banke Bosne i Hercegovine promptno je djelovalo u nastojanju da poboljša ukupnu likvidnost i krajem 2008. godine smanjilo stopu obavezne rezerve sa 18% na 14%, a zatim su sve nove kreditne linije koje komercijalne banke povuku iz inostranstva isključene iz osnovice za obračun

<sup>1</sup> Naravno, proširenje diskrecionih ovlaštenja i „koketiranje” sa monetarnom politikom ne dovodi nužno do negativnih posljedica, kao što je to bio često slučaj u Argentini početkom 21. vijeka. S druge strane, Estonija je pozitivan primjer fleksibilnog valutnog odbora u koji su naknadno uspješno uvedene dodatne diskrecione mjere u posljednjih 10 godina i koja je uspješno završila proces ulaska u evrozonu 1. 1. 2011.

ence (Gregorio, Edwards and Valdes, 2000). The basic role of reserve requirements on foreign lending in Chile during the 1990s was to affect the reduction of capital inflows, in particular, the revenue of a speculative character to prevent the real appreciation of the domestic currency and to increase the level of monetary control. Namely, in 1991, the 20% cash reserve ratio was introduced on foreign lending with the maturity of 3 and 12 months. Later on, this ratio was increased to 30% to be reduced first to 10% and subsequently abolished after the domestic currency was placed under considerable pressure. However, experience and the results of numerous empirical analyses showed that this measure did not have a long-term effect but only temporarily led to an increase in the interest rate. Nevertheless, this measure significantly influenced the structure of capital inflows in favour of long-term borrowing, while the aggregate level of indebtedness did not significantly change.

In addition to Chile, a large number of central banks intensively used the cash reserve ratio as an instrument of monetary policy during the 1980s and '90s. This characterized countries in transition during the 1990s, as they had an underdeveloped financial market and inadequate institutions that did not provide efficient use of market instruments. However, today even transitional economies are increasingly turning to market instruments, the interest rate on open market operations (if they are in the inflationary targeting regime) or interventions in the foreign exchange market (if they pursue a fixed exchange rate policy). In most countries, except Croatia, Serbia and Romania by 2015, the reserve requirement rate is below 10% and is not actively used. In countries that are in the inflation targeting regime, this rate is below 5% (e.g. Czech Republic, Slovenia, Poland etc.).

## 2. RESULTS

### 2.1. Experiences in using reserve requirements in Bosnia and Herzegovina

This brief overview of the CBBH objectives and measures indicates that, until now, this institution has fulfilled the first condition regarding the monetary framework consistency i.e. firm attachment to the fixed exchange rate, behaving as a passive mediator in meeting the objectives of monetary policy and not using discretionary powers other than those permitted in accordance with the currency board concept.

However, the CBBH has shown a clear tendency to evolve towards greater discretionary powers, and it raises the question of establishing an appropriate balance between preserving the credibility of the currency board and increasing the scope of discretionary powers as with conventional central banks. The concept of a currency board in its basic form requires a certain conservatism in terms of the use of authority and maximum transparency since experience has shown that increases in discretionary powers can lead to a reduction in credibility, which can often lead to the unsustainability of the country's monetary system itself.<sup>1</sup>

The Law on the Central Bank of BiH stipulates that this bank has the authority to "determine and control the monetary policy of BiH", its explicit goal being "to achieve and maintain the stability of the domestic currency". Although the only instrument available to the CBBH according to the law is the level of required reserves, the CBBH does not appear either in the role of 'lender of the last resort'

or banking system supervisors, which have close cooperation with the Bank (Kondić, 2004).

However, in the history of the existence and functioning of the CBBH, there were many secondary (implicit) goals that the CBBH sought to achieve to protect its ultimate goal, i.e. the stability of Euro-BAM parity. Therefore, the following CBBH goals are observed at the chronological order. All of them were attempted to attain using the only available instrument – reserve requirements (Krstić, 2007):

- The inflation rate is limited to 4% per year in 1999, as a consequence of the implementation of the CBBH monetary policy (Central Bank of B&H, the 1999 Annual Report);
- In June 2003, a measure was taken by the CBBH for the first time to reduce the cash reserve ratio from 10% to 5%, and the deposit base on which the required reserve was allocated was expanded to slow the accelerated growth of bank loans, in particular, the household sector in 2002 and 2003. This illustrates two very important facts. Firstly, it is noted that the banking sector has been improved so that its operations have led to macroeconomic consequences for B&H. Second, it turns out that the CBBH acts as a 'central bank' rather than merely being a 'currency board'. This natural course of events will continue. However, the CBBH will ensure that none of the extended functions conflicts with its fundamental role, that is, the maintenance of the CBBH Currency Board integrity (Central Bank of B&H, the 2003 Annual Report);
- The population and business environment can continue to plan their future having the full confidence that the CBBH will be able to maintain a stable exchange rate against the Euro and retain a low inflation rate (Central Bank of B&H, the 2003 Annual Report);
- Since 1 September 2004, the CBBH has increased the reserve requirement rate from 5% to 7.5% and 10% from 1 December. This change was a result of the high credit growth rate and, consequently, high current account deficits (Central Bank of BiH, the 2004 Annual Report);
- After analyzing credit growth and its effects on foreign trade deficit (70% of loans were intended to financing imports), the CBBH increased the reserve requirement ratio from 10% to 15% as of 1 December 2005 (Central Bank of BiH, The 2005 Annual Report);
- In early 2008, the rate was raised to 18% in order to increase the liquidity of the sector in the wake of the crisis emerging through the Bear Stearns collapse etc.

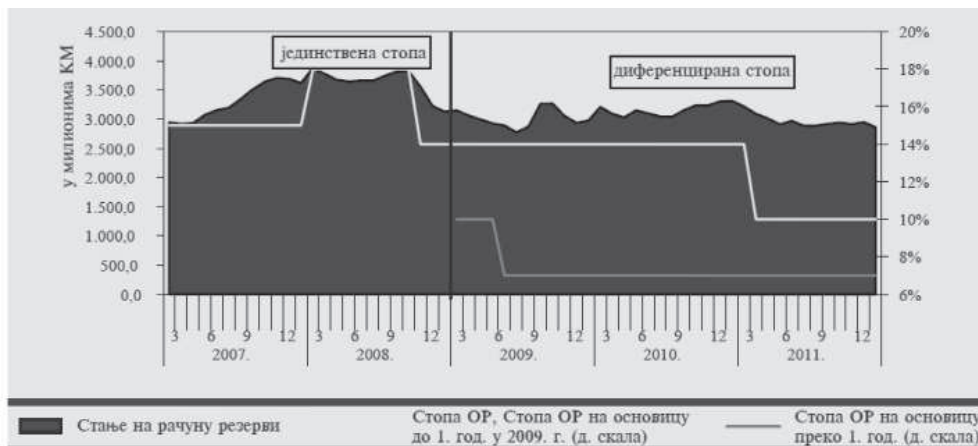
In this section, we will specifically observe the behaviour of the CBBH during the global financial crisis. The consequences of the global financial crisis in late 2008 and early 2009 were manifested in the BH banking sector through the withdrawal of deposits in foreign currencies and conversion of cash and deposits in domestic currency into cash in foreign currencies. This significantly jeopardized the banking sector liquidity and hence the CBBH took appropriate measures in an attempt to help banks overcome liquidity problems. In addition to the operational and technical measures taken, which were reflected in the provision of necessary cash in foreign currencies (primarily the Euro), the Managing Board of the Central Bank of Bosnia and Herzegovina acted promptly to improve the overall liquidity. To this effect, the Board reduced the reserve requirement from 18% to 14% in late 2008, after which all new credit lines withdrawn from abroad by commercial banks were

<sup>1</sup> Of course, the extension of discretionary powers and 'flirting' with monetary policy does not necessarily lead to negative consequences, as was often the case in Argentina at the beginning of the 21st century. On the other hand, Estonia is a positive example of a flexible currency board, where successful additional discretionary measures have been introduced in the past 10 years and which completed the eurozone accession process on 1 January 2011.

obavezne rezerve. Diferencirana stopa obavezne rezerve na depozite komercijalnih banaka počela se primjenjivati od 1. januara 2009, pa je na sve obaveze s ročnošću do jedne godine ostala 14%, dok je stopa na obaveze s rokom dužim od jedne godine smanjena sa 14% na 10%. Cilj ove odluke bio je da se iz obavezne rezerve oslobode dodatna likvidna sredstva komercijalnim bankama i da se stimuliše kreditna aktivnost u nastojanju da se pozitivno utiče na ukupnu privrednu aktivnost u zemlji. Iako su preduzete aktivnosti

imale pozitivne rezultate, bar u segmentu koji se odnosi na tekuću likvidnost, Upravno vijeće je na sjednici održanoj 16. 4. 2009. godine donijelo dvije dodatne mjere koje su stupile na snagu 1. 5. 2009. godine. Prvom mjerom stopa obavezne rezerve na depozite oročene na period duži od jedne godine smanjena je sa 10% na 7%, a drugom mjerom iz osnovice za obračun obavezne rezerve isključeni su depoziti vlada namijenjeni za razvojne programe.

**Grafikon 1. Ukupne rezerve na RR i stopa obavezne rezerve**



Izvor: CBBiH

U toku godine, sve banke (ukupno 30) uredno su ispunjavale zahtjeve vezane za obaveznu rezervu, pa niti u jednom desetodnevnom obračunskom periodu nije zabilježen slučaj neispunjavanja obavezne rezerve.

U 36. (posljednjem) obračunskom periodu u 2011. godini, vrijednost depozita vlade za finansiranje razvojnih projekata koji su izuzeti iz osnovice za obračun obavezne rezerve iznosila je 743,4 miliona KM. Ovaj iznos bio je relativno stabilan tokom cijele godine. Ukupno oslobođena sredstva kojima su komercijalne banke mogle dodatno raspolagati iznose po ovom osnovu 58,8 miliona KM. Iznos novopozajmljenih sredstava iz inostranstva komercijalnih banaka na kraju 2011. godine jeste 1,76 milijardi KM, što predstavlja kumulativni iznos od početka primjene ovog izuzeća (od 1. novembra 2008). Primjetno je da je ovaj iznos tokom godine značajno porastao, s obzirom na to da je na kraju 2010. iznosio 1,20 milijardi KM. Ukupno oslobođena sredstva po ovom osnovu (oduzimajući iznose prijevremeno vraćenih pozajmica od 737,7 miliona KM) iznose 133,8 miliona KM.

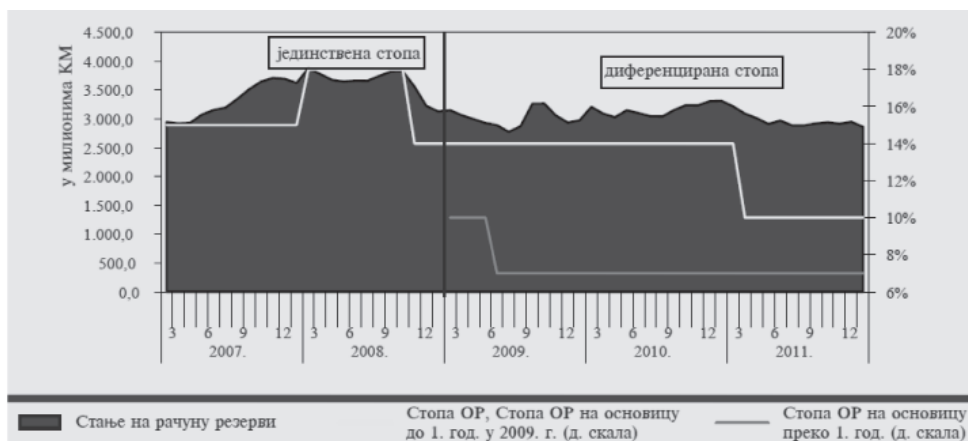
Osnovica za obračun obaveze imala je različite trendove, jer je nakon naglog pada u januaru nivo stagnirao u prvih sedam mjeseci, da bi onda u periodu do kraja godine značajno porastao. Visina osnovice za obaveznu rezervu je u decembru dostigla vrijednost od 15,41 milijardu KM,

što je samo za 0,3% niže nego na kraju 2010. Posmatrajući prosječne godišnje vrijednosti, smanjenje osnovice za obračun obavezne rezerve iznosi 390,4 miliona ili 2,5%, čime je nastavljen trend smanjivanja od 2008. godine. Pod tim uticajem promjena osnovice, prosječne obavezne rezerve su varirale tokom godine u rasponu od 1,29 do 1,60 milijardi KM, da bi na kraju godine zabilježile vrijednost od 1,31 milijardu KM, što je za 315,8 miliona KM (19,4%) manje nego na kraju 2010. Banke su i tokom 2011. držale na svojim računima kod CBBiH značajan iznos sredstava iznad obavezne rezerve.

U prosjeku, taj višak je iznosio 1,63 milijarde KM, što predstavlja povećanje od 105,5 miliona KM (6,9%) u odnosu na prosječne vrijednosti u 2010. U valutnoj strukturi osnovice došlo je do povećanja učešća domaće valute na koju se na kraju godine odnosilo 44,1%, dok je na kraju prošle godine to učešće bilo 42,2%. Razlog povećanja učešća domaće valute leži u intenzivnijem rastu domaćih depozita u KM, dok je osnovica u stranoj valuti istovremeno pretrpjela smanjenje.

Smanjenje osnovice u stranim valutama u iznosu od 264 miliona KM znatno je manje nego u 2010. (1,06 milijardi KM), a direktan je odraz pomenute mjere u pogledu izuzimanja novopozajmljenih sredstava iz inostranstva iz osnovice za obračun obavezne rezerve.

**Grafikon 2. Likvidnost komercijalnih banaka po obračunskim periodima u 2010. i 2011.**

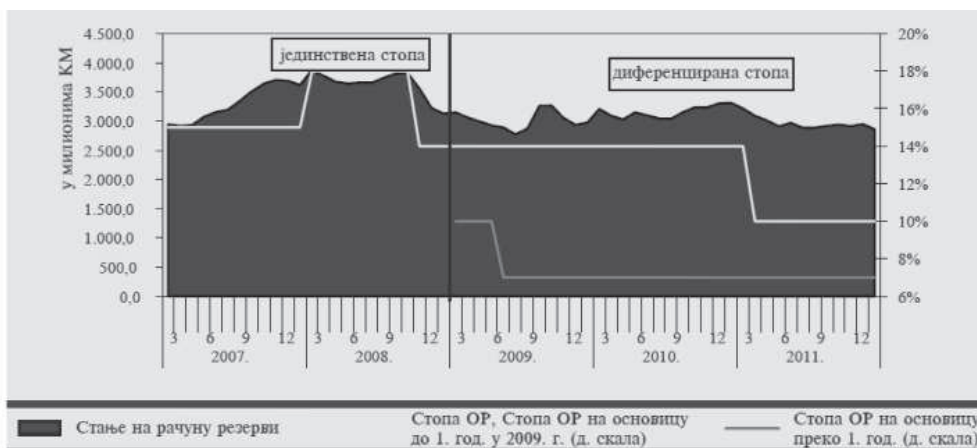


Izvor: CBBiH

excluded from the base for calculating the reserve requirement. The differentiated reserve requirement rate on commercial bank deposits became effective from 1 January 2009, so it remained 14% for all liabilities with the maturity of up to one year and was reduced from 14% to 10% for liabilities with the maturity longer than one year. The decision was aimed at providing commercial banks with additional liquid assets from the reserve requirement and stimulating credit activity to exert a positive influence on the overall

economic activity in the country. Although the taken activities had positive results, at least in the segment related to current liquidity, the Managing Board, in its session held on 16 April 2009, adopted two additional measures with the effective date 1 May 2009. The first measure reduced the reserve requirement for deposits with a term longer than one year from 10% to 7%, and the government's deposits for development programs were excluded from the base for calculating the reserve requirement.

Chart 1. Total RR and cash reserve ratio



Source: CBBiH

During the year, all banks (a total of 30) duly met the reserve requirements; there was no case of non-compliance with the reserve requirements in any of the 10-day accounting period.

In the 36th (the last) accounting period of 2011, the value of government deposits for financing development projects exempted from the base for calculating the reserve requirement amounted to BAM 743.4 million. This amount was relatively stable throughout the year. Total additionally provided money available to commercial banks in this respect were BAM 58.8 million. The amount of newly borrowed money commercial banks got from abroad at the end of 2011 was BAM 1.76 billion, which has been a cumulative amount since the beginning of the application of this exemption (from 1 November 2008). It is noticeable that this amount increased significantly during the year, amounting to BAM 1.20 billion at the end of 2010. Total released funds on this basis (together with deduction of BAM 737.7 million of premature repayments) amount to BAM 133.8 million.

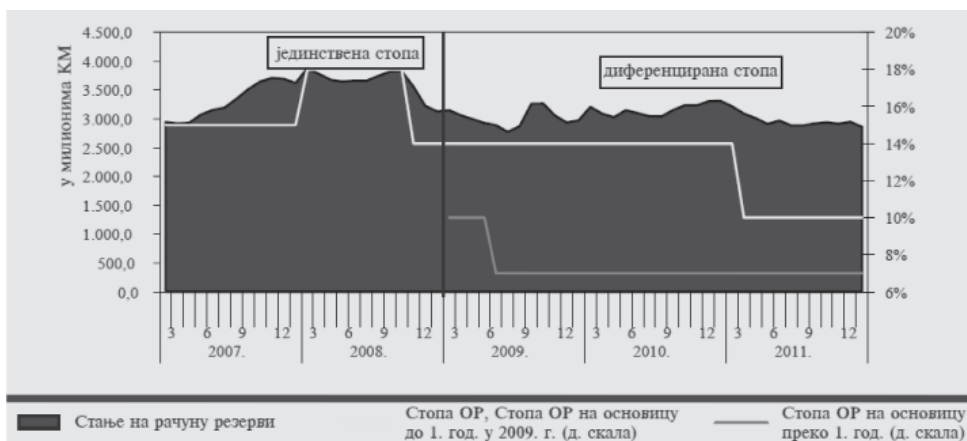
The basis for the calculation of the liability had different trends; after a sharp fall in January, the level stagnated in the first seven months to increase significantly by the end of the year. The amount of the reserve requirement base in December reached a value of BAM 15.41 billion, which is only by 0.3% lower than at the end of

2010. In terms of the average annual value, the reduction of the base for the calculation of the reserve requirement amounted to 390.4 million or 2.5%, which has been a continuation of the downward trend since 2008. Under the influence of the base change, the average reserve requirements varied over the year in the range of BAM 1.29 to 1.60 billion to come to BAM 1.31 billion at the end of the year, which is BAM 315.8 million (19, 4%) less than at the end of 2010. In 2011, banks also kept a significant amount of money above the required reserve in their accounts with the CBBH.

On average, this surplus was BAM 1.63 billion, which represents an increase of BAM 105.5 million (6.9%) compared to the average values in 2010. In the currency structure of the base, there was an increase in the share of the domestic currency (44.1%), and, at the end of last year, the share was 42.2%. The reason for the increase in the share of the domestic currency is the intensified growth of domestic deposits in BAM, while the foreign currency base experienced a decrease at the same time.

A reduction of the foreign currency base of BAM 264 million is significantly lower than in 2010. (BAM 1.06 billion), and it is a direct reflection of the above-mentioned exemption of newly borrowed money from abroad from the base for calculating the reserve requirement.

Chart 2. Liquidity of Commercial Banks by Calculation Periods in 2010 and 2011



Source: CBBiH

Naime, u nedostatku kvalitetnih zajmotražilaca i kvalitetnih investicionih projekata, banke radije drže slobodna sredstva na računima rezervi nego da se izlažu riziku kroz pozajmljivanje klijentima.

Ovaj kratki pregled ciljeva i mjera Centralne banke ukazuje na to da je do sada ova institucija BiH ispunila prvi uslov u smislu konzistentnosti monetarnog okvira, tj. vezala se za fiksni devizni kurs, ponašala se uglavnom kao pasivni posrednik monetarne politike i nije koristila nijednu od značajnih diskreционih ovlaštenja osim onih koje su inače dopuštene valutnom odboru.

Međutim, CBBiH je pokazala jasnu i izričitu tendenciju da evoluira ka većim diskreционim ovlaštenjima i to je zapravo situacija gdje se postavlja pitanje uspostavljanja odgovarajuće ravnoteže između kredibilitnosti valutnog odbora i većih diskreционih ovlaštenja banaka. Održavanje valutnog odbora u njegovom baznom konceptu iziskuje najveću moguću transparentnost i određen konzervativizam u smislu korištenja njegovih ovlaštenja, budući da je istorijsko iskustvo pokazalo da, kada se značajna povećanja diskreционih ovlaštenja unesu u aranžman valutnog odbora, to može da dovede do smanjenja kredibilitnosti, što često može dovesti do neodrživosti.

Kada sagledamo efekte Centralne banke, odnosno njeno djelovanje za vrijeme krize, možemo konstatovati da nije imala uticaja na ublažavanje posljedica. Ovo iz razloga što nije imala zakonskih mogućnosti da djeluje preko ostalih poznatih instrumenata koji stoje na raspolaganju klasičnoj centralnoj banci. Iz tih razloga potrebno je preispitivati mogućnost modifikacije postojećeg sistema valutnog odbora, ali pritom imati u vidu sve specifičnosti države Bosne i Hercegovine, odnosno njeno istorijsko nasljeđe, pravno ustrojstvo, te narušeno povjerenje građana u nestabilnu državu i u političkom i u ekonomskom smislu.

## 2.2. Stopa obavezne rezerve Centralne banke BiH

Kako je već navedeno, Centralna banka BiH je u cilju ublažavanja posljedica svjetske krize koristila jedini instrument na raspolaganju – stopu obavezne rezerve. Iz tih razloga zanimljivo je ispitati da li promjena stope obavezne rezerve utiče na kreditnu aktivnost poslovnih banaka te u kakvom odnosu su se nalazile stope obavezne rezerve, iznosi obavezne rezerve deponovani kod CBBiH i višak sredstava iznad obavezne rezerve.

Obavezna rezerva ima dvije osnovne uloge. Prva je prudencijalnog karaktera, budući da kroz regulisanje likvidnosti banaka pomaže stabilnosti finansijskog sistema, a druga je da djeluje kao instrument transmisije mjera monetarne politike na ekonomsku aktivnost i inflaciju. U ekonomskoj teoriji najčešće se pominju dva osnovna pravca djelovanja stope obavezne rezerve na ekonomsku aktivnost i inflaciju, i to preko uticaja na ponudu kredita i kontrolu priliva inostranog kapitala. Kada je u pitanju prvi pravac djelovanja, uglavnom se polazi od teorije kreditnog kanala (Bermanke i Blinder, 1988). Prema ovoj teoriji, obavezna rezerva djeluje na ekonomsku aktivnost i inflaciju putem uticaja na kreditni potencijal banaka, tj. kroz kreditni kanal. Naime, povećanje stope obavezne rezerve utiče na smanjenje ponude bankarskih kredita i za rezultat ima usporavanje ekonomske aktivnosti i pad inflacije. Navedeno predstavlja teoretski prikaz uticaja koji bi trebalo da ostvari stopa obavezne rezerve, ali u praksi se često dešavaju odstupanja. Iz tabele 1. vidljivo je da je u svim posmatranim periodima višak sredstava iznad obavezne rezerve deponovan kod CBBiH bio izuzetno visok. Stoga se nameće pitanje koliko je stopa obavezne rezerve efikasan instrument transmisije i koliko ona zapravo utiče na obim kreditiranja privrede i stanovništva, tj. povećanje i smanjenje likvidnosti bankarskog sistema.

**Tabela 1.** Pregled kretanja stope obavezne rezerve i viška obavezne rezerve po godinama od 2004. do 2012.

Godina	Stopa obavezne rezerve	Osnovica za obračun obavezne rezerve u milionima KM	Prosječne obavezne rezerve u milionima KM	Višak iznad obavezne rezerve u milionima KM
2004.	Od 5% do 7,5%	6.596	406	655
2005.	10%	8.456	885	630
2006.	15%	10.905	1.635	737
2007.	15%	14.328	2.149	1.160
2008.	18% do 11. 10. 14%	17.320	2.961	686
2009.	14% na sredstva sa dospijecem do jedne godine 10% na sredstva sa dospijecem preko jedne godine 7% na sredstva sa dospijecem preko jedne godine od 1. 5.	16.194	1.754	1.256
2010.	14% na sredstva sa dospijecem do jedne godine 7% na sredstva sa dospijecem preko jedne godine	15.617	1.624	1.529
2011.	10% na sredstva sa dospijecem do jedne godine 7% na sredstva sa dospijecem preko jedne godine	15.227	1.324	1.635
2012.	10% na sredstva sa dospijecem do jedne godine 7% na sredstva sa dospijecem preko jedne godine	14.757	1.258	1.453

Izvor: CBBiH



Namely, in the absence of good borrowers and quality investment projects, banks will hold free funds in reserve accounts rather than expose themselves to the risk lending to customers.

This brief overview of the CBBH objectives and measures indicates that, until now, this institution has fulfilled the first condition regarding the monetary framework consistency i.e. firm attachment to the fixed exchange rate, behaving as a passive mediator in meeting the objectives of monetary policy and not using any significant discretionary powers other than those permitted in accordance with the currency board concept.

However, the CBBH has shown a clear and explicit tendency to evolve towards greater discretionary powers, which raises the issue of establishing an appropriate balance between the credibility of the currency board and the greater discretionary powers of banks. Maintaining the currency board in its basic concept requires the greatest possible transparency and a certain conservatism in terms of the use of the currency board powers, since historical experience has shown that when significant increases in discretionary powers are entered into a currency board organization, this can cause a reduction in credibility, which can often lead to unsustainability.

Looking at the effects of the Central Bank i.e. its activities during the crisis, we can conclude that it did not have any impact on mitigating the consequences. This is because the Central Bank had no legal capacities to act through other known instruments available to the typical central bank. For these reasons, it is necessary to examine the possibility of modifying the existing currency board system, at the same time bearing in mind all the specifics of Bosnia and Herzegovina i.e. its historical heritage, legal structure and the shaken citizens' confidence in a politically and economically unstable state.

## 2.2. Cash reserve ratio imposed by the Central Bank of BiH

As already mentioned, to mitigate the effects of the global crisis, the Central Bank of BiH used the only instrument available – cash reserve ratio. For these reasons, it is interesting to examine whether the change in the cash reserve ratio affects the lending activity of commercial banks and to examine the relationship between the cash reserve ratios, the amounts of required reserves deposited with the CBBH and the surplus of funds above the required reserve.

Reserve requirements have two basic roles. The first one is prudential as it supports the financial system stability using the regulation of liquidity of banks, and the second one is acting as an instrument of transmission of monetary policy measures to the economic activity and inflation. The economic theory mostly refers to two basic directions of the effect of cash reserve ratio on economic activity and inflation exerted by the influence on the supply of lending and foreign capital inflow control. As for the first effect, the starting point is mostly the credit channel theory (Bermanke and Blinder, 1988). According to this theory, the reserve requirements have an effect on the economic activity and inflation through the influence on lending capacity of banks i.e. credit channel. Namely, an increase in cash reserve ratio affects the reduction of bank loans supply and results in a slowdown in economic activity and a drop in inflation. The above-said represents a theoretical view of the impact that should be achieved using the cash reserve ratio, but there are often discrepancies in practice. Table 1 shows that in all observed periods the excess of funds above the reserve requirement deposited with the CBBH was extremely high. Therefore, this paper aims to ascertain to which extent the cash reserve ratio is an efficient instrument of transmission and how much it can influence lending to the economy and population i.e. the increase or decrease in the banking system liquidity.

**Table 1** Rate trend, reserve requirements and required reserves surplus per years (2004 - 2012)

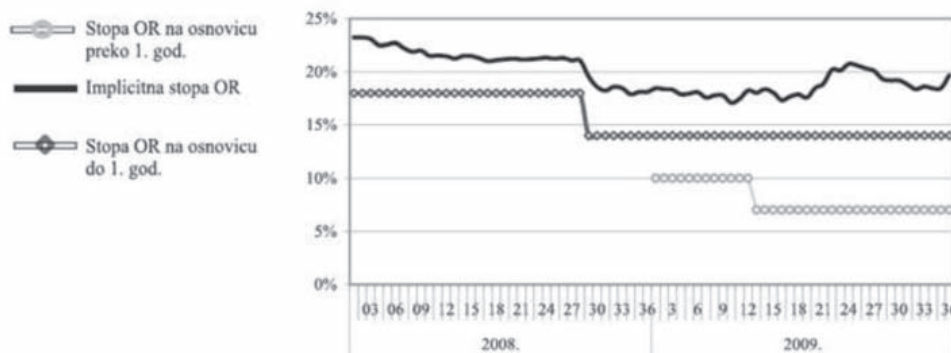
Year	Cash reserve ratio	The basis for required reserves calculation (BAM million)	Average required reserves (BAM million)	Surplus above required reserves (BAM million)
2004	5% - 7.5%	6596	406	655
2005	10%	8456	885	630
2006	15%	10905	1635	737
2007	15%	14328	2149	1160
2008	18% by 11 October 14%	17320	2961	686
2009	14% on reserves with maturity up to 1 year 10% on reserves with maturity over 1 year 7% on reserves with maturity over 1 year from 1 May	16194	1754	1256
2010	14% on reserves with maturity up to 1 year 7% on reserves with maturity over 1 year	15617	1624	1529
2011	10% on reserves with maturity up to 1 year 7% on reserves with maturity over 1 year	15227	1324	1635
2012	10% on reserves with maturity up to 1 year 7% on reserves with maturity over 1 year	14757	1258	1453

Source: CBBiH

Kao što se vidi iz prethodne tabele, do početka 2007. godine stopa obavezne rezerve iznosila je 15%, da bi od početka 2008. godine do 29. obračunskog perioda iste godine iznosila 18%, zbog pregrijanosti privrede krajem 2007. godine. Akademskoj javnosti nisu u potpunosti jasni razlozi povećanja stope obavezne rezerve jer nije bilo znakova pregrijanosti privrede (iskorištenost kapaciteta faktora proizvodnje bila je na relativno niskom nivou). Dolaskom

krize Upravno vijeće Centralne banke BiH je u oktobru 2008. godine smanjilo stopu na 14%, da bi od početka 2009. do aprila stopa obavezne rezerve na osnovicu do godinu dana iznosila 14%, a na osnovicu preko jedne godine 10%. Od aprila 2008. godine, stopa obavezne rezerve za kratkoročnu osnovicu ostala je ista, dok je za dugoročnu smanjena sa 10% na 7%. Promjene ovih stopa jasnije ilustruje sljedeći grafikon:

**Grafikon 3.** Stope obavezne rezerve za posmatrani period kod CBBiH



Izvor: Bilten CBBiH, 2009.

Koliko vidimo, bilo je velikih promjena kod ovog instrumenta u vrlo kratkom roku. Iz tih razloga, zanimljivo je ispitati da li je promjena stope obavezne rezerve imala uticaj na rast plasiranih kredita koji bi trebalo da posluže kao osnova investicione potrošnje.

Da bismo ispitali ovaj uticaj, koristićemo korelacionu analizu. Podsjetimo se da je svrha korelacione analize da se utvrdi da li između varijacija posmatranih pojava postoji kvantitativno slaganje (korelaciona veza) i, ako postoji, u kom stepenu. Kao mjera jačine proste linearne korelacione veze u uzorku koristi se relativna mjera koja se naziva Pearsonov koeficijent proste linearne korelacije ili često samo koeficijent korelacije.<sup>2</sup> Ovaj koeficijent pokazuje stepen pravolinijskog kvantitativnog slaganja dvije pojave. Koeficijent proste linearne korelacije uzima vrijednosti od -1 do +1. Ukoliko uzima

pozitivne vrijednosti, korelacija između pojava je direktna ili pozitivna (obje pojave pokazuju istosmjernu varijaciju). U slučaju kada je  $r < 0$ , veza je inverzna ili negativna (kada jedna pojava raste, druga opada i obrnuto) (Lovrić, Komić, Stević, Zečević, Žižić i Kočović, 2006 pg. 364).

S obzirom na to da je Centralna banka BiH od 2009. godine odredila zasebne stope obavezne rezerve za osnovicu do jedne godine i preko jedne godine, izračunaćemo koeficijente korelacije za kratkoročne i dugoročne plasmane. Naglašavamo da u modelu koristimo podatke od 2007. do 2012. godine na mjesečnom nivou, uzimajući u obzir stopu obavezne rezerve, kratkoročne kredite i dugoročne kredite.

Postojanje korelacione veze između stope obavezne rezerve i kratkoročnih kredita pokazuje sljedeći model:

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.448a	.201	.189	.526511524	.201	16.818	1	67	.000

a. Predictors: (Constant), Stopa obavezne rezerve

ANOVA <sup>b</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	4.662	1	4.662	16.818	.000a
	Residual	18.573	67	.277		
	Total	23.236	68			

a. Predictors: (Constant), Stopa obavezne rezerve  
b. Dependent Variable: Kratkoročni krediti

Coefficients <sup>a</sup>						
Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	6.237	.702		8.890	.000
	Stopa obavezne rezerve	-.195	.048	-.448	-4.101	.000

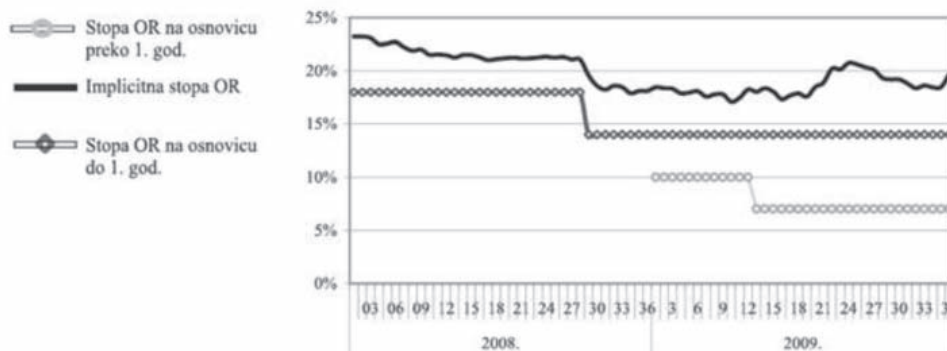
a. Dependent Variable: Kratkoročni krediti

<sup>2</sup> Formulisaó ga je Karl Pearson 1896. godine.

As can be seen from the table, by early 2007 the cash reserve ratio was 15% to jump to 18% in early 2008 to the 29th calculation period of the same year due to the overheating of the economy in late 2007. The academic community is not entirely clear about the reasons for increasing the reserve requirement rate as there were no signs of overheating the economy (the utilization of the capacity of the production factor was relatively low). With the emergence of

the crisis, the CBBH Managing Board reduced the rate to 14% in October 2008. By April 2009, the cash reserve ratio on the base of up to one year and over one year was respective 14% and 10%. Since April 2008, the cash reserve ratio for the short-term base remained the same, while for the long-term it was reduced from 10% to 7%. Changes in these rates are more clearly illustrated in the following chart:

**Chart 3** CBBH cash reserve ratio in the observed period



Source: CBBH newsletter, 2009

As can be seen, major changes in this instrument took place in a very short period. For these reasons, it is interesting to examine whether the change in the cash reserve ratio had an impact on the growth of provided loans that should serve as the basis for investment spending.

We will use the correlation analysis to examine the impact. Recall that the purpose of the correlation analysis is to determine whether there is a quantitative agreement between variations of observed phenomena (correlation connection) and, if yes, to what extent. As a measure of the intensity of the simple linear correlation relation in a sample, a relative measure is used which is called the Pearson correlation coefficient or often only the correlation coefficient.<sup>2</sup> This coefficient shows the degree of the linear quantitative agreement between two phenomena. The Pearson correlation coefficient takes values in the range -1 to +1. If it

takes positive values, the correlation between phenomena is either direct or positive (both phenomena show variations of the same direction). When  $r < 0$  connection is inverse or negative (when one phenomenon increases, the other decreases and vice versa) (Lovrić, Komić, Stević, Zečević, Žižić, and Kočović, 2006 pg. 364).

Given that the Central Bank of BH has set separate cash reserve ratios for the period up to 1 year and over 1 year since 2009, we will calculate the correlation coefficients for short-term and long-term loans. We emphasize that within the model we use data from 2007 to 2012 on a monthly basis, taking into account the cash reserve ratio, short-term loans and long-term loans.

A correlation between the cash reserve ratio and short-term loans shows the following model:

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.448a	.201	.189	.526511524	.201	16.818	1	67	.000
a. Predictors: (Constant), Stopa obavezne rezerve									

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.662	1	4.662	16.818	.000a
	Residual	18.573	67	.277		
	Total	23.236	68			
a. Predictors: (Constant), Stopa obavezne rezerve						
b. Dependent Variable: Kratkoročni krediti						

Coefficients <sup>a</sup>						
	Model B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	6.237	.702		8.890	.000
	Stopa obavezne rezerve	-.195	.048	-.448	-4.101	.000
a. Dependent Variable: Kratkoročni krediti						

<sup>2</sup> The coefficient was developed by Karl Pearson in 1896.

Rezultati su sljedeći:  $r = -0,448$ , što jasno pokazuje da ne postoji linearna veza između promjene stope obavezne rezerve i kratkoročnih kredita. Koeficijent determinacije iznosi  $r^2 = 0,20$ , što pokazuje da promjena stope obavezne rezerve utiče 20% na masu kratkoročnih kredita, a oko 80% svi drugi faktori.

Takođe, model pokazuje da rast stope obavezne rezerve od 1% izaziva pad kratkoročnih kredita za 195.000.000 KM.

Nadalje, korelacionu vezu između stope obavezne rezerve i dugoročnih kredita pokazuje sljedeći model:

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.597a	.356	.346	.911325750	.356	37.054	1	67	.000

a. Predictors: (Constant), Stopa obavezne rezerve

Coefficientsa						
Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	13.108	.455		28.835	.000
	Stopa obavezne rezerve	-.222	.036	-.597	-6.087	.000

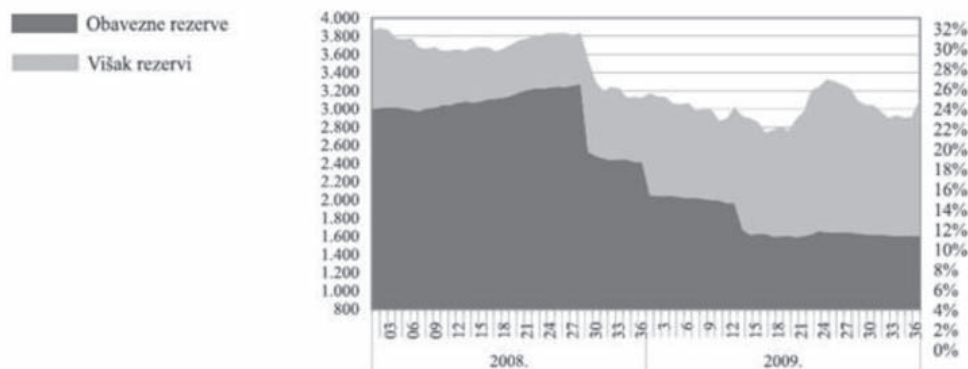
a. Dependent Variable: Kratkoročni krediti

Model pokazuje sljedeće:  $r = -0,597$ , što takođe jasno pokazuje da ne postoji linearna veza između promjene stope obavezne rezerve i dugoročnih kredita. Koeficijent determinacije iznosi  $r^2 = 0,356$ , što pokazuje da promjena stope obavezne rezerve utiče 35,6% na masu dugoročnih kredita, a oko 65% svi drugi faktori. Takođe, model pokazuje da rast stope obavezne rezerve od 1% izaziva pad dugoročnih kredita za 222.000.000 KM.

Generalno, zaključujemo da promjene stope obavezne rezerve koje je vršila Centralna banka BiH u uslovima krize nema značajne korelacione veze sa nivoom plasiranih kredita. Ipak, ta veza je nešto jača kada su u pitanju dugoročni krediti.

Treba priznati da je smanjenje stope obavezne rezerve imalo uticaja na samu likvidnost bankarskog sektora koja je doprinijela održavanju povjerenja deponenata i poslovnih subjekata. To pokazuje i sljedeći grafikon:

**Grafikon 4.** Likvidnost komercijalnih banaka po obračunskim periodima



Izvor: Bilten CBBiH, 2009.

Rezultati analize upućuju na to da se obavezna rezerva nije pokazala kao efikasan instrument monetarnog regulisanja, osim u domenu poboljšanja likvidnosti bankarskog sektora.

## ZAKLJUČAK

Kada govorimo o aranžmanu valutnog odbora Bosne i Hercegovine, ističemo da se radi o najkonzervativnijem tipu valutnog odbora i, time, sistemu u kojem postoji minimum mogućnosti monetarnog djelovanja. Analogno navedenom, i efekat krize se u punom kapacitetu prevaljuje na sektor realne ekonomije. Naveli smo u radu da je stopa obavezne rezerve u Bosni i Hercegovini jedini instrument monetarne politike i time jedini način da se preko sektora monetarne ekonomije utiče na realne varijable. Takođe, pokazano je da korištenje ovog instrumentarija nije imalo značajnije efekte na oporavak privrede iako su i u pretkriznom i kriznom periodu banke imale ogromne viškove

likvidnosti koje ekonomija nije uspjela da apsorbuje. Time postoji značajna ograničenost Bosne i Hercegovine u smislu ekonomskog djelovanja radi prevazilaženja efekata krize. Svemu navedenom moramo dodati još neke činjenice svojstvene ekonomijama sa valutnim odborima. Kod ovih ekonomija karakterističan je visok nivo stranih doznaka koje imaju pozitivnu korektivnu socijalno-političku dimenziju, ali su ekonomski efekti suprotnog pravca. Naime, strane doznake vode apresijacijskim pritiscima, to jest omogućavaju održavanje fiksnog deviznog kursa na nerealno visokom nivou i time narušavaju međunarodnu konkurentsku poziciju zemlje. U suprotnom bi se desilo neminovno valutno prilagođavanje koje bi, između ostalog, vodilo poboljšanju konkurentne pozicije i stvaranju povoljnijih uslova za rast onog što nazivamo realnim sektorom. Za zemlje sa čvrsto vezanim deviznim kursom u kojima nema mogućnosti za aktivno korištenje monetarne politike ili gdje devalvacija nema ekonomske opravdanosti, alternativni pristup se nalazi u tzv. fiskalnoj devalvaciji. Ovaj pristup podrazumijeva smanjenje oporezivanja rada uz istovremeno povećanje poreza na potrošnju, čime direktno

The results are as follows:  $r = -0.448$ , which clearly shows that there is no linear relationship between the change in the cash reserve ratio and short-term loans. Determination coefficient is  $r^2 = 0.20$ , which shows that the impact of change in the cash reserve ratio on aggregate short-term loans is 20%, while the impact of all other factors is approx. 80%.

Besides, the model shows that the increase in the cash reserve ratio of 1% causes a fall in short-term loans by BAM 195,000,000.

Furthermore, the following model shows the correlation between the cash reserve ratio and short-term loans:

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.597a	.356	.346	.911325750	.356	37.054	1	67	.000

a. Predictors: (Constant), Stopa obavezne rezerve

Coefficients <sup>a</sup>						
Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	13.108	.455		28.835	.000
	Stopa obavezne rezerve	-.222	.036	-.597	-6.087	.000

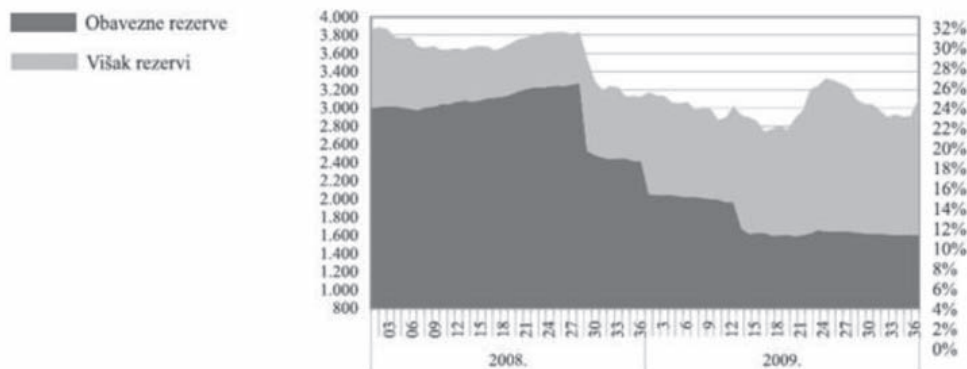
a. Dependent Variable: Kratkoročni krediti

The model shows the following:  $r = -0.597$ , which clearly shows that there is no linear relationship between the change in the cash reserve ratio and long-term loans. Determination coefficient is  $r^2 = 0.356$ , which shows that the impact of change in the cash reserve ratio on aggregate long-term loans is 35.6%, while the impact of all other factors is approx. 65%. Besides, the model shows that the increase in the cash reserve ratio of 1% causes a fall in short-term loans by BAM 222,000,000.

The general conclusion is that changes in the cash reserve ratio implemented by the Central Bank of BiH during the crisis have no significant correlation with the level of granted loans. However, the correlation is somewhat stronger when it comes to long-term loans.

It should be acknowledged that the reduction in the cash reserve ratio had an impact on the very liquidity of the banking sector, which contributed to maintaining the confidence of depositors and businesses. This is also shown in the following chart:

**Chart 4** Liquidity of Commercial Banks by Calculation Periods



Source: CBBH newsletter, 2009

The results of our analysis demonstrate that reserve requirements have not proven an efficient instrument of monetary regulation except in terms of improving the banking sector liquidity.

**CONCLUSION**

Speaking about the arrangement of the currency board of Bosnia and Herzegovina, we point out that this is the most conservative type of currency board and therefore the system with minimal possibilities of monetary activity. Accordingly, the real economy suffers the full effect of the crisis. We pointed out that cash reserve ratio in Bosnia and Herzegovina is the only instrument of monetary policy and thus the only way to influence the real variables through the monetary economy sector. It has also been shown that the use of this instrument did not have significant effects on the economic

recovery, although in the pre-crisis and crisis period banks had huge liquidity surpluses the economy failed to absorb. Therefore, there is a significant limitation of Bosnia and Herzegovina in terms of economic activity aimed at overcoming the effects of the crisis. Besides, we need to add some more facts inherent in economies with currency boards. These economies are characterized by a high level of foreign remittances that have a positive corrective social and political dimension; however, the economic effects are quite the opposite. Namely, foreign remittances lead to appreciation pressures, that is, they allow the maintenance of a fixed exchange rate on an unrealistically high level thus disturbing the country's international competitive position. Otherwise, there would be an inevitable currency adjustment that would, among other things, lead to an improvement in the competitive position and creation of more favourable conditions for the growth of what we call the real sector. For countries with tightly fixed exchange rates without the possibility for active use of monetary policy or where devalu-

izvozna dobra pojeftinjuju, a uvoz poskupljuje. Na taj način bi se stvorili preduslovi za angažovanje slobodnih sredstava koje banke očigledno u nedostatku kvalitetnih projekata sada drže kod CBBiH, a koje ista nije u mogućnosti vratiti u privredu uz pomoć instrumenta obavezne rezerve. Na kraju moramo naglasiti da bi optimalno rješenje za podizanje konkurentnosti bilo smanjiti poreze i doprinose na rad, bez povećanja poreza na dodatu vrijednost. Ovo bi imalo efekta na makroproduktivnost, a samim tim i na konkurentnost. Ukoliko se smanjenje nameta na rad ne bi odrazilo na budžet, onda bi to bio pun pogodak i jedna od najvažnijih mjera koje bi vlade u BiH mogle usvojiti, a da su „tržišno podsticajne“, kako to voli nazvati Molsun.

## IZVORI

1. Bernanke B. i Blinder A. S. (1988). Credit, Money, and Aggregate Demand. Cambridge: *American Economic Review* 78, Papers and Proceedings, May, pp. 435-439.
2. Burda, M. i Viploš, Č. (2004). *Makroekonomija: evropski udžbenik*. Beograd: Centar za liberalno demokratske studije.
3. Godišnji izvještaj (2018). Sarajevo: Centralna banka BiH
4. Gregorio J., Edwards S. i Valdes R. (2000). *Controls on capital Inflows: Do they Work?* Cambridge: NBER working paper No. 7645, April
5. Kondić N. (2004). *Monetarni sistemi*. Banja Luka: Ekonomski fakultet
6. Kristić I (2007). *Održivost aranžmana valutnog odbora u BiH*. Sarajevo: Direkcija za ekonomsko planiranje Savjeta ministara BiH
7. Lovrić M, Komić J., Stević S., Zečević T., Žižić M. i Kočović J. (2006). *Statistička analiza: metodi i primjena*. Banja Luka: NUBRS
8. Zakon o CBBiH, "Službeni glasnik BiH" br. 1/97, 29/02, 8/03, 13/03, 9/05 i 76/05"

ation has no economic justification, an alternative approach is the so-called 'fiscal devaluation'. This approach involves a reduction in the taxation of labour, along with a simultaneous increase in consumption tax, which makes direct export goods cheaper and imports more expensive. This would create prerequisites for using free funds, which banks would, in the absence of quality projects, keep with the CBBH, while the CBBH cannot return those funds to the economy enforcing reserve requirements. In the end, we must emphasize that an optimal solution for raising competitiveness would be to reduce labour taxes and levies without increasing value-added tax. This would have a positive effect on macro productivity and therefore on competitiveness. If the reduction in levies on labour did not affect the budget, this would hit the target and be one of the most important measures the governments in BiH could adopt at the same time being "market incentive" as Molson likes to call it.

## REFERENCES

1. Berrnanke B. and A. S. Blinder (1988), 'Credit, Money, and Aggregate Demand', *American Economic Review* 78, Papers and Proceedings, May, pp. 435-439, 1998. S. Blinder, Credit, Money, and Aggregate Demand, *American Economic Review* 78, Papers and Proceedings, May, pp. 435-439, 1998.
2. Burda, M., Viploš, Č., *Macroeconomics: European Textbook*, Centre for Liberal Democratic Studies, Belgrade, 2004. evropski udžbenik, Centar za liberalno demokratske studije, Beograd, 2004.
3. CBBH Annual Reports and Publications.
4. Gregorio J., S. Edwards and R. Valdes, *Controls on Capital Inflows: Do they Work?*, NBER working paper No. 7645, April 2000.
5. Kondić, N., *Monetary Systems*, Faculty of Economics, Banja Luka, 2004.
6. Kristić, I., *Sustainability of the Currency Board Principle in B&H*, Sarajevo, 2007.
7. Lovrić M, Komić J., Stević S., Zečević T., Žižić M. i Kočović J. (2006), *Statistical Analysis – Methods and Application*. Banja Luka: NUBRS.
8. The Law on the Central Bank of Bosnia and Herzegovina (Official Gazette of BiH, 1/97,29/02,8/03,13/03,9/05 and 76/05)