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The Reasons for Additional Growth Limit of Consumer Non-Purpose Loans in the Banking Sector of Bosnia and Herzegovina

Разлози за додатно ограничавање раста ненамјенских потрошачких кредита у банкарском сектору Босне и Херцеговине

Summary

The growth in consumer non-purpose loans leads to the reduction in BiH current account balance and amplifies the current account deficit. According to regression models, the commercial loan has the same effect on the current account. However, in dynamic VAR models, a commercial loan has, either neutral influence on the current account balance, or contributes to its mild growth. A commercial loan is necessary for BiH economy, because the private sector is the main factor of the economic growth, while a consumer non-purpose loan generates mainly demand for import. When a credit growth is very low, the credit is economic and not free good and additional need for the direct regulation of credit appears, especially in countries with underdeveloped financial market. The share of private companies in the credit distribution is reduced and from the economic point of view, redistribution of loans can be made only at the expense of consumer loans. Additional growth limit on the consumer non-purpose loan, which is composed of 74.2% of total consumer loans, and 34.9% of all bank's loans (10/2016), is one of the preconditions for the decrease of current account deficit, economic growth and economic development acceleration.

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Keywords: *consumer non-purpose loan, direct regulation of credits, banking sector of Bosnia and Herzegovina, credit growth, crowd out effect, current account.*

Резиме

Раст ненамјенског потрошачког кредита доводи до смањења салда босанскохерцеговачког текућег рачуна и повећава дефицит текућег рачуна. Исти ефекат, према регресионим моделима, на текући рачун има и комерцијални кредит. Међутим, у динамичким VAR моделима комерцијални кредит или има неутралан утицај на салдо текућег рачуна, или доприноси његовом благом расту. Комерцијални кредит је нашој привреди неопходан, јер је сектор приватних предузећа главни фактор економског раста, док ненамјенски потрошачки кредит повећава тражњу за увозом. Када је кредитни раст врло низак, кредит је економско а не слободно добро и појављује се потреба за додатном директном регулацијом кредитног портфолиа, поготово у земљама са неразвијеним финансијским тржиштем. Удио сектора приватних предузећа у расподијели кредитног потенцијала се смањује, а економски рационалну прерасподијелу кредитног потенцијала је могуће извршити једино на рачун потрошачког кредита. Додатно ограничење раста ненамјенских потрошачких кредита, који чине 74,2% укупних кредита становништву и 34,9% укупних кредита (10/2016.) је један од предуслова за смањење дефицита текућег рачуна и убрзавање босанскохерцеговачког раста и развоја.

Кључне ријечи: *ненамјенски потрошачки кредити, директна регулација кредита, банкарски сектор Босне и Херцеговине, кредитни раст, ефекат истискивања, текући рачун.*

1. Introduction

Consumer loan in the banking sector of Bosnia and Herzegovina (BSBiH), as one of the two main types of bank loans, was not the subject of intensive research in the past. Since the end of the ownership transformation of BiH banks (2002), and after the beginning of development of market-oriented banking system, in accordance with the ruling paradigm about liberalization of economy and banking, the question whether to apply additional forms of direct regulation to the loan portfolio has not appeared. The dilemma regarding the market or planned credit distribution was not formed even after 2009, when the global economic crisis began to manifest itself in BSBiH through extremely low, and even negative, credit growth rate. Extremely restrictive credit policy of BiH banks, a sluggish credit

growth and the continuous reduction of foreign investors' exposure towards domestic banking sector, should put optimal credit distribution (optimal in terms of the economic growth and development) at the first place in BiH economic policy.

For individuals in BiH with a net salary below 1.000 BAM, a current maximum amount of monthly installment (regardless of the type of credit) is half the net salary, while a maximum monthly installment for the borrowers with a net salary above 1.000 BAM is two-thirds of the net salary. This model of direct regulation of loans is not part of the banking regulation. The model of direct regulation emerged because of the norms of the Law on Enforcement Procedure, which defines the limit of execution on debtor funds[2].

The subject of our research is a consumer non-purpose loan in BSBIH. In October 2016 they reached about 74.2% or 34.9% of total banking loans, i.e. total consumer loans. Our goal is to determine whether there is a need/reason for additional direct regulation of consumer non-purpose loans. Our hypothesis is that their growth should be additionally restricted because it increases domestic current account deficit crowding out private companies from the bank balance sheets.

In 2008 the BiH current account deficit was 13.8%, a year later it was 6.4%, and in 2015 it was 5.7%. The average current account deficit in the period 2009-2015 was 7%.

In the first part of the study we give a review of the most important domestic and foreign studies on the direct regulation of consumer loans and a review of the impact of bank credits (together with the impact of consumer loans) on macro variables, especially on the current account balance.

Methodological issues are addressed in the second part of the study, followed by the central part of the research in which we present the main findings of the research and discuss them. At the end of the study, we summarize the main conclusions and bring them in connection with the thesis of the study, and at the very end there are sources and references.

2. Literature Review

In the most developed world economy, USA, the regulation of consumer loan was introduced during the World War II. The motive was to limit inflation and facilitate the smooth development of war military industry (Bartels, 1953). The regulation is justified starting from a few basic assumptions of which two are the

[2] The limit is determined based on Article 138 of the Law on Enforcement Procedure of the Federation BiH (Official Gazette of FBiH No. 32/03 and No. 33/06) and Article 138 of the Law on Enforcement Procedure of the Republic of Srpska (Official Gazette of Republic of Srpska No. 85/03, 64/05, 118/07, 29/10, 57/12 and 67/13).

most important: that purchasing power of consumers is growing with the use of consumer loans and that economic activity is directly connected with the movement of consumer loans. After the Second World War the regulation of bank lending is becoming an integral part of the regulatory policy of many developed Western European countries, and this kind of regulatory approach is placed in the framework of market-planned economy that is installed in a war-torn economies. The regulation of credit shall be implemented through mandatory credit investments, the direct regulation of interest rates and borrowing restrictions. The last model of the direct regulation includes the regulation of loan portfolio and the regulation of the credit extension to priority sectors of the economy.

The main reason for leaving the indirect/monetary regulation of the loan portfolio (reserve requirement, key rates and open market operations) and the transition to direct regulation of credit portfolio is a doubt in the effectiveness of the monetary regulation, which was expressed in the leading theoretical debates of that time (Gurley and Shaw, 1960).

During the general wave of deregulation that swept over the banking sector in the 80s of the last century, the concept of credit growth restriction was abandoned. The new paradigm rejected the regulation of the loan portfolio, and the model of a market economy was declared incompatible with the direct regulation of the loan portfolio.

In domestic literature, the survey of consumer loans has been conducted since the 50s of the last century. In the most comprehensive survey of this kind (Stranjak, 1971) we find systematization and explanation of the reasons in favor of direct regulation of credits.

During the 80's in Yugoslavia, consumer loans were approved solely for the purchase of domestic goods (Ćirović, 1982), thus limiting the imports of goods, with the goal to reduce the current account deficit.

Eknci et al. (2014) isolated on the panel data a very strong impact of the credit growth on the deterioration of the current account. In addition, the credit growth has a greater impact on the deterioration of the current account balance in the countries with a lower level of financial intermediation. More recent studies (Atoyan et al., 2013 and IMF, 2013) demonstrated an extremely strong and statistically significant influence of the credit growth to the current account balance even in the cases where the gap in GDP was used as a control variable.

One of the latest research, which we took as a reference for our study, about the relationship between the current account and loans (Aliogullari, H et al., 2015) by using multiple regression model, VAR and the panel regression, identified an inverse relationship between consumer loans and the current account balance, even with the use of a large number of control variables.

3. Data and methodology

The research methodology is based on the multiple linear regression model and VAR model. The analysis covers the period from Q12005 to Q12016, totally 11 years. For the credit growth forecasting we used *ARIMA* model and we used the analysis of the time series structure and dynamics to demonstrate the effect of crowding out.

The value of consumer non-purpose credits is determined according to the survey conducted by the CBBiH (Central Bank of Bosnia and Herzegovina) among 10 largest banks in BSBIH for the period December 2008 – October 2016. For the period prior to 2008 the value of consumer non-purpose loan is determined based on data published by BiH banking agencies.

Most of the variables were previously transformed (Table 1), and in all multiple regression models the dependent variable is the current account balance, i.e. its transformation. By performing the transformations of the variables, the condition of the stationarity of the variables was fulfilled, and that is, by some authors, the precondition for the usage of VAR methodology.

In regression models independent variables are: changes in the balance of the current account/GDP, quarterly growth rates of commercial loans and consumer non-purpose loans, changes in commercial loans/GDP, changes in consumer non-purpose loans/GDP, the growth rate of real GDP, the real effective exchange rate, oil price, and the index of domestic industrial production.

In VAR models, endogenous variables are: changes in the current account balance/ GDP, the growth rate of real GDP, the real effective exchange rate, change in commercial loans/GDP, change in consumer non-purpose loans/GDP and the change in total loans/GDP. The external shock is a change of one standard deviation in oil prices.

Structural shocks in VAR model are based on the Cholesky decomposition. The connection between the residuals from the reduced forms (u_t) and the structural shock (ε_t) is recorded in the form; $u_t = S\varepsilon_t$ where $u_t=(u_{CA,t}, u_{GDP,t}, u_{REER,t}, u_{LOANS,t}, u_{CONS,t}, u_{COMM,t})$ is the vector of random errors, while the vector of structural shock (see specification *VAR* - matrix equation) is $\varepsilon_t=(\varepsilon_{CA,t}, \varepsilon_{GDP,t}, \varepsilon_{REER,t}, \varepsilon_{LOANS,t}, \varepsilon_{CONS,t}, \varepsilon_{COMM,t})$. The matrix *S* is a lower triangular matrix where the elements above main diagonal have a value of zero.

Order of variables in *VAR* model is determined according to the economic intuition, and in accordance with the reference survey (Aliogullari, H et al., 2015).

In order to determine the number of lags in *VAR* specifications the information criterion was used. The number of lags for which there is the greatest consensus of information criterion was elected.

Table 1.
List of Abbreviations *

	Full abbreviation	Short abbreviation	Full name	Method of Calculation	Unit of measure
	1		2	3	4
1	*CA_GDP*	*CA*	current account balance *(BiH)*	current account balance/GDP	u %
2	*GDP_REAL_GR*	*GDP*	real GDP growth rate *(BiH)*	quarterly growth rate (q/q-1)	u %
3	*REER*	*REER*	real effective exchange rate *(BiH)*	nominal effective exchange rate adjusted for price movement (domestic prices/foreign prices)	index
4	*d_LOANS_GDP*	*LOANS*	total loans *(BiH)*	first quarterly difference in total gross loans of banking sector divided with nominal GDP	%
5	*d_CONS_GDP*	*CONS*	consumer non-purpose loans *(BiH)*	first quarterly difference in consumer non-purpose loans divided with nominal GDP	%
6	*d_COMM_ GDP*	*COMM*	commercial loans *(BiH)*	first quarterly differences of loans (gross loans to non-financial public and private companies) divided with nominal GDP	%
7	*COMM g.r.*	-	-	quarterly growth rate of commercial loans (q/ q-1)	%
8	*CONS g.r*	-	-	quarterly growth rate of consumer non-purpose loans (q/ q-1)	%
9	*OIL*	-	oil price	Dated Brent	in BAM
10	*IIP*	-	Index of industrial production	-	-
11	*VAR*	-	Vector autoregression	-	-
12	*BSBiH*	-	banking sector of Bosnia and Herzegovina	-	-
13	*BiH*		Bosnia and Herzegovina	-	-
14	*DW*	-	Durbin-Watson test/ statistics	-	-
15	*BAM*		BiH mark (legal tender in BiH)	-	
16	*DUM*	-	dummy variable	-	-
17	*C*	-	constant	-	-
18	*SASE*	-	Sarajevo Stock Exchange	-	-
19	*BLSE*	-	Banjaluka Stock Exchange	-	-
20	*p.p.*	-	percentage point	-	-

The impulse response functions (*IRF*) for the current account are constructed relative to shocks in all endogenous variables, as well as the current account (*CA*), the growth of real *GDP* (*GDP*), the real effective exchange rate (*REER*), commercial loans (*COMM*), consumer non-purpose loans (*CONS*) and total loans (*LOANS*). Shock is defined as an impulse of one standard deviation of the variables.

The essence of Cholesky decomposition is that in the first quarter of the shock/ impulse, the shock does not affect the variable that is set first. In our study, this assumption is very real because you cannot expect credit growth, or any other variable, immediately in the first quarter after the shock affects the current account balance.

If agreements between trading partners are not short-term and if the credit transmission mechanism operates with a time lag then this assumption is very realistic.

VAR specification - matrix equation *

$$\begin{bmatrix} CA_t \\ GDP_t \\ REER_t \\ LOANS_t \\ CONS_t \\ COMM_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \\ c_5 \\ c_6 \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} & a_{56} \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & a_{66} \end{bmatrix} * \begin{bmatrix} CA_{t-1} \\ GDP_{t-1} \\ REER_{t-1} \\ LOANS_{t-1} \\ CONS_{t-1} \\ COMM_{t-1} \end{bmatrix} + \begin{bmatrix} u_{CA,t} \\ u_{GDP,t} \\ u_{REER,t} \\ u_{LOANS,t} \\ u_{CONS,t} \\ u_{COM,t} \end{bmatrix}$$

* Note: Due to savings in space, only the first lag is displayed.

The assumption that domestic variables affect the *CA* is correct. However, the assumption that only local variables affect the *CA* is not realistic. That is why we introduced in the *VAR* model price of oil (*OIL*) as an exogenous variable, i.e. external shock. In *VAR* specification, *OIL* is placed in front of the variable *CA*, and order of other variables in Cholesky decomposition is identical: *OIL CA_GDP GDP_REAL_GR REER d_LOANS_GDP d_CONS_GDP d_COM_GDP*. The introduction of an external shock in the model requires a restriction on the parameters (eng. Restricted VAR), because domestic macro variables cannot affect the price of oil, while oil price affects them. Restrictions of this kind mean that in equation for OIL value of all the parameters/ coefficients with domestic (BiH) variables is zero, because only in that way the impact of domestic macro variables on the foreign can be prevented. Zero restrictions in this equation are introduced for all lags of endogenous variables.

4. Results and Discussion

4.1. The relationship between the current account balance and bank loans in the multiple regression model

Regression models were developed gradually (Table 2). The simplest model has two variables (commercial loans and consumer non-purpose loans), and in the most complex one, with six variables, we added: the real effective exchange rate, GDP, the index of industrial production and oil price.

We developed 10 multiple linear regression models for assessing impact on the current account balance. In all models the dependent variable is the ratio of the current account balance and *GDP* in % (hereinafter *CA* or *CA_GDP*). All coefficients are significant at a level below 10%, and the largest number of parameters is significant at the level from 1% to 5%. An average coefficient of determination is 0.58 and varies from a maximum of 0.72 to a minimum of 0.39. Some models have a positive (*DW* statistics below 2), and the others have negative autocorrelation of the first order (*DW* statistics above 2). Four models have a value of *DW* statistics of about two, which indicates the lack of the first order autocorrelation. From the economic theory point of view, the parameters/coefficients in almost all models have the expected sign.

The growth in consumer non-purpose loans and commercial loans overturn *CA*, and the impact of the first type of the loan is more significant at the time (current value) and the impact of the second is more significant in the first lag. The average (arithmetic mean) growth in consumer non-purpose loans and commercial loans (the first lag) for one p.p. decreases *CA* by 0.09 p.p. and by 0.14 p.p. respectively (Table 3). The regressors, defined as the change in the credit relative to *GDP* (*d_CONS_GDP* and *d_COMM_GDP*) have far more influence on the *CA*. Growth in the value of the regressors *d_COMM_GDP* and *d_CONS_GDP* for one p.p. reduces *CA* from 0.3 p.p. to 0.72 p.p. The growth, i.e. the appreciation of the real effective exchange rate (*REER*), and the rise in oil prices lead to decline in *CA*, and the movement of *GDP* and industrial production are positively associated with the movement of *CA*.

Table 2.
The Multiple Regression Models, BiH Current Account Balance is the Independent Variable *

	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6	EQ7	EQ8	EQ9	EQ10
C	**-6.21** -13.08			**-3.42** -2.49	**-3.16** 2.23		**-14.47** -2.22	**-4.92** -3.19		
CA /GDP (-2)		**0.24** 2.23	**0.324** 2.54							
CA /GDP(-3)								**-0.15** -1.90	**-0.16** -2.05	**-0.23** -3.12
d_COMM_GDP		**-0.55** -3.36								
d_COMM_GDP (-1)			**-0.30** -1.505							
COMM g.r.	**-0.13** -3.08			**-0.138** -3.40	**-0.14** -3.49	**-0.14** -3.47	**-0.14** -3.55	**-0.15** -3.78	**-0.15** -3.79	**-0.16** 4.53
d_CONS_GDP		**-0.717** -2.34								
d_CONS_GDP (-1)			**-0.697** -1.97							
CONS g.r.	**-0.09** -1.958			**-0.09** -1.94	**-0.08** -1.88	**-0.08** -1.90	**-0.08** -1.78	**-0.10** -2.26	**-0.10** -2.32	**-0.10** -2.4
GDP (-3)		**0.17** 2.15	**0.189** 1.957							
REER		**-0.045** -4.28	**-0.042** -3.312							
REER(-1)						**-0.03** -2.31			**-0.05** -3.33	**-0.20** -4.0
OIL				**-0.022** -2.149			**-0.02** -1.72	**-0.019** -1.91	**-0.02** -1.79	
OIL(-1)					**-0.02** -2.26	**-0.024** -2.24				**-0.02** -2.25
IIP (-1)							**0.10** 1.73			**0.14** 3.14
R^2	0.526	0.550	0.39	0.58	0.585	0.59	0.61	0.62	0.63	0.717
Variables	3	5	5	4	4	4	5	5	6	6
DW	1.94	1.52	2.16	2.18	2.049	2.06	1.955	1.89	1.90	1.54

Source: Exit from EViews. Note: * Coefficients are bolded, and below there is the *t* statistics.

Table 3
Descriptive Statistics for the Regression Coefficients

	Median	Arithmetic mean	Standard deviation	Coefficient of variation	Max.	Min.
C	-4.92	-6.44	4.66	-0.72	-3.16	-14.47
CA /GDP (-2)	0.28	0.28	0.06	0.21	0.32	0.24
CA /GDP(-3)	-0.16	-0.18	0.04	-0.24	-0.15	-0.23
d_COMM_GDP	-0.55	-0.55			-0.55	-0.55
d_COMM_GDP (-1)	-0.30	-0.30			-0.30	-0.30
COMM g.r.	-0.14	-0.14	0.01	-0.06	-0.13	-0.16
d_CONS_GDP	-0.72	-0.72			-0.72	-0.72
d_CONS_GDP (-1)	-0.70	-0.70			-0.70	-0.70
CONS g.r.	-0.09	-0.09	0.01	-0.09	-0.08	-0.10
GDP (-3)	0.18	0.18	0.01	0.07	0.19	0.17
REER	-0.04	-0.04	0.00	-0.05	-0.04	-0.05
REER(-1)	-0.05	-0.09	0.09	-0.96	-0.03	-0.20
OIL	-0.02	-0.02	0.00	-0.10	-0.02	-0.02
OIL(-1)	0.12	0.12	0.03	0.23	0.14	0.10
IIP (-1)	-0.02	-0.02	0.00	-0.08	-0.02	-0.02
R^2		0.58	0.08	0.15	0.56	0.18
DW statistics		1.92	0.23	0.12	1.75	0.60

Source: Author

The analysis of the parameters of multiple regression models shows that after the introduction of control variables the growth of commercial and consumer non-purpose loans leads to an increase in the current account deficit. Imports of equipment, which are largely linked with the commercial loans, represent necessity of the current stage of our socio-economic development. Limiting this type of the loan would mean depriving the economy of the fixed and current assets, which are a prerequisite for the economic growth and development and for strengthening the material base of the society. With the direct regulation of consumer non-purpose loans things are completely different. These loans cover a wide range of consumption loans, and loans for liquidation of debts. Though without purpose, they are used with the "purpose" to deepen current account deficit. The user of these loans is the population, i.e. individuals and households, the sector that presents a very low need for the acquisition of fixed and current assets from consumer loans. These loans are mainly used for consumption in

circumstances when productivity is very low, and when the share of industry in GDP is small (22% in 2016). The dominant part of in this way created purchasing power is used for imports of durable and non-durable consumer goods. Due to the low level of development of the domestic productive forces, the other types of loans (i.e. commercial loans) also increase BiH trade imbalance, but the dilemma about which type of loans should be regulated does not exist. Only commercial loans create the basis for sustainable economic growth and development while consumer non-purpose loans are an instrument of development of foreign economies. Consumer non-purpose loans generate growth of foreign economies and this part of consumer loans should be subject to additional regulation.

4.2. Relationship between the current account balance and bank loans in the *VAR* model

Response of the current account to the shock in the selected variable, is in line with the economic theory, and working hypothesis is confirmed (Figure 1). The shock of the *CA* abruptly, but in the short term (first two quarters) increases the current account balance. The deterioration of the current account balance, which occurs because of the growth in real *GDP* (*GDP_REAL_GR*), could perhaps be unexpected. However, in a small open economy which has undergone a process of deindustrialization an increase in purchasing power leads to an increase of import, and to the deterioration of the *CA*. The shock/*REER* growth, which is the appreciation of the exchange rate (due to the faster growth of domestic prices relative to foreign prices) reduces the current account balance, and leads to the current account deficit. The shock in commercial loans (*d_COM_GDP*) initially was not statistically significant, but in a medium term, it leads to the growth of the current account balance. The shock in consumer loans (*d_CONS_GDP*) causes a reduction of the current account balance, which is very persistent – it lasts for 11 consecutive quarters. This finding could be interpreted in a way that most of the newly created purchasing power through the consumer non-purpose loans creates demand for import. Due to insufficient influence of commercial loans on the current account balance improvement, the shock in total loans (d_*LOANS_GDP*) has similar impact on our (*BiH*) position in the international division of labor, as well as the consumer loan, but with higher intensity. The difference in the direction and intensity of the impact of the shock in the commercial and consumer loan on the *CA* (where the impact of the first type of loans is either neutral or slightly positive), shows that the growth of consumer loan is one of the main determinants of the current account balance deterioration.

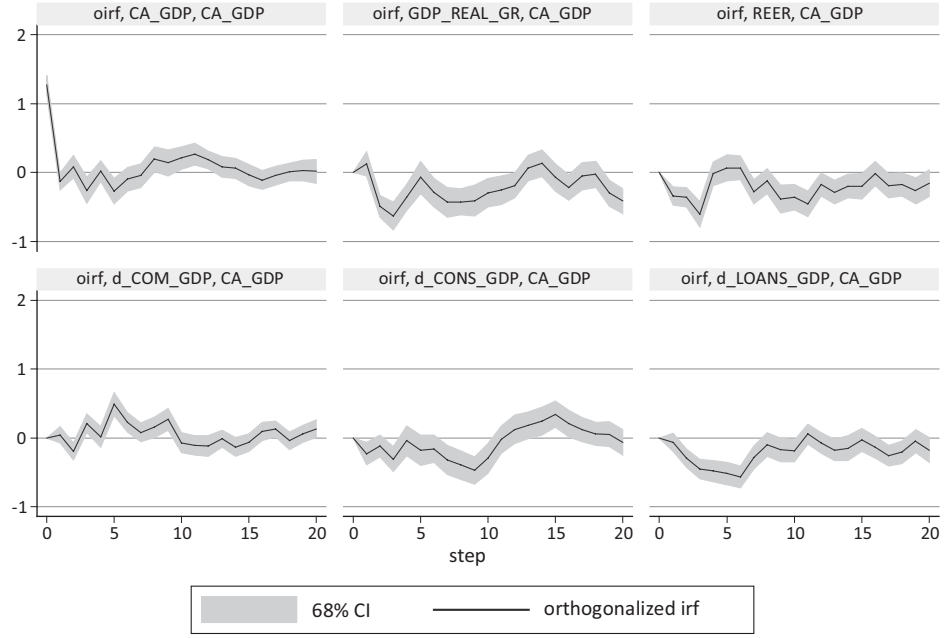

Figure 1 Responses of the BiH Current Account Balance to the Shocks in One Standard Deviation of Selected Variables (*IRF*) *. Source: Exit from the software package *STATA*. Note: * *VAR* specification in *STATA* software package for this model is: *var CA_GDP GDP_REAL_GR REER d_LOANS_GDP d_CONS_GDP d_COM_GDP lags (1/4). Y*-axis is in %, and the x-axis shows the time, i.e. quarters.

In the model with an external shock (Figure 2), the reaction of the *CA* to the impulse in the endogenous variables and to the impulse in credits is similar to the model without exogenous variables, except that due to the external shock, the intensity of responses to the impulse/ shock in endogenous variables is lower. The impulse in consumer loans decreases *CA* in the medium term, and the shock in commercial loans is neutral. The cause of this form of *IRF* is the "purpose" of consumer non-purpose loans, which are mainly used, directly or indirectly, for import. On the other side, commercial loans are mainly used to increase the domestic production base. Reaction of the *CA* to an external shock shows the dependence of BiH economy on the oil prices, but only immediately after the shock. This effect is expected because BiH is a small and open economy without domestic oil resources.

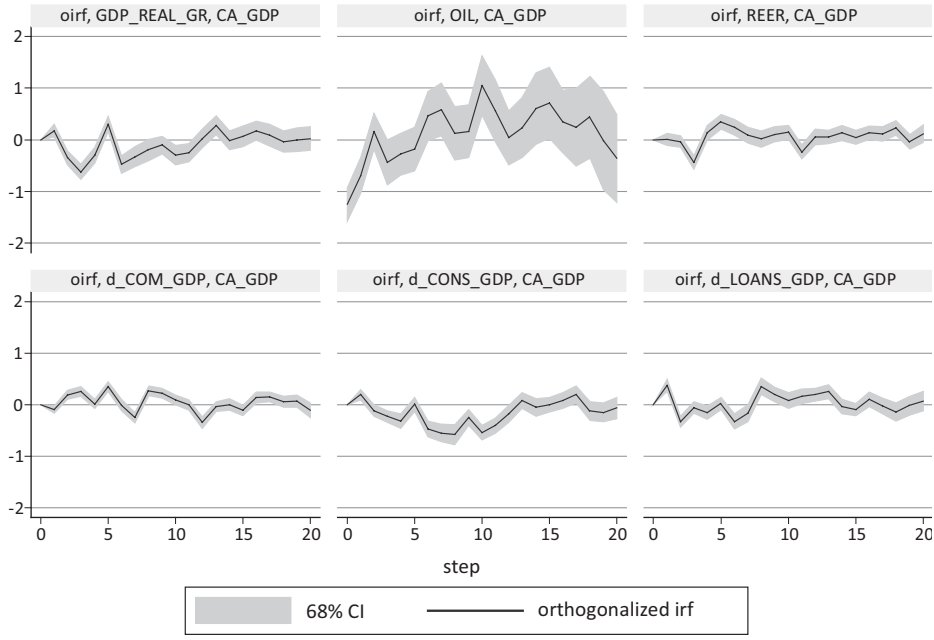

Figure 2 *VAR* Model with External Shocks*. Source: Exit from software package STATA. Note: * VAR specification in STATA software package for this model; *var OIL CA_GDP GDP_REAL_GR REER d_LOANS_GDP d_CONS_GDP d_COM_GDP, lags (1/4) constraints (1/24)*. Y-axis is in %, and the x-axis shows the time, i.e. quarters.

4.3. Expected credit growth and the crowding out effect

Based on the *ARIMA* model (Table 4), we have predicted credit growth in *BSBiH*. All model variables - two moving averages, one autoregressive component and three artificial variables (*DUM2009, DUM2010* and *DUM2014*) were significant at the level below 5%.

Table 4
*ARIMA Model **

Variable	Coefficient	Standard error	*t*-statistics	Probability, significance level
DUM2009	-221.42	111.60	-1.98	0.0506
DUM2010	239.30	110.19	2.17	0.0328
DUM2014	-224.19	110.31	-2.03	0.0454
AR(12)	0.50	0.12	4.32	0.0000
MA(4)	0.21	0.10	2.10	0.0391
MA(6)	0.35	0.10	3.49	0.0008
SIGMASQ	3,327.03	512.48	6.49	0.0000
R^2	0.44			
DW statistics	1.82			

Source: Exit from the software package EViews. Note: * Variable total loans *BSBiH* is non-stationary in level. For this reason, we have taken the first difference of total loans for the independent variable. *ARIMA* model was developed for the period 06/2009 - 10/2016.

Diagnostics of the model is satisfactory (Table 5). Distribution of residuals is normal and homoscedastic. *Q* statistics (correlogram of residuals) shows the absence of an autocorrelation.

Table 5
*Diagnostics ARIMA Model**

No.	Test	Statistics	Value of statistics	Probability
1.	Correlation	*Q* statistics – fourth lag	2.208	0.137
2.	Correlation	*Q* statistics – fifth lag	2.624	0.269
3.	Normality	*Jarque-Bera* statistics	1.009	0.603
4.	Homoscedasticity (*Breusch-Pagan-Godfry)*	*F* statistics	0.395	0.7566

Source: Exit from the software package EViews. Note: * The null hypothesis is defined as; 1-2) There are no auto-correlation between residuals, 3) Distribution of the residuals is normal, 4) Distribution of the residuals is homoscedastic.

According to the model the expected credit growth in 2017 is extremely low (Table 6). On average, the expected increase in the credit is 1.35% per annum (m/m-12), or 0.08% per month (m/m-1).

Table 6
*Actual and Forecasted Credit Growth Rates in BSBiH **

		Total loans (in millions BAM)	Credit growth, annual rate in % (m/m-12)	Credit growth, monthly rate in % (m/m-1)
2016.	01.	16,772.3	2.93	-0.55
	12.	17,094.6	1.36	0.06
2017.	01.	17,097.1	1.94	0.01
	12.	17,259.8	0.97	0.03
Average	01/2017-12/2017	17,192.1	1.35	0.08

Source: Exit from the software package EViews.
Note: * Grayed part of the table is forecast.

In conditions of the extremely low credit growth and the extremely low expected credit growth, the legitimacy of full market allocation of the credit may be called into question. If the banks are holders of a public license, then the loan is a public good. In conditions of extremely restrictive lending policies of banks, the correction of the market mechanism is required in order to ensure preferred distribution of the credits, in line with the goals of economic growth and development.

There are two sectors with a large imbalance in the growth of loans and deposits - the public sector and other sectors (Table 7). The imbalance at the level of other sectors is not relevant for these studies, because it is caused by an increase in deposits of non-bank financial institutions. Relatively, most of the credit resources are absorbed by the public sector and public companies (2008 = 100). The imbalance between the growth in deposits (98%) and loan growth (20%), on average, does not reduce the purchasing power of the households, because households are always a sector with surplus, which operates with low financial leverage. The only sector that is on average (due to characteristics of its liability), deprived of the proportional distribution of credit resources, is the sector of private companies. Deposits of private companies increased by 33% and loans only by 12%, while the overall growth of deposits and loans (excluding private companies) was 50% and 29% respectively.

Table 7
Index for Credits and Deposits 10/2016, BSBiH (12/2008 = 100)

	Public sector	Public companies	Private companies	Households	Other sectors	Total	Total (without private companies)
Deposits	-23	-22	33	98	90	47	50
Loans	300	50	12	20	-56	21	29

Source: CBBiH.

The problem of the bank credit allocation may not be so important in the financial systems of the developed countries, because banks in these countries are not the only or the main source of external funding. The banking system of Bosnia and Herzegovina is a bank-based system with an extremely underdeveloped financial market (Table 8). The average depth of the financial market measured by the turnover ratio (turnover/market capitalization) is low. In 2016 it was only 0.14, and it was even below 0.02 (2010).

Table 8
*Turnover Ratio on SASE **

	2009.	2010.	2011.	2012.	2013.	2014.	2015.	2016.
Turnover ratio	0.031	0.015	0.056	0.083	0.052	0.129	0.214	0.138

Source: SASE. Note: * Turnover is total annual turnover. The market capitalization is at the end of December.

Deepening of the financial market (*SASE* and *BLSE* also) can produce the impression that the financial market is a substitute for the credit market. However, the analysis of the turnover structure (Table 9) shows that the public offer of stocks is relatively low, and the regular turnover of stocks has declined. The public offer of bonds and treasury bills and the regular turnover of debt are becoming increasingly dominant, and in Q4 2016 they were 85.2% of the total turnover. The private sector and, therefore, the corporate sector, have limited access to this part of the financial market, because issuers of treasury bills and bonds are BiH entities. Only exceptional profitable parts of private sectors, large corporations and banks, have access to the primary market of debt securities, and *SMEs* are completely excluded from this market.

Table 9
Turnover Structure on BLSE, in %

	Q4 2009	Q4 2010	Q4 2011	Q4 2012	Q4 2013	Q4 2014	Q4 2015	Q4 2016
Public offering (stocks)	3.5	5.9	0	5.9	13.6	0	6.5	0
Regular turnover (stocks)	21.9	21.8	6.1	16.3	10.5	9.6	3.4	3.1
Regular turnover (bonds)	22	18.4	2.7	28.4	24.7	25.4	7.6	27.5
Regular turnover -treasury bills	0	0	0	7.6	11.9	7	6.6	0
Auctions (bonds and treasury bills)	18.9	23.1	70.5	31.4	23.9	51	74.6	67.7
Others	33.7	30.8	20.6	9.4	15.5	7	1.3	1.8
Total	100	100	100	100	100	100	100	100

Source: BLSE.

By retaining only the market mechanism in the allocation of credits during the low credit growth and with financial market, that does not express the demand for financial instruments of the private sector, companies are left without a sufficient amount of external funding.

Crowding out private companies from bank balance sheets has lasted since 2009, when the credit growth contribution of private companies to overall credit growth, after double-digit, became negative (Table 10). Crowding out private companies reached its peak in 2014. After 2013, the sector of public companies has also contributed negatively to the credit growth.

Nevertheless, changes occurring in the contribution of public companies loans to the overall credit growth did not differ significantly with the respect to the pre-crisis level.

Since 2011, the contribution of consumer non-purpose loans to the total loan growth has been continuously positive and constantly above one p.p.

Table 10
Contributions to Annual Growth Rates of Loans for Domestic Sectors, BSBiH in p.p.

	Public sector	Companies	Public companies	Private companies	Households	Consumer non-purpose loans	Other sector	Total credit growth rate (in %)
	1	2=2a+2b	2a	2b	3	3a)	4	5=1+2+3+4
2008	1.18	12.60	-0.13	12.73	8.94	5.99	0.25	22.97
2009	0.60	-0.45	0.09	-0.53	-2.76	-2.30	-0.59	-3.19
2010	0.72	2.64	0.54	2.10	0.12	-0.21	-0.11	3.36
2011	1.28	1.44	0.11	1.33	2.69	2.64	-0.06	5.35
2012	1.34	2.33	0.21	2.12	0.60	1.43	0.03	4.30
2013	0.49	0.95	0.41	0.54	1.74	1.73	-0.07	3.11
2014	1.24	-0.69	-0.05	-0.64	2.26	2.65	-0.02	2.79
2015	0.21	-0.11	-0.28	0.16	2.16	1.01	0.13	2.39
2016	-0.50	0.36	-0.09	0.46	1.45	1.75	-0.10	1.22

Source: CBBiH.

The crowding out effect is evident when we analyze the structure of total loans in, for *BSBiH*, crucial years (Table 11). In 2002, when the privatization of *BiH* banking sector was completed, the share of claims against the company is almost two thirds of the total claims. Private sector companies (whose shares grew parallel with shares of household sector until the start of the global economic and financial crisis (2008)) in the eight-year period (2008 - 2016) recorded a significant decline of 3.48 p.p. while other sectors' shares increased significantly, or increased slightly, or remained the same.

These extremely strong trends cannot be stopped, not even in the medium term, by market forces. The only way that trends can reverse or at least stop is the additional direct regulation of consumer non-purpose loans. The household sector is the only one from which the part of the credits can be taken. Its share in total loans was 32.4% (2008), and it increased to 34.9% (2016), and only the share of loans to the public sector increased significantly.

Table 11
Structure of Loans in BSBIH, in %

	Public sector	Companies	Public companies	Private companies	Households	Consumer non-purpose loans *	Other sectors	Total
	1	2=2a+2b	2a	2b	3	3a)	4	5=1+2+3+4
2002.	1.42	63.00	29.31	33.69	34.02	-	1.57	100
2003.	0.89	59.09	22.78	36.31	38.39	28.5	1.63	100
2008.	1.86	49.35	1.79	47.55	47.37	32.4	1.42	100
2009.	2.54	50.51	1.94	48.57	46.09	31.0	0.86	100
2016.	6.16	46.30	2.23	44.07	47.03	34.9	0.52	100

Source: CBBIH. Note: * For 2003 estimates.

5. Conclusion

The hypothesis set about the need for the additional growth limitation of the consumer non-purpose loans because they increase the current BiH account deficit and crowd out private companies from the bank balance has been proven.

The multiple regression models and VAR also show that one of the important determinants of the current account deficit is consumer non-purpose loans. The effect of the commercial loans on the *CA* according to the regression models is identical to the effect of consumer loans without loans, while on other side, the effect of commercial loan in VAR model is neutral in relation to the *CA*, or contributes to its slight increase.

The crowding out of private companies from the domestic bank balance sheets by the public sector and by consumer loans, in connection with the low expected rate of the loan growth are the reasons for additional growth limit of consumer non-purpose loans.

Further research on this topic should be focused on the methods of the additional direct regulation of consumer non-purpose loans.

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