# THE IMPACT OF CONSUMER LOAN VOLUME ON GROSS FIXED CAPITAL FORMATION IN BULGARIA: A VECTOR ERROR CORRECTION MODEL (VECM) APPROACH

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### Abstract

The goal of this article is to study the impact of consumer loans volume and effective interest rate of consumer loans on gross fixed capital formation in Bulgaria. The survey is realized on the grounds of quarterly data during the period 2009-2023. The econometric methodology through which the data are processed includes: Stationarity Test; Vector Autoregressive (VAR) Model; Selection of the maximal lag; Cointegration Test; Vector Error Correction Model (VECM); Granger causality test. It is established: in long-term period 1% increase in consumer loans increase the volume of gross fixed capital formation with 0.94%; the coefficient value of ECT<sub>1-1</sub> is 0.765, which means that approximately 77% of the discrepancy between long-term and short-term gross fixed capital formation is adjusted for a quarter; in short term there is bilateral causality between consumer loans and gross fixed capital formation and unidirectional causality from effective interest rate of consumer loans to gross fixed capital formation.

**Keywords:** gross fixed capital formation, effective interest rate, consumer loans, Vector Error Correction Model (VECM), Granger causality test

JEL: C55, E22.

### Introduction

One of the significant components of gross domestic product is gross fixed capital formation, which is associated with the investment potential of companies in a given economy. The latter is related to the desire of each national economy, driven by a desire for economic growth, to create favourable conditions for stimulating the investment activity of economic entities. The growth of investments in a given economy largely depends on the study of the factors influencing their increase and the observation of their multiplier effect on aggregate production. In this regard, a number of authors focus their efforts on the construction of dif-

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ferent regression models describing the relationship between investment activity and the generation of economic growth, as well as the study of various factors and their impact on the amount of investments made in the economy, with an emphasis on the volume of bank loans (Amoah, Adu-Nti and Tuah, 2014, pp. 67-74; Ali, 2017, pp. 25-34; Zahir, Hayat and Haider, 2020, pp. 138-147; Alam and Haque., 2017, pp. 1-12; Ali and Mingque, 2018, pp. 133-139; Molocwa, Choga and Mongale, 2018, pp. 6-13; Tsoklinova, Kolev, 2018, pp. 59-71; Eric and Paul, 2023, pp. 346-356; Indrajaya, 2021, pp. 65-77; Velushev, 2019, pp. 22-39). In connection with the last one the goal of this article is to survey the impact of consumer loans volume and efficient interest rate of consumer loans on gross fixed capital formation in Bulgaria.

#### Literature review

The realization of the goal starts with literature survey on the topic from the point of view of specifying a reliable model to understand the relationship between the variables under consideration (Beev, 2015). E. B. Ikwuagwu and K. O. Onyele construct an econometric model examining the relationship between financial inclusion and gross fixed capital formation (Ikwuagwu and Onyele, 2023, pp. 59-76). Based on the studied literature, the authors use several variables with which they characterize the concept of financial inclusion applied to rural areas, due to the fact that it is there that a large part of economic subjects, for various reasons, are excluded from the production of capital for the purposes of economic growth - (1) rural commercial banks' loans; (2) rural commercial banks' deposits; (3) number of commercial banks' branches and (4) commercial banks' credit to SMEs (Ikwuagwu and Onyele, 2023, p. 67). The authors use Vector Error Correction Model (VECM) in which the dependent variable is gross fixed capital formation and the independent variables are: rural commercial bank loans; rural commercial bank deposits; number of commercial banks' branches and total credit to SMEs, proving that there is a long-term relationship between the dependent and independent variables (Ikwuagwu and Onyele, 2023, p. 67). The results of the research allow the authors to make recommendations regarding the government policy for providing easier access to credit services for the population in rural areas, with the aim of ensuring their financial inclusion, which in turn has a positive effect on stimulating economic growth (Ikwuagwu and Onyele, 2023, p. 74).

The amount of investment is a determining factor for the growth of any economy. In this context, many of the available studies are related to the search for causal relationships between business and household credits and economic growth. According to the authors M. Škare, D. Sinković and M. Porada-Rochoń, the existing credit structure of the national economy, expressed in the amount of loans granted to businesses and households, has a positive impact on economic growth (Škare, Sinković and Porada-Rochoń, 2019, pp. 294-310). The authors use a VECM model with the following variables: real GDP, the share of households' credits in total private credits; the share of private firms' credits in total private credits; total factor productivity; KOF globalization index as the empirical study is for Croatia (Škare, Sinković and Porada-Rochoń, 2019, p. 300). The authors conclude that in the case of Croatia, it is more appropriate to examine business and household lending separately than to consider the total amount of credit in GDP, as business and household lending do not account for the same impact on economic growth and differ in the period of induced changes (Škare, Sinković and Porada-Rochoń, 2019, p. 306). Despite the need to divide lending into two parts and the formation of a credit structure of the population, the research proves that the amount of loans granted has an impact on economic growth.

The effects of loan size on economic growth are a widely debated topic and a subject of continuing research interest. The literature study on the subject shows different results, since to a large extent the impact of lending to private market entities on economic growth depends on the conjuncture in which the respective national economy is developing. For example, the authors H. M. Aliero and Y. Z. Abdullahi (2013), using data for Nigeria over a thirty-seven-year period, examine the relationship between loans granted to private economic entities and economic growth achieved (Aliero and Abdullahi, 2013, pp. 83-90). In conclusion, based on the obtained results, the authors assume that according to the Granger causality test, in the short term there is no relationship between the amount of loans in the private sector and economic growth, but in the long term there is a relationship (Aliero and Abdullahi, 2013, pp. 88-89). The latter confirms the theoretical concept of the positive impact of the amount of loans in the private sector and the achievement of long-term economic growth. Other authors such as Awad, Ibrahim Mohammed; Al Karaki, Mohammed S. (2019) try to find a relationship between lending and economic growth in Palestine (Awad and Al Karaki, 2019, pp. 1-21). The research covers the period 1996 – 2015, quarterly data are used for the following variables: real GDP (dependent variable) and independent variables - Gross Capital Formation; percentage Labour and Bank Lending, and the methodology used includes cointegration tests, VAR and VECM models, Granger causality test, etc. (Awad and Al Karaki, 2019, pp. 6-9). Based on the results obtained, the authors conclude that in Palestine, bank lending does not stimulate economic growth and needs a sustainable government credit policy targeting those industries that have a high added value in the economy. In addition, the authors conclude that even if in the long term the amount of loans granted has a insignificant effect on economic growth, there is a need to shift credit from consumers to businesses, which will encourage private domestic investment and thus stimulate long-term economic growth (Awad, and Al Karaki, 2019, p. 9).

The literature survey proves the need to study the impact of the amount of bank loans on the economic growth at the national level. At the same time the obtained results make it possible to summarize the credit structure and its impact on the gross fixed capital formation respectively economic growth, as well as to trace the influence of the individual components of the credit structure of the respective economy on economic growth in the short and long term. Also, the decomposition of the amount of loans allows to draw conclusions and recommendations to stimulate the investments in those sectors that have the larger contribution to economic growth.

#### **Materials and Methods**

On the grounds of the presented above in the current article are used three variables: gross fixed capital formation, effective interest rate of consumer loans in BGN and consumer loans volume in BGN. Regarding the gross fixed capital formation and consumer loans in the research quarterly data from the first quarter of 2009 to the fourth quarter of 2023 are used. Considering the effective interest rate, it should be mentioned that the data are published on a monthly basis. Due to this in the time series only the values of the variables at the end of each quarter for the period 2009 - 2023 are retained. The sources of the data are National Statistical Institute (NSI) and Bulgarian National Bank (BNB). All data are seasonally adjusted and after that the gross fixed capital formation and the amount of consumer loans are converted into natural logarithm. The data are processed with EViews 7.

The econometric methodology through which the data are processed includes: Stationarity Test; Vector Autoregressive (VAR) Model; Selection of the maximal lag; Cointegration Test; Vector Error Correction Model (VECM); Granger causality test; Verification of the model.

### The stationarity test

If the variance and mean of the time series are constant during the time, then there is not unit root or the process is stationary. On the contrary, if the variance and mean are not constant than there is random walk and the series are nonstationary. In current study the stationarity of the variables is tested trough the Augmented Dickey-Fuller (ADF) test. The equation of ADF test can be applied in three different forms: without constant and trend; with constant and no trend; with constant and trend. The analytical expression of the third form is as follows (Gujarati and Porter, 2009, p. 922):

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{t=1}^m \alpha_i \Delta Y_{t-1} + \varepsilon_t \tag{1}$$

The null hypothesis (H0) states that  $\delta = 0$  or the time series is nonstationary while the alternative one (H1) states that  $\delta < 0$  or the time series is stationary (Gujarati and Porter, 2009, p. 922).

#### Vector Auto Regression (VAR) model

In the VAR system the optimal lag lengths is selected (Petkova, 2018, pp. 136-143) on the grounds of the information criterions mentioned below. The VAR model in this study is expressed as follows:

$$LGGFCF\_SA_{t} = d_{1} + \sum_{j=1}^{p} \propto_{1,j} IRCL\_SA_{t-j} + \sum_{j=1}^{p} \beta_{1,j} LGGFCF\_SA_{t-j} + \sum_{j=1}^{p} \gamma_{1,j} LGLOANS\_SA_{t-j} + \varepsilon_{1,t}$$

$$IRCL\_SA_{t} = d_{2} + \sum_{j=1}^{p} \propto_{2,j} IRCL\_SA_{t-j} + \sum_{j=1}^{p} \beta_{2,j} LGGFCF\_sa_{t-j} + \sum_{j=1}^{p} \gamma_{2,j} LGLOANS\_SA_{t-j} + \varepsilon_{2,t}$$

$$LGLOANS\_SA_{t} = d_{2} + \sum_{j=1}^{p} \alpha_{2,j} IRCL\_SA_{t-j} + \sum_{j=1}^{p} \beta_{2,j} LGGFCF\_SA_{t-j} + \sum_{j=1}^{p} \gamma_{2,j} LGLOANS\_SA_{t-j} + \varepsilon_{2,t}$$

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$$LGLOANS\_SA_{t-j} = \sum_{j=1}^{p} \alpha_{2,j} IRCL\_SA_{t-j} + \sum_{j=1}^{p} \beta_{2,j} LGGFCF\_SA_{t-j} + \sum_{j=1}^{p} \gamma_{2,j} LGLOANS\_SA_{t-j} + \varepsilon_{2,t}$$

$$LGLOANS\_SA_{t-j} = \sum_{j=1}^{p} \alpha_{2,j} IRCL\_SA_{t-j} + \sum_{j=1}^{p} \beta_{2,j} LGGFCF\_SA_{t-j} + \sum_{j=1}^{p} \gamma_{2,j} LGLOANS\_SA_{t-j} + \varepsilon_{2,t}$$

where  $d_1, d_2$ , and  $d_3$  are the intercepts;

 $\alpha$ ,  $\beta$ , and  $\gamma$  are the coefficients in front of the variables LGGFCF\_SA (gross fixed capital formation), *IRCL\_SA* (interest rate of consumer loans), LGLOANS\_SA (consumer loans);

t – current time;

 $\varepsilon_{1,i'} \varepsilon_{2,i'} \varepsilon_{3,i}$  are the stochastic error terms (called impulses or innovations or shocks in VAR) (Todorov, 2022, pp. 55-60).

#### Selection of the maximal number of lags

The information criteria used for selection of the maximal lag numbers in the model in the current article are Akaike's Information Criterion (AIC), Schwarz Information Criterion (SC), Hannan-Quinn Information Criterion (HQ). The minimal value of these criterea defines the suitable number of lagged variables included in the model (Rumánková et al, 2019, pp 853-861).

#### **Co-integration Test**

If the unit root is established the co-integration test has to be done. In the current article the cointegration method by Johansen is applied. It tests the longrun equilibrium relationship among the surveyed non-stationary variables and reveals the numbers of cointegrating vectors between them, i.e. the cointegration rank (r). The Johansen cointegration test produces two types of statistical results – Trace statistics and Max-Eigen Statistics. They are based on Trace test and the Maximum Eigenvalue test. The H0 in Trace test states that there is at most "r" cointegrating vectors, while the H1 states that there is "r" or more cointegrating vectors. The H0 in Maximum Eigenvalue test states that there are precisely "r" cointegrating vectors, while H1 sounds that there are precisely "r+1" co-integrating vectors. The Johansen cointegration test is applied after selecting the optimal number of lags (Velichkov, 2016, pp. 70-83). The co-integration test begins with the number of r equal to 0 and continues until for the first time the zero hypothesis is accepted. At the bottom of th Johansen's procedure is vector autoregression (VAR) of order p (Awad and Karaki, 2019; Rumánková et al, 2019. pp 853-861).

#### Vector error correction model (VECM)

When two nonstationary variables are cointegrated then between them exist long-term equilibrium relationship. In short-run period the disequilibrium between the time variables is possible to exist. To correct it the VECM is used. In the current article its analytical expression considering the gross fixed capital formation is as follows:

$$\Delta LGGFCF\_SA_t = \gamma_0 ECT_{t-1} + \sum_{i=1}^{p-1} \gamma_{1,i} \Delta IRCL\_SA_{t-i} + \sum_{i=1}^{p-1} \gamma_{2,i} \Delta LGGFCF\_SA_{t-i} + \sum_{i=1}^{p-1} \gamma_{2,i} \Delta LGLOANS_{t-i} + \varepsilon_t$$
(3)

where ECT is the error correction term. If the coefficient  $\gamma_0$  before it is negative and significant, then it explains the speed to return to the equilibrium (Awad and Karaki, 2019).

#### Granger causality test

The Granger-causality test is used to study the cause-effect relationship between two time series. The test works on the assumption of stationary time series. If the variables are non-stationary then they should be converted into stationary. Very often taking the first differences of the variables makes them stationary (Gujarati and Porter. 2009, p. 922). If the variables are stationary in the level form the traditional Granger causality test for testing the causality between gross fixed capital formation and the amount of consumer loans can be presented in the following way:

$$LGGFCF\_SA_{t} = \sum_{j=1}^{p} \propto_{j} LGLOANS\_SA_{t-j} + \sum_{j=1}^{p} \beta_{j} LGGFCF\_SA_{t-j} + \varepsilon_{1,t}$$

$$LGLOANS\_SA_{t} = \sum_{j=1}^{p} \mu_{j} LGLOANS\_SA_{t-j} + \sum_{j=1}^{p} \theta_{j} LGGFCF\_SA_{t-j} + \varepsilon_{2,t}$$
(4)

## **Results and Discussions**

In correspondence with the methodology described above the research starts with the results of the unit root. The null hypothesis states that the time series have unit root for the three variables for level. At the same time the null hypothesis for the time series of the first differences is rejected, i.e. they are stationary. The results from the ADF test for the equations with intercept and trend and intercept are presented in table 1. From it it becomes clear that the time series under consideration are non-stationary and integrated of order 1, .i.e I(1).

	Equation with intercept				Equation with trend and intercept			
Variables	Level		First Difference		Level		First Difference	
	ADF	Prob	ADF	Prob	ADF	Prob	ADF	Prob
LGGFCF_SA	2.1938	0.9999	-6.1034	0.0000	-0.1818	0.9920	-6.5535	0.0000
LGLOANS_SA	1.3948	0.9888	-3.0354	0.0385	1.9691	0.9999	-3.5058	0.0481
IRCL_SA	-1.2820	0.6324	-11.087	0.0000	-0.7822	0.9612	-12.290	0.0000

Table 1: Augmented Dicker -Fuller Unit Root Test Results

Source: Authors' Computations and Eviews 7 Output

After establishing that the time series are non-stationary the optimal lag length has to be selected. From table 2 it becomes clear that according to Schwarz Information Criterion (SC) the optimal lag is 1 and according to Akaike's Information Criterion (AIC) and Hannan-Quinn Information Criterion (HQ) the optimal lag order is 3. The further tests are done with 3 lags.

Table 2: Lag selection in VAR system

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-24.88739	NA	0.000534	0.978505	1.086034	1.020294
1	226.8174	468.0826	1.07e-07	-7.537452	-7.107336*	-7.370294
2	238.0741	19.74861	9.92e-08	-7.616635	-6.863932	-7.324109
3	253.4648	25.38112*	7.98e-08*	-7.840869*	-6.765579	-7.422975*

\*Indicates lag order selected by the criterion

Source: Authors' Computations and Eviews 7 Output

The research continues with Johansen Cointegration test of both Trace test and Maximum Eigenvalue test. Through the Trace test it is established that the trace statistic is 41.43536 and is larger than the critical value at 5% significance level, which is 29.79707. Due to this the H0 that r is equal to zero is rejected and H1 is accepted, i.e.  $r \ge 1$ . At the same time H0, which states that  $r \le 1$  is accepted as the trace statistic of 12.27084 is smaller than the critical value of 15.49471 at 5% significance level (see table 3). This means that there is only one cointegration relationship among the time series under consideration. The same conclusion can be drawn up on the grounds of Maximum Eigenvalue test (see table 3). In other words, among the quarterly data of gross fixed capital formation, effective interest rate of consumer loans and volume of consumer loans during the period 2009 – 2023 in Bulgaria, there exists long-run equilibrium relationship. This fact makes VECM model appropriate (Velichkov, 2016, pp. 70-83).

Trace Test				Maximum Eigenvalue							
Нуро	thesis	Eigen	Trace	Trace 5% Hypothesi totictic Critical P-value	thesis	Eigen	Max eigen	5% Critical	P-value		
HO	H1	value	Statistic	Value		HO	H1	value	statistic	Value	
r = 0	$r \ge 1$	0.405952	41.43536	29.79707	0.0015	r = 0	r = 1	0.405952	29.16453	21.13162	0.0030
$r \leq 1$	$r \ge 2$	0.194834	12.27084	15.49471	0.1444	$r \leq 1$	<i>r</i> = 2	0.194834	12.13555	14.26460	0.1056
$r \leq 2$	$r \ge 3$	0.002413	0.135284	3.841466	0.7130	$r \leq 2$	<i>r</i> = 3	0.002413	0.135284	3.841466	0.7130

Table 3: Results of Trace test and Maximum Eigenvalue test

Source: Authors' Computations and Eviews 7 Output

The VECM model describes both short-run and long-run relationships among the three variables. The cointegration equation (long-run model) between gross fixed capital formation, effective interest rate of consumer loans and amount of consumer loans for Bulgaria for one cointegrating vector during the period 2009 - 2023 is as follows (in the parenthesis below are displayed the standard errors)

#### $ECT(-1) = LGGFCF\_SA(-1) - 0.943LGLOANS\_SA(-1) + 0.029IRCL\_SA(-1) + 0.571$ (5) (0.07604) (0.00625)

The coefficients in equation (5) are statistically significant and two of them are in logarithms. Due to this can be explained as long run elasticities or 1% increase in consumer loans will increase the volume of gross fixed capital formation with 0.94%. The explanation of this quantitative relationship can be search in two directions: First, the number of micro and small enterprises employing up to 9 people in Bulgaria is 420 011 or more than 93% from the total number of nonfinancial enterprises in Bulgaria (NSI, 2024). They are created as family business and due to do this part of the private domestic investments in the economy are financed with consumer loans. Second, part of the consumer loans are used for consumption, which stimulates the entrepreneurs to invest in assets from the point of view of answering to the increase in demand of goods and services. At the same time the impact of effective interest rate of consumer loans is not so stronger, but its sign is theoretically sound which means that an increase in its value leads to decrease in the volume of gross fixed capital formation.

The estimated VECM equation with LGGFCF as a target variable is presented in formula (6) and in table 4 are presented VECM estimates. From the table it is obvious that ECT variable is negative and significant. The absolute value of the ECT variable coefficient is 76,55%. This means that approximately 77% of the short-run disequilibrium is corrected towards the long-run equilibrium each quarter. The value of R-squared means that the variables included in the variable (6) explained 57% of the changes in the gross fixed capital formation. It should be pointed out that in the short-run at conventional level of significance the coefficients before D(LGGFCF\_SA(-1)), D(LGGFCF\_SA(-2)), D(LGLOANS\_SA(-1)) and D(IRCL\_SA(-2)) are not statistically significant and as a result they are not interpreted. At the same time it is established that the coefficients in front of D(LGLOANS\_SA(-2)) and D(IRCL\_SA(-1)) are statistically significant at level of less than 0.05. The increase of consumer loans with lag 2 and the decrease of the efficient interest rate of consumer loans with 1 lag increase the volume of gross fixed capital formation.

$$\begin{split} D(LGGFCF\_SA) &= -0.765*(LGGFCF\_SA(-1) - 0.939*LGLOANS\_SA(-1) + 0.029*IRCL\_SA(-1) + 0.571) + 0.048*D(LGGFCF\_SA(-1)) + 0.07*D(LGGFCF\_SA(-2)) - 0.774*D(LGLOANS\_SA(-1)) & (6) \\ &+ 2.823*D(LGLOANS\_SA(-2)) - 0.08*D(IRCL\_SA(-1)) + 0.049*D(IRCL\_SA(-2)) + 0.063 \end{split}$$

Variables	D(LGGFCF_SA)		
ECT(-1)	-0.765586 (0.11425) [-6.70122]		
D(LGGFCF_SA(-1))	0.048485 (0.11365) [0.42661]		
D(LGGFCF_SA(-2))	0.077268 (0.10906) [ 0.70848]		
D(LGLOANS_SA(-1))	-0.774497 (1.13253) [-0.68386]		
D(LGLOANS_SA(-2))	2.823936 (1.07628) [2.62379]		
D(IRCL_SA(-1))	- 0.084387 (0.03226) [-2.61588]		
D(IRCL_SA(-2))	0.049935 (0.02647) [1.88655]		
С	0.063184 (0.01453) [ 4.34715]		
R-squared	0.575304		
Adj. R-squared	0.514633		
F-statistic	9.482366		

 Table 4: Vector Error Correction Estimates

\* Standard errors in () and t-statistics in []

Source: Authors' Computations and Eviews 7 Output

The short-run causality established by means of t-statistics in the VECM estimates is verified also by means of VEC Granger Causality/Block Exogeneity Wald Test. From it it becomes clear that in the short run there is bilateral causality between consumer loans and gross fixed capital formation and unidirectional causality from efficient interest rate of consumer loans to gross fixed capital formation.

Table 5: VEC Gra	anger Causaliy/E	Block Exogeneity	Wald Test
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Null Hypothesis	Chi-sq	df	Probability	Decision
D(LGLOANS_SA) does not Granger cause D(LGGFCF_SA)	19.10362	2	0.0001	Reject
D(IRCL_SA) does not Granger cause D(LGGFCF_SA)	9.190459	2	0.0101	Reject
Jointly D(LGLOANS_SA) and D(IRCL_SA) do not Granger cause D(LGGFCF_SA)	21.51189	4	0.0003	Reject
D(LGGFCF_SA) does not Granger cause D(LGLOANS_SA)	6.437864	2	0.0400	Reject
D(LGGFCF_SA) does not Granger cause D(IRCL_SA)	2.755620	2	0.2521	Do not reject

Source: Authors' Computations and Eviews 7 Output

The stability of the model is verified on the grounds of residual analysis for autocorrelation, heteroscedasticity and normality respectively by means of LM Breusch-Godfrey test, White test and Jarque-Bera test. The H0 in LM test is that there is no serial correlation, the H0 in White Heteroscedasticity Test (No Cross Terms) states that there is homoscedasticity, and the H0 hypothesis in Jarque-Bera test states that the data are normally distributed. The null hypotheses are rejected at a significance level of less than 0.05. The results from the residuals diagnostics test are presented in table 6. From it become clear that the classic assumptions are fulfilled so the model can be accepted as reliable.

Diagnostic	Tests Statistic	Prob.
VEC Residual Serial LM Test (Lags 1 to 3)	Lag 1 LM = 15.15295 Lag 2 LM = 12.7744 Lag 3 LM = 9.847089	0.0868 0.1728 0.3630
VEC Residual Heteroscedasticity Test	$\lambda^2 = 66.44081$	0.9208
Normality	Jarque-Bera = 9.672515	0.1391

Table 6: Residual Diagnostics Test

Source: Authors' Computations and Eviews 7 Output

### Conclusion

The survey on the relationship between gross fixed capital formation; effective interest rate of consumer loans and consumer loans in BGN gives ground for the following conclusions:

*First*, among the quarterly data of gross fixed capital formation, effective interest rate of consumer loans in BGN and consumer loans in BGN during the period 2009 - 2023 in Bulgaria exists long-run equilibrium relationship.

*Second*, in long-term period 1% increase in consumer loans increase the volume of gross fixed capital formation with 0.94%. The logical explanations of this fact are: first, the number of micro and small enterprises in Bulgaria is 420 011 and part of private domestic investment is probably financed with consumer loans; second, part of the consumer loans are used for consumption, which stimulates the entrepreneurs to invest in assets from the point of view to answer on the increase in demand of goods and services.

*Third*, the coefficient value of  $ECT_{t-1}$  is 0.765, which means that approximately 77% of the discrepancy between long-term and short-term gross fixed capital formation is adjusted for a quarter.

*Fourth*, in the short term there is bilateral causal relationship between consumer loans and gross fixed capital formation and unidirectional relationship from efficient interest rate of consumer loans to gross fixed capital formation. In the short-run period 57% of the changes in the gross fixed capital formation are explained with the impact of consumer loans and effective interest rate.

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