

“Impact of state finance on macroeconomic stability of Ukraine”

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Impact of state finance on macroeconomic stability of Ukraine

Abstract

According to reports data of the International Institute of Management Development (IMD) and World Economic Forum (WEF), countries' competitiveness tendencies were defined: rate of global competitiveness index remains lower than the rate, achieved before the global financial and economic crisis, non-linear distribution of benefits from economic growth between the EU countries, Ukrainian rating falling by macroeconomic stability by 21 points in 2017 in comparison with 2018. It is not unexpected that realization of countries' policy concerning their competitiveness growth requires some cost. Thus, author supposes that it is important to study key aspects of state finance, which can have great impact on the international competitiveness and solve the country's macroeconomic stability problem.

This paper shows results of author's own research, carried out using methodic tools of scientists Ahvaz Shahid Chamran University, Ahvaz, Iran Abdolmajid Ahangari and Aziz Arman. It is based on evaluation of instability time rows of four economic variables of inflation (TINF), the ratio of budget deficit on growth domestic product (GDP) (TBD), foreign debt on GDP (TFD) and exchange rate deviation from the previous period (TRO) and calculation of macroeconomic instability index on their base MII_{tn} . Research showed that all variables of macroeconomic instability index MII_{tn} have a positive correlation; therefore, subindex of inflation rate instability and subindex of exchange rate to the previous period have the largest impact on the macroeconomic instability index MII_{tn} .

Keywords: competitiveness, deficit, economic growth, external debt, inflation, macroeconomic instability, stability.

JEL Classification: E63, F43, F63, C23, O11.

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Introduction

Annual reports of International Institute of Management Development (IMD) and World Economic Forum (WEF) (IMD, 2017, 2009, 2004; WEF, 2017–2018, 2009–2010, 2004–2005) showed tendency of the economies gradual growth in various countries, on the view point of their competitiveness, after global financial and economic crisis (Table 1).

In spite of some differences in methodology, implemented to evaluate competitiveness of these two institutions, place of leading countries in both ratings is practically the same. Particularly, due to the international competitiveness indices, economies of Switzerland, United States, Singapore, Netherlands, Hong Kong SAR, Sweden and Finland are included to 10 best countries by both methodologies in 2017.

According to data (WEF, 2017–2018, 2009–2010, 2004–2005), Switzerland is the largest competitive country among analyzed ones, starting from 2004–2005 competitiveness index of which was increased 0.37 points and was 5.86. Leading position of Switzerland in the global rating was provided, first of all, by factors of subindices A (institutes, infrastructure, macroeconomic stability, health protection and elementary education) and C (business sophistication, innovation) of global infrastructure (in 2017, subindex A was 6.39, and subindex C 5.86). At the same time,

United States (6.01) had the best position by subindex in 2017, owing to improvement of the given subindex factor (higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size). Country managed to keep the second position among all other analyzed countries. On the other hand, maximum increase of the global competitiveness index has not reached its maximum rate, received in the pre-crisis period in Finland in 2005 (5.94).

New countries-members of EU have high potential and dynamic for competitiveness growth, especially economies of Poland, Lithuania, Bulgaria, positions of which were greatly improved in comparison with 2009. Poland improved its positions in rating by 10 places (+0.26 points), Lithuania by 18 places (+0.28 points), Bulgaria by 26 places (+0.44 points). It should be noted that in spite of progressive convergence of the mentioned countries, spreads with absolute indices of EU countries leaders (Netherlands (5.57), Germany (5.57), Sweden (5.53), United Kingdom (5.49), Finland (5.44)) are different, but newest countries-members of EU managed to increase competitiveness index rate. At the same time, in comparison with data in 2004–2005, the largest negative changes of the global competitiveness index were registered in Latvia (-0.03 points). However, in spite of index falling, Latvia (49 place in the rating) remains more competitive country than Bulgaria (50 place), Croatia (74 place), Romania (62 place). In such situation of non-linear distribution of benefits from the economic growth, the ideology base of the country's special policy is a problem to increase its competitiveness.

Table 1. Changes in the international competitiveness indices in 2004–2017
(IMD, 2017, 2009, 2004; WEF, 2017–2018, 2009–2010, 2004–2005)

Country	Index of the world competitiveness			World competitiveness yearbook		
	2004–2005 Rank (out of 104) / Score (1-7)	2009–2010 Rank (out of 133) / Score (1-7)	2017–2018 Rank (out of 138) / Score (1-7)	2004 Rank (out of 59) / Score (0-100)	2009 Rank (out of 57) / Score (0-100)	2017 Rank (out of 63) / Score (0-100)
Switzerland	8/5.49	1/5.60	1/5.86	14/78.809	4/94.2	8/91.9
United States	2/5.82	2/5.59	2/5.85	1/100	1/100	3/95.4
Singapore	7/5.56	3/5.55	3/5.71	2/89.0	3/95.7	1/100.0
Netherlands	12/5.30	10/5.32	4/5.66	15/78.6	10/87.8	6/93.2
Germany	13/5.28	7/5.37	5/5.65	21/73.4	13/83.5	17/84.1
Hong Kong SAR	21/5.06	11/5.22	6/5.53	6/85.8	2/98.1	7/92.1
Sweden	3/5.72	4/5.51	7/5.52	11/79.6	6/90.5	2/95.9
United Kingdom	11/5.30	13/5.19	8/5.51	22/72.2	21/76.1	11/88.9
Japan	9/5.48	8/5.37	9/5.49	23/71.9	17/78.2	27/78.1
Finland	1/5.95	6/5.43	10/5.49	8/83.6	9/88.4	4/95.0
Bulgaria	59/3.98	76/4.02	50/4.46	-/-	38/59.0	45/56.8
Croatia	61/3.94	72/4.03	74/4.19	-/-	53/48.6	48/54.8
Latvia	44/4.43	68/4.06	49/4.40	-/-	-/-	35/67.7
Lithuania	36/4.57	53/4.30	35/4.58	-/-	31/64.9	29/75.0
Poland	60/3.98	46/4.33	36/4.59	-/-	44/53.9	37/65.9
Romania	63/3.86	64/4.11	62/4.28	54/47.9	54/46.9	54/52.5
Ukraine	86/3.27	82/3.95	81/4.11	-/-	56/40.421	60/44.0

As Oliver Cann, Head of Media Content, World Economic Forum Geneva mentioned, high level of the competitiveness in the country leads "...to growth, which leads to income levels and hopefully, at the risk of sounding simplistic, improved well-being" (Oliver Cann, 2017).

It is not unexpected that realization of the mentioned objectives in the country's policy concerning its competitiveness increase requires some cost. Ukrainian scientists Vladimir Zakharchenko, Sergei Zakharchenko in their work (Zakharchenko & Zakharchenko, 2016) distinguish state finance as main factors to form total competitiveness in the country. The authors focus their attention on the fact that the state finance evaluation, on the one hand, shows an impact on international competitiveness in the country, and, on the other hand, allows to define strategic direction to strengthen the competitive potential of state finance in the global financial and competitive space.

In comparison with 2004–2005, Ukraine improved its position in the global competitiveness rating by five positions and took 81 place in 2017, in absolute terms, global competitiveness index was increased by 0.84 points. At the same time, Ukrainian rating fall by macroeconomic stability level by 21 points in 2017 (121 place) in comparison with 2008 (100 place) shows the necessity to introduce an economic policy, oriented to reduction of development cyclicity and economic collapse consequences.

1. Literature review

Scientific and practical range of problems on issues to evaluate state finance and their impact on economic growth, macroeconomic stability of the country are actively studied in the world and native scientific literature.

Particularly, these problems are studied in research of EU scientists, which show conception of state finance stability as a governmental ability to provide debt and expected cost financing (Consolidated, 2010). That is why, it is not by chance, the main economic criterion of EU countries convergence is a rule of state deficit relation to GDP, which has not be over 3% and relation of state debt to GDP, which has not to be over 60%. According to IMF prognostications till the end of 2020 level of Ukrainian state debt ratio to GDP will be 71.0%, that will not conform to the maximum allowed norms of ratio and will mean the constant loss of the Ukrainian financial system paying capacity (Request, 2015).

Scientists from University of Lisbon António Afonso and José Alves in their work (Afonso & Alves, 2014) having analyzed impact of state debt on real GDP per capita within 14 European countries during 1970–2012, concluded that state debt has negative impact on economic growth both in the short and long term. The similar result within the framework of Eurozone countries research from 1970 till 2010 is received by scientists from European Central Bank, Fiscal Policies Division Checherita-Westphal and Rother (Checherita-Westphal & Rother, 2012). Authors distinguish non-linear impact of state debt on the economic growth, therefore, the negative effect of government debt on growth stands between 70% and 80%.

Kudryashov (2012) defines stable state of state finance as a one that does not lead to extreme growing of the fiscal load and total amount of state debt obligations accumulation and their structure worsening. Therefore, in author's opinion, evaluation of state finance has to undergo several stages: a) to evaluate every component stability of state finance; to establish integral indicators, which show the state

finance; b) to carry out monitoring of state finance stability indicators dynamics during some periods; c) to evaluate dynamics of such indicators in the current, midterm and long term periods and to define general state of state finance; d) to justify actions to provide state finance stability both in current and future periods.

The World Bank describes macroeconomic terms as stable ones "...when the inflation rate is low and predictable, real interest rates are appropriate, the real exchange rate is competitive and predictable public sector saving rates are compatible with the resource mobilization requirements of the program, and the balance of payments situation is perceived as viable" (World Bank, 1990).

Rozhko investigated state finance role to provide macroeconomic stability processes and formed the following position. The aim of the macroeconomic stability policy in the country is based on combination of the conventional monetary policy and tools to regulate, to create best automatic stabilizers of the fiscal policy to achieve stable level of production and stable inflation gap. Therefore, macroeconomic stability leads to shortening of the main macroeconomic indices fluctuation (amount of national product, rate of prices, employment and absence of terms for GDP stable growth) and their fall decrease (Rozhko, 2014).

The purpose of the research is to define impact of state finance on the macroeconomic stability of the country, which is based on some state finance economic indices instability evaluation and on calculation of country's macroeconomic instability index.

2. Key research findings

Within this research, in order to evaluate state finance impact on the macroeconomic stability of the country, one uses methods, suggested by scientists Ahvaz Shahid Chamran University, Ahvaz, Iran Abdolmajid Ahangari, Aziz Arman and Aziz Saki, who due to research (Rozhko, 2014) understand macroeconomic instability as accumulation of changes levels fluctuation consequence (deficit and surpluses) concerning four variables of inflation rate (TINF), the ratio of budget deficit on growth domestic product (GDP) (TBD), foreign debt on GDP (TFD) and the ratio of actual currency rate on nominate currency (TRO) as a result of macroeconomic management, in other words, instability is increase or decrease of the index rate, which characterizes tendencies of the management process change (Ahangari et al., 2014).

Thus, instability index of each factor is calculated according to the formula:

$$IX_t = X_t - TX_t, \quad (1)$$

where IX_t – index of variable X_t instability;

X_t – real value of the variable in the moment of time t ;

TX_t – target value of the X variable, depending on the concrete form of the process tendency change equation.

Equation of the tendency concerning variable X values changes is:

$$TX_t = a_0 + a_1t + a_2t^2 + a_3t^3 + \dots + a_nt^n + e_t, \quad (2)$$

where t – time;

a_0 – free member;

$a_1 \dots a_n$ – regression coefficients;

e_t – coefficient, which characterizes impact of various occasional factors on variable X values increase.

The total index of macroeconomic instability is calculated as an average value of four constituents of instability indices:

$$MII_{tn} = \frac{\sum(IINF_{tn}, IBD_{tn}, IFD_{tn}, IRO_{tn})}{N}, \quad (3)$$

where MII_{tn} – index of the macroeconomic instability;

$IINF_{tn}$ – subindex of the inflation instability level;

IBD_{tn} – subindex of the factor concerning state deficit relation to GDP;

IFD_{tn} – subindex of factor concerning the external debt to GDP;

IRO_{tn} – subindex of instability of the ratio of actual currency rate on nominate currency.

Sanjay Kalra (2012) distinguishes the following criteria in his report about international experience to calculate macroeconomic indicators and their use: indices have to consider countries specific nature, must have clear economic value, wide statistic scope and cyclic behavior. According to main requirements to select indices, we propose to use index of deviation of exchange rate to the previous period as a factor, which characterizes stability or instability of the exchange rate due to Maastricht criteria requirements.

Using the data concerning mentioned factors for non-linear evaluation module of the program STATISTICA from 1995 to 2015 enabled to receive such equations of every index tendency:

$$TINF_{tn} = 841.826 - 644.725t + 186.208t^2 - 26.022t^3 + 1.886t^4 - 0.068t^5 + 0.01t^6R^2 = 0.98$$

$$TBD_{tn} = 6.24177 + 3.0229t - 2.09951t^2 + 0.39874t^3 - 0.03393t^4 + 0.00136t^5 - 0.00002t^6R^2 = 0.85$$

$$TFD_{tn} = 38.1722 - 36.0579t + 19.5117t^2 - 3.9015t^3 + 0.3605t^4 - 0.0155t^5 + 0.0003t^6 R^2 = 0.98$$

$$TRO_{tn} = 8.10036 - 6.70701t + 2.07818t^2 - 0.30648t^3 + 0.02309t^4 - 0.00086t^5 + 0.00001t^6 R^2 = 0.93$$

Table 2. Calculation of macroeconomic instability index MII_{tn} on the example of Ukraine in 1995–2015 (own calculations based on Eurostat data)

Year	$IINF_{tn}$	IBD_{tn}	IFD_{tn}	IRO_{tn}	MII_{tn}
1995	17.6407	0.36930	-0.58972	0.310446	4.432688
1996	-36.7633	-1.67754	3.22987	-0.648081	-8.96477
1997	-1.9047	2.35394	-3.68688	-0.061348	-0.82475
1998	16.7085	-0.77968	-4.90277	0.323542	2.837394
1999	21.0394	-0.02721	8.49635	0.530863	7.509856
2000	12.2895	-0.55348	4.32756	0.007697	4.01783
2001	-12.6784	0.06520	-7.56314	-0.361244	-5.1344
2002	-23.8979	-0.33950	-2.63516	-0.275610	-6.78705
2003	-12.8662	-0.49326	-2.39765	-0.112172	-3.96733
2004	-0.1330	2.27053	11.93591	0.042354	3.528954
2005	-11.0885	0.27562	-7.40698	0.110635	1.016942
2006	8.1899	-1.11735	1.47732	0.144124	2.173498
2007	7.9329	-0.91584	1.99355	0.078735	2.272325
2008	12.5603	-0.68546	-7.45757	-0.016333	1.100233
2009	-4.3754	-0.02488	8.66533	0.282015	1.136771
2010	-13.7207	3.17433	-3.53119	-0.250922	-3.58212
2011	-9.8239	-1.61704	-0.59095	-0.226915	-3.06471
2012	-4.2594	-0.49561	1.08600	-0.089462	-0.93962
2013	7.8377	-0.13992	-1.25243	0.034663	1.619994
2014	14.2589	0.48994	1.20347	0.370127	4.08061
2015	-9.1233	-0.13207	-0.40094	-0.193116	-2.46236

Table 2 demonstrates the results of macroeconomic instability index calculation by the proposed methods on the example of Ukraine in 1995–2015.

Macroeconomic instability index (MII_{tn}) has to be oriented to the zero value, at the same time, crisis situations or booms impact will cause its reduction or increase.

Results of the correlation matrix (Table 3) show that, on the one hand, macroeconomic instability index (MII_{tn}) during 1996–2015 has a positive and essential correlation with subindex changes of inflation instability rate (0.924), subindex of instability factor of ratio concerning exchange rate relation to the previous period (0.917), and, on the other hand, has positive connections with subindex of instability

of state deficit relation to GDP (0.128) and with subindex of instability of foreign debt to GDP (0.3788). Therefore, subindex of instability of exchange rate relation to the previous period has positive correlation with subindex of inflation rate instability (0.8820). It proves that there is almost 90% mentioned subindices fluctuation tendencies agreement. Although ratio between instability index of state deficit to GDP and macroeconomic instability MII_{tn} index, is statistically large at the level of 13%. Evaluation of amplitude is low, that it is supposed to be economically insignificant. Total estimated results show that all variable models of macroeconomic instability index (MII_{tn}) have a positive correlation, i.e., when one subindex is growing, macroeconomic instability index is increasing too (MII_{tn}).

Table 3. Correlation matrix of macroeconomic instability index MII_{tn} and its subindices dependence on the example of Ukraine in 1995–2015 (own calculations based on Eurostat data)

	$IINF_{th}$	IBD_{th}	IFD_{th}	IRO_{th}	MII_{th}
$IINF_{th}$	1.0000				
IBD_{th}	0.0438	1.0000			
IFD_{th}	0.0571	0.0378	1.0000		
IRO_{th}	0.8820	0.0936	0.2942	1.0000	
MII_{th}	0.9425	0.1282	0.3788	0.9170	1.0000

Dependence of macroeconomic instability index change in Ukraine in 1995–2015 with proper values of GDP growth is shown in Fig. 1. The greatest fall of the macroeconomic instability index of Ukraine was observed in 1996 (–8.96), when the GDP growth rate was –10%. In 1999, Ukrainian economies collapse rates in comparison with previous periods, in 1997 and in 1998 accordingly –3% and –1.9%, were stopped (–0.2%) and macroeconomic

instability index MII_{tn} reached its maximum positive rate (7.51). During the whole economic rising of Ukrainian economy in 2000–2004, when economic growth curve was fast moving to the maximum level, achieved in 2004 (+12.1%), macroeconomic instability index MII_{tn} fluctuated in the range of 4.02 in 2000 to 3.53 in 2004. One of the most powerful subindices in the mentioned period, which stopped an economic development is instability of

the foreign debt to GDP (approx. 4.33 in 2000 and 11.94 in 2004). Beginning from 2004 over attracting finance (137% of GDP in 2015) on half favorable terms together with irrationality of their use prevent from long-term economic growth and reduction of country's macroeconomic stability fluctuation amp-

litude. During the financial and economic crisis 2007–2010 and post-crisis period 2011–2015, inflation growth rates were increased together with debt in Ukrainian economy, rate of which reached double-rated value in the analyzed period (particularly, in 2015 inflation was growing to 48.72).

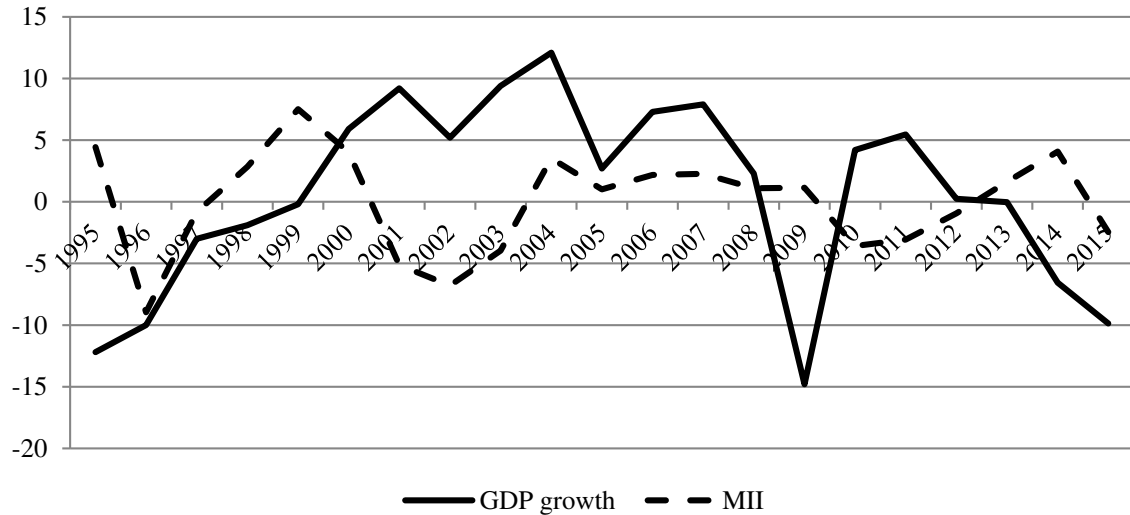


Figure 1. Macroeconomic instability index and economic growth of Ukraine during 1995–2015 (own calculations based on Eurostat data)

Table 4. Linear regression of the macroeconomic instability index (MII_{tn}) and proper value of GDP growth of Ukraine during 1995–2015 (own calculations based on Eurostat data)

MII_{tn}	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDP growth	-0.0295725	0.1241744	-0.24	0.814	-2.894724.2303275
Const.	0.0197592	0.9300215	0.02	0.983	-1.9267981.966317

Data of the Table 4 justify inverse relation of mentioned factors. In other words, increase of the GDP growth leads to reduction of macroeconomic instability index. Thus, one can confirm that changes of macroeconomic instability index factors will be related to increase (decrease) of the economic growth in the long-term perspective.

Conclusion

Study of state finance impact on the country's macroeconomic stability, which is based on evaluation of instability time rows of four economic variables of inflation (TINF), the ratio of budget deficit on growth domestic product (GDP) (TBD), foreign debt on GDP (TFD) and exchange rate deviation from the previous period (TRO) and calculation of macroeconomic instability index MII_{tn} justified non-linear changes of the mentioned index for Ukraine during 1996–2015, which correlates with results of Global Economic Forum, according to which Ukrainian rating by macroeconomic stability ratefell by 21 points, in comparison with 2008 (100 place).

Evaluation results of impact, made by four economic variables of inflation rate (TINF), the rate of budget deficit on GDP (TBD), foreign debt on GDP (TFD) and ratio of exchange rate deviation from previous period (TRO), based on macroeconomic instability index MII_{tn} in Ukraine during 1996–2015, show that all variables have a positive correlation, i.e., increase of one subindex rate will lead to macroeconomic instability index MII_{tn} growth. Therefore, the largest impact on the macroeconomic instability index MII_{tn} is made by instability index of inflation rate and instability subindex of the exchange rate ratio to the previous period. That is why, prevention of the mentioned subindices negative macroeconomic tendencies is a necessary condition to provide macroeconomic stability, and thus, country's international competitiveness.

Further research requires investigations of the macroeconomic stability development in the country, taking into account optimal rate of subindices fluctuation.

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