

INVESTMENTS EFFICIENCY AND ECONOMIC GROWTH: A COMPARATIVE ANALYSIS OF NORTH MACEDONIA AND ALBANIA

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Abstract: The Western Balkan countries have undergone quite a difficult and process of transition; although for some of them transition seems to be a never-ending process. In their trip towards the European Union these countries are faced with almost identical economic, social and political problems. Regardless, the fact remains that the first sign of a stable and prospering national economy, is having appropriate macroeconomic indicators.

Seen from a macroeconomic point of view, investments are an important part of the income and expenditures model, in which they are considered an injector factor. On a macro-plan, the theory of investments is based on the multiplayer effects. This makes investments an important pillar for each national economy as well as a major factor contributing to economic growth.

The World Bank as a prestigious institution, recommend ICOR as one of the most useful tools for determination of the impact of investment on economic growth. This indicator is also useful when it comes to make country comparisons. Therefore, the Incremental Capital-Output Ratio (ICOR) is used in determining the efficiency of investments in Northern Macedonia and Albania. Our preliminary assumption is that investment efficiency in both countries is low. Therefore, the main rationale behind the paper is to determine whether this assumption is correct or not.

Keywords: investment, economic growth, GDP, ICOR.

1. INRODUCTION

The allocation of scarce resources and the efficiency in their utilisation is perhaps one of the main issues contemporary national economies are faced with. From a company point of view, making adequate and efficient investment decisions is among the greatest challenges managers are being faced with in continuity, specially having in mind the importance of such decisions for company growth and development. On the other hand, on a larger scale of analysis, the inefficiency of public and private investments is beyond any doubt, one of the main obstacles for stable economic development. This due to the fact that the efficiency of investment, directly reflects on the final output of the national economy as a whole. The capital- output ratio, especially Incremental Capital-Output Ratio (ICOR) as a key economic indicator, will help us to measure the investment efficiency as a main aim of this research. Investment efficiency means more output with less investment, so that with less investment capital will realize more marginal outcomes effects.

The capital-output ratio has a key role in the Harrod-Domar model. According to the HD-model the ICOR is calculated based on some standard assumptions (economy has steady growth; there is no lag between investment and generation of added value in GDP, adequate capacity utilisation, unchanging production structure within an economy, etc.).A vast number of researchers in order to estimate or calculate investment efficiency, are using the marginal or incremental capital-output ratio (ICOR) instead of the average capital-output ratio (ACOR).The incremental capital coefficient falls within a group of not a simultaneously marginal capital coefficient. It represents the relationship between the discrete increment of fixed capital (ΔK) and the growth of gross domestic product (ΔY), so that the capital increase is made a year ahead in relation to the analysis of the time interval for which the growth of the gross domestic product is measured (Mazllami, 2007):

This relation is mathematically expressed:

$$ICOR = \frac{K_{n-1} - K_{m-1}}{Y_n - Y_m} = \frac{\Delta K}{\Delta Y} = \frac{\overset{n-1}{\Delta} K}{\underset{m}{\Delta} Y} \dots\dots\dots(1)$$

The time interval (t) for ICOR calculation is define as the period n-m. The symbol (K) is the value of gross fixed capital formation, the symbol (Y) is the Gross Domestic Product (GDP). In another form, the equation (1) will express by Gross fixed capital formation (GFCF) and GDP.

$$ICOR = \frac{GFCF_{t-1}}{Y_t - Y_{t-1}} \dots\dots\dots(2)$$

Many authors the ICOR have measured both as a ratio of Gross Investment (Gross Capital Formation) in a given period (t-1) and the gross domestic product growth in period (t) ($\Delta Y = GDP_t - GDP_{t-1}$), expressed below:

$$ICOR = \frac{GI_{t-1}}{\Delta Y} \dots\dots\dots(3)$$

If the formula (3) will divide by (Y_{t-1}) both in the numerator and in the denominator, then will obtain:

$$ICOR = \frac{\frac{GI_{t-1}}{Y_{t-1}}}{\frac{\Delta Y_t}{Y_{t-1}}} = \frac{r_i}{r_Y} \dots\dots\dots(4)$$

where:

- r_i . Gross capital formation (% of GDP)
- r_Y . GDP growth nominal (%)

From formula (4) shown above, will obtain:

$$ICOR = \frac{r_i}{r_Y} \Rightarrow r_Y = \frac{r_i}{ICOR} \dots\dots\dots(5)$$

From the formula (5), the GDP growth rate (r_Y) is expressed as a ratio between the growth rate of gross investments as a % of GDP (t-1) and the ICOR (t). In this case we can conclude that if the ICOR will be small, then the GDP growth should be higher and vice versa.

The aim of this research is to provide an analysis with about ICOR level on North Macedonia and Albania. The results from the formulas mentioned above will be the answer of our research assumption.

2. LITERATURE REVIEW

Since the pioneering works of R. Harrod (1939) and E. Domar (1946), through the works of N.R. Kaldor (1957), R. Solow (1956), E. Phelps (1961) and, thirty years after, the birth of the endogenous growth theory [P. Romer (1986), R. Lucas (1988), R. Barro (1988), Bencivenga & Smith (1991)], to its most recent developments (theories of “pro-poor” growth and “inclusive” growth) and the “alternative” growth theories (Setterfield, 2010), productive investment, a labor has always been regarded as the pillar engine of growth along (Berthomieu at all, 2016).

Economics researchers during last two decades have been dedicated to measuring the efficiency of investments through ICOR. It is noteworthy that nowadays this indicator for developing economies is usually higher but for developed economies is low because as the latter make a more efficient use of their productive capital. Researcher paper in this field for western Balkan are in a small number or can say scarce.

Ivo Vinski (1961) considered as first researcher who provided a direct estimation of all physical assets in former Yugoslavia during the period 1909-1951. According his measurement, the CORE value have moved among 4,5 and 7,5.

Antiochou (2011) has calculates ICOR for Croatia, Albania, Bosnia and Herzegovina, FYROM and Serbia during the period from 1998 to 2009. His estimate was based using mean real growth rates and net fixed capital investment series.

Gabrisch (2014) has calculated value of ICOR on the one hand for Western Balkan countries with Croatia and the other hand Czech Republic, Hungary, Poland, Slovak Republic and Slovenia as new EU members. The author has made a complaisant among the countries has finds surprisingly low ICOR values, especially in Western Balkan countries such are, very small values for Serbia (0.7) and negative value for Macedonia.

Berthomieu at all (2016) have calculated the value of ICOR for WB countries during the period 2001-2012. This period was used as the reference period to calculate mean growth rates and average net investment and a one-year lag was used as it is suggested by the literature. The data obtained from their research show strange results in Serbia and Macedonia one unit of output is produced with less than one unit of physical capital and thus that the stock of capital is used more efficiently than in the United States or in Germany.

3. EFFICIENCY OF INVESTMENTS (ICOR) IN NORTH MACEDONIA AND ALBANIA

The period of research is from 1993 till 2017 year. The starting point of this period is two years after the independence of North Macedonia (at that time FYROM) from the ex-Yugoslav federation, while the last point of analysis is 2017 a year considered to be a new starting point in the development of Macedonia. Based on this period we will try to analyse the same indicators in both countries and after that to make a comparison of ICOR values in their economy.

The indicators which we use will be as a follow:

Table 1.Relevant indicators of the research	
Symbols	Indicators
GCF	Gross capital formation (current US\$)
GCF (% of GDP)	Gross capital formation (% of GDP)
GFCF	Gross fixed capital formation (current US\$)
GFCF (% of GDP)	Gross fixed capital formation (% of GDP)
GDP	GDP (current US\$)
GDP nom (a.g. %)	GDP _n (annual growth %)
GDP real (a.g. %)	GDP _r (annual growth %)

Since 1993 till 2017 year, the economy of Republic of North Macedonia has realised these values of the indicators mentioned above (see Table 2):

- Positive trend of Gross Capital Formation an average of 1.76 billion \$ and an average of 25.35 % of GDP, where GCF_{Min}=407.89 million \$ in 1993 year, and GCF_{Max}=3.72 billion \$ in 2017 year.
- Positive trend of Gross Fixed Capital Formation an average of 1.52 billion \$ and an average of 21.8% of GDP, where GFCF_{Min}=425.78 million \$ in 1993 year, and GFCF_{Max}=2.66 billion \$ in 2016 year.

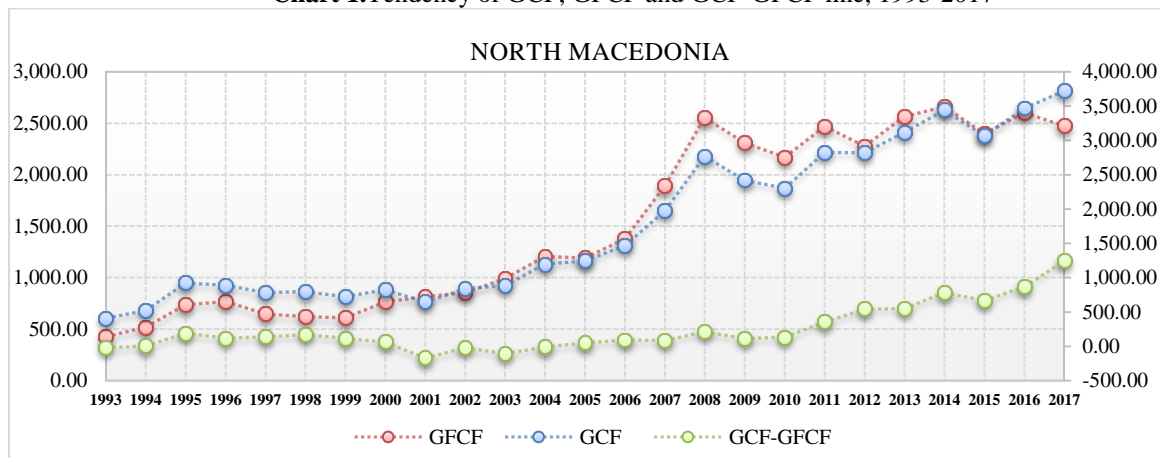
Analysing the trend lines of GCF and GFCF, we can conclude that from 1993 to 2008 year these lines are approximately in the same position, but with a small deviation while from 2008 to 2010 they cross down. This situation is as a result of the impact of World financial crisis, but from 2010 year the state of these indicators got changed, with a growing tendency (left axis of Chart 1) but with a significant difference between GCF and GFCF (right axis, Chart 1).

Table 2. North Macedonian data, 1993-2017 (absolute value in mil.\$)							
Year	GC F	GCF (% of GDP)	G FCF	G F	G DP	GD P nom (a.g. %)	GD P real (a.g. %)
1993	407.86	15.20	425.78	15.87	2682.46	-	-
1994	522.93	14.70	518.73	14.59	3556.58	32.59	-
1995	923.60	19.73	735.62	15.72	4680.08	31.59	-
1996	888.33	19.10	768.28	16.52	4651.45	-	0.8
1997	783.42	19.94	647.31	16.48	3928.98	-	0.9
1998	795.02	21.17	622.38	16.57	3756.21	-	2.7
1999	723.57	18.73	610.02	15.79	3863.74	2.8	3.7
2000	825.49	21.88	765.77	20.30	3772.85	6	4.0
2001	643.80	17.35	515.91	21.99	3709.64	2.35	1
2002	837.02	20.83	855.87	21.30	4018.37	1.68	-
2003	886.82	17.93	929.91	20.07	4946.29	8.3	1.1
						2	9
						23.09	2.0

004	1,1 95.96	21.05	1 ,206.32	21.23	5 ,682.72	14. 89	4.4 9
005	1,2 42.05	19.85	1 ,191.47	19.04	6 ,258.60	10. 13	4.5 6
006	1,4 68.84	21.41	1 ,377.98	20.08	6 ,861.22	9.6 3	4.9 9
007	1,9 76.76	23.71	1 ,891.96	22.69	8 ,336.48	21. 50	6.3 5
008	2,7 68.00	27.93	2 ,552.64	25.76	9 ,909.55	18. 87	5.3 7
009	2,4 20.24	25.74	2 ,308.81	24.56	9 ,401.73	- 5.12	- 0.44
010	2,3 01.78	24.47	2 ,169.52	23.06	9 ,407.17	0.0 6	3.2 8
011	2,8 24.41	26.91	2 ,469.30	23.53	1 0,494.63	11. 56	2.2 6
012	2,8 19.03	28.93	2 ,277.52	23.37	9 ,745.25	- 7.14	- 0.54
013	3,1 16.35	28.81	2 ,564.98	23.71	1 0,817.71	11. 00	2.8 4
014	3,4 42.23	30.30	2 ,660.57	23.42	1 1,362.27	5.0 3	3.5 4
015	3,0 66.69	30.47	2 ,399.37	23.84	1 0,064.52	- 11.42	3.7 7
016	3,4 69.59	32.51	2 ,602.47	24.38	1 0,672.47	6.0 4	2.7 5
017	3,7 19.93	32.98	2 ,475.38	21.95	1 1,279.51	5.6 9	0.1 5
	1,7 62.79	25.35	1 ,516.27	21.80	6 ,954.42	6.8 6	1.8 1

Source: World Development Indicators, WB, 2019, author calculation.

Chart 1. Tendency of GCF, GFCF and GCF-GFCF line, 1993-2017



Since 1993 till 2017 year, the values of the relevant indicators of the Albanian economy, are as a follow (Table 3):

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Table 3. Albanian data, 1993-2017 (absolute value in mil.\$)							
Year	GC F	GCF (% of GDP)	G FCF	GF CF (% of GDP)	GD P	GD P nom (a.g. %)	GD P real (a.g. %)
1993	162 .11	13.68	1 62.11	13. 68	1,1 85.32	-	9.6 0
1994	355 .44	18.90	3 55.44	18. 90	1,8 80.95	58. 69	8.3 0
1995	509 .14	21.28	5 09.14	21. 28	2,3 92.76	27. 21	13. 30
1996	701 .24	21.92	6 97.35	21. 79	3,1 99.64	33. 72	9.1 0
1997	483 .57	21.41	4 54.31	20. 12	2,2 58.51	- 29.41	- 10.92
1998	569 .13	22.35	5 47.10	21. 49	2,5 45.96	12. 73	8.8 3
1999	784 .93	24.44	7 56.23	23. 54	3,2 12.12	26. 17	12. 89
2000	1,1 52.60	33.12	1, 110.47	31. 91	3,4 80.36	8.3 5	6.9 5
2001	1,5 57.71	39.72	1, 440.56	36. 73	3,9 22.10	12. 69	8.2 9
2002	1,6 80.99	38.66	1, 567.72	36. 06	4,3 48.07	10. 86	4.5 4
2003	2,3 25.95	41.45	2, 014.19	35. 89	5,6 11.50	29. 06	5.5 3
2004	2,7 21.11	37.87	2, 715.50	37. 80	7,1 84.69	28. 04	5.5 1
2005	3,0 17.45	37.47	3, 053.33	37. 92	8,0 52.07	12. 07	5.5 3
2006	3,5 05.30	39.40	3, 386.75	38. 07	8,8 96.07	10. 48	5.9 0
2007	4,1 36.53	38.74	3, 884.92	36. 38	10, 677.32	20. 02	5.9 8
2008	4,6 08.75	35.78	4, 373.13	33. 95	12, 881.35	20. 64	7.5 0
2009	4,1 62.22	34.56	3, 939.53	32. 71	12, 044.21	- 6.50	3.3 5
2010	3,6 14.90	30.31	3, 390.65	28. 43	11, 926.96	- 0.97	3.7 1
2011	4,0 49.48	31.41	3, 785.56	29. 37	12, 890.87	8.0 8	2.5 5
2012	3,4 90.02	28.33	3, 263.35	26. 49	12, 319.78	- 4.43	1.4 2
2013	3,5 84.07	28.05	3, 332.00	26. 08	12, 776.28	3.7 1	1.0 0
2014	3,3 96.31	25.67	3, 195.77	24. 16	13, 228.25	3.5 4	1.7 7
2015	2,9 39.99	25.82	2, 779.94	24. 41	11, 386.93	- 13.92	2.2 2
2016	3,0 51.40	25.68	2, 915.95	24. 54	11, 883.68	4.3 6	3.3 5
2017	3,2 45.00	24.89	3, 207.48	24. 60	13, 038.54	9.7 2	3.8 4
	2,3 92.21	30.95	2, 273.54	29. 42	7,7 28.97	11. 87	5.2 0

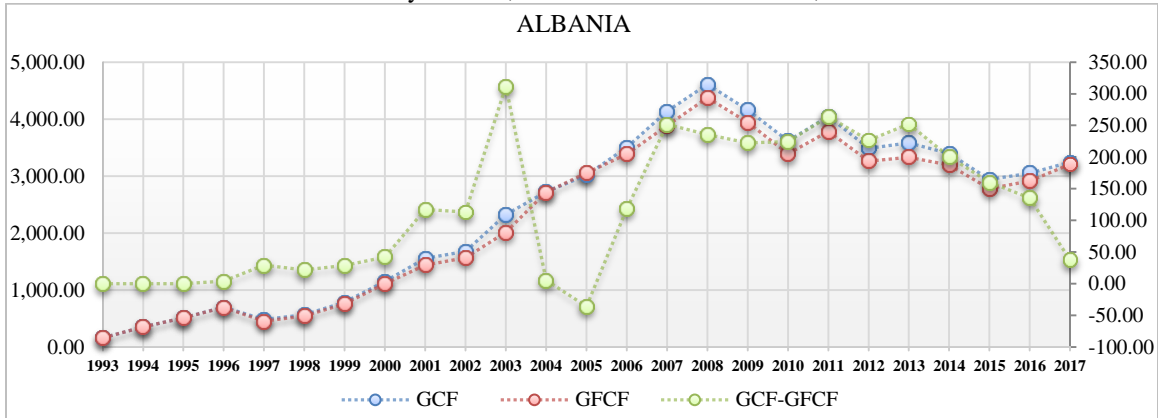
Source: World Development Indicators, WB, 2019, author's calculation.

According to the value of the Table 3. dedicated to the Albanian economy, we can conclude as a follow:

- Positive trend of Gross Capital Formation an average of 2.39 billion \$, where Min=162.11 million \$ in 1993 year, and Max=4.6 billion \$ in 2008 year, and an average of 30.95 % of GDP.
- Positive trend of Gross Fixed Capital Formation an average of 2.27 billion \$, where Min=162.11 million \$ in 1993 year, and Max=4.37 billion \$ in 2008 year, and an average of 29.42 % of GDP.

If we analysing the trend lines of GCF and GFCF, we can conclude that from 1993 to 2008 year these lines are approximately in the same position but with a small deviations, while from 2008 to 2010 they cross down. This situation is as a results of the impact of World financial crisis, but From 2010 year the position of these indicators was changed zigzag till 2013 year. After that these lines declining (left axis of Chart 2) but with a significant difference between GCF and GFCF (right axis, Chart 2).

Chart 2.Tendency of GCF, GFCF and GCF-GFCF line, 1993-2017



According to research aims, in the table below we will calculate the ICOR value and its correlation with growth rate.

Table 4. ICOR calculation, correlation between ICOR and growth rate (Macedonia VS Albania), 1993-2017

Year	GDP-M (n.a.g. %)	GCF-M (bil.\$)	GDP-M (bil.\$)	COR-M	Best value of ICOR	COR-A	GDP-A (bil.\$)	CF-A (bil.\$)	COR-A	GDP-A (n.a.g. %)
1993	-	407.86						62.11		-
1994	2.59	22.93	74.13	.47	COR-A	.23	95.64	55.44		8.30
1995	1.59	23.60	123.50	.47	COR-M	.69	11.81	09.14		13.30
1996	0.61	88.33	28.63	32.27	COR-A	.63	06.88	01.24		9.10
1997	15.53	83.42	722.48	1.23		0.75	941.13	83.57		10.92
1998	4.40	95.02	172.77	4.53	COR-A	.68	87.45	69.13		8.83
1999	.86	23.57	07.53	.39	COR-A	.85	66.16	84.93		12.89
2000	2.35	25.49	90.89	7.96	COR-A	.93	68.23	,152.60		6.95
2001	1.68	43.80	63.21	13.06	COR-A	.61	41.75	,557.71		8.29
2002	.32	37.02	08.73	.09	COR-M	.66	25.97	,680.99		4.54
2003	3.09	86.82	27.93	.90	COR-M	.33	,263.43	,325.95		5.53
2004	4.89	,195.96	36.43	.20	COR-M	.48	,573.19	,721.11		5.51
2005	0.13	,242.05	75.88	.08	COR-M	.14	67.39	,017.45		5.53
										5.93

006	.63	,468.84	02.62	.06	COR-M	.58	44.00	,505.30	0
007	1.50	,976.76	,475.26	.00	COR-M	.97	,781.25	,136.53	8
008	8.87	,768.00	,573.07	.26	COR-M	.88	,204.03	,608.75	0
009	5.12	,420.24	507.82	5.45		5.51	837.15	,162.22	5
010	.06	,301.78	.44	45.13	COR-M	35.50	117.25	,614.90	1
011	1.56	,824.41	,087.46	.12	COR-M	.75	63.91	,049.48	5
012	7.14	,819.03	749.38	3.77		7.09	571.08	,490.02	2
013	1.00	,116.35	,072.46	.63	COR-M	.65	56.50	,584.07	0
014	.03	,442.23	44.56	.72	COR-M	.93	51.97	,396.31	7
015	11.42	,066.69	1,297.76	2.65		1.84	1,841.32	,939.99	2
016	.04	,469.59	07.96	.04	COR-M	.92	96.75	,051.40	5
017	.69	,719.93	07.04	.72	COR-A	.64	,154.86	,245.00	4
	ICOR-M			3	>	7	ICOR-A		
	Correlation			0.087	>	0	Correlation		

Source: World Development Indicators, WB, 2019, author's calculation.

Based on research findings presented in the Table 4, on one hand we can say that some of the ICOR value on the both countries are negative, therefore ICOR values of these years aren't significant, and on another hand some ICOR values are surprisingly low (see Table 4, Chart 3-4).

Chart 3.Trend of ICOR and GDP growth-nominal (%), Republic of North Macedonia (1994-2017)

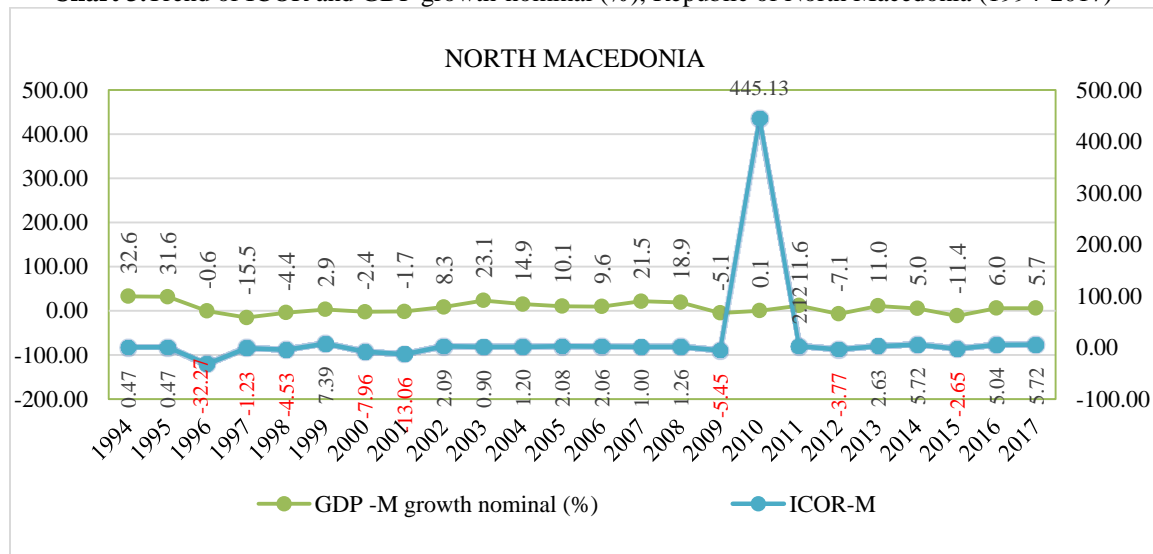
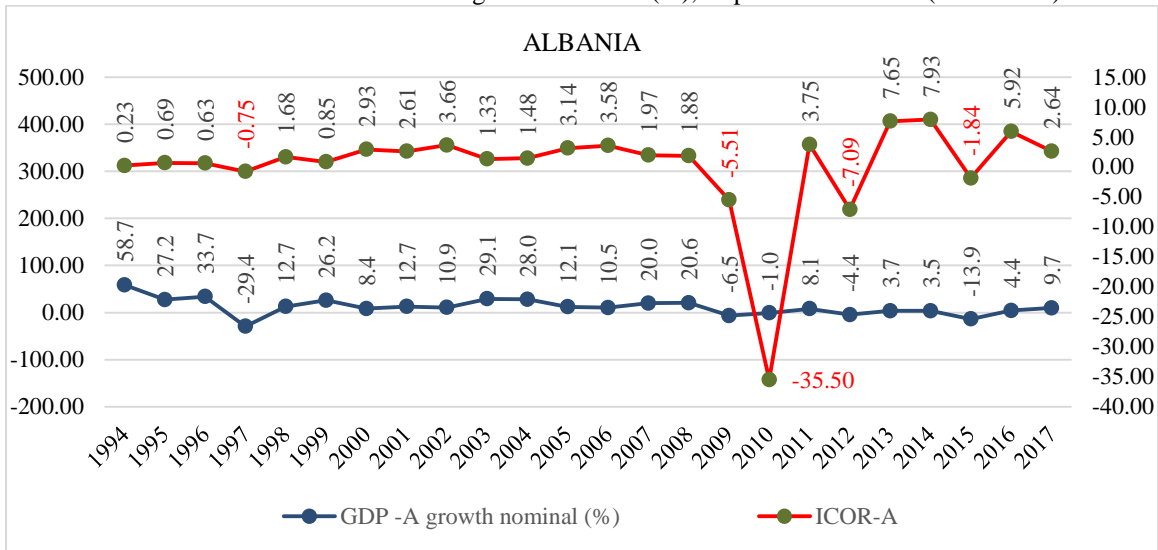


Chart 4.Trend of ICOR and GDP growth-nominal (%), Republic of Albania (1994-2017)



4. CONCLUSIONS

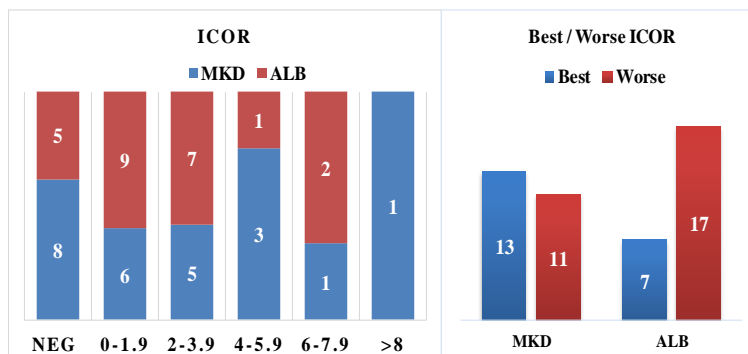
According to research estimation related ICOR value in both countries we can come to the following conclusions:

- Both countries have ICOR low in a lot of years, similar to developed countries, but not characteristic for the countries analyzed in this research. (see Chart 5).
- Values of ICOR into the interval 0-1,99 are encountered in a 6 years in MKD, and in 9 years in ALB ore 25% and 37,5% respectively.
- Values of ICOR into the interval 2-3,99 are encountered in a 5 years in MKD, and in 7 years in ALB ore 20.8% and 29,3% respectively.
- Value of ICOR more than 4 are encountered in a 5 years in MKD, and in 3 years in ALB ore 20.8% and 12,5% respectively.
- Both countries have e negative ICOR, Macedonia has had in the 8 years from 24 years or 33.3% of the analyzing period, Albania has had in the 5 years from 24 years or 20.8% of the analyzing period. These value are not significant enough to be further addressed.
- The correlation between ICOR and GDP growth nominal (%) in Republic of North Macedonia is very low and negative (-0.087). This will be interpreted whenever the ICORE decreases then GDP nominal (a.g.%) increases and vice versa, but with poor relationship (Would not the comment!).
- The correlation between ICOR and GDP growth nominal (%) in Republic of Albania is also very low but positive (0.198). The obtained result is outside the rule of ICOR (Would not the comment!).

If we would like to make a comparison related efficiency of investment between the national economies of North Macedonia and Albania for the same periods, then we will emphasize as follows (see Chart 5):

- Republic of North Macedonia has a 13 Best ICOR value versus 12 worse values.
- Republic of Albania has a 7 Best ICOR value versus 12 worse values.

Chart 5.ICOR evaluation, Republic of North Macedonia and Albania (1994-2017)



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