Research Article

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Analysis of the Albanian Economy through the IS-LM Model

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Abstract

The objective of the study is the analysis of IS-LM curves. The aim is to prove that the current theoretical models of IS-LM are not applicable in the Albanian economy. In this paper, the theoretical IS-LM model is analyzed according to the balance of I = S (investment - savings), and AE = Y (aggregate expenditure - gross domestic product). The models I + G = S + T and NX = NFI are not analyzed in this study. Two representative models were obtained, by the authors Hicks - Hansen and Dornbusch - Fischer - Startz. The theoretical and practical aspects of the application of the models are analyzed. The defect of the Dornbusch-Fischer-Startz model and the impossibility of applying it to the data of the Albanian economy is evident. The authors have proposed an improvement of the Hicks-Hansen model for the IS curve because the theoretical model is not applicable. They have replaced the half where Investment equals Savings with a reflection curve of the opportunity cost. This has made the model effective. In the analysis, two of the features of the Albanian economy were taken into consideration: the structure of the currency market where half of it is covered by foreign currency (euro and dollar), and the informal economy that affects the exchange rates and the effectiveness of the policies of the Bank of Albania. In the material, it is found that the transmission effect of the monetary policies implemented by the Bank of Albania is missing. There are weak connections between the rate of REPOs, monetary aggregates and some of the macroeconomic indicators. The rate of inflation and the rate of REPOs are strongly related to the first direction. Recommended; to apply the IS model according to the proposal made by the authors, to realize the de-euroization of the market, to change the objective of the Central Bank, putting as the main objective the preservation of the exchange rate of All in function of economic growth and financial stability. In the analysis, the method of comparison, description, analytical methods and statistical methods are used. Used Data is from INSTAT and the Central Bank of Albania.

Keywords: *GDP, Repos, Inflation, Economic Growth, Deposits, Loans, Euroization, IS-LM Model of Dornbusch-Fischer-Startz and Hicks-Hansen, etc*

1. Introduction

This study intends to apply the IS-LM theoretical models, according to Dornbusch - Fischer - Startz and Hicks - Hansen. Both models were analyzed theoretically, the respective figures were created and their analysis was made, to see the connection between the models and the possibility of their implementation in practice. In this study, it will not be applied to the equilibrium models I + G = S + T and NFI = NX (Mankiw G. 2000).

The six weaknesses of the Dornbusch - Fischer - Startz model for the IS curve are derived, starting from its theoretical model. The reasons why it becomes impossible to implement in the Albanian economy are given.

With the data of the Albanian economy, the model cannot be created, in this way we cannot draw any conclusions in the service of the monetary policies of the Bank of Albania. The authors have not found any studies in other countries of the region, Europe and the world where the IS-LM model according to Dornbusch - Fischer - Startz has been applied. There are only theoretical models. If there were applied models in literature, then they would have become the object of study. No changes are intended to be made to the Keynesian Cross model from which the IS curve is derived. The weaknesses of the Keynesian Cross itself are also given.

Several economic indicators have been analyzed where the dependence between macroeconomic indicators and monetary aggregates is determined. The policy of the Bank of Albania and the unexpected effects of this policy have been analyzed. The reasons for the lack of effectiveness of the policies, in the special conditions of the Albanian economy, have been analyzed.

The IS theoretical model according to Hicks – Hansen is analyzed. This model is based on the placement of an angle bisector that balances investments with savings. It is based on positive correlations between GDP and savings and negative correlations between interest rates and investment. The model is not built with the data of the Albanian economy.

Under these conditions, the authors have made a change in the IS model by replacing the quadrant where through the angle bisector the balance between Investments and Savings is created. Instead of the angle bisector, it is placed on a reflection curve, the opportunity cost curve, or the Marginal Rate of Substitution curve, $\Delta S/\Delta I$. With this change the model works.

In this paper, the analysis of the dynamics of deposits and loans for the years 2010-2019 has been carried out. The years 2020 and 2021 were not taken because the first was the year with the negative impacts of covid-19 and the second because the GDP data was not released. The relationship with other monetary aggregates and some of the main macroeconomic indicators has been analyzed. In the analysis, only the data of the Albanian economy were taken into consideration. This analysis is done in the prism of the effectiveness of the monetary policies designed and implemented by the Bank of Albania (or the Central Bank).

BoA in the years under analysis has applied an aggressive monetary expansionist policy. It has reduced the REPO Interest rate from 5% in 2010 to 1% in 2019, 0.5% in 2020 and 1% in 2022. The material presents data showing how this policy has affected macroeconomic indicators and monetary aggregates. The aim of BoA has been to maintain the stability of the price level by maintaining an inflation rate of 3%+-1%, to influence the growth of the economy and financial stability. In the material, it has been proven that the Central Bank, with its expansionist policies, did not affect the inflation rate at all. It had little or no effect on the growth of the GDP level, because the monetary policy applied by it did not have the effect of transmission. It has had a slight impact on the increase in loans in All (lek = the name of Albanian money), because commercial banks have reduced the interest rates of deposits and very little those of loans in lek.

Statistical and econometric methods, analytical and comparison methods were used in the paper to reach the relevant conclusions and make them reliable. At the end, the authors have provided conclusions and made relevant recommendations. In the paper, the authors have also proposed an improvement of the existing IS-LM model. In the IS model, the angle bisector should not be used to create balance, instead the reflection curve or the opportunity cost curve between deposits

and loans should be used. This improvement will make it applicable in developing economies such as the Albanian economy.

2. An Overview of the Albanian Economy

The Albanian economy continues to be an economy in transition, although for over 30 years it has been trying to get on the tracks of the market economy. It relies mainly on the service sector, agriculture, construction and trade. A small part of the income is provided by the mineral extraction and processing sector. More than 1 million tons of oil is extracted. It is all exported since there are no processing factories in Albania. If there were fuel processing factories, Albania would not have a fuel price crisis. In Albania, the oil processing factories in Ballsh operated until a few years ago, which processed all the crude oil produced in the country. The Albanian government, contrary to the will of the employees of the factory, destroyed it and enrolled its employees in Employee Assistance Programs.

The service sector, especially "tourism" is seen as a priority sector. Billions of euros have been invested in this sector, it is the sector that has 6% VAT from the 20% that other sectors' products have.

The Albanian economy is a consumer economy that relies on imports, that has priority activity tourism which produces non-tradable goods. In this way, we can say that an economy like the Albanian economy, with rich oil and mineral resources, that relies on tourism cannot be a sustainable economy. This was proven during the years 2019, 2020, 2021 and 2022, which coincide with the earthquake that hit Albania, the Covid-19 pandemic and the war in Ukraine. The economy of non-tradable goods was the hardest hit, as such the Albanian economy was also hit. In 2020, real GDP decreased by 3.5%. This shows that it is completely dependent on external political, social and economic conditions. It is an unstable economy, not stabilized and very sensitive to internal and external political changes. Any negative phenomenon that occurs outside of Albania, such as wars, pandemics, earthquakes, etc., is immediately reflected in the Albanian economy.

Table 1: The dynamics of some macroeconomic indicators and monetary aggregates

	M3	M2	M1	Monetary Base	Money outside bank	Total time deposits ALL + foreign currency (million All)
2010	980,283.90	604,500.00	276,898.10	283,453.50	195,059.00	617,384.80
2011	1,070,149.60	647,000.00	281,246.50	289,809.50	194,923.20	706,498.40
2012	1,123,407.80	669,577.10	281,246.60	297,721.90	192,705.10	752,954.70
2013	1,148,980.90	693,172.20	295,876.50	308,073.70	198,892.70	743,476.80
2014	1,195,086.30	722,356.70	353,321.70	332,899.30	217,665.60	693,907.70
2015	1,216,175.30	722,954.10	384,106.90	383,972.80	230,601.50	638,150.10
2016	1,263,453.80	736,944.10	435,432.30	414,380.90	249,415.10	577,900.90
2017	1,266,906.90	738,900.00	461,550.10	377,074.80	275,281.40	537,943.70
2018	1,264,127.40	731,502.10	478,721.50	423,427.90	275,285.30	496,173.20
2019	1,318,662.00	758,021.70	523,968.30	433,951.20	291,409.00	470,035.00

Source: Bank of Albania

Table 2: The dynamics of some macroeconomic indicators and monetary aggregates

	Total loans (mill. All)	Average Inflation	Weekly repurchase agreement	Nominal GDP	Average Exchange Rates All/Euro	Unemployment
2010	483,129.70	3.56	5	1,222,631.00	137.79	14.2
2011	541,899.80	3.45	4.75	1,319,836.00	140.33	14.3
2012	554,732.10	2.04	4	1,332,747.00	139.04	13.9

	Total loans (mill. All)	Average Inflation	Weekly repurchase agreement	Nominal GDP	Average Exchange Rates All/Euro	Unemployment
2013	547,927.60	1.94	3	1,350,053.00	140.26	16.1
2014	559,986.90	1.63	2.25	1,395,305.00	139.97	16.2
2015	546,793.90	1.89	1.75	1,427,799.00	139.74	15.5
2016	547,602.50	1.28	1.25	1,472,791.00	137.36	15.6
2017	550,280.40	1.8	1.25	1,531,702.64	134.15	14.1
2018	532,818.60	1.8	1	1,636,731.30	127.59	12.8
2019	570,792.20	1.15	1	1,691,728.90	123.01	12
19/'10%	18.1	-67.7	-80.0	38.4	-10.7	-15.5

Source: Bank of Albania

In managing the economy, the government mainly relies on governance through PPPs and concessions. This has led to a disconnection from the economic reality of the country.

Below, we will analyze some main macroeconomic indicators and monetary aggregates to see the effectiveness of the policies of the government and the Central Bank of Albania.

- GDP has been increasing, the annual average in 2010, 2019 was 2.61%. Nominal GDP increased by an average of 3.84%. The sectors that have seen growth have been the construction, trade and agriculture sectors.
- Aggregates M1, M2, M3, Monetary Base and Money outside the bank have been increasing. The highest growth in the years 2010, 2019 was the M1 aggregate with 81%, which includes money outside the bank, current accounts, demand deposits and traveler's checks. Aggregate M1 and the items that make it up show that the money outside the bank and the money ready to be used as cash, outside the bank, have increased tremendously. It is an indicator that reflects the growth of the informal economy.
- Term deposits in Lek and foreign currency decreased by 23.9%. This indicator is opposite to the indicators of demand deposits and current accounts.
- Total loans have increased at low rates. For the years 2010, 2019, the average has increased by 1.8% per year or by 18.1% in total.
- The average inflation rate and the rate of REPOs have been in continuous decline, inflation decreased by 67.7% (2010-2019) and the rate of REPOs decreased by 80% (2010-2019). The decrease in the inflation rate indicates the lack of effectiveness of the monetary policies of the Central Bank. The decrease in the REPO rate should have been accompanied by an increase in the inflation rate and not a decrease in it. The Central Bank cannot control the rate of inflation. Inflation in the Albanian economy is mainly imported. This was also shown in 2022, where in June it reached the figure of 7.4%.
- The exchange rate of the lek with the euro has strengthened. The Central Bank is interested in protecting All and not devaluing it. The protection of All has negatively affected the Albanian economy because it has increased imports and decreased exports. The difference between exports and imports has deepened, or the deficit in the Trade Balance has deepened.
- The unemployment rate has been decreasing. This indicator is not real since over 220,000 people have left Albania in the last 5 years (INSTAT).
- The above analysis is also supported by Table No. 2 in which the correlation coefficients between the analyzed indicators are given.

Table 3: Correlation between the indicators given in Table No. 1

	M3	*M2*	*M1*	*Monetary base*	Currency outside depository corporations	*Total time deposits ALL + foreign currency (million All)*	*Total loans (mill. All)*	*Annual average inflation*	*Weekly repurchase agreement*	*Nominal GDP*	*Echange rate All/Euro*	*Employment*
M3	1											
M2	0.989	1										
M1	0.908	0.860	1									
Monetary base	0.913	0.871	0.960	1								
Currency outside depository corporations	0.876	0.822	0.993	0.928	1							
Total time deposits ALL	-0.636	-0.557	-0.900	-0.831	-0.919	1						
Total loans (mill. All)	0.706	0.738	0.412	0.411	0.368	-0.008	1					
Annual average inflation	-0.907	-0.925	-0.718	-0.761	-0.663	0.386	-0.741	1				
Weekly repurchase agre	-0.969	-0.967	-0.915	-0.934	-0.884	0.688	-0.544	0.877	1			
Nominal GDP	0.915	0.863	0.960	0.921	0.954	-0.817	0.527	-0.730	-0.881	1		
Echange rate All/Euro	-0.619	-0.530	-0.823	-0.733	-0.843	0.868	-0.201	0.436	0.590	-0.867	1	
Employment	-0.232	-0.108	-0.485	-0.370	-0.536	0.644	0.006	0.015	0.151	-0.566	0.839	1

Source: Authors

- Money outside the bank and the monetary base are strongly related to aggregate M1, but are negatively related to term deposits All+currency (-0.919 and -0.831)
- The rate of inflation, excluding term deposits, has a negative relationship with all other indicators. The opposite should have happened, the growth of monetary aggregates M1, M2 and M3 should have been accompanied by an increase in the inflation rate and not a decrease in it.
- The rate of REPOs: The correlation with inflation is +0.877, this shows that monetary expansionist policies have not had any effect on increasing the rate of inflation, on the contrary, they have had the opposite effect. The correlation with monetary aggregates is negative and strong with -0.969 for M3 and -0.967 for M2.
- Nominal GDP has a strong relationship with the aggregate M1 (+0.960), with the Monetary Base (+0.921) with Money Outside the Bank (+0.954). There is a negative relationship with time deposits, with the rate of REPOs and with the rate of inflation.

In the economy that we described above, we will try to build the IS curve model as part of the IS-LM model of authors Hicks-Hansen and Dornbusch-Fischer-Startz.

3. S-LM Theoretical Models of Dornbusch-Fischer-Startz. Considerations on Models

3.1 IS - LM model of Dornbusch-Fischer-Startz. The application in the Albanian economy and the authors' considerations

The IS-LM model has been built by many authors (De Gregorio J. 2012), (Mankiw G. 2000), (Hall R &

Taylor B. 1988), (Lipsey G. 1989), (Crouch R. 1972), etc., but the model designed by Dornbusch-Fischer-Startz will be taken into consideration (Dornbusch R and Co. 2011). It is based on the simple Keynesian Model of expenditure, which is often called the "Keynesian Cross" diagram. This model was also built by other authors (Samuelson A, Nordhaus D. 1985), (Scacciati F. 2002), (Spenser H. 1990), etc. Fiscal and monetary policy elements are added to this model. The effects of the fiscal policy are related to the tax coefficient as well as to the changes in the autonomous expenditure elements. Monetary policy is related to the inclusion of the nominal interest rate as well as the investment sensitivity coefficient in relation to this rate.

In the Keynesian model Fig. No. 1(A), real GDP is placed on the X-axis and AE (nominal aggregate expenditures) is placed on the Y-axis. The AE1 curve is drawn. It starts on the Y-axis, at the size of the total autonomous aggregate expenditure (Ā) and its slope is the size of the MPC (Marginal Propensity to Consume). Equilibrium in this model is where this curve intersects the angle bisector. AE1 cuts the angle bisector at point E1. From this point, we drop a perpendicular and take the size of Y1 (real GDP) on the X-axis. In the model, it is assumed that the interest rate will decrease to i2. Lowering the interest rate will increase investments by ΔI. This will result in the shift of the curve AE1(i1) to AE2(i2). The new curve will cut the angle bisector at point E2. From this point, we drop a perpendicular on the X-axis and get Y2 (real GDP2). The level of GDP increases by multiplying the autonomous investments (ΔI) by the Expenditure Multiplier (M).

Based on this model, the new IS (investment-savings) - LM (liquidity money) model is built. In the model of Fig.No. 1(B), the real GDP is placed on the X-axis and the interest rate (i) is placed on the Y-axis. Y1 is created as the size of Y1 of Fig. No. 1(A) This size of GDP is related to a certain interest rate i1. Based on them, we create the intersection point E1, which is the equilibrium point.

The actions taken in Fig.1(A) are reflected in Fig.1(B). Following the same steps, we also create the second intersection point E2. The points with the coordinates (i1,Y1) and (i2,Y2) are joined and the IS curve is created. Finally, we build model No. 1 with part (A) and (B):

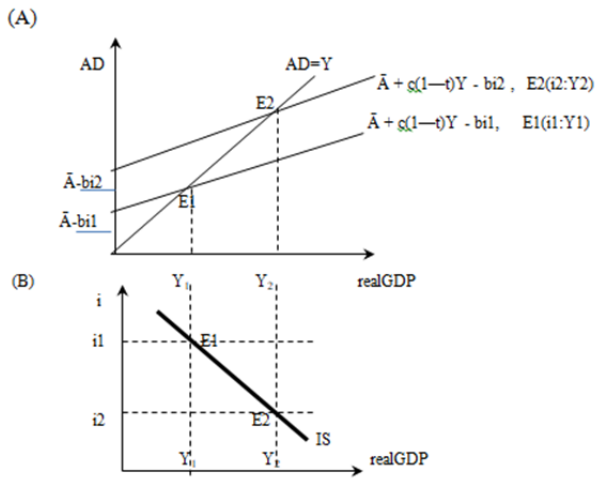

Figure 1: IS-LM model according to Dornbusch - Fischer

AE is the aggregate expenditure. $AE = \underline{C} + MPC * YD + \underline{G} + \underline{I},\ Y = \frac{1}{1-MPC} * \underline{A}$. This is the simple Keynesian model of expenditure. Including fiscal and monetary policy the model takes the following form. $AE = \underline{C} + MPC * (Y - TA + TR) + \underline{G} + (\underline{I} - bi),\ AE = \underline{A}(\underline{C} + MPC * TR + \underline{G} + \underline{I}) + cY - ctY - bi,\ AE = \underline{A} + cY - ctY - bi,$

$Y - cY + ctY = \underline{A} - bi$, Y(1-c+ct) = $\underline{A} - bi$, Y(1-c(1-t)= $\underline{A} - bi$

$Y = \left(\frac{1}{1-c(1-t)}\right)\underline{A} - bi, ag = \frac{1}{1-c(1-t)}, Y = ag\underline{A} - agbi,\ i = \frac{\underline{A}}{b} - \frac{1}{agb}Y$

(Dornbusch R- Fischer S. -Startz R. 2011)

Abbreviation and Explanation. IS-LM = Investments Saving- Liquidity Money. SKM= Simple Keynesian Model. GDP= Gross Domestic Product. Y=Real GDP. AE= Aggregate Expenditures. MPC= Marginal Propensity to Consumption. GNI= Gross National Income. NNI= Net National Income. GVA= Gross Value Added. YD= Disposable income. TA=Taxes. $\underline{A}$= total autonomous costs. $\bar{I}$=autonomous investments. $\hat{G}$= autonomous government expenditures. $\hat{C}$= autonomous consumption. TR= payment transfers. Ag= tax multiplier. i= Nominal interest rate. b= The investment sensitivity coefficient by the interest rate. C= MPC= Marginal Propensity to Consume. t= Tax rate. NTP= Net Taxes on Products. C= Final Consumption. I= Investment. D= Deposits. ALL(Albanian lek). REPO= Repurchase agreements. BIR= Base Interest Rate. Base Interest Rate. M1, M2 and M3 = Monetary Aggregates. CPI= Consumer Price Index. ECB= European Central Bank. FDI= Foreign Direct Investment.

The formulas used in the model show the factors that affect Y. It is affected by the multiplier at the foundation of which is the marginal propensity to consume. The more it increases and the less savings increase, the larger will be the multiplier and the more will increaseY . It is affected by autonomous spending, the coefficient of sensitivity for investments to the interest rate and the interest rate itself. The latter throws down the model because in the model it is assumed that investments are autonomous, not related to GDP and the interest rate.

To argue the conclusions, the authors also provide Tables with the corresponding indicators.

Table 4: Dynamics of national account indicators (Mill ALL)

	Gross domestic product at current prices	Employee net salaries	Net property income	Gross National Income	Net taxes on products	Net National Income	Final consumption	Consumption - Net national income
	1	2	3	1+2+3=4	5	(4-5)6	7	8(7-6)
2010	1,239,644.58	22,494.70	-34,879.08	1,227,260.20	162,160.04	1,065,100.16	1,106,590.15	41,489.99
2011	1,300,624.08	18,020.69	-17,683.84	1,300,960.94	169,503.28	1,131,457.66	1,161,113.86	29,656.20
2012	1,332,810.99	12,441.49	-22,369.00	1,322,883.48	178,064.43	1,144,819.05	1,183,692.06	38,873.01
2013	1,350,052.64	21,632.36	1,648.92	1,373,333.91	172,354.22	1,200,979.69	1,229,288.97	28,309.28
2014	1,395,304.63	30,723.01	-17,930.86	1,408,096.79	177,461.46	1,230,635.33	1,287,018.49	56,383.16
2015	1,434,306.51	34,189.68	-17,189.62	1,451,306.57	174,580.44	1,276,726.13	1,316,771.21	40,045.08
2016	1,472,479.13	35,750.84	-11,837.01	1,496,392.96	181,275.92	1,315,117.04	1,358,072.93	42,955.89
2017	1,550,645.49	35,227.62	-31,441.76	1,554,431.35	196,155.25	1,358,276.10	1,412,737.72	54,461.62
2018	1,636,731.32	36,198.08	-38,189.64	1,634,739.77	205,173.41	1,429,566.36	1,479,509.98	49,943.62
2019	1,691,728.89	36,781.93	-58,925.72	1,669,585.10	212,904.25	1,456,680.85	1,543,610.52	86,929.67

Source: Bank of Albania 2010-2020, INSTAT

In this table, the first seven indicators have increased. GDP, Gross and Net National Income as well as net Taxes on products with current prices have increased. Final consumption is distinguished, which is higher than Net National Income. This indicator and other indicators such as money outside the bank, demand deposits and current accounts indicate the existence of high numbers of the informal economy as part of the non-observed economy. It is this reason that has brought in several years a Marginal Propensity to Consume higher than 1, as shown in Table No. 4.

Table 5: Calculated Indicators

	Net National Income	Final Consumption	ΔTR	ΔC	MPC	M
2007	868,244.55	890,645.06	868,244.55	890,645.06	1.03	-38.76
2008	942,372.29	1,010,136.93	74,127.74	119,491.87	1.61	-1.63
2009	971,610.49	1,051,607.10	29,238.20	41,470.17	1.42	-2.39
2010	1,065,100.16	1,106,590.15	93,489.67	54,983.05	0.59	2.43
2011	1,131,457.66	1,161,113.86	66,357.50	54,523.71	0.82	5.61
2012	1,144,819.05	1,183,692.06	13,361.39	22,578.20	1.69	-1.45
2013	1,200,979.69	1,229,288.97	56,160.64	45,596.91	0.81	5.32
2014	1,230,635.33	1,287,018.49	29,655.64	57,729.52	1.95	-1.06
2015	1,276,726.13	1,316,771.21	46,090.80	29,752.72	0.65	2.82
2016	1,315,117.04	1,358,072.93	38,390.91	41,301.72	1.08	-13.19
2017	1,358,276.10	1,412,737.72	43,159.06	54,664.79	1.27	-3.75
2018	1,429,566.36	1,479,509.98	71,290.26	66,772.26	0.94	15.78
2019	1,456,680.85	1,543,610.52	27,114.49	64,100.54	2.36	-0.73

Source: Author's own calculations

The data in Table No. 4 have been taken since 2007, because it was the time when the cultivation of cannabis had begun to expand throughout Albania. From 2007 to 2019, during 8 years, the MPC has been greater than 1, as well as final consumption greater than net national income. In the Keynesian model, YD (disposable income) is taken.

3.1.1 The Dornbusch Fischer Startz model has a number of weaknesses which make it of little applicability

First, it doesn't take savings into account. To remove savings is to remove "one arm" of the Hicks-Hansen model. According to the authors of the paper, the economy does not grow without an increase in savings and as a consequence an increase of investments. Investment growth, internal accumulation is the main factor that grows the economy, loans are an auxiliary factor. Internal accumulation is ignored in the model.

Second, equilibrium is considered when Y = GDP = AE, aggregate income equals aggregate expenditure. In an open economy we rarely have such an equilibrium because we have no match between them. This is due to the existence of the foreign sector. Only in closed economies can exist a match between Y and AE. It is different to express GDP in terms of expenses and income, which are equal, and it is different to express aggregate demand and supply.

Third, autonomous investments stay on the basis of the investment model. Autonomous investments do not depend on income and interest rate. In the model there is no autonomous investment. It is Investment when the interest rate is zero, because in an investment model it is the intersection of the investment curve with the I-axis. The formula is $I = \bar{I} - bi$. Autonomous means that they do not depend on the interest rate and income. In the model built by Dornbusch Fischer, the investment curve is shifted by the interest rate change, so it is not an autonomous investment. The autonomous item includes loans and debts used for investments.

Fourth, nominal GDP should be placed on the X-axis in order to see the reactions from the application of monetary and fiscal policies.

Fifth, in the Keynesian model, expenditures (AE) are nominal while GDP is real. Both must be measured in the same unit of measure.

3.1.2 Other reasons that make the model inapplicable

a. ***Marginal Propensity to Consume (MPC) in some years has been greater than 1.*** With MPC greater than 1, the model fails because the angle bisector that represents income is not intersected. This shows that was spent more than the disposable income (Table No. 4). Consumption has been greater than Net National Income (Table No. 3).
b. ***Since 2014, time deposits in Lek and time deposits in currency have been decreasing.***

Table 6: Dynamics of time deposits in All and in currency, demand deposits and current accounts

	Deposits in Lek (milion All)				Deposits in currency, (milion All)		
	Total Deposits	Current accounts and demand deposits	Money outside the bank	Time Deposits	Total Deposits	Current accounts and demand deposit	Time Deposits
2010	409,458.40	80,368.40	195,059.00	329,090.00	375,766.60	87,471.80	288,294.80
2011	452,080.10	81,974.90	194,923.20	370,105.20	423,146.20	86,753.00	336,393.20
2012	476,872.00	88,541.50	192,705.10	388,330.50	453,830.80	89,206.60	364,624.20
2013	494,279.50	96,983.90	198,892.70	397,295.60	455,808.80	109,627.60	346,181.20
2014	504,691.10	135,656.10	217,665.60	369,035.00	472,729.60	147,856.90	324,872.70
2015	493,397.90	153,505.40	230,601.50	339,892.50	494,125.50	193,918.40	300,207.10
2016	487,535.30	186,023.60	249,415.10	301,511.70	526,512.20	250,122.00	276,389.20
2017	473,663.80	196,313.90	275,281.40	277,349.90	528,006.90	267,413.00	260,593.80
2018	456,216.80	203,436.20	275,285.30	252,780.60	532,625.30	289,232.70	243,392.60
2019	466,612.60	232,559.30	291,409.00	234,053.40	560,640.30	324,658.70	235,981.60
19/'10	13.96	189.37	49.40	-28.88	49.20	271.16	-18.15

Source: INSTAT

In these 10 years, total deposits have increased by about 14%. Lek term deposits have decreased, foreign currency term deposits have decreased at lower rates, as a result, foreign currency deposits have exceeded 50% of total term deposits.

Table 7: The dynamics of the indicators of Table No. 5 in percentage

Year	Total Deposits, million All	% of increase in total deposits	% of the growth of current account and demand deposits in total	% increase in time deposits / total deposits	% of the increase in money outside the bank	% of time deposits (All) / total deposits in All	% of time deposits in currency / total deposits in foreign currency	Deposits in All/ total deposits in %	Deposits in foreign currency/ total deposits in %	Current account and time deposits in total/total deposits
2010	785,225.00					80.4	76.7	52.1	47.9	21.4
2011	875,226.30	11.5	0.53	14.4	-0.07	81.9	79.5	51.7	48.3	19.3
2012	930,702.80	6.3	5.35	6.6	-1.1	81.4	80.3	51.2	48.8	19.1
2013	950,088.30	2.1	16.24	-1.3	3.21	80.4	75.9	52.0	48.0	21.7
2014	977,420.70	2.9	37.22	-6.7	9.44	73.1	68.7	51.6	48.4	29.0
2015	987,523.40	1.0	22.54	-7.8	5.94	68.9	60.8	50.0	50.0	35.2
2016	1,014,047.50	2.7	25.54	-9.7	8.16	61.8	52.5	48.1	51.9	43.0
2017	1,001,670.70	-1.2	6.32	-6.9	10.3	58.6	49.4	47.3	52.7	46.3
2018	988,842.10	-1.3	6.24	-7.8	0.00	55.4	45.7	46.1	53.9	49.8
2019	1,027,252.90	3.9	13.10	-5.3	5.86	50.2	42.1	45.4	54.6	54.2

Source: Authors' own calculations

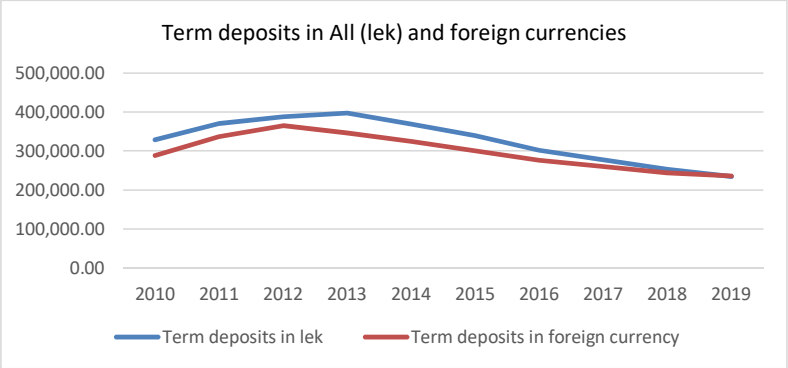

Figure 2: Term deposits in All(lek) and foreign currencies
Source: Authors

- Time deposits in Lek in relation to total deposits in Lek have decreased. From the 80.4% that they occupied in 2010, in 2019 they occupied only 50.2%, the rest are demand deposits and current accounts.
- Time deposits in foreign currency in relation to total deposits in foreign currency have decreased. From the 76.7% that they occupied in 2010, in 2019 they occupied only 42.1%, the rest are demand deposits and current accounts.
- Time deposits in Lek in relation to total deposits (All + currency) have decreased. In 2010 they occupied 52.1% while in 2019 they occupied 45.4%. In this way, deposits in All account for less than 50% of total deposits. Time deposits in currency account for most of the deposits, making it possible to reduce the effect of the monetary policies of the Bank of Albania.
- Time deposits in currency in relation to total deposits account for more than 54.6% in 2019. This shows that commercial banks have more autonomy in the use of currency in relation to the use of All.

Conclusion: the above indicators of deposits show that, in general, time deposits have little influence on the growth of GDP, or GDP has not influenced the growth of time deposits at all. In this way, we have a negative relationship between these two indicators and not a positive relationship, as assumed in the Hicks-Hansen model. Other indicators, formal and informal, have influenced GDP growth.

c. From 2010 to 2019, total loans have been unstable.

In order to do this analysis, a table with two indicators was built, total time deposits and total loans compared to GDP growth.

Table 8: Dynamics of GDP, total time deposits in All + currency and loans

	Nominal GDP (million All)	Total time deposits ALL + foreign currency (million All)	Total loans (million All)
2010	1,222,631.00	617,384.80	483,129.70
2011	1,319,836.00	706,498.40	541,899.80
2012	1,332,747.00	752,954.70	554,732.10
2013	1,350,053.00	743,476.80	547,927.60
2014	1,395,305.00	693,907.70	559,986.90
2015	1,427,799.00	638,150.10	546,793.90
2016	1,472,791.00	577,900.90	547,602.50
2017	1,531,702.64	537,943.70	550,280.40

	Nominal GDP (million All)	Total time deposits ALL + foreign currency (million All)	Total loans (million All)
2018	1,636,731.30	496,173.20	532,818.60
2019	1,691,728.90	470,035.00	570,792.20
19/'10	38.4	-23.9	18.1

Source: Bank of Albania (2010-2019)

Table 9: Correlation coefficients between nominal GDP, total loans and Total time deposits ALL + foreign currency (million All)

	Nominal GDP (million All)	Total time deposits ALL + foreign currency (million All)	Total loans (mill. All)
Nominal GDP,million All	1		
Total time deposits ALL + foreign currency (million All)	-0.817	1	
Total loans (mill. All)	0.527	-0.008	1

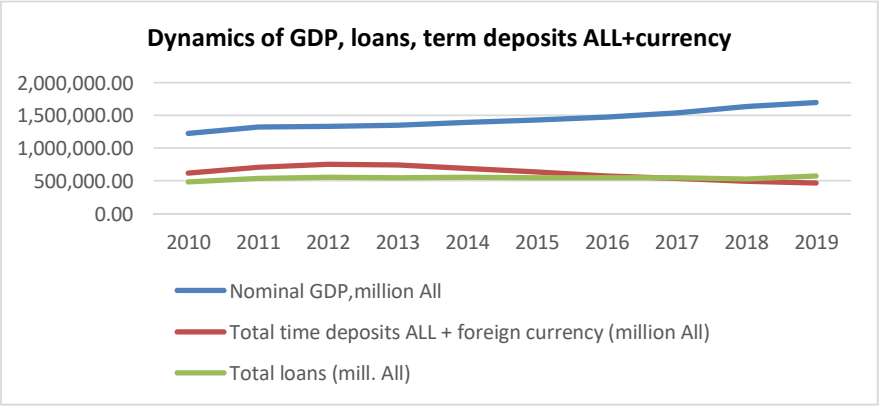

Figure 3: Dynamics of GDP, loans, term deposits ALL+currency
Source: Authors

From the data of Tables No. 7-8 and Fig. No. 3 we draw the following conclusions:

- GDP has increased by an average of 3.8%, a normal figure for a country with an economy in transition that has even greater growth opportunities.
- Total deposits in Lek and time deposits in currency have decreased. From 2010 to 2019, they decreased by about 24%. Total loans have been unstable, they have increased only 18.1%. Time deposits and the amount of loans have been equal between 2017 and 2018.
- Time deposits in Lek and time deposits in foreign currency have a relationship that can be taken into account, but with the opposite sign -0.817. This shows that the increase in GDP has been accompanied by a decrease in time deposits. The strength of the connection with loans is negligible, only 0.527. Total loans and total deposits are almost completely unrelated.

Conclusion: the dynamics of deposits and loans do not justify the level of economic growth, even less when about 25% of loans are overdrafts.

d. Money outside the bank, current accounts and demand deposits have almost tripled.

Table 10: Dynamics of current account + demand deposits in All and foreign currency, dynamics of money outside the bank

	Current accounts and open deposits, in millions of All	Money outside the bank in millions of All	Current accounts and open deposits, (currency) in millions of All
2010	80,368.40	195,059.00	87,471.80
2011	81,974.90	194,923.20	86,753.00
2012	88,541.50	192,705.10	89,206.60
2013	96,983.90	198,892.70	109,627.60
2014	135,656.10	217,665.60	147,856.90
2015	153,505.40	230,601.50	193,918.40
2016	186,023.60	249,415.10	250,122.00
2017	196,313.90	275,281.40	267,413.00
2018	203,436.20	275,285.30	289,232.70
2019	232,559.30	291,409.00	324,658.70
19/'10	189.4	49.4	271.2

Source: Bank of Albania

Table 11: Correlation of the indicators of Table No. 9

		Current accounts and open deposits, in millions of All	Money outside the bank in millions of All	Current accounts and open deposits, (currency) in millions of All
		x1	x2	x3
Current accounts and open deposits, in millions of All	x1	1		
Money outside the bank in millions of All	x2	0.985	1	
Current accounts and open deposits, (currency) in millions of All	x3	0.996	0.991	1

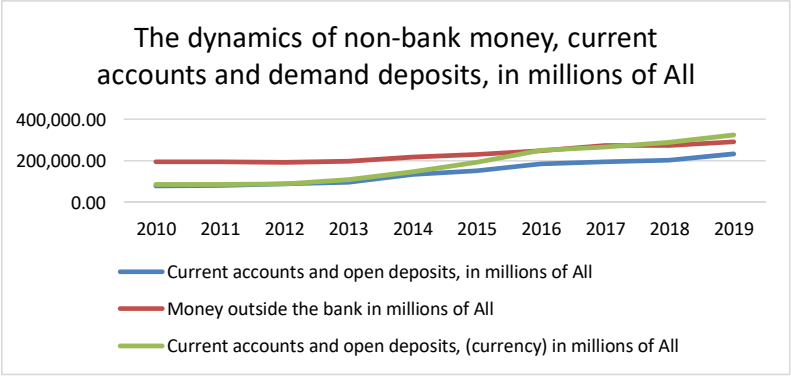

Figure 4: The dynamics of non-bank money, current accounts and demand deposits, in mill. of All
Source: Authors

The data of Tables No. 9-10 and Figure No. 4 show that the indicator of money outside the bank has increased. From 2010 to 2019, it has increased by 49%. Current account and demand deposits in ALL increased by 189.4%, current account and demand deposits in foreign currency increased by 271.2%.
General conclusion: The above indicators reflect more the non-observed economy, the informal

economy. Their correlation is strong, from 0.985 to 0.996. Since 2013, they have been growing at high rates. The year 2013 coincides with the transition of power from the Democratic Party to the Socialist Party. After 2013, the cultivation of drugs in the village of Lazarat was hit, but its cultivation began in other districts of the country, so much so that it became a concern not only for Albanians but also for the region. This situation affected the rampant outflow of money from the banks to carry out cash transactions between labor sellers and labor buyers. This action avoided the banking system. Current accounts and demand deposits allowed people to move money around easily by withdrawing it from banks. The role of monetary policies in these conditions became more difficult to influence the growth of the economy.

*e. **The Albanian lek is appreciated in relation to the euro, at a time when imports have increased.***

For this analysis we use All/Euro exchange rate data from 2010 to 2019.

Table 12: All/Euro exchange rate dynamics

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average All/Euro exchange rate	137.79	140.33	139.04	140.26	139.97	139.74	137.36	134.15	127.59	123.01

The All/Euro exchange rate has been strengthening. On 15.7.2022 it was 117.24.

Source: Bank of Albania

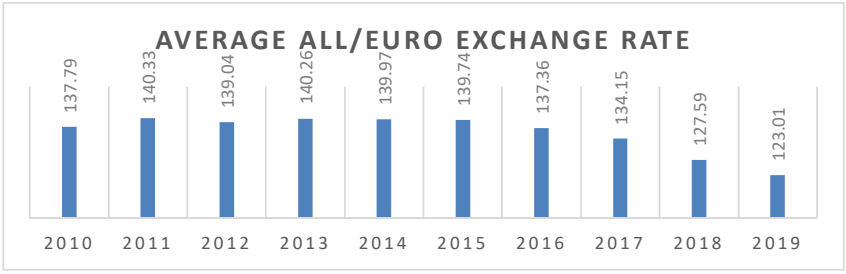

Figure 5: Average All/Euro exchange rate
Source: Authors

The data of Table No. 11 and Figure No. 5 show that starting from 2013, the exchange rate of the Albanian lek against the euro has been appreciated. The strength of the ALL against the Euro did not come simply from the increase in remittances, exports and FDI, but the inflows of currency from non-formal sources had their role as well. The strength of the Lek against the euro has inhibited the development of the economy, has influenced the increase of imports and the decrease of exports, as a result to the decrease of GDP.

Finally, the IS-LM Model according to Dornbusch-Fischer is built without considering the coordination of the elements that make it up. It remains just a theoretical model without technical arguments that cannot be applied in practice. The authors have not read any studies where the IS-LM Model has been applied. Why is it not applied? We have elaborated the reasons above, however we add the explanations for the autonomous expenditures which are considered as a basic element in the growth of the GDP. In Ā (autonomous expenditures) are included:

- Ĉ. Autonomous consumption that does not depend on income. This includes taking on debts, using savings and others of this kind. Some people in need consume meals in public canteen. These items cannot contribute to economic growth because this would imply the fact: the more debt for consumption the people in need get, the more the economy will grow. This is absurd.

- Ī. Autonomous investments. In the model, they are not autonomous, but the investments depend on the interest rate. When the interest rate decreases, they increase and their curve shifts to the right while the expenditure curve shifts up. Autonomous investments are those that come from loans, credits, etc. tand do not depend on income and the interest rate.
- Ĝ. Government expenditures. Government expenditures are considered autonomous. This is untrue because they depend on the realization of income from taxes, customs, etc. Employee salaries are fixed and do not change with changes in income. We can consider these autonomous. If it is true, according to the model, that the increase in autonomous spending would increase the GDP, then it would be enough for the government to increase 100 times the salaries and there will be an increase in the GDP. This is absurd.

4. The Hicks-Hansen Model - Its Application in the Albanian Economy and the Authors' Considerations

4.1 The IS-LM model created by Alvin Hansen is as follows (Hansen A. 1953). It should be mentioned also: (Abel B. & Bernanke B. 1998), etc

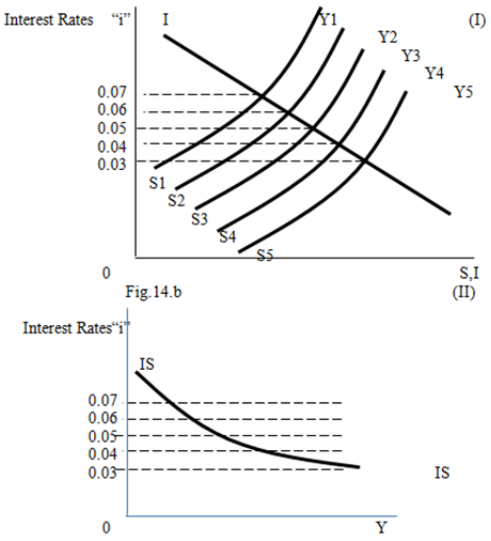

Figure 6: The IS-LM model created by Alvin Hansen

In the first quadrant, the investment and savings curve is set on the X-axis, the interest rate is set on the Y-axis. The investment curve has a negative slope, while the savings curve has a positive slope. In the intersection point, there is macroeconomic equilibrium for a given amount of GDP. This relation is reflected in figure (II). In figure (II) the GDP is placed on the X-axis and the nominal interest rate "i" is placed on the Y-axis. If we take into consideration the real rates of the Albanian economy for some years, they turn out to be negative. We combine the level of Y with the level of "i" and obtain the theoretical IS curve. This model was created by Alvin Hansen.

4.2 The Hicks-Hansen model. This model is taken from the model (BERNIER B. & YVES SIMON Y. 2001)

The construction of the figures of the theoretical model Hicks-Hansen begins in the quadrant (I).
In the first quadrant (I) on the X-axis, investments are placed in absolute amounts. Nominal interest

rates in % are set on the Y-axis. When the nominal interest rate is i_1%, investments are I_1. When the interest rate decreases to i_2 %, investments increase to I_2. This phenomenon is reflected in the quadrant (II).

In the second quadrant (II) a bisector is placed that reflects on the Y-axis the same size of the investments that are placed on the X-axis. On the Y-axis in this quadrant, savings are placed in absolute amounts, just like investments. The bisector is set because when in equilibrium, according to the Keynesian theory, Investments are equal to Savings (I = S).

In the third quadrant (III) the Y-axis reflects the same amount of savings that is in the Y-axis of the second quadrant. On the X-axis is real GDP which is connected to the X-axis of the fourth quadrant (IV).

In the IS-LM (Hick-Hansen) model we have this scheme:

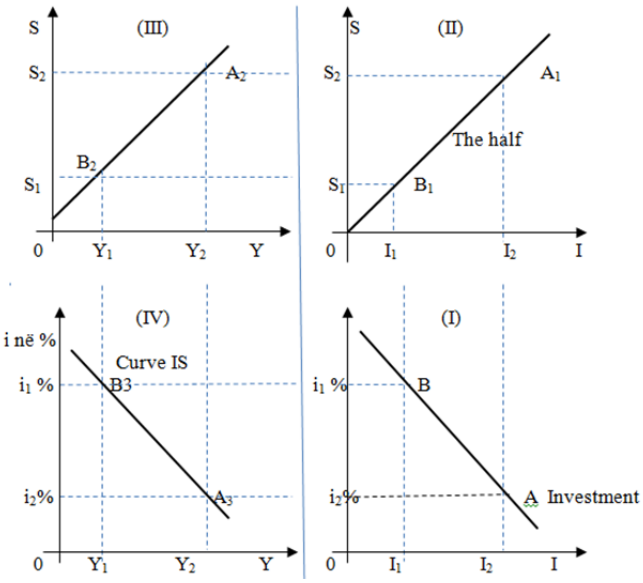

Figure 7: Hicks-Hansen's IS-LM theoretical model. This model is taken from the model (Scacciati F. 2002), (Bernard Bernier B, & Yves Simon Y. 2001)

In the fourth quadrant (IV) real GDP or Y is set on the X axis and the nominal interest rate in % is set on the Y axis. In i_1% where investments are low to the extent of I_1, Y is also low to the extent of Y_1. When the interest rate decreases to i_2%, Investments increase to I_2 million, and as a result, Y_1 also increases to Y_2. We join the points with the coordinates $(i_1;Y_1)$ and $(i_2;Y_2)$ and obtain the IS curve which is an equilibrium curve. This curve shows the values of interest rate "i" and Y when the market for goods and services is in equilibrium.

In this way, in the four quadrants we have: the negative relationship between the interest rate and Y, the positive relationship between savings in millions of Lek and income in millions of Lek. This means that when Y increases, savings also increase. When savings increase, Investments also increase. This is the theoretical model.

4.3 The IS model, in our opinion, presents the following weaknesses that make it inapplicable in practice

The nominal interest rate of loans is placed on the Y-axis (quadrant I and IV). Its placement does not make the model applicable because Deposits have different nominal rates compared to Loans. They

can be placed in the model, but no relationship can be established between deposits and loans, except with the opportunity cost coefficient. It is very difficult to find meeting points between deposits and loans for the same interest rate. For the same GDP, deposits and loans have different interest rates and different amounts in absolute terms. This is due to the degree of transmission of the monetary policies of the Central Bank. How do commercial banks reflect REPO rates in loan and deposit interest rates? In Albania, commercial banks reflect more on the reduction of deposit rates than on the reduction of loan rates. Commercial banks have maintained almost the same difference between the loan rate and interest rates.

The deposit-loan ratio in the Albanian economy.

Table No. 12 presents Real GDP in %, REPO in %, interest rate of 12-month deposits in All, in % and the interest rate of 12-month loans in All, in %. They are calculated as follows: the interest rate on deposits minus the inflation rate and the interest rate of loans in All minus the rate of deposits in All.

Table 13: Dynamics of interest rates, GDP, REPOs and their relation

	Real GDP,%	REPO in %	Interest rate of 12-month deposits in All, in %	The interest rate of 12-month loans in All, in %	The interest rate on deposits minus the inflation rate	The interest rate of loans in All minus the rate of deposits in All
2010	3.71	5	6.4	11.29	3.03	4.89
2011	2.55	4.75	5.87	11.17	4.17	5.3
2012	1.4	4	5.38	10.28	2.98	4.9
2013	1	3	4.17	9.52	2.27	5.35
2014	1.8	2.25	1.92	7.66	1.26	5.74
2015	2.2	1.75	1.35	7.79	-0.61	6.44
2016	3.4	1.25	0.8	5.89	-1.38	5.09
2017	3.95	1.25	0.75	5.98	-1.05	5.23
2018	4	1	0.73	5.65	-1.07	4.92
2019	2.1	1	0.49	6.25	-0.61	5.76
2020	-3.5	0.5	0.45	6.06	-1.47	5.61

Source: Authors

Real GDP in % from 2010 to 2013 has been decreasing and from 2014 to 2019 it has been increasing. The reason is that the new Government that came to power in 2013 changed the tax system. It switched from flat taxes to progressive taxes and increased the base of taxpayers, increased control and the fight against corruption, etc.

REPOs have been steadily declining. The Central Bank has implemented an expansionary monetary policy in order to stimulate the increase of demand for loans.

The interest rate of 12-month deposits has decreased significantly, from 6.4% in 2010 to 0.49% in 2019 and 0.45% in 2020. The effect of the transmission of the monetary policy of the Central Bank was applied only in this indicator.

The interest rate of 12-month loans has been decreasing until 2018. In 2019 and 2020, it has been increasing. The real interest rate of 12-month deposits has been continuously decreasing. From 2015 to 2022, it has a negative sign. This is one reason that in macroeconomic models the real interest rate should not be taken into consideration but the nominal rate.

The profit from the difference between the interest rates of 12-month loans and the interest rate of 12-month deposits has almost remained at the same level. In 2010, this difference was 4.89 points, it reached its maximum in 2015 with 6.44 points and in 2019 it was 5.76 points. These values show that commercial banks have worked to meet their economic-financial objectives and have not been interested in achieving the main objective of the Central Bank. They have reduced the rate of loans but they have reduced the rate of deposits at higher rates to preserve their profits from interest rates. This trend is also presented in Figure No. 8.

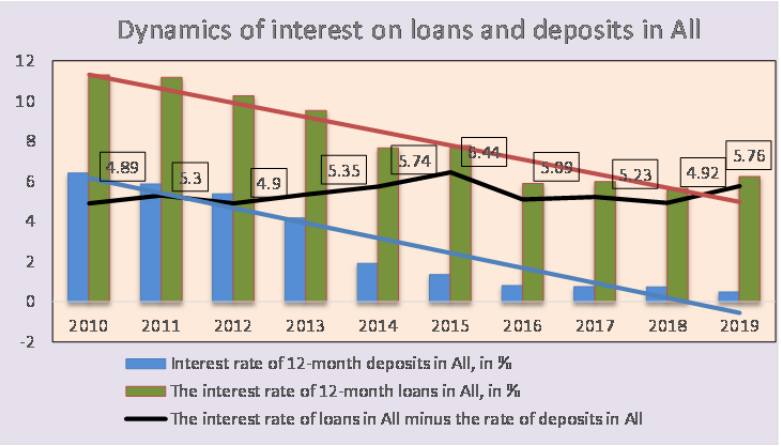

Figure 8: Dynamics of interest on loans and deposits in All
Source: Authors

Table 14: The relationship between interest rates and other indicators

		Real GDP,%	*REPO in %*	*Interest rate of 12-month deposits in All, in %*	*The interest rate of 12-month loans in All, in %*	*The interest rate on deposits minus the inflation rate*	*The interest rate of loans in All minus the rate of deposits in All*
		x1	x2	x3	x4	x5	x6
Real GDP,%	x1	1					
REPO in %	x2	-0.021	1				
Interest rate of 12-month deposits in All, in %	x3	-0.097	0.987	1			
The interest rate of 12-month loans in All, in %	x4	-0.194	0.978	0.981	1		
The interest rate on deposits minus the inflation rate	x5	-0.209	0.961	0.960	0.962	1	
The interest rate of loans in All minus the rate of deposits in All	x6	-0.422	-0.369	-0.418	-0.234	-0.308	1

Source: Authors

Table No. 13 shows the correlation between the indicators of Table No. 12. The data in the Table show that real GDP has a negative relationship with interest rates of 12-month deposits and loans, as well as with the rate of REPOs.

The relation of the REPO rate with the interest rates of loans and 12-month deposits is strong, as well as with the real deposit rate. This is normal because these indicators have been decreasing. They differ in their size.

4.4 How has the reduction of interest rates affected the amount of deposits and 12-month loans?

To answer this question, Authors analyze the data of Table No. 14 .

Three characteristics can be observed from the data.

Firstly, the reduction of interest rates of deposit rates has led to a decrease in the amount of

deposits. This is a normal and expected relationship.

Second, the reduction of loan interest rates has led to an increase in them, but not a uniform increase, as there has been a decrease in some years.

Third, the difference between interest rates on loans and deposits is high and almost uniform. It varies from 4.2 in 2012 to 6.44 in 2015. In 2019 it was 5.76 and in 2020 it was 5.61%.

Interest rates of deposits vary from a minimum of 0.49% in 2019 to a maximum of 6.4% in 2010. The maximum interest rate for 12-month loans was 11.29% in 2010, while the minimum rate was 5.65% in 2018. These data show that the minimum loan rate corresponds to the maximum interest rate of deposits. In this way, the possibility of equalizing deposits with loans is small, they have been equalized only once in ten years (2010-2019). We cannot call this equation a balance. This is a passing tie.

Table 15: The dynamics of interest rates and the absolute amount of 12-month deposits and loans

	Term deposits in mill. All	Interest rate of 12-month deposits in All, in %	Loan in Lek (mill. All)	The interest rate of 12-month loans in All, in %
2010	329,090.00	6.4	157,197.30	11.29
2011	370,105.20	5.87	188,779.10	11.17
2012	388,330.50	5.38	215,122.70	10.28
2013	397,295.60	4.17	219,933.00	9.52
2014	369,035.00	1.92	233,443.00	7.66
2015	339,892.50	1.35	240,783.90	7.79
2016	301,511.70	0.8	259,547.60	5.89
2017	277,349.90	0.75	273,258.30	5.98
2018	252,780.60	0.73	268,753.00	5.65
2019	234,053.40	0.49	298,723.80	6.25

Source: Bank of Albania

The data of Table No. 14 are shown in Fig. No. 9. The figure clearly shows the relationship between the two curves of deposits and 12-month loans with their interest rates.

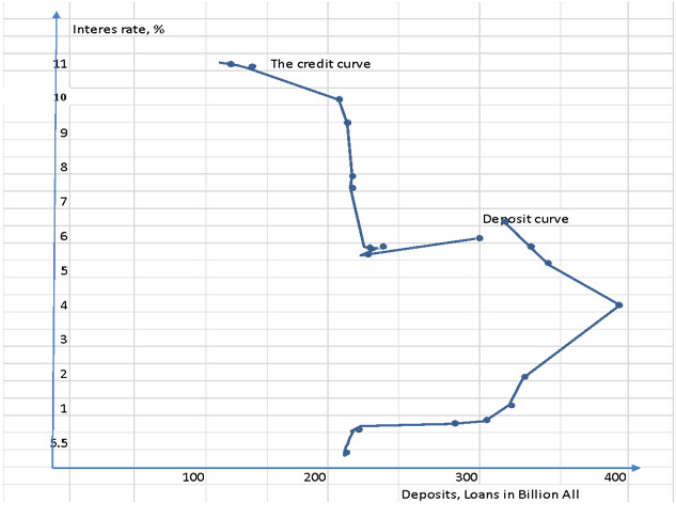

Figure 9: The curves of deposits and 12-month loans with their interest rates
Source: Authors

The upper curve is for loans, while the lower one is for deposits.

Conclusion: the possibility of cutting them is low due to the large difference in interest rates.

Authors think that it is more adequate and creates opportunities for analysis to place the rate of REPOs on the Y-axis and not the interest rates of deposits and loans, being nominal or real. The amount of deposits and loans in Lek is set on the X-axis. In the model, we can also get the opposite, put the amount of loans and deposits on the Y-axis and put the REPO rate on the X-axis. Figure No. 10 shows the dynamics of deposits and loans in millions of All in relation to the rate of REPOs.

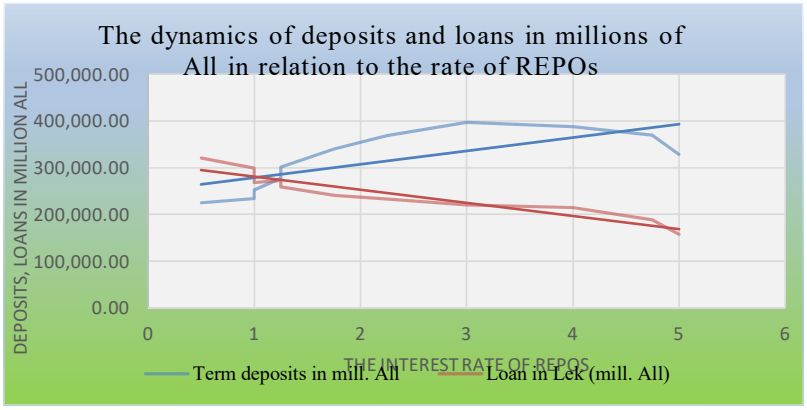

Figure 10: The dynamics of deposits and loans in millions of All in relation to the rate of REPOs
Source: Authors

Model presented in Fig. No. 10 is a normal model. It can be seen that the curves are interrupted only once between 2017 and 2018 with interest rates of 1.25 and 1%. There have been two years of 1.25% REPO rate and two years of 1% rate. We emphasize that the amount of deposits and loans was different, regardless of the same interest rate. Therefore, we cannot say that if the interest rate does not change, the amount of deposits and loans does not change, on the contrary, it changes because the demand for loans does not simply depend on the interest rate, but also depends on many other factors, among which is the need of businesses for loans.

Authors have emphasized that at the intersection of the curves of deposits and loans there is no equilibrium. We have equilibrium, but it is an unstable equilibrium. Subjects always need loans and banks always have opportunities to lend. Time deposits are not the only ones used as loans, but money generated from bank circulation, interest, and excess reserves are used as well. Excess reserves in the Albanian money market are high because there is a large amount of money in the current account and demand deposits.

It should be taken into account that the loan that individuals request and the offer that banks make are based on the same interest rate, as well as the demand and supply for deposits. The deposit curve that connects the amount of deposits with different interest rates is a consequence of the confrontation between supply and demand for the same interest rates. This is also the case with loans. In this way, the analysis of the model with loans, deposits, income with the inclusion of the rate of REPOs is more possible than with the inclusion of the interest rates of deposits and loans.

4.5 Model Hicks-Hansen with the data of the Albanian economy for the years 2014-2016.

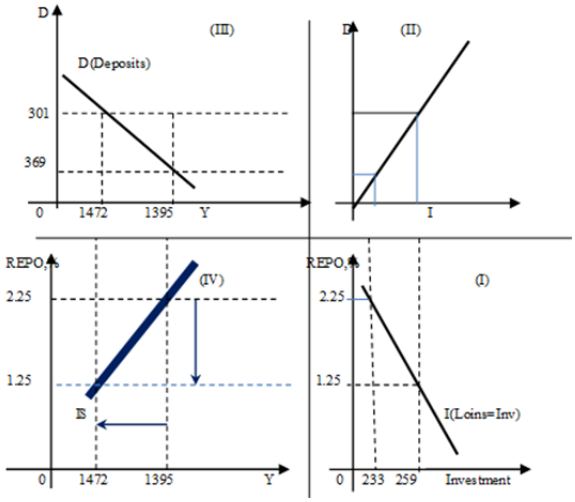

Figure 11: Hicks Hansen's IS-LM model with data from the Albanian economy for the years 2014-2016, in billion All
Source: The model is built by the authors

With the data of the Albanian economy for the years 2014-2016, the IS-LM model according to Hicks-Hansen cannot be built. The curves of quadrants (III) and (IV) have abnormal trends. No conclusion can be drawn from this model on the monetary policies of the Central Bank.

This phenomenon also happened because of the features of the Albanian economy:

First, two main groups of economic entities have been created in Albania. A rich class constitutes the minority of the population, a small group of the middle class and the largest group is that of the poor class.

Second, incomes for the middle and poor class have increased slightly. This income has gone to consumption expenses and not to savings. The income of the rich class has increased, but they have deposited a small part within the country, the rest have been deposited in banks abroad.

Third, economic entities have no interest in saving their money because the interest rate since 2016 has been lower than 1%. Also, the real interest rate of deposits since 2015 has been negative. Albanian depositors have lost, therefore they are not interested in depositing their money in Albania.

Fourth, economic subjects are not aware of paying taxes because the government returns only a small part of them in the form of services. Most of it is channeled in other directions. In Albania, the government largely applies Public Private Partnership and concessions. Recently, part of the archaeological sites that are protected by UNESCO have been granted concessions.

The H.Hansen theoretical model supposes a population with high welfare, with a large and wealthy middle class, such as the USA or Western European countries, and not for an economy like the Albanian economy, where the majority of the population is still poor.

4.5.1 Model Hicks-Hansen with the data of the Albanian economy for the years 2010-2019.

The data of the ten years 2010-2019 were taken into analysis. Deposits and loans are linked to nominal GDP by year. The conclusion is based on the analysis that was carried out for the years 2014-2016.

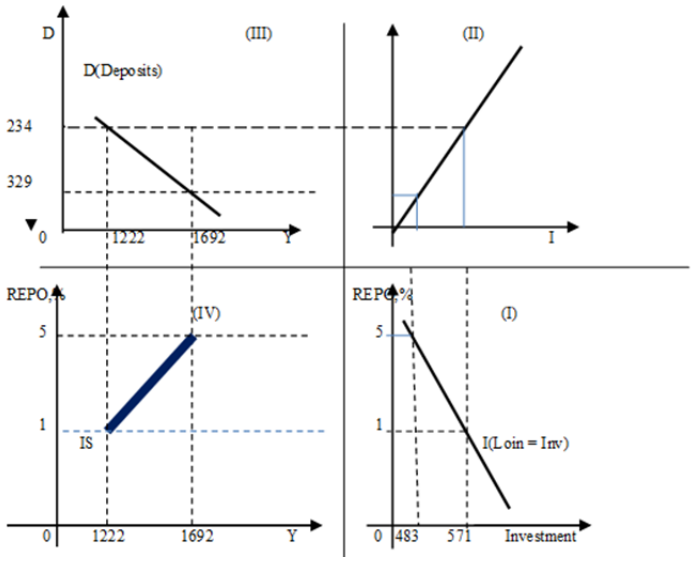

Figure 12: Hicks Hansen's IS-LM model with data from the Albanian economy for the years 2010-2019 (in billion All)
Source: The model is built by the authors

The Hicks Hansen model with angle bisector cannot be built. The main obstacle is the angle bisector that equates Deposits with Savings. If it is removed and substituted with another curve then the model becomes applicable.

5. The IS-LM Model Proposed by the Authors and the Result, (with Data from the Albanian Economy)

5.1 Model with Reflection Curve

In this analysis, we will take the data for the years 2014-2016 and 2010-2019. We will not include 2020 because there are deviations due to the impact of the Covid-19 pandemic.

The proposed model has the following changes compared to the existing model:

First, the angle bisector is deleted and replaced with the reflection curve (quadrant (II).

Second, on the Y-axis in the investment model, is not taken into consideration the nominal or real interest rate, but the REPOs rate is set (quadrant (I).

Third, in the quadrant (III) on the X-axis, is placed nominal and not real GDP. On the Y-axis are placed time deposits in All. These deposits are not equal to loans for the same REPO rates. The deposit curve has a negative slope and it has a negative relationship with GDP.

Fourth, in square (IV) on the X-axis we put nominal GDP while on the Y-axis we put the rate of REPOs.

The model consists in changing the role of the angle bisector that connects the Investments quadrant with the Deposits quadrant. The angle bisector from the Hicks-Hansen model is substituted with The Reflection Curve. It is called the "Reflection Curve" because its slope is related to the ratio between deposits and loans, with their opportunity cost. This was done because, in the Albanian economy, only once in ten years, the total of term deposits in Lek was equal to the total of loans. With these data, the Theoretical Model is a special case. Deposits in Albania are partially used for

loans. A part of them is used for the purchase of Treasury Bonds, Bonds, etc. In this way their curves are difficult to intersect. Applying the Reflection Curve solves this problem and makes the Model applicable in practice.

The weaknesses highlighted above are reflected in this Model.

5.2 IS-LM macroeconomic model for the years 2014-2016, according to the authors

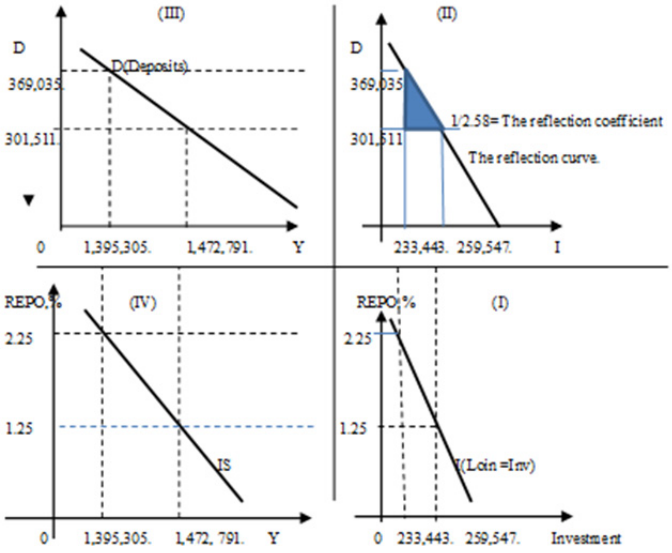

Figure 13: The IS-LM model according to Hicks Hansen with the changes proposed by the authors for the years 2014-2016. In million All
Source: The model is built by the authors

Building the model starts from quadrant (III). Nominal GDP is placed on the X-axis and Time Deposits are placed on the Y-axis. We continue with quadrant (I). On the X-axis we put loans in All and on the Y-axis we put the rate of REPOs. In quadrant (II) the connection between deposits and loans is made through the creation of the reflection curve. In the quadrant (IV) the IS curve is constructed. Macroeconomic analysis can be done with this model. The model works and gives us data for analysis.

5.3 IS-LM curve model for the years 2010- 219. Two figures will be built

In the first figure, only term deposits in All will be included, while in the second figure, time deposits in Lek and foreign currency will be included. The loans in the first figure will be taken in All. In the second figure, All + currency will be taken in total. The exclusion of demand deposits and current accounts is important because they only serve to create excess surpluses which are used to provide loans. Demand deposits and current accounts can not be used in 90% as time deposits and in lek and time deposits in forign currency can be used.

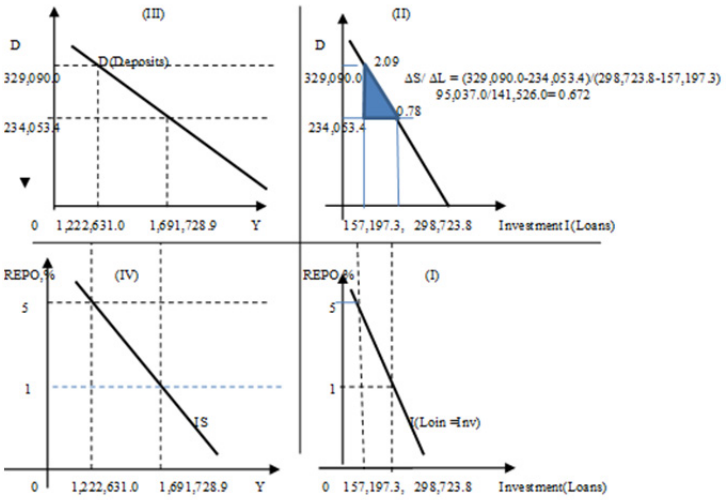

Figure 14: The IS-LM model according to Hicks Hansen with the changes proposed by the authors for the years 2010-2019. In million All
Source: The model is built by the authors

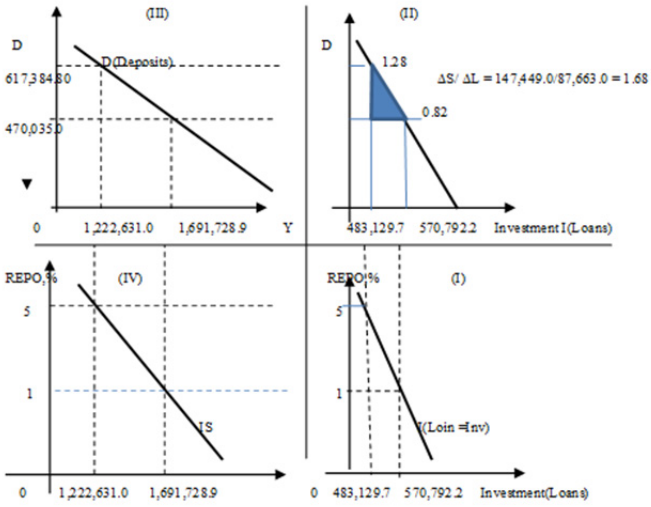

Figure 15: The IS model takes into account nominal GDP, total time deposits ALL + foreign currency and total loans. In million All. (2010-2019)
Source: The model is built by the authors

From the analysis of Figures 7 and 8, we can draw the same conclusions as those we drew for the 2014-2016 model.

The increase in GDP has not been followed by an increase in savings, or a decrease in savings has not been followed by a decrease in GDP.

6. Conclusions

In each topic, relevant conclusions have been made. Some general conclusions are briefly given here. The IS-LM model is an important model in the analysis of monetary and fiscal policies. It reflects the impact of these policies on the economy: on the interest rate of loans and deposits, on the level of deposits and loans, on GDP, etc.

From the application of the existing theoretical models of IS, with the data of the Albanian economy, it was not possible to build an effective model.

The Dornbusch-Fischer-Startz model was not applied because Investments were taken as dependent variables. In the Keynesian model, they are assumed to be autonomous, independent of the interest rate and GDP.

Hicks-Hansen's IS model needed an upgrade.

The improved Hick-Hansen Model was presented by the authors. Through this model it was possible to construct the IS Curve. The model became effective, macroeconomic indicators can be analyzed.

The relationship between REPOs, as a monetary policy instrument, with monetary aggregates, indicators of loans and deposits, was analyzed. The conclusion was that the relationship between them was weak. This proves that monetary policies have not had the desired effect on the economy. The transmission effect has been quite weak.

The relationship between the rate of inflation and the rate of REPOs was analyzed. The correlation between inflation rate and REPOs has been insignificant -0.01. This shows that the Bank of Albania cannot control the inflation rate.

The relationship between the exchange rate of the euro and the dollar with the rate of REPOs was analyzed. The relationship with the Euro exchange rate was positive. This means that expansionary monetary policies have produced opposite effects from those predicted. With expansionist policies, the Lek had to be devalued. The opposite happened.

7. Recommendations

The new model of the IS curve built by the authors, based on the Hicks-Hansen model, is included in the macroeconomic analysis of the money market. Only through this model, concrete and effective analyzes can be carried out. We recommend deleting the angle bisector from the existing model, otherwise the model does not work.

It is recommended that gradually the deuroization of the Albanian economy happens. Avoid Euros from Time Deposits and Loans. The lek plays its role strongly when it becomes the ruling currency of the money market. To change the objective of the Central Bank. The main objective is to maintain exchange rates, economic growth in the function of financial stability.

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