Theories of Money Supply: The Relationship of Money Supply in a Period of Time T_{-1} and Inflation in Period T- Empirical Evidence from Albania

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Abstract

The aim of this paper is to present different approaches and theories, which are linked with money and inflation. Many studies are made to provide a high relationship of money and inflation. The changes in money supply always have affected the macroeconomic indicators such as inflation, unemployment, economic growth, trades and have let the governments to conduct the necessary fiscal and monetary policies, in order to react in an efficient way to reduce uncertainty and to build a sustainable economy. The paper analyses the theoretical links of money supply with unemployment, trade and exchange rate, taxes and wages. The regression analysis is conducted based on the theories of money. The analysis and the empirical results for Albania showed that money supply has strong relationship with economic growth, interest rate and inflation, but money supply has a negative sign toward inflation, by arguing that the case of Albania is specific, because of lack of money supply from banking system and money in circulation outside banks. From the results, we found that all money supplied by the financial system is fully absorbed by the private sector and individuals, without causing an increase on the inflation level. This may be argued from the financial crisis that affected Albania and the reduction of production, consumption, unemployment and delayed payments from the government toward business sector. Furthermore, there are suggested monetary policies for increasing the supply of money, and fiscal policies for increasing the demand for goods and services. The supply increases by the demand side, which need to be stimulated by production sector through fiscal policies and government development programs.

Keywords: money supply, inflation, interest rate, gdp, trade

1. Introduction

"*Lenin is said to have declared that the best way to destroy the capitalist system was to debauch the currency. By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens*". (J. M. Keynes)

The effects of money in an economy are crucial points. The literature review that is presented in this paper gives the chronology of the theories and approaches in different periods of time from several economists. The studies have begun under the Classical frameworks, where it is said that money has no relationship with inflation. Then Fischer came with its Quantity Theory, where velocity is a constant element. To continue with the Cambridge Approach (Marshall and Pigou) and The Keynes theory, as a latest Cambridge Approach, gave a different view from the previous. They stated that interest rate influenced the money supply and Velocity is not constant. The research continuous with the post Keynesians (Moore and Kaldor, Ricardo, Marx and Eltis), where the important theory was The Labor Theory of value, where the economy works under a full employment resources. Finally, the paper concluded with the Modern Quantity of Money and New-Classical economists (Friedman, Laidler, etc).

The paper continuous with the effects of inflation in relation to unemployment, wages, taxes and exchange rates. From the studies is found out that changes in Inflation creates changes in the above factors. Furthermore, the paper is followed by the empirical study, taking the Albanian's data from the year 1994-2015 for Money supply, GDP growth rate, Interest rate and Inflation. From the survey, the paper found that there is a strong relation between Inflation and the other variables.

According to the money theories, money supply has a positive sign related to inflation, while in contradiction to the theory; the empirical results showed that money in Albania has a negative relationship with inflation, because of the lack of other financial markets. Albania has only the banking system and money is strongly linked to the interest rate and the macro development of the country. Without other financial and capital markets, the supplier of the money is done only by the banking system. Since the beginning of the financial crisis in 2008, Albania has been attached to crisis because of the strong connection of trade with European countries, especially Greece and Italy. During these difficult years, Albania has been accompanied by an increase of unemployment, reduction of production, consumption, trade and increase of budget deficit and public debt. The business and consumer transactions are shrunken only to the basic ones. Consumers do not spent more than the necessary products and businesses do not invest in new projects. All the supplied money is fully absorbed by the market and there is no free circulation of money, in order to cause inflation. Inflation is reduced year by year, by reaching the lowest level during these 25 years of transition. Albania is in a critical point of development and recession has caused a worse financial and economical situation. Consumption, trade and investments have been significantly reduced, by not giving a hint to the economic growth. The conclusion summarizes all the theoretical and empirical part of the paper with suggestions for better policies in the future.

2. Theories of Money

The classical theory of money developed the most important feature that interest rate has no effect on the demand for money. Fischer found from the examination of the relationship of the total quantity of money supply with the spending on goods, the equation of exchange *Quantity Theory of Money* MV=PY, which relates the nominal income with the quantity of money and velocity. According to the theory, velocity is a measure of what people use to buy their goods. Hence, if people use charge accounts than Money supply will decrease and velocity will increase, in contrast if people purchase with cash then money supply will increase. Fischer took in consideration the technology and he stated that velocity will be affected slowly in the short run. (Mishkin, 1998)

The classical Quantity of Money assumed that V and Y were constant and prices were flexible and in the long run the economy is predisposed to full employment, so this implies that if M doubles than P doubles two. The theory provided that changes in the quantity of money effect the changes in the price level. Also Fischer argued that the theory shows how much money is held for a given amount of money. In the same time, the *Cambridge Approach* appears with the same equation as the Fischer's equation, but differently argued. The economists, Marshall and Pigou, set the equation asking people how much they were able to hold without being bound by technology and institutions. The Cambridge economists suggested that the level of money is affected by wealth of people; as wealth increases then people tend to hold more money. They concluded that the demand for money is in proportion with income and *k* is the coefficient. M= k x PY. The classical ruled out the role of interest rate on the demand for money, whereas the Cambridge approach proved the contrary. (Mishkin, 1998)

According to Cottrell (1997), there are two important points in the Quantity theory: 1) if the ceteris paribus (proportionality of M and P) has any force, major deviation of V and Y must steam from basis independent of the quantity of money, any reliance must be slight and temporary. 2) Significant changes in the quantity of money led that money have to be exogenous. So, two independence ways were the sources of difference between M in one side and V and Y on the other side. The problem of the Quantity Theory has taken the structure of contradiction of one type of independence or the other. Keynes framework was born in that time. (Cottrell, 1997)

Keynes brought the *Liquidity Preference Theory*, which related the interest rate with the income. He affirmed that exogenous variation in money leans steadily to stimulate changes in both V and Y. Consequently, he argued that an increase in money tends to lower the interest rate by stimulating investments to grow. Also, the velocity will decrease. He rejected the idea that velocity is constant. Keynes stated that e normal state under employment, will increase the spending and the previous effects will be not temporary. So, inflation will be the case. (Batiz and Batiz, 1985)

According to Cottrell (1997), the modern *Post-Keynesian* approach was focused on the second point of the independence of the Quantity Theory. Kaldor and Moore rejected the arrgument that quantity of money has any independent fundamental role. The endogenous theory stated that the Central Bank has indirect power and private sectors can increase the quantity of money by their transactions and velocity is fixed. Rogers stated: "In particular the role of money as cause or effect should be seen in terms of the distinction between commodity and bank money. Commodity money is clearly compatible with the

classical quantity theory of money in which the quantity of money has a causal influence on the price level". (Rogers, 1989, p.175 as cited in Cottrell 1997).

The inapplicability of the Quantity Theory is given by Marx and Ricardo in their *Labor Theory of value*. Based on the Labor Theory of value, the value of each commodity depends on the quantity labor time required directly or indirectly to produce that commodity. Marx says: "The total quantity of money functioning during a given period as the circulating medium is determined by on the one hand the sum of prices of the commodities in circulation, and on the other hand by rapidity of alternation of the antithetical process of circulation". (Marx, 1976, pp 217-8 as cited in Cottrell 1997). This means that the commodities enter with a price and with a money value, so the speed of circulation brings the occurrence of inflation. Another post-Keynesian economist, Eltis, said that: "Monetary exogeneity is essential to Quantity Theory. A larger money supply must produce a higher price level: causation must run from money to prices, and not the other way round". (Eltis 1995, p.23 as cited in Cottrell 1997).

From the previous theories and arguments, it is promoted that Quantity theory is accepted as a short-run theory, where the classics argued that commodities go into without a price and money without a value, but the critics said that changes in money drive the prices, because they are alteration in the connection between "the unit of account and the money commodity". According to Marx and Ricardo money is endogenous and changes in money play an important role in price levels, under some conditions, so inflation is the result from the supply of money. (Cottrell 1997)

According to Laidler (2003), the *Modern Approaches* for money come from Friedman and other modern economists. Friedman was closer to the Keynes and Cambridge framework, and he applied the Portfolio Choice to Money. The theory indicates that the demand for money is based on people's wealth (permanent income). He based his research in more than one interest, and he argued that changes in interest rate will have not a great effect on the demand for money, because of any raise in return from the raise of interest rate will increase the return on money. The demand for money and velocity can be predicted. Inflation is seen as a result of cost-push and demand-pull influence. Friedman put more attention to monetary policies in the longer run, for money growth targeting and for "the imposition of quasi-constitutional rule for money supply growth". The rule was proposed to maintain low inflation, but different countries have to be aware of the benefits from inflation, developing countries need investments, more money in circulation (Rowe (2003, as cited in Laidler 2003).

According to Cantillon and Hume (as cited in Laidler 2003), inflation is about the value of money and the value of money is linked with the demand for it, and this relationship inform the monetary policies. However, the changes of money supply are not always matter of inflation, but it is to say that inflation is a matter of variations in demand and supply of money. Then, from monetarism approaches, the new-classical economics was born.

The New-Classical economics predicted that: "the price level would respond to changes in the money supply, and that the amount of that shift would be determined by the extent to which those changes had been anticipated in the first place, but it accounted for the fact of the price level's change with the simple observation that this was necessary to keep markets cleared". This means that any unexpected rate of inflation will affect negatively the money supply and the outputs in the market will not have a real value. They followed the "transmission mechanism" from Fischer effect that interest rates are related with money supply, and more money in circulation will cause inflation. (Laidler 2003)

Reviewing the monetary theories, we can state that the Classical theories have not given a clear vision of the relationship of money with inflation. The Quantity of Money and the Cambridge Approach suggested that Money supply is related with Inflation, taking into account the wealth of people, the level of income, and ruling out the interest rate effect. The Keynes theory put emphasize on the interest rate, saying that the Central Bank has the power to control the money supply through monetary policies. The Post-Keynesian said that velocity is fixed and Central Bank can not affect the money, but private sector can control it through transactions. Marx was the critter with his theory on Labor value. The Modern and New-Classics economics put attention to the monetary policies that inflation is caused by an increase of money supply and prices will determine this change. Almost all the theories that are treated in this paper have shown that is a relationship between money and inflation, taking in consideration other elements of macroeconomics as unemployment, income level etc.

3. Effects of Inflation

3.1 Inflation and Unemployment

It is said that inflation and unemployment are two crucial points of the monetary policies. According to Mankiw (2005), "the inflation-unemployment tradeoff is inexorable, because it is impossible to make sense of the business cycle and in particular the short-run effects of monetary policy". This is the claim, that changes in monetary policies push these two variables in opposite directions". According to the business cycle theorist, a supply of money increases employment and then decreases the prices. They include the "price stickiness". According to sticky-wage theory, the nominal wages were difficult to be adjusted, so when the bank decreases the money supply, prices fell, real wages rose and unemployment rose too. This happens not because the wages per labor were high, but because the firms can not sell the amount of production that they wanted. Therefore, the relation between unemployment and inflation is a short-run tradeoff, because the government intervenes by increasing the money supply, and the cycle goes on (cost push effect). (Mankiw, 2005)

3.2 Inflation and wages

Many economists argued that, if wages are high then the level of employment is high, this brings an upward of inflation (demand pull effect). However, according to Johnsson and Palmqvist (2004), changes in wage in the short-run can not help the economists to predict the level of inflation. The first reason is that monetary can stabilize inflation and the effect of wages is small, while the second reason is that labor unions collaborate with businesses for setting the wages. Consequently, different unions and different business sectors can charge different wages, so the effect on inflation will be reduced. To conclude, as the wage-markup is exogenous, the changes on wages can cause inflation and not the other way. (Johnsson and Palmqvist, 2004)

3.3 Inflation and Taxes

The government put taxes in order to collect revenues for filling the budget deficit. If the taxes are high then investment will decrease. According to Ueda (2001), "inflation affects the resource allocation, because the government levies taxes proportionally or progressively on nominal income". The income is nominal so the effective tax changes according to the inflation rate. If inflation rises than the tax increases, this brings a decrease in revenue. Inflation affects the: 1) corporate depreciation; 2) corporate interest payments; 3) household interest receipts and 4) household holding stock. (Appendix A). (Ueda, 2001)

3.4 Inflation and Exchange rates

According to McKinnon (2005), sustained exchange rates reflect the monetary policies that a government takes: tight money brings an appreciation of the currency, which leads to deflation; easy money brings depreciation and inflation in the economy. Based on Ito and Sasaki and Sato (2005), a country with deflation (appreciation of the currency), its exports become expensive, whereas imports increase because they become cheaper. In contrast, a country with inflation (depreciation of the currency), loses competitiveness and financial crisis occur. In order to be flexible to this problem "the exchange rate can be crawling peg, namely the exchange rate depreciate by the rate approximately equal to the inflation differential".

4. Empirical study- Case of Albania

Albania is a Western Balkan Country that is facing macro economical problems, but the governments are working hard for implementing policies and development programs to stimulate growth and promote stability. In order to achieve the EU requirements, Albania needs to stabilize the political and economic situation, through negotiations, preparing draft proposals according to the interest groups needs and to strongly implement the rule of law. After the completion of the requirements, then Albania will have a date for opening the negotiations for becoming an EU member, which it is still a long journey with hard work on the road to high fiscal consolidation and political discipline.

Albania is one the countries that even the financial crisis was present, its growth was still positive and slow. The main sectors that were affected were construction, exports and the inward processing industry. The government and private investments were strongly reduced, by creating an economic impasse. The level of unemployment was increased by causing a reduction in consumption spending. The positive growth came only from the exports of energy, minerals and from the public investments done until the year 2013. After the year 2013, Albania is on a steady recession period, which needs fiscal policies and development programs to overpass this stagnation phase.

The aim of the study is to analyze the empirical findings for Albania and to discuss whether the theories of money are readily ascertainable or not. The study takes in analysis a range of years from 1994 to 2015, because historical data are not available before the transition years. Based on the Inflation function, the regression analysis studies the relationship of

Inflation with Money Supply, GDP growth rate and Interest Rate. The study runs a Multiple Regression with three Independent Variables and one Dependent Variable.

The regression equation for the Multiple Regression is $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

From the equation we find this information:

a – constant number (intercept)

b_1 – coefficient of Money supply

b_2 – coefficient of the interest rate

X_1 – Money supply variable

X_2 – Interest rate variable

b_3 – coefficient of GDP

X_3 – GDP growth rate variable.

We stated the null hypothesis and the alternate hypothesis.

The null hypothesis is: Ho: $\beta_1 = \beta_2 = \beta_3 = 0$ (insignificant relationship)

The alternate hypothesis is:

H1: Not all the βs are 0 (significant relationship)

After the statement of the regression equation, data were collected from the World Bank database and Ministry of Finance of Albania. The results from the test will show the Significance F of the model from the Regression Statistics. We will test the hypothesis at the 0, 05 level. If F < 0, 05 we don't accept the Ho (null hypothesis). Also we test all the coefficients in terms of t-statistics or p-value. The confidence Level is 95%, so if t > 1.96 we reject the Null Hypothesis. If p-value is <0.05 then we reject the Null Hypothesis. After the test we see which of the independent variables has relationship with the dependent variable (inflation). The table below shows the results from running the regression analysis.

Table 1: The summary of the regression analysis

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.94794257
R Square	0.89859515
Adjusted R Square	0.88169431
Standard Error	3.20404359
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*

Regression	3	1637.475168	545.825056	53.16874725	3.80866E-09
Residual	18	184.7862046	10.26590026		
Total	21	1822.261373			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	28.43597083	7.29482039	3.898104314	0.001053859	13.11012192	43.76181974
gdp	0.635189177	0.285887607	2.221814308	0.039356837	0.034561602	1.235816751
real i	-0.991317348	0.136155262	-7.280786179	9.12492E-07	-1.277368938	-0.705265758
money1	-0.254551165	0.097957439	-2.598589407	0.018153122	-0.460352108	-0.048750221

Source: Authors

According to the F-value, which is 3.81E-09 < 0.05, we reject the null hypothesis and accepting the alternative one, which means that there is a significant relationship between the dependent variable with the independent ones. Also, our model has a F=53, which shows a very significant model.

R^2 is an important coefficient. The coefficient of correlation measure the goodness of fit of the dependent variable (inflation) with the independent variables. It takes value from –1, 00 to +1, 00. If R^2 is –1, 00 or +1, 00 indicates e perfect correlation. In our study, R^2 is equal to 0.89 and Adjusted R square is 0.88. This means that Inflation has a high correlation with Money supply, Interest Rate and GDP.

Based on the p-value and t-value, we will see if the dependent variables are significant or not related to dependent variable.

P-value (Money) = 0.01< 0, 05 (significant)

P-value (Interest rate) = 9.12E-079 < 05 (significant)

P-value (GDP) = 0.03 < 0, 05 (significant)

t-value (Money) = 2.5 >1.96 (significance)

t-value (Interest rate) = |7.2| > 1.96 (significance)

t-value (GDP) =2.22 > 1.96 (significance)

then, we can re-write the equation as:

$\Pi = 28.43 - 0.25$ Money supply $- 0.99$ Interest Rate $+ 0.63$ GDP $+ \varepsilon$

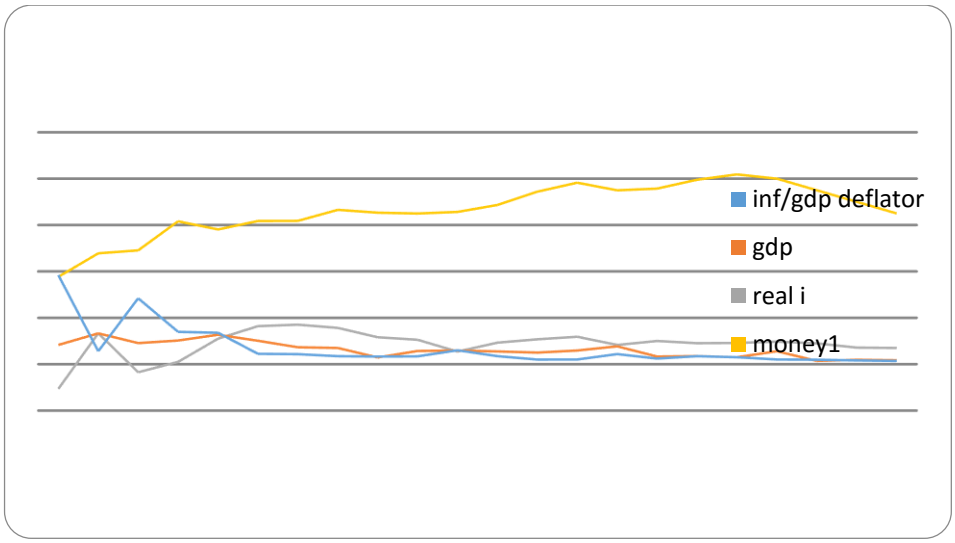
If 1% increase in growth rate of Money will cause a decrease of 0.25% growth rate of inflation.

If 1% increase in growth rate of Interest rate will cause a decrease of 0.99% growth rate of inflation.

If 1% increase in growth rate of GDP will cause an increase of 0.63% growth rate of inflation.

Hence, these results could be linked to the negative impacts that have *i* and *money supply* toward inflation. During recession and economic crisis periods, if the financial system increases the interest rate for deposits or loans, then more money will be deposited and fewer loans will be taken from the private sectors. Then, less supply of money will be in the market by causing a reduction of inflation. If, we see the graph below, Albania has passed an economic crisis caused from global crisis and especially the European one. The private sector reduced the demand for loans by reducing further the private investments, because of the reduction of the demand for goods and services. On the other side, individuals and small enterprises decided to increase savings, by reducing the level of money in circulations. The uncertainty of future government policies is high and businesses are afraid to start financing their projects.

Graph 1: The relationship of inflation with M^s, GDP, and interest rate



In the Albanian case, the interest rate and the money supply are linked to each other, because the only supplier of money is the financial system. Albania has no active financial market and stock exchange institution. Furthermore, the increase of economical growth causes an increase of inflation, but during the last 5-6 years, the economic growth of Albania has been reduced steadily even with positive signs. Hence, with the reduction of economic growth, inflation has been reduced too, because the rhythm of development has been reduced through the reduction of demand from private sector and consumers.

From the empirical results, we can say that the Keynesian theory of money and the Modern Approach (Friedman framework) have been confirmed, where the demand and supply of money are based on the income of people. According to Keynes, since Albania is not in a full employment situation, there are no private and public investments, no consumption spending and then inflation is not the case. Furthermore, the Fischer effect is supported that interest rate is related to money supply. Moreover, the relationship of inflation and unemployment is short-run and not very strong, because of the interventions of the government. Here, we can say that since money supply has been reduced, then unemployment has been increased. That is the case of Albania, where changes in money supply do not play a very important role in price levels, by saying that the most important factors in the determination of prices are the demand and spending on goods and services, by giving the income level and the wealth of people the most important role. Albania is the country with the lowest level of GDP/capita in the region and Europe.

Moreover, Albania has changed the tax system from proportional to progressive one at year 2014. This change was not positive towards businesses' investments and the reduced level of loans and money supplied came from the low possibilities of businesses to produce and to invest. Hence, governments should apply expansionary fiscal policies, by reducing the taxes and increasing the public investments. If the bureaucratic procedures will be reduced, corruption and fiscal evasion will be monitored and strongly controlled, then the government will extend the tax base. This extension will bring more money to the budget, by creating more possibilities for the government to pay the unpaid bills to the private

sector. Furthermore, if the tax rates will be lower, then businesses will have more earnings, by stimulating investment and employment.

Conclusion

The paper summarizes the Theories of Money and the effects of Inflation. It was proven theoretically and empirically that money supply is related with inflation. The initials were the classical that developed the aspect that interest rate has no effect on the demand for money. Fischer with the Quantity of Money assumed that V and Y were constant and prices were flexible and in the long run the economy is predisposed to full employment. The Cambridge economists suggest that the level of money is affected by wealth. Keynes brought the Liquidity Preference Theory, which was related the interest rate with the income. Keynes stated that e normal state under employment, will increase the spending and the previous effects will be not temporary. The modern post-Keynesian rejected that quantity of money has any independent fundamental role. The endogenous theory states that the Central Bank has indirect power and private sectors can increase the quantity of money by their transactions and velocity is fixed. Friedman argued that changes in interest rate will have not a great effect on the demand for money, because of any raise in return from the raise of interest rate will increase the return on money. New-Classical followed the "transmission mechanism" from Fischer effect that interest rates are related with money supply, and more money in circulation will cause inflation.

These theories are the base of further studies on money in different countries. The Effects of Inflation show the relation of Inflation with unemployment, wages, taxes and exchange. Countries with high inflation lose their competitiveness and suffer from instability.

The empirical part analyzed the theories of money and the relationship with inflation in Albania. The economic growth and interest rate have the correct signs based on the theory, while the money supply has the opposite one. This is the case, when the economic crisis has been reflected in the demand for money and investments. Furthermore, may be the case when the money supply is focused on investment and it is fully absorbed by the market, no free money is in circulation. Moreover, we can say that, there is a few supply of money, because the demand is low (from the private sector and consumers). Sometimes, the supply of money is less than demand, because of uncertainty and asymmetric information. In this situation, all the supplied money by banks is used for other purposes (payments of unpaid bills or accounts payables). From these results, the study shows that Albania has not enough money to stimulate growth, by causing a reduction in spending from the private sector and individuals. Financial crisis has brought a reduction of demand for goods and services, by consuming less and saving more. But, since Albania has the lowest GDP per capita, then even savings are very low. All the earned money are spent and absorbed by the system. To conclude, the model was significant and there is a correlation between Inflation and other variables (money supply, GDP and Interest Rates), by confirming the Modern framework of Friedman.

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APPENDIX A

The passage is given as is cited in Ueda (2001). The inflation changes the effective tax rate in the nominal value of: 1) corporate depreciation; 2) corporate interest payments; 3) household interest receipts; 4) house holding stock.

1) To calculate the corporate tax, the depreciation is deducted from the taxable income. Because a rise (fall) in the inflation rate does not affect the nominal values of depreciation allowances, their real values become smaller (larger) and taxable income increases (decreases). When the inflation rate rises (falls), the effective tax rate rises (fall) and the post-tax real rate of return falls (rises).

2) On the assumption that a) the future inflation rate is perfectly foreseeable and b) both the nominal rate of return and the nominal interest rate change by the same amount as changes in the inflation rate (Fischer effect), corporate interest payments increase (decrease) and the taxable income decreases (increases), reflecting a rise (fall) in the inflation rate. Then the effective tax rate falls (rises) and the post-tax real rate of return rises (falls).

3) The rise (fall) in the inflation rate causes the nominal values of household interest receipts to increase (decrease). The effective tax rate on interest income rises (falls) and the post-tax rate of return falls (rises).

4) The rise (fall) in the inflation rate raises (reduces) stock prices. Even if the real values of households holding stock do not change, the nominal capital gains increase (decrease). The effective tax rate on capital gains rises (falls) and the post-tax real rate of return falls (rises). (Ueda, 2001)