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## **THE NATURE AND REASONS OF INFLATION. IMPACT OF INFLATIONARY FACTORS ON KAZAKHSTAN'S PRICE LEVEL**

The inflation is a complex event and involves many factors - monetary and nonmonetary factors. The inflation can also be caused by people's habit, expectations and psychology. Also the considerable effect on inflation has speculations on different markets which are called as the successful investments. As it is known that the inflation rate is the growth rate of the aggregate price level, obviously, any increase of the prices is not inflation, so particularly it is important to identify the really inflation. Nowadays there are three basic approaches to understanding inflation phenomenon: Keynesian theory of the inflation caused by excess demand, monetarists' quantitative theory and the theory of extreme costs. First approach states that the increase in demand from the state and businessmen leads to manufacture and employment growth. At the same time the increase in demand of the population has unproductive character which leads to inflation. Because of that reason Keynes recommended to stimulate private and state investments, but to limit wages of workers. Keynes considers two kinds of inflation: semi-inflation and real inflation. Semi-inflation occurs whenever the unemployment exists and it is considered to be normal because it reduce unemployment. Real inflation occurs at full employment when growth of money supply leads to the rise in prices for the goods and services. Second approach is based on Milton Friedman's theory that considers inflation as the result of excess quantity of money in circulation. And the last approach is related to neo Keynesian concept of economy that explains a rise in prices by an increase in production costs.

Based on assumptions of these theories I tried to understand the nature of Kazakhstan's inflation by using econometric modeling.

### 1) Econometric analysis

As it is known, the econometrics is engaged in the analysis of economic data and forecasting of the possibilities existing in the field of economy. It allows to explain laws of development of economy and to show what it could become under those or other conditions. Besides, the purpose of the econometric analysis consists not only in an explanation of economic events, but also in economic policy improvement.

Monetary and fiscal policies of the state regulation have serious influence on economy - both in positive, and in a negative side, and the econometrics helps the state regulators (which are carrying out economic policy) to apply it to various courses. All indicators are presented in the form of chain of monthly increase/decrease rates. Inputs of the model are producer price index (PPI), M0, M1-M0, M2-M1, M3-M2, export oil revenue and official exchange rates of United States' dollar (USD) and euro. Time range is 1994-2008.

During the test of these factors I found out that official exchange rates slightly affect the overall price level and coefficient of determination was only 25%. The final model is:

$$\text{INF} = 0.001 + 0.657 \text{ PPI} + 0.0297 \text{ M0} - 0.041 (\text{M1-M0}) + 0.037 (\text{M2-M1}) + 0.04 (\text{M3-M2}) - 0.024 \text{ REV}$$

$$\text{Regression statistics } (R^2) = 0.76873117$$

$$\text{Standard error} = 0,025406352$$

It is necessary to pay attention that the coefficient of determination  $R^2$  in this model is 0,768 which means that the selected factors explain an inflation variation by 76.8% confidence. This means that qualitative factors affect the rate of inflation only by 25% (at most) but we should recognize the effect of sample error and the short time period. My observations based on 1994-2008 monthly data and may be by using more data in the future or by using weekly data I can obtain another result. The increase in money supply leads eventually to a rise in price level. However this effect is weak because

doubling in cash currency will lead to only 3% increase in price level. But this excess of money should be invested somewhere. This result can be occurred because of low level of monetization of tenge in the economy (28.9% of GDP). The another point here is that decreasing in money supply eventually may not decrease inflation because we live in an open system and even if we will take back all the money in the economy the price level will not decrease less than world price.

The result of the test based on estimations of oil export revenue is show us negative relationship between revenue and inflation. This happened due to the government's policy. The revenue from oil export does not exceed the real need of economy and the excess of money go directly to the National Fund. But there is one important relationship between inflation rate and the level of monetization. The well developed countries with GDP level over 8 thousand dollars per capita experience monetization level at the rate of 77% of GDP (see table1)and their inflation rate on average don't exceed 3.5% a year (see table 2).

Table 1. The level of monetization (%) and GDP per capita

GDP per capita	M0/GDP	M1/GDP	M3/GDP
<\$1000	7,2	14,2	26,3
\$1000-3000	6,3	15,3	42,1
\$3000-8000	5,9	16,1	46,6
> \$8000	5,7	21,9	77

Table 2. The level of monetization and annual inflation rate

Annual Rate of Inflation	M0/GDP	M1/GDP	M3/GDP
<3,5%	6,9	24,2	73,4
3,6-9%	5,9	15	49,8
9,1-15%	5,7	12,2	30,4
> 15%	6,5	13,2	26,7

By using these tables I can determine a relationship between monetization level and consumer price index. But high monetization level can be maintained only by strong economies which produce products with high added cost. So I again come to the point of production. The production is determined by such factors as capital, labor and productivity. And the solution of the problem lies in the solving the temporal problems in all fields of economy.

## 2) Application to other countries

The following results were obtained by using of Microsoft Excel® software:

USA	$INF = 0.08 + 0.089 PPI + 7.05 M0 - 1.259 (M1-M0) - 2.87 (M2-M1) + 5.8(M3-M2)$
Australia	$INF = 0,15 - 0,06 PPI - 3,53 (M1-M0) - 3,678 (M2-M1) + 1,095 (M3-M2)$
Korea	$INF = 0.609 - 0.76 PPI - 8,264 M0 - 4,77 (M1-M0) + 4,62 (M2-M1) + 6,385 (M3-M2)$

Regression statistics	USA	Australi	Kore
R <sup>2</sup>	0,538	0,649	0,433
Standard Error	0,019	0,023	0,051

The coefficient of determination (R<sup>2</sup>) in these models varies from 43.3% to 65% which mean that the selected factors explain an inflation variation by this rate confidence. However it is the good result because I tested only quantitative factors and from this point I can say that the qualitative factors affect the inflation rate in the United States of America by 40 - 50 percent. This means that 3 - 3.5 percent out of 6-7 percent inflation rate of the United States of America in 2008 can be eliminated by

decreasing panic among the citizens and domestic entrepreneurs. By the same logic 1% out of the 2008 inflation rate of Australia (which is reached 3%) and 2 - 2.5 percents out of the 2008 inflation rate of Korea (which is reached 4%) can be eliminated by changing price expectations.

In this model we see that the main source of inflation in the USA is the emission of the cash dollars which is neutralized by the positive (which means in this case lowering inflation) effect of non cash money or quasi-money. However this model differs from others which prove that the USA's economy model works in other way than most of the countries. Kazakhstan's inflation rate depends on the producer price index approximately at the same rate with Australia. The dependency from producer price index in Australia is 0.76 while Kazakhstan's one is 0.657, so the model behaves almost at the same manner.

The difference in the natural level of inflation which is represented by constant number is not so much comparing with United States and Australia. Kazakhstan's natural level is about 0.01, so I can say that I almost shouldn't have any inflation in the long-run period.

The next point is that developed countries have negative relationship between (M2-M1) factor and inflation rate. Another interesting result is that Korea has negative relationship between cash money (M0) and consumer price index. It is hard to explain but it can be affected by fluctuated official exchange rate or it can be related with the structure of economy which is based on "chebols", the big corporations which absorb most of the money supply in the economy.

If I analyze all countries' inflation models I find that in developing countries M1-M0 factor and M2-M1 factor eliminate each other and slightly affect the inflation rate. While in the developed countries non-cash money decrease the overall inflation rate. From this observation I can conclude that in order to lower inflation Kazakhstan should establish well developed framework of non-cash transaction and increase the role of the non-cash money. Otherwise I cannot catch the desired effect of lowering inflation from changing cash money into non-cash money. Another interesting point is that all these countries have a strong relationship between M3-M2 factor and inflation rate. This is also explained by low monetization rate and it shows that Kazakhstan has a potential of increasing money supply without considerable increase in price level.

### **Conclusion**

There was nearly no country in the world in the second half of XX century, where the inflation didn't exist. It came as the change for cyclic crisis, market economies disease which became obviously to weaken. The inflation is a complex event and involves many factors - monetary and non-monetary factors. The inflation can also be caused by people's habit, expectations and psychology. Also the considerable effect on inflation has speculations on different markets which are called today as the successful investments. As it is known that the inflation rate is the growth rate of the aggregate price level, obviously, any increase of the prices is not inflation, so particularly it is important to identify the really inflation.

During the econometric analysis of the inflation process in the economy of Kazakhstan I can define following results:

- First of all, many economists specify that inflation in the Kazakhstan and most of the Commonwealth Independent States countries' economies have accurately expressed inertness that is the rise in prices is inertial process.
- Inflation is the systematic phenomenon. So there is a "system effect", connected with influence of the specified earlier factors on dynamics of inflation.
- Inflation in Kazakhstan's economy has well expressed season dependency. It rises during the autumn and winter and decreases during the spring and summer seasons.
- Another point is the high dependency between producer price and consumer price indexes. Also I can conclude that the main source of inflation is the producers and the main problem is the situation in the industry and we have huge disproportions in real sector of economy. In order to fight with inflation we should solve the core of the problem not the sequences.

The increase in money supply leads eventually to a rise in price level. However this effect is weak factor in our economy (according to the econometric model) because doubling in cash currency will

lead to only 3% increase in price level. But here should be one assumption: people should use excess of money as the investments or savings in the banks. Another point here is that decreasing in money supply eventually may not decrease inflation because we live in an open system.

The government follows rational monetary policy and does not take radical actions in order to restrain inflation and I think that is right. But inflation is the very complex problem which has various factors which are described in my work. And because of that reason the anti-inflationary program must be in the form of complex of actions related to all industries in Kazakhstan. It should change the mind and mentality of people. And of course our economy should become more productive; we should invest into the industries which produce high cost added goods in order to maintain our production and power of national currency.

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### Түйін

Баяндаманың мақсаты инфляцияның негізгі және басты факторларын экономикалық және жалпы тұрғыда қарастыру. Осы баяндамада Қазақстан Республикасындағы инфляция бағамын ақша-кредит саясатына жататын және жаппайтын себептері талқыланады; статистикалық мәліметтерді қолдана отырып, негізгі гипотезаның эконометрикалық моделін құрастыру арқылы инфляция себептерінің әсерлерін түсіндіріледі.

### Резюме

Эта статья описывает основные факторы инфляции в целом и в экономическом смысле, и рассматривается денежные и неденежные причины инфляции в Республике Казахстан. При разработке эконометрической модели анализа инфляции, здесь использованы статистические данные из открытых источников, которые будут объяснять влияние различных факторов с точки зрения цифр.

### Özet

Bu makalede ekonomik anlamda enflasyonun ana faktörleri açıklanıyor ve Kazakistan Cumhuriyeti enflasyonun parasal ve parasal olmayan nedenleri tartışılıyor. Enflasyonun bir ekonometrik model analizi gelişiminde, sayılar açısından çeşitli faktörler etkisi açıklanıyor ve kamu kaynaklarından gelen istatistik veriler kullanılıyor.