The analysis of modern cyclically-wave inflation processes in Russia

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Abstract. The article considers the 1992—1998 period when the highest dependence between GDP changes and inflation was observed in Russia. It is conducted the comparison of inflation waves in 1992 and 1998. It is proved that there are minor monthly fluctuations by «small inflation waves» in this period. It is revealed that for the 1992—1998 period two inflation waves of 10 years duration was observed, and since 2003 «the Great Moderation phenomenon» was appeared in Russian Federation.
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Introduction

The inflation is the most severe decease if all economies, it affects all areas of life and can result in irreversible consequences. That is why the problem of inflation research always will be actual one. D. Fischer [1, p. 3–5] and M. Vernengo [2, p. 2], continuing the study of F. Braudel [3] , have compared the secular trends of prices in the economic development of England with historical changes in Europe for the past 800 years and identified four large waves of price revolutions: the price waves of late Middle Ages (1180–1350); «prices revolution» of XVI (1470–1650); inflationary shocks of the Industrial Revolution and the Napoleonic Wars (1730–1815); and the Great inflationary waves in the XX century (1896–1996).

It should be noticed that foreign stidues on this subject, including researches of such authors as F. Stanley, R. Sahay [4], J. Munro [5], M. Postan [6] and others, are mainly based on methodological assumptions of monetarist and neoclassical inflation models. Theories that were begin developed in the line of Neo-Malthusianism and which explained the long waves of inflation by long-term demographic fluctuations, also could not provide the descriptions of long inflationary wave of XX century since it is recognized that «Malthusian trap» were overcome at the end of XIX century.

We will try to conduct an analysis of inflationary waves in Russia, taking into attention the cumulative methodological analysis of this process.

There were a high dependence between GDP change and inflation (correlation rate was -0,74) in Russia for the period of 1992—1998. Prior to 1998, the inflationary wave was gradually weakened, but mainly it was caused by reducing of production.

In 1997 the annual inflation rate was reduced to 11%. However, the reducing of production was resulted in reduction of tax revenues to the state budget, which caused the rising budget deficit. Trying to compensate this, the Government applied internet and external loans, that eventually had led to default and new inflationary wave increasing with the highest peak in 1998.

Main part

We will compare inflationary waves of 1992 and 1998.

First of all, we have calculated, that the 1998 inflationary wave was 10 years in duration, i.e. it is equal with the 1992 inflationary wave. It suggests an idea about periodicity of annual inflationary waves in the Russian economy. However, it is too early to state about this periodicity.

Second, the common characteristic of inflationary waves of 1992 and 1998 is that a peak of inflationary wave coincides with demand-pull inflation, i.e. Consumer Price Index (CPI) significantly outstrips producer price index [7]. Consequently, inflationary dynamics is not only cyclical, but also the alternation of inflation types. Table 1 shows that there are periods of alternation of demand-pull inflation and cost-push inflation, and for for the period of demand-pull inflation there were inflationary wave hits. The demand-pull inflation was observed in 2008 too with the inflation increase.

Thus, it could be stated that peak periods of inflationary waves account for demand-pull inflation, but the lack of statistical base don't allow to make any specific conclusions about cyclical alternation of demand-pull inflation and cost-push inflation.

Table 1. The alternation of Demand-pull inflation and Cost=push inflation in the Russian economy for the period of 1991—2008 [7, 8]

Indicator	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CPI, %	750	2510	840	220	130	21.8	11	84.4	36.5	20.2
Producer price index, %	238	2049	987	235	180	25.6	7,5	23,2	65	31,6
Inflation type	Demand-pull		Cost-push				Demand-pull		Cost-push	
Indicator	2001	2002	2003	2004	2005	2006	2007	2008	-	-
CPI %	18,6	15,1	12	11,7	10,9	9	11,9	13,3	-	-
Producer price index, %	10,7	17,1	13,1	28,3	13,4	10,4	25,1	-7	-	-
Inflation type	Demand-pull	Cost-push						Demand-pull	-	-

Third, after wave peak of 1998 the dependence between inflation and money supply M2 was decreased. To substantiate the given confirmation we turn to chart which shows the dynamics of annual change of money supply and inflation for the 1992—2008 period (see Table 2).

Table 2. Dynamics of money supply annual change (M2) and inflation change in 1992—2008 [8, 9]

Year	1992	1993	1994	1995	1996	1997
Inflation, %	2508,80	839,90	215,10	131,30	21,80	11,00
M2, % of the previous year	-	414,3	166,3	125,8	30,6	29,8
Year	1998	1999	2000	2001	2002	2003
Inflation, %	84,40	36,50	20,20	18,60	15,10	12,00
M2, % of the previous year	8,9	62,9	58,9	37,8	34,2	45,9
Year	2004	2005	2006	2007	2008	-
Inflation, %	11,70	10,90	9,00	11,90	13,30	-
M2, % of the previous year	38,5	38,0	47,4	51,8	8,7	-

From Table 2 we can see that prior to 1998 the money supply and inflation have moved in the same direction and there were high positive correlation between them. Starting from 1998, in opposite, there were weak negative correlation between these indicators. Consequently, if prior to 1998 the inflation was highly influenced by the factor of money supply change, after that period other factors (monetary or non-monetary) character have influenced on inflation with more significant impact. It is reflected in correlation indexes between inflation and money supply: in 1992—1997 correlation index was 0,98, but in 1998—2009 it was -0,27. It is obvious that only in cases of 1992 and 1998 factors of inflationary waves increase were more internal rather than external.

In fourth, the only significant difference between inflationary wave of 1998 from the wave of 1992 could be a nature of economy growth in the period after inflation peak.

As it was mentioned above, after the peak of 1992 there were an economic recession. Although the inflationary wave with the peak in 1998 for the first time has led to economic recession (in 1998 GDP has decreased by 4,6%), after that an economic growth has dramatically increased.

In fifth, the second inflationary wave was already much lower in amplitude: its peak in 1998 was 84,4%, which about 30 times less than the inflation peak in 1992. The given fact could be explained by «the Great Moderation» phenomenon that appeared in Russian economy.

There is a strong correlation between world inflation and Russian inflation, and the estimated correlation index for the period 1992—2008 was 0.97 (see Table 3).

Table 3. Dynamics of inflation in the world and in Russia in 1992—2008 [8, 10]

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
World inflation, %	37,47	35,33	27,97	14,59	8,66	6,11	5,53	5,43	4,50
Inflation in Russia, %	2508,8	839,9	215,1	131,3	21,8	11	84,4	36,5	20,2
Year	2001	2002	2003	2004	2005	2006	2007	2008	-
World inflation, %	4,02	3,53	3,70	3,56	3,71	3,64	3,97	6,18	-
Inflation in Russia, %	18,6	15,1	12	11,7	10,9	9	11,9	13,3	-

From Table 3 could be noted that the Russian inflation repeats the movement of world inflation, which states about successful, but painful integration of Russian economy into world system. And although the inflation in Russia was much higher than the world had, since 2003 the level of Russian inflation was relatively stable and fluctuated in 9—12%. Thus, the clearest manifestation of «the Great Moderation» was observed in Russia 9 years later in comparison with developed countries and at the same time with other developing countries and countries with the transitional economy (according to the cumulative index of developing countries and countries with transitional economy).

Conclusions

To conclude all mentioned above, the provided major similarities and differences of two inflationary waves in the modern Russian economy could be formulated in the next way (see Table 4).

Table 4. Similarities and differences of inflationary waves of 1992 and 1998

Factors compared	Inflationary wave of 1992	Inflationary wave of 1998
Duration	10 years	
Movement nature	Sharp rise and gradual decline	
Inflation peak rate	2508,8%	84,4%
Wave rise factors	monetary	non-monetary
	internal	
Economic growth way after peak	Decline	Growth

Consider smaller wave movements, which occurred within the «large» annual waves Name such small monthly fluctuations «small inflationary waves». For the period of 1992—1998 there were 33 such small waves in Russia of average duration of 7 months and average amplitude of 12%.

We have analyzed and summarized the small inflation cycles data in 1992—2008 (see Table 5).

Table 5. Small cycles (waves) of inflation for the period 1992—2008

Wave number	Wave period	Wave duration, months	Fluctuations amplitude, %
1	May 1992—August 1992	4	233,4
2	August 1992—May 1993	10	10,5
3	May 1993—December 1993	8	8
4	December 1993—March 1994	4	13,5
5	March 1994—August 1994	6	10,5
6	August 1994—November 1994	4	3,9
7	November 1994—December 1995	14	0,4
8	December 1995—August 1996	9	14,6
9	August 1996—May 1997	10	4,3
10	May 1997—September 1997	5	1,4
11	September 1997—June 1998	10	1,4
12	June 1998—October 1998	5	1,4
13	October 1998—June 1999	9	33,9
14	June 1999—August 1999	3	9,7
15	August 1999—November 1999	4	1,6
16	November 1999—March 2000	5	0,3
17	March 2000—August 2000	6	1,7
18	August 2000—November 2000	4	1,6
19	November 2000—August 2001	10	0,6
20	August 2001—March 2002	12	2,8
21	March 2002—August 2002	6	2
22	August 2002—August 2003	13	1,6
23	August 2003—March 2004	8	2,8
24	March 2004—May 2004	3	1
25	May 2004—September 2004	5	0,3
26	September 2004—August 2005	12	0,5
27	August 2005—September 2006	14	2,7
28	September 2006—April 2007	8	2,3
29	April 2007— August 2007	5	1,1
30	August 2007—December 2007	5	0,9
31	December 2007—March 2008	4	0,5
32	March 2008—August 2008	5	1,1
33	August 2008—…	…	…
Average	-	7	12
Max	-	14	233,4
Min	-	3	0,3
Standard deviation	-	2,90	15,55

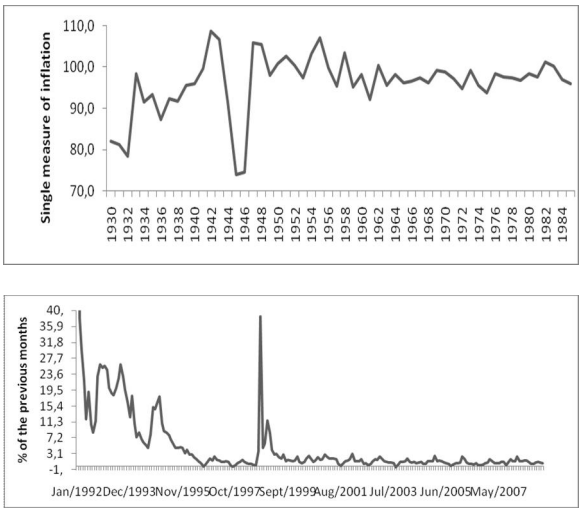
So, based on the data from Table 5, we consider the characteristics of small inflationary waves. First, we think that small waves of inflation in 1992—1998 remind by its «picture» the mirror reflect of annual waves of inflation in 1930—1985 more than annual waves of 1992—1998 period (see Picture 1).

However, modern small inflationary fluctuations in 1992—2008 have a shorter length of inflation cycle: if in 1930—1985 the wave length in average was 2,9 years (34,8 months), in the researched period its average rate have decreased to 7 months, and fluctuations appeared within 3—14 months with the standard deviation of 2,9 months.

Then, small inflationary waves are more numerous: for the past 56 years there were just 17 annual inflationary waves, while for the past 17 years there were almost 2 times more of small inflationary waves. In average, for the period 1992—2008 it was observed 2 inflationary waves per year.

It should be also noticed that modern small cycles of inflation differ greatly from the oscillation amplitude: in 1992—2008 fluctuations occurred within the interval 0,3—233,4% with a standard deviation of 15,5%.

Strong fluctuations in the amplitude of given cycles of inflation could be explained by two serious shocks in the Russian economy: there were crisis of 1992 and 1998 in Russia. If to throw away form the range of inflationary waves these tow crisis, the inflationary fluctuations are shrunk to 0,3—14,6% with standard deviation of 3,13%.



Picture 1 – The comparison of the dynamics of annual inflationary waves in 1930—1985 and monthly inflationary waves in 1991—2008 [8]

Finally, after 1998 the fluctuations of small inflationary waves have dramatically decreased in the amplitude: the inflation in the period of 1998—2008 was changed within the -0,4—3,1% interval. In other words, in difference from annual inflationary waves, in which the Great Moderation was clearly observed since 2003, small inflationary waves had occurred earlier starting from about 1999. It means that the stability of average monthly fluctuations of inflation have influenced also on annual volatility of inflation with a lag of 4 years.

Thus, to conclude all mentioned above, the next conclusions of inflation processes in Russian Federation could be done:

1. After Russian economy transition to the market economy (1992) the inflationary cycles have lost its periodicity.

2.For the period of 1992—2008 it was observed two inflationary waves with the duration of 10 years, the fluctuations amplitude of these waves was «damped» (the peak of the first wave was 2508,8%, the second one was 84,4%).

3. Inside of annual waves there were «small» monthly inflationary waves with the duration of 3—14 months and an average fluctuations amplitude of 12%.

4. Since 2003 there was «the Great Moderation» phenomenon in Russian Federation (annual inflation rates were 9—12%).

5. Relatively to small inflationary waves, «the Great Moderation» occurred 4 years earlier (since 1999, with the monthly inflation fluctuations if -0,4—3,1%).

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