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INFLATION IN THE RUSSIAN FEDERATION: DYNAMICS AND CAUSES

Vladimir TITKOV and Andreas WÖRGÖTTER

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"INFLATION IN THE RUSSIAN FEDERATION: DYNAMICS AND CAUSES"

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Presented at the Institute: July 1, 1993

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CONTENT

Abstract

This paper examines the case of inflation during the period of transition in Russia. We propose that the current inflation cannot be properly explained without understanding its roots - inflation in the centrally-planned economy where it existed in open, repressed, and hidden forms. The price liberalization implemented in January 1992 transformed all prior forms of inflation into the open form. After an initial huge price jump in January 1992, inflation in Russia has since persisted at a high level for 2 years. On the basis of inflation dynamics analysis after the price liberalization the paper argues that inflation in Russia could be characterized as extreme and increasingly chronic. We identify and analyze two groups of causes of inflation: "classical" (monetary and fiscal) and specific causes related to the Russia's transition from a centrally-planned to a market economy.

INTRODUCTION

The purpose of this paper is to analyze the case of inflation in Russia during the transition period.

In particular, it aims to:

1. demonstrate that inflation had already emerged in Russia before price liberalization;

2. analyze and explain the dynamics of inflation in Russia after price liberalization, detect possible statistical discrepancies in the dynamics of inflation and make overall estimation of current inflation in Russia;

3. determine possible causes of inflation.

In order to fulfill these purposes the paper proceeds as follows. The first chapter considers the dynamics of inflation in Russia before price liberalization, with special emphasis on the analysis of repressed inflation. The second chapter analyzes the dynamics of inflation after price liberalization. Availability of data permits us to consider the period up to October 1993. The third chapter considers possible causes of inflation. For this purpose we execute quantitative tests of monetary causes and consider fiscal origins of inflation. In addition, we analyze specific causes related to the transition from a centrally-planned to a market economy.

In order to make the paper focused and achieve its aims the effects and/or consequences of inflation in Russia such as welfare effects of inflation, exchange rate feedback, etc. are not examined. This may be subject of further studies.

The necessity for an analysis of inflation before price liberalization relates to the fact that, in our opinion, current inflation in Russia cannot be properly explained and understood without considering its roots. This question is also relevant for a correct evaluation of recent economic policies in Russia. To this extent the current price increases are inherited consequences of repressed and hidden inflation that had already existed in the former centrally-planned system.

CHAPTER I

INFLATION IN RUSSIA BEFORE PRICE LIBERALIZATION

This chapter focuses on the dynamics of inflation in Russia before price liberalization. It aims to show that high inflation already existed in Russia before price liberalization.

Inflation, by the typical definition, is the rise of the price level. This definition is the most fitting for a market economy with free pricing. In a centrally-planned economy with fixed prices, inflation manifests itself differently than inflation in a market economy.

In the scientific literature three types of inflation are usually identified in centrally-planned economies: ***open, repressed and hidden.***[1] In this chapter we analyze data pertaining to open and repressed inflation. Data on hidden inflation are deficient (per definition).

In order to analyze these data it is necessary to specify the price system that existed in Russia during the Soviet era.

1.1 The price system

Up to the end of 80's a strict centralized setting of prices existed in the Russian economy. From a nail to a space station, enterprises were not free to set prices. All prices were set by the State Price Committee. Usually these prices remained unchanged for quite long periods of time (5 - 10 years). An exception to this rule was in the so-called kolkhoz agricultural markets, where sellers were free to set prices, but the share of these markets in retail trade turnover was insignificant.

A very similar system existed for setting wages. The Ministry of Labor and Social Affairs determined all wage rates. The so-called "Tariff books" enumerated all possible job

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[1] See for example: [2, p.30]

positions for all branches of the national economy. The task of an enterprise was to adjust its positions to these books. No enterprise was free to change this payment system.

"Perestroika" reform development. In 1988 the "Law on Enterprise" was adopted. This law canceled mandatory wage rates and allowed enterprises to freely set wages. (The immediate results of this measure may be observed in table 1.)

In January 1991, the system of producer price determination was reformed. A so-called wholesale "contractual price" system was introduced for some branches of the economy. This permitted the selling of production at higher prices than state prices.

In April 1991, the retail price reform was put in force. It was characterized by an administered price rise of state prices and the imposition of "contractual prices" for retail trade.

We will consider next the dynamics of different forms of inflation in Russia before price liberalization.

1.2 Open inflation.

Up until 1988 prices and wages in Russia were almost fixed, their average rate of increase was 2-4% per year.

The first significant acceleration in the dynamics of open inflation indicators occurred in 1988 when the average wage grew by 8.3%. This was related to the liberalization of the wage setting system that was allowed by the "Law on Enterprise" (table 1).

Table 1

Average wage dynamics in Russia

Year	1980	85	86	87	88	89	90	91
Avg. wage (Rbls./month)	177.7	201.4	207.8	216.1	235.2	258.6	296.8	552.0
Change (over prev. period, *** %)		13.3	3.1	3.9	8.3	9.9	14.7	85.9

Source: "Narodnoe khozaistvo Rossiskoy Federatsii", p.37 , Moscow 1992.

A significant acceleration in price rises occurred in 1990, when state retail prices grew by 5.2% and kolkhoz market prices by 34.3% (table 1A in appendix).

1991 can be considered as the year when high open inflation began. During this year the CPI grew by 95% (jumping by 54.4% in April) and the PPI grew by 138% (with a jump of 62.9% in January). An important aspect in the analysis of open inflation is the fact that all major changes in CPI, PPI (jumps in April and January, respectively) and wage growth dynamics coincide with price reform developments as described in the section 1.1.

In a centrally-planned economy with administrative control over prices, open price level increase reveals only a part of inflation. We examine next data which characterize repressed inflation in Russia.

1.3 Repressed inflation

The main form of repressed inflation in a system with fixed prices is the *appearance of shortages of goods and services*.

Figure 1 illustrates the mechanism of repressed inflation. If prices are kept at p'* below the market clearing level p*, a part of consumer demand will not be satisfied. Shortages are the consequence in such a situation. If price controls are eliminated, we should observe both an increase in prices and in the number of transactions (assuming enterprises are not subsidized). Ideally, price liberalization should eliminate the phenomenon of repressed inflation and shortages.

Measurement of shortages is complicated, because of different levels of shortages and the difficulties with constructing aggregated indicators of shortages.

The data in table 2A (see appendix) present the average number of days when certain food products were available in stores.[2] From these data we may easily see the dynamics of

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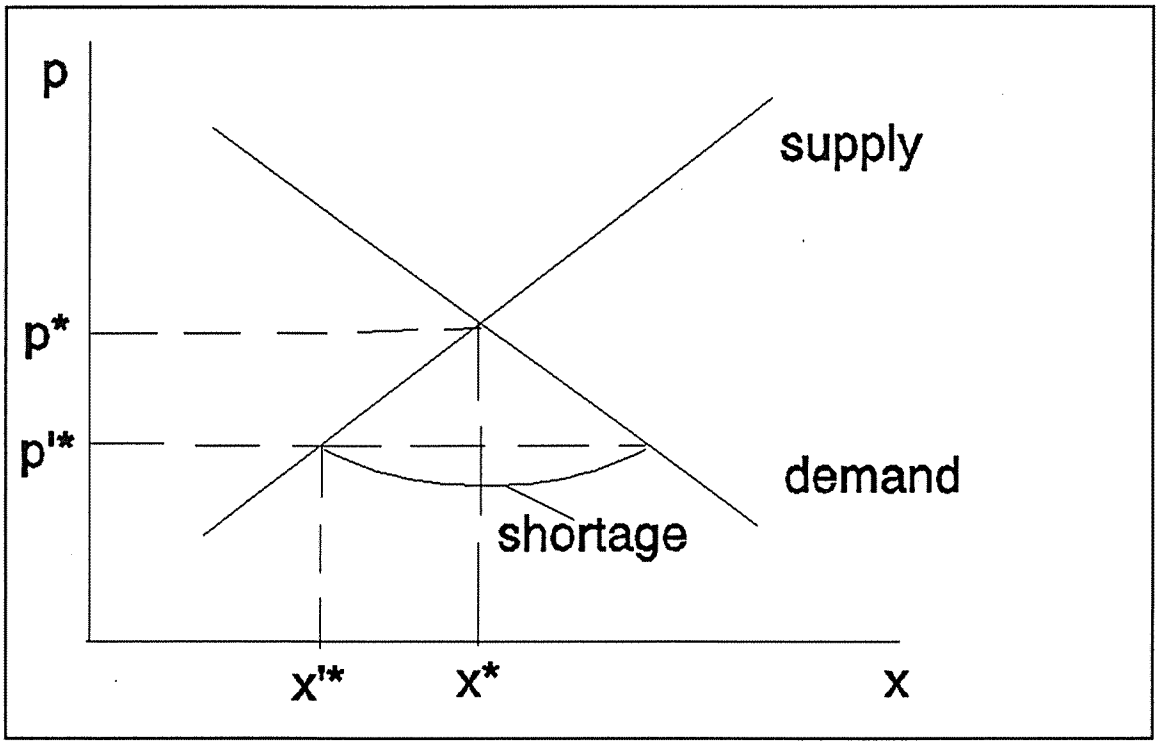
[2] These data have been collected by the Research Institute of the Ministry of Trade. Up to December 1991 data related to the USSR, later data related to the economy of the Russian Federation.

increasing shortages in the Russian (the USSR) economy. For example, flour and rice were almost constantly in stores up to

Figure 1



1990 (28 - 30) days per month, in 1990 flour and rice were available 22.1 and 13.3 days per month and in December 1991 just 5.3 and 3.3 days respectively; wafers - in 1984 - 27.1 days per month, in 1988 - 22.9, in 1990 - 10.4 days per month; cognac: in 1984 it was in daily trade, in 1988 it was available for just a bit more than half a month; household soda: in 1984 - already just 12.3 days per month, in 1988 - 5.8 and in 1990 - 3.3.

These data may be analyzed in a more aggregated form arranging them into the following 3 groups based on different dynamics of shortages:

Group 1. Sensitive to demand goods with market behavior. (see figure 2)

When demand rose (due to a rise of wages) shortages of these goods increased. This group includes flour, rice, caramel, cognac, champagne and vinegar. One of the possible hypotheses for

such a behavior of these goods is that many of them are durable and can be used by the population as a form of savings due to inflationary expectations. Of course, not all of these goods may be considered in this respect.

Group 2. Exceptions. "Surviving minimum".

(see figure 3)

This group of goods was under special control by authorities and their production received large subsidies. These are basic food goods: bread, milk, eggs, potatoes and some others. Most of these goods are not durable.

Group 3. Goods with a permanently poor supply.

(see figure 4)

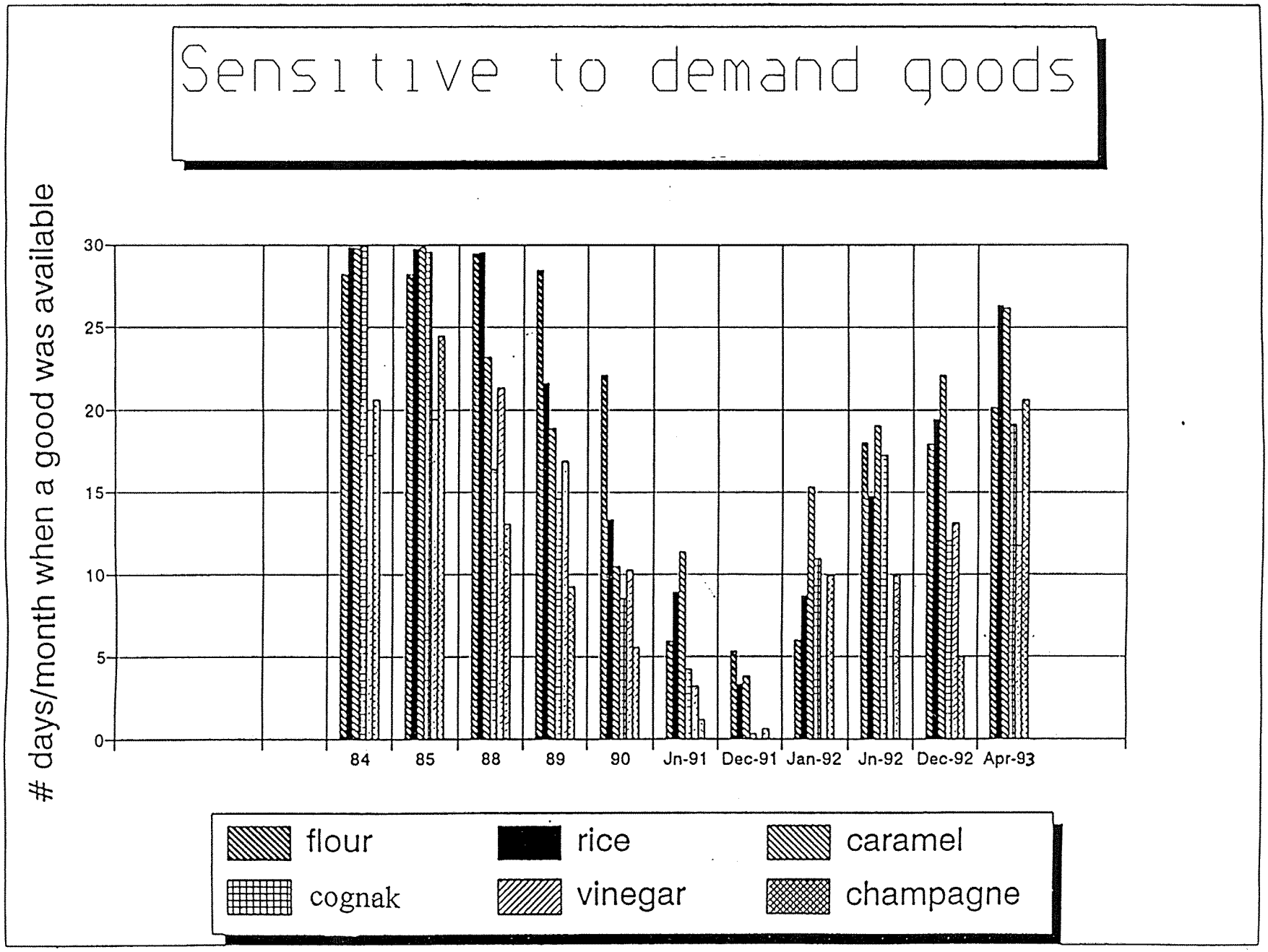
Data on these goods show that the centrally-planned economy of the former Soviet Union was in disequilibrium for a very long time. Shortages already existed for a considerable number of these goods in 1984 (data for earlier periods are not available). Examples of such goods are: meat (beef, mutton, pork), frankfurters, filled fish, yeast, tomatoes, and pears.

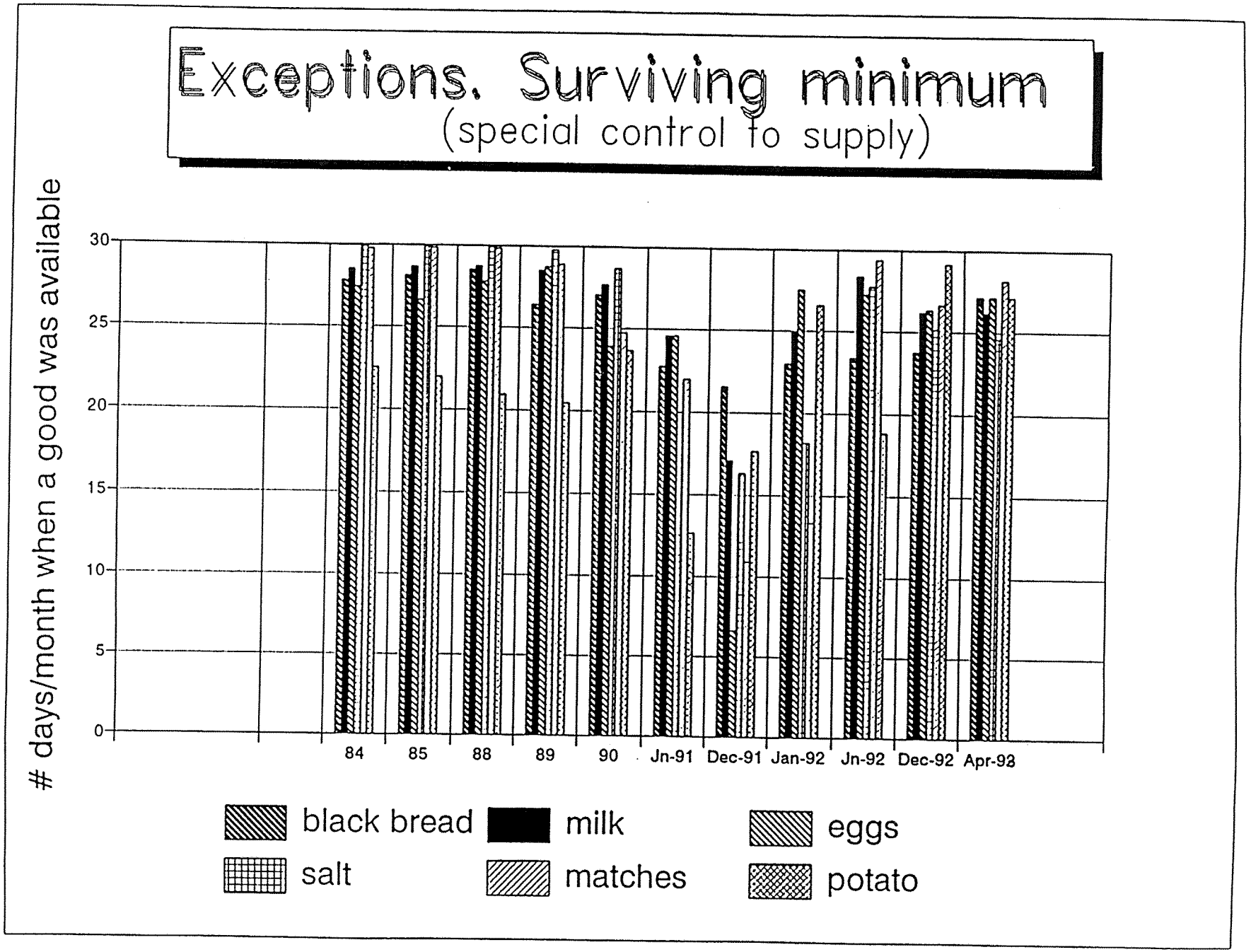
It is necessary to mention that the 1991 data for all these groups may be biased due to expected price liberalization and therefore, inflationary expectations of the population. We can observe an overshooting in shortages but nevertheless, the figures on shortages are very impressive for 1991. The demand for goods exceeded the supply considerably, so stores were constantly empty. Many goods were obtainable in stores less than 1 day per month, and the rare exceptions, goods from group 2, were available more than 15 days per month.

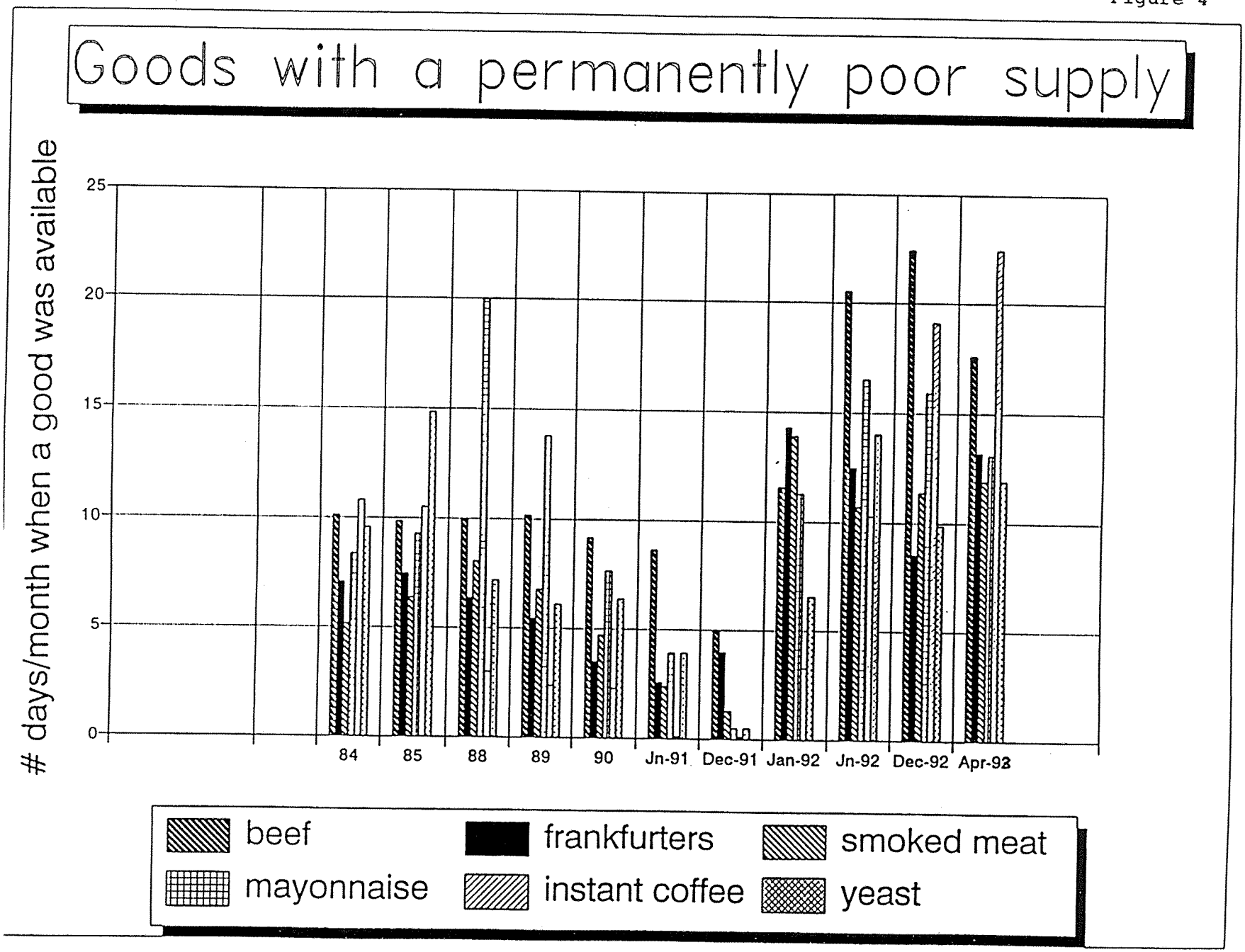
As mentioned above, the acceleration of open inflation was registered in 1991. However, the data presented in table 2A reveal a noticeable deterioration in provision of goods (i.e. acceleration of repressed inflation) already in 1990.

The existence of shortages after price liberalization in January 1992 may be considered as a measure of market imperfections. After 70-years of non-market related price administration the whole infrastructure of decentralized market activities was distorted. The result may be "frictional shortages" as illustrated in figure 5.

Figure 2


Sensitive to demand goods
days/month when a good was available
30
25
20
15
10
5
0
84
85
88
89
90
Jn-91
Dec-91
Jan-92
Jn-92
Dec-92
Apr-93
flour
rice
caramel
cognak
vinegar
champagne


Exceptions. Surviving minimum
(special control to supply)
days/month when a good was available
30
25
20
15
10
5
0
84
85
88
89
90
Jn-91
Dec-91
Jan-92
Jn-92
Dec-92
Apr-93
black bread
milk
eggs
salt
matches
potato


Goods with a permanently poor supply
days/month when a good was available
25
20
15
10
5
0
84
85
88
89
90
Jn-91
Dec-91
Jan-92
Jn-92
Dec-92
Apr-93
beef
frankfurters
smoked meat
mayonnaise
instant coffee
yeast

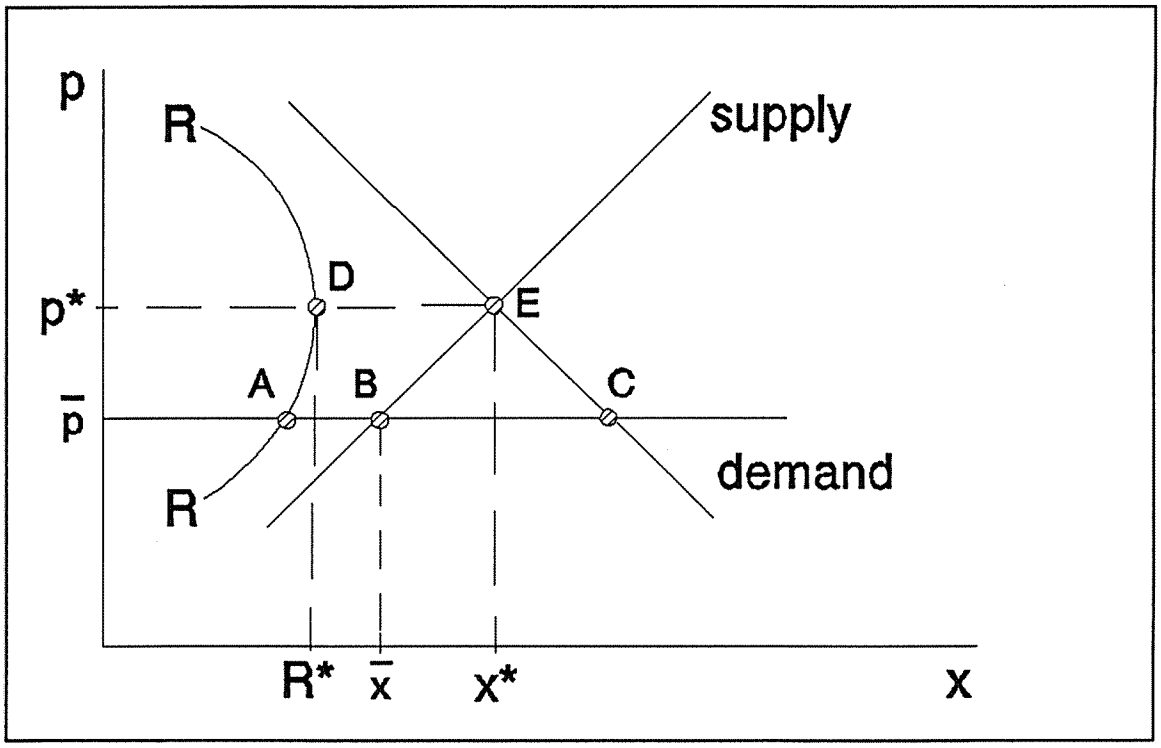


Figure 5

RR ... Realization curve

Due to market imperfections (entry barriers, imperfect information, undeveloped market infrastructure, etc.) the level of realized transactions is lower than under a market clearing level, i.e. potential supply do not meet potential demand. After all market transactions settled it turns out that demand and supply do not meet at x^*p^* (matching perfectly). The realization curve depicts transactions realized within the existing market conditions. Due to market imperfections realized transactions may have a lower level. As a consequence, frictional shortages ($X^* - R^*$) may exist even after price liberalization has been implemented. Prices may be freed, but the necessary infrastructure and market mechanisms take time to be set up. With the advancement of market development over time the RR curve moves to the right and ideally coincides with the min {D,S} schedule. The elimination of price controls may therefore:

1). increase prices (from $\bar{p}$ to p^*);

2). lower the transactions volume (from $\bar{x}$ to R^*);

3). leave shortages more or less unchanged (compare BC with DE in figure 5).

1.4 Hidden inflation

Another manifestation of inflation in a centrally-planned economy is hidden inflation. Its mechanism is as follows. In order for enterprises to improve their economic indicators within the centrally-planned system they attempted to reduce or stop production of low-priced goods and start production of high-priced goods (because the monetary value of production was one of the key indicators of the enterprise's performance). However, such substitution could sometimes be difficult due to technological capacities. Besides, regulations within the central plan might also prevent shifts of this kind. One of the ways of circumventing these obstacles, successfully used by many Russian enterprises, was to introduce so-called "improved" models that differed from the previous ones only marginally, but for which it was possible to charge higher prices with the consent of the State Price Committee. Such a mechanism allowed for price level increase without being measured as inflation.

Hidden form makes it difficult to obtain and analyze data on this kind of inflation.

* * *

On the base of the data analyzed in this chapter we can conclude that the acceleration of inflation in Russia began in 1990 and was characterized by a moderate acceleration of prices and an increase in repressed inflation. These may be lagged effects of wage growth acceleration which began two years earlier in 1988 and later reflected on the market. High inflation started

in 1991 with considerable growth of open inflation and repressed inflation in the form of increase of shortages plus hidden inflation.

This background allows us to analyze and explain the dynamics of inflation after price liberalization in January 1992. Inflation in Russia was already just around the corner when price liberalization was introduced in January 1992.

CHAPTER II

INFLATION DYNAMICS ANALYSIS AFTER PRICE LIBERALIZATION

The purpose of this chapter is to consider key inflation indexes available in Russia in order to analyze the dynamics of these indexes, and, in particular, to estimate the speed of inflation and determine possible statistical discrepancies in analyzed dynamics of inflation.

We begin by considering price liberalization reform developments to provide a framework for our analysis.

2.1 Price liberalization reform development

Price liberalization reform was put into effect in January 1992. A considerable part of wholesale and retail prices was liberalized. The only prices that remained regulated were those of most energy sources (oil, gas, coal, etc.), some basic food products, public services, rent of apartments for householders and services for householders (water, gas, electricity supply, telephone fees). In March 1992, local authorities were permitted to liberalize prices for food products. Later, oil products prices were gradually liberalized. One of the latest measures, liberalization of coal prices, was undertaken on July 1, 1993. So, currently most prices, including prices for basic food products and raw materials are fully liberalized.

As far as wholesale level price mechanism is concerned there were some restrictions on price rises imposed by monopolistic production units in the form of restricting the rate of profitability of these enterprises. Retail sellers were restricted to adding only 25% to the wholesale price of purchased goods. But at the present time all these restrictions have been canceled.

2.2 Dynamics of inflation analysis

> *"High inflation means different things to different people. In Germany it means 3 percent or more per year; in Mexico, 20 percent per year; in Brazil, 15 percent per month; and in Argentina 6 percent per week. While Cagan defined hyperinflation as an inflation rate of 50 percent per month, or 12,875 percent per year, our threshold is a more modest 1,000 percent per year. In particular, we take extreme inflation to be rates above 15 to 20 percent per month, sustained for several months"*
>
> "Extreme Inflation: Dynamics and Stabilization"
> Rudiger Dornbusch, Federico Sturzenegger, Holger Wolf
> Brookings Papers on Economic Activity, 2:1990, p.2

There are two types of inflation indicators available in Russia: Consumer Price Index (CPI) and Producer Price Index (PPI). Russian CPI is analogous to any Western CPI. The exact translation of another index is "wholesale industrial price index", but it is very similar to a conventional PPI by the methodology of its computation. In this paper we use the PPI abbreviation for this index.[3]

Except for the CPI and the PPI, specific indexes are computed by the State Statistical Committee of Russia. For consumer prices these specific indexes are for food products, for non-food goods, for services and for alcohol. For producer prices the indexes for different branches of industries are computed.

Unless otherwise specified changes in the CPI and the PPI indexes are analyzed over the previous period. Annual (or aggregated for a period) growth rates of these indexes are usually presented by the State Statistical Committee of Russia in the form of an "annual average" (or "period average"), that is average growth rate for this year (period) compared with the

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[3] In some other studies this index is called "WPI" (wholesale price index).

previous year (or the same period of the previous year) and in other cases as the growth "within period" rate.

The first index which will be considered is the PPI because *inflation at the producer market may be considered as a greater contributor to total inflation than inflation at the consumer market.* Verification of this statement will be given below.

2.2.1 Producer price index dynamics

In January 1992 the PPI jumped 382% compared with December 1991. Among branch producer price indexes the highest jumps were registered in the petro-chemical industry (696%), the chemical industry (502%) and in non-ferrous metallurgy (500%). The lowest jump was registered in the light industry (230%).

Between February 1992 and October 1993, the average monthly growth rate of the PPI was 25.6%. The annual average growth rate for 1992 compared to 1991 is 1,949%. The growth rate from December 1991 to December 1992 was 3,275%.

Table 2

Key statistical characteristics of the PPI from February 1992 to October 1993

Variable	# Obs	Avg. monthly growth rate	Std. Dev.	Min (%)	When
PPI	21	25.6	14.3	13	Aug-92

The lowest PPI growth rate was registered in August 1992 at 13%. This minimum is related to the payments crisis in the national economy.

Branch producer price indexes will not be analyzed due to gaps in monthly data. As far as the results of branch producer price indexes average annual increase in 1992 compared with 1991 is concerned, it is possible to detect that the leadership in

price rise belongs to two groups of branches. First is the metallurgy complex (ferrous and non-ferrous metallurgy). Prices in these branches rose by 3,085% and 2,820% respectively compared with 1991.

The second group is the fuel-energy complex. Prices for the production of the fuel-energy complex branches had been regulated for a long period of time. However, periodical considerable administrative price rises made them leaders among branches. Branches of this complex include[4]: fuel (3,323%), electric energy (2,675%), petro-chemical (2,894%), chemical (2,293%). Such high price rise may be explained by the intention of government to cut subsidies to these branches.

The lowest price rises were registered in the light industry (874%), timber processing and timber (1,465%) and the food industry (1,722%). Relatively low growth of these PPIs may be related to greater competition in these industries and shrinking demand from consumers.

Results of price increases during the first nine months of 1993 compared with the same period of 1992 (period average) are characterized by a lower price dispersion among different branches than during the first year of reform. The highest price increases were registered in the fuel industry (1949%), electric energy (1317%) and the food industry (1095%). The lowest price increases were in forestry, timber processing, the paper industry (691%) and the light industry (624%). But remarkable is that in the construction materials industry (934%) and machine construction (849%) price increases exceeded those in non-ferrous metallurgy (858%), ferrous metallurgy (810%) and in the petro-chemical industry (775%).

Therefore, it is possible to conclude from these data that in 1992, prices in branches that produce raw-materials and semi-finished goods rose remarkably faster than prices of branches

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[4] Annual (period) average price rises are given in brackets.

producing final goods. During the first nine months of 1993 compared with the same period of 1992, such a tendency was partially overcome; growth rates differentials among branches became smaller than in 1992 and prices in some branches producing final goods rose faster than in the raw-materials producing branches.

2.2.2 Consumer price index dynamics

In January 1992 the CPI jumped by 245%. The highest jump was registered for food (306%) and the lowest one for services (130%).

After January 1992 the CPI growth rates declined until August of 1992 when they reached their lowest rate of 9% (as well as the PPI); in the same month all other CPI specific indexes bottomed. After August 1992 a rise in the speed of CPI changes was registered. Since that time CPI dynamics was characterized by oscillations with tops in November 1992 (26%), August 1993 (26%), and bottoms in March (19%) and November (15%) of 1993.

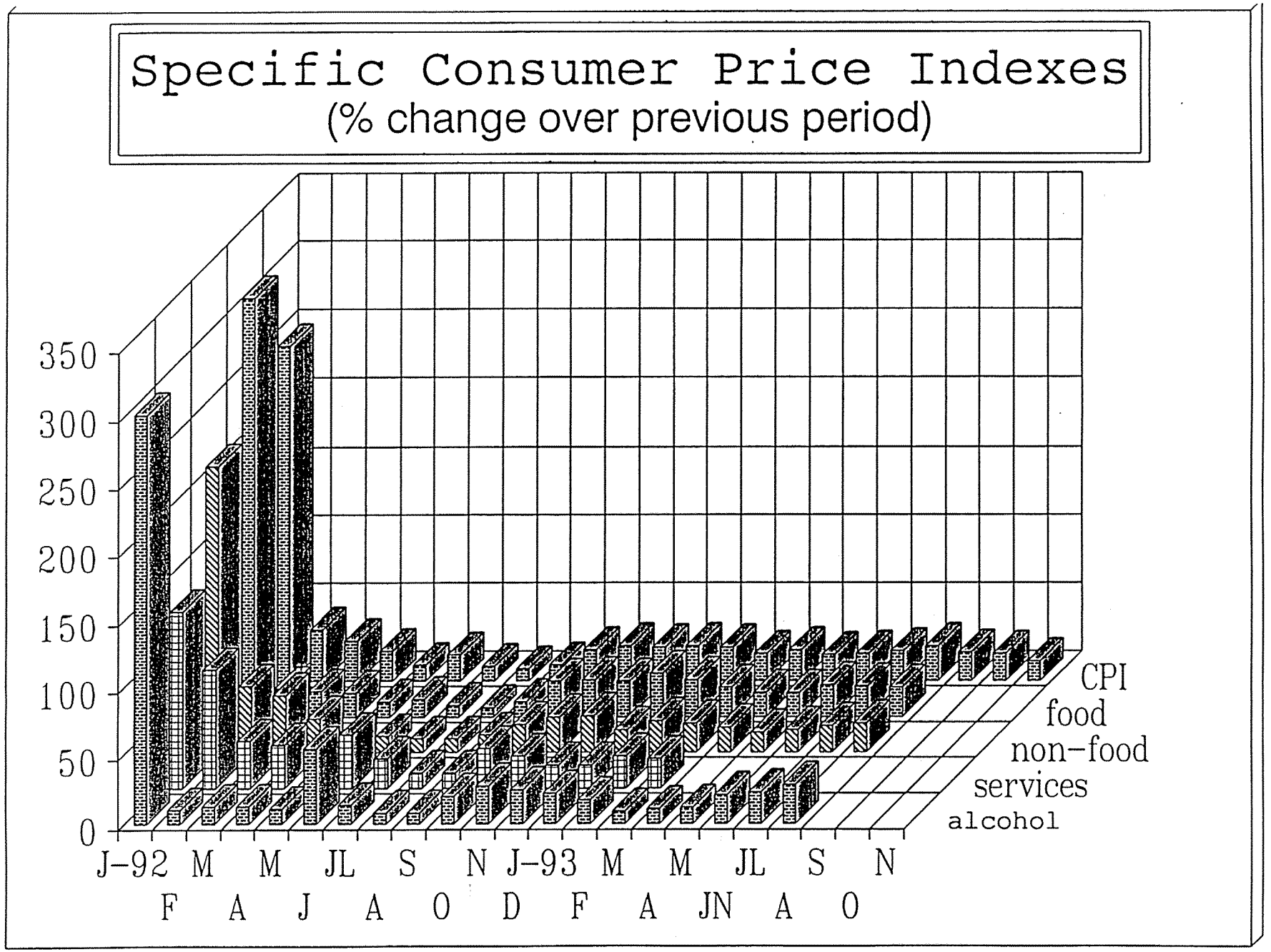
The declining trend in CPI changes from January to August 1992 may be explained by the huge payments crisis and cash shortage in Russia's economy from February 1992 to the beginning of Fall 1992. A considerable part of wages earned in that period was paid only in September-October. Late CPI fluctuations fit well to M2 dynamics lagged by 4 months (see ch.3).

Table 3

Key statistical characteristics of the CPI from February 1992 to November 1993

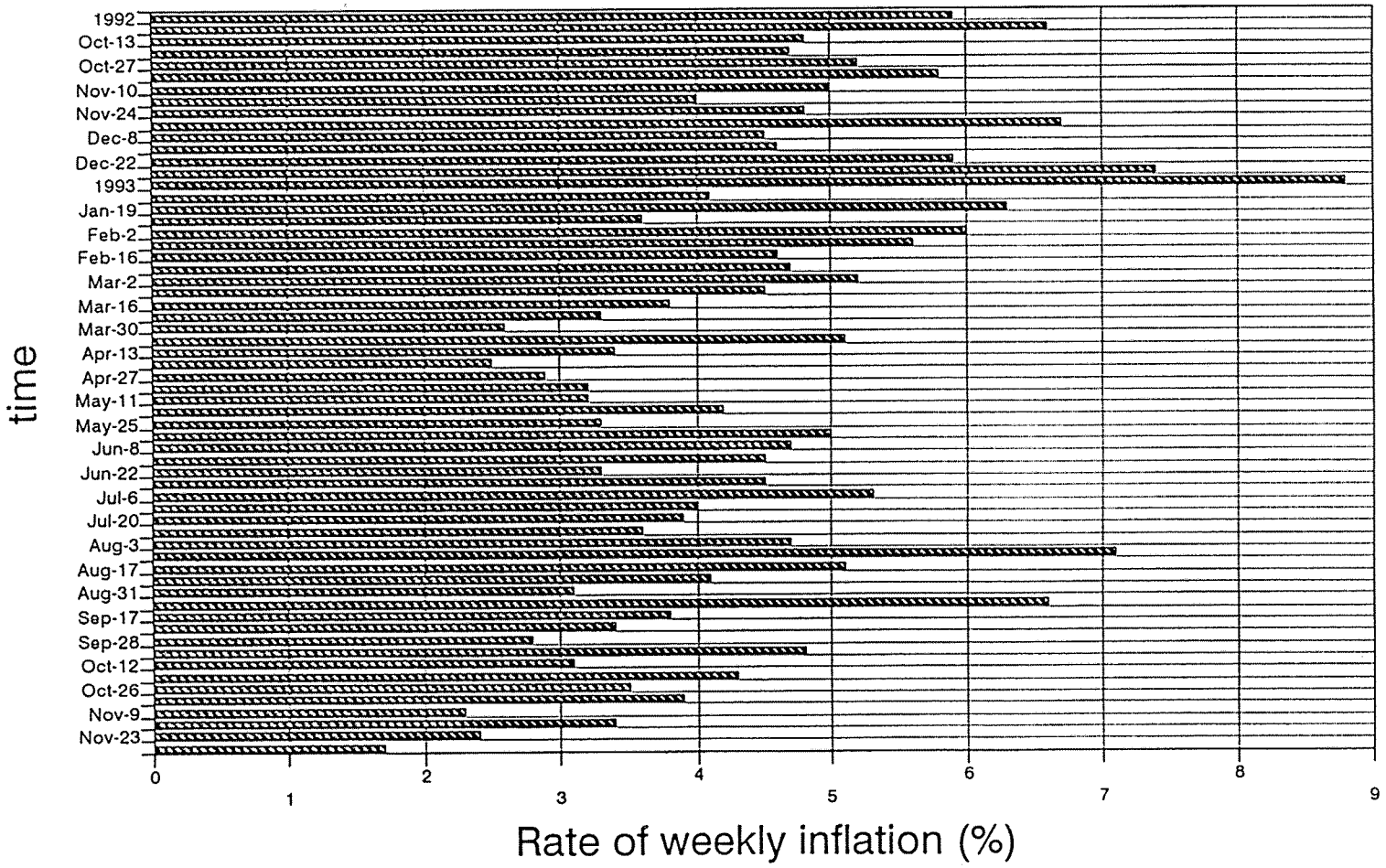
Variable	# Obs	Avg. monthly growth rate	Std. Dev.	Min (%)	When
CPI	22	21.1	7.87	9	Aug-92

The average monthly change of the CPI from February 1992 to


Specific Consumer Price Indexes
(% change over previous period)
350
300
250
200
150
100
50
0
J-92 M M JL S N J-93 M M JL S N
F A J A O D F A JN A O
CPI
food
non-food
services
alcohol

WEEKLY INFLATION IN RUSSIA

(% change over the previous period)



November 1993 is 21.1%. The average weekly change in CPI from September 29, 1992 to November 30, 1993 was 4.47%. The average annual growth in the CPI in 1992 compared with 1991 was 1,355%. CPI growth from December 1991 to December 1992 was 2,509%.

Among specific consumer price indexes alcohol and food have the lowest averages during the period from February 1992 to August 1993 (18.4% and 19.1% per month respectively), while prices of services have the highest average from February 1992 to March 1993 (27.1% per month).

2.2.3 Biased measurement of CPI and PPI

An important aspect in the analysis of the dynamics of inflation in Russia is the determination of possible discrepancies in this dynamics. We suppose that the following discrepancies have crucial importance:

(i). Different prices of cash and money in deposits.

It is known that in a socialist economy money did not play the same role as in a market economy, because enterprises were not free to use their money as they please. Consequently, money in deposits was not money in the usual meaning of this notion in a market economy, due to the problems with its usage. Economic reform started to change this situation. The channels of transferring deposit money into cash money emerged. Since 1990 till the beginning of 1993 many firms offered services for transferring money from deposits into cash money. Initially the price of cash money to money in deposits was 3:1 (1 cash ruble cost 3 rubles in deposits). Since price liberalization the prices of cash and money in deposits have been converging. Currently there is practically no difference any more.

Therefore up to the middle of 1993 it was necessary to distinguish prices in cash and prices in money in deposits. Even many expensive goods in stores had 2 prices: in cash or by bank

transfer. From the price indexes point of view it is impossible to determine where prices nominated in cash and where prices nominated in bank deposits were registered. This fact imposes a bias in the computation of average prices, and as a consequence in the dynamics of the index.

(ii). Payments problems

From February 1992 till Fall 1992 a serious payments crisis existed in the Russian economy. It revealed itself via considerable growth of inter-enterprise arrears.

That is why many of producer prices registered by the PPI during the period of the crisis were not prices of real bargains, but just prices of nomination of bargains. The same situation was with wages. A considerable part of wages earned from February to Fall 1992 was paid only in Fall 1992. During the same period a considerable part of inter-enterprise arrears was cleared by sharp expansion of the Central Bank of Russia credits.

This episode provides reasons for the decline of the CPI till August 1992 and its sharp rise during Fall. It also explains why the lowest PPI change was registered in August.

(iii). Shortages and barter trade

In spite of a long period of price liberalization, shortages still exist in the consumer market in Russia. As we mentioned in chapter 1 it is very difficult to have aggregated data on shortages. Data for the average number of days per month when a good was available in stores during the period after price liberalization are presented in table 2. We can see improvements in the provision of goods compared with the period before price liberalization, but still there is poor provision of such goods like meat, frankfurters, etc.

Barter trade still take place at the producer market after price liberalization. According to a report in "Economika i

zhizn" (N18, 1993, p.1), in the first quarter of 1992 its share grew considerably compared with 4-th quarter of 1991.

These two factors put a downward bias on the CPI and the PPI indexes, respectively.

(vi). Price dispersion over the regions

Table 4

Price dispersion in Russia

Price (in Rubles per kg)				
Good	Avg.	Min	Max	Max pr./Min pr.(*)
Beef	597.85	143.03	1026.00	7.17
Sausage, boiled	829.84	350.00	1700.00	4.86
Butter	1221.59	98.91	2580.00	26.08
Cheese (brine)	1279.25	350.00	3000.00	8.57
Eggs (per 10)	211.53	59.24	515.00	8.69
Bread, black (per loaf)	34.06	4.70	93.00	19.79
Bread, white (per loaf)	43.02	1.18	113.78	96.42

Source: "Delovoi Mir", N86 (654). May 8, 1993, p.7
[Data of the State Statistical Committee of the Russian Federation]
(*) Authors' computations

Among the data available on price dispersion, we selected prices for food products as the most homogeneous among goods (for example high price dispersion for shoes may be related to product differentiation within different kinds of shoes). At the same time food products like sugar, bread or butter have a high level of homogeneity. Data on price dispersion are presented in

table 4. We would like to emphasize that these data are for May 8, 1993 i.e. practically 1,5 years after price liberalization.

Such a high degree of price dispersion creates considerable problems with the derivation of price indexes, because it requires enlarging the amount of observations and thus biases the indexes in the case of extrapolation of a price observed in one territory into other territories.

2.3 Overall estimation of inflation dynamics.

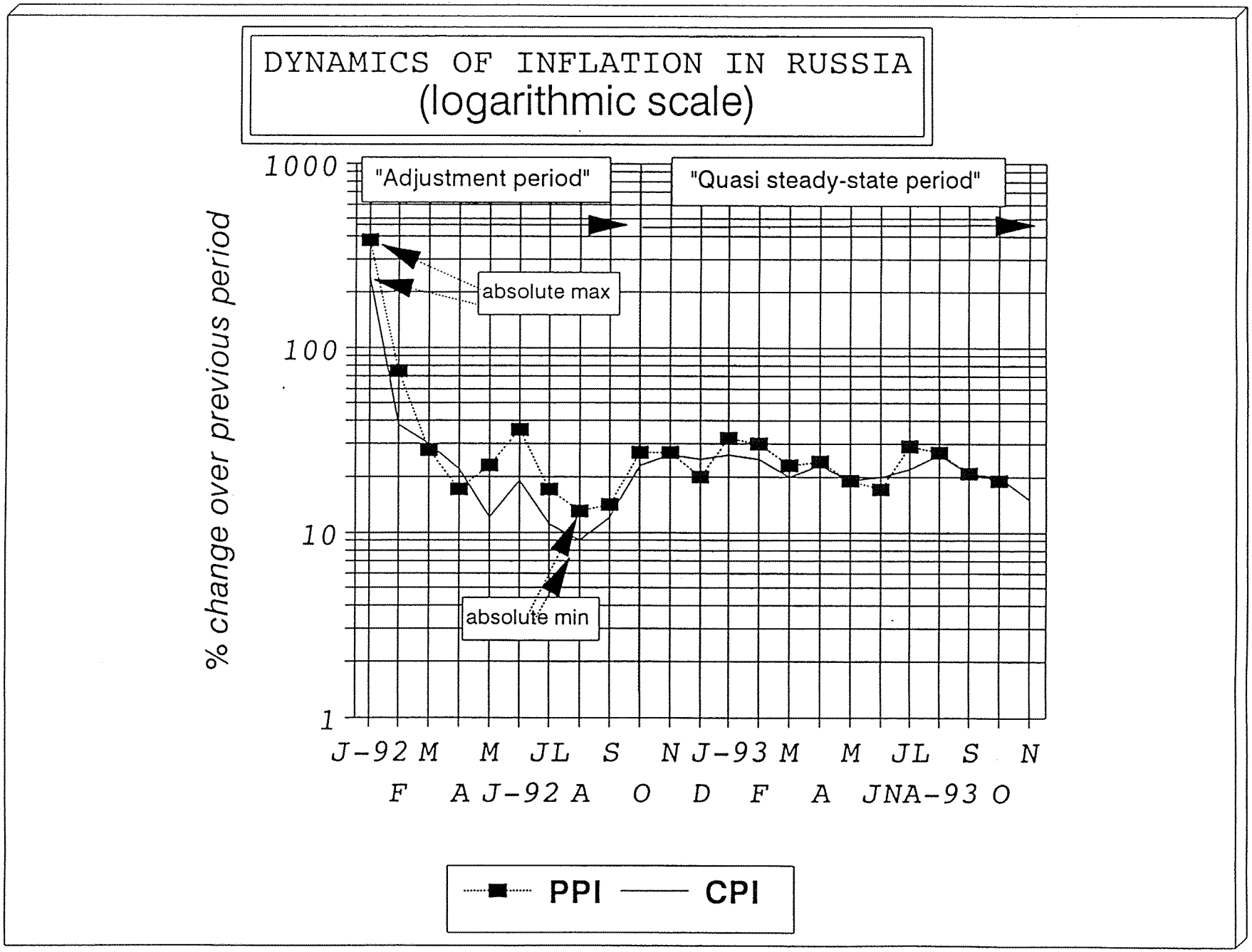
Analyzed data on CPI and PPI dynamics do not provide evidence of a gradual decline of inflation in Russia. For almost two years it was maintained at two digits monthly level.

We suppose that the overall dynamics of inflation in Russia could be divided into two periods:

1. "Adjustment period" from January 1992 to September 1992. During this period PPI and CPI showed their highest magnitudes (382% and 245% respectively) in January and their lowest magnitudes in August (13% and 9% respectively). January-February could be considered as a **"shock therapy reaction" sub-period.** If a market were perfect then after the "adjustment period" it should reach equilibrium and inflation should decline considerably (as it occurred in most Eastern European countries). However, because of different reasons (the most important of them in our opinion are considered in chapter 3) this did not happen and the second period could be detected.

2. "Quasi steady-state period" from October 1992 up to the October 1993. During this period inflation oscillations "stabilized" within the asymptotic limits from 17% to 32% per month. The character of oscillations was neither dumping nor accelerating.

Classification of inflation in Russia is quite a difficult task. We suppose that the first 6 months of the "adjustment period" could be characterized as a period of hyperinflation as defined by Cagan. Since July 1992 inflation in Russia better fits


DYNAMICS OF INFLATION IN RUSSIA
(logarithmic scale)
"Adjustment period"
"Quasi steady-state period"
absolute max
absolute min
% change over previous period
1000
100
10
1
J-92 F M A M J J A S O N D J-93 F M A M J J A S O N D
PPI
CPI

the definition of extreme inflation, worked out by Dornbusch, Sturzenegger and Wolf (see epigraph to this chapter). Therefore inflation in Russia could be characterized as a border case between high and hyperinflation, but not as hyperinflation. The duration of inflation (in 1991 in high open and repressed form and in 1992-1993 in extreme open form) allows us to characterize it as increasingly chronic inflation. Combining these two characteristics we could characterize inflation in Russia as extreme and increasingly chronic.

Table 5

Key PPI and CPI characteristics during "adjustment" and "quasi steady-state" periods

variable	#obs	avg.	std. deviation	min	max
"ADJUSTMENT PERIOD": from January to September 1992					
PPI	9	67.22	119.59	13	382
CPI	9	44.22	75.91	9	245
"QUASI STEADY-STATE PERIOD": from Oct. 92 to Oct. 93					
PPI	13	24.23	4.79	17	32
CPI	13	22.77	2.62	19	26

In order to estimate the role of CPI and PPI in the total inflation process, it is necessary to emphasize that during the "adjustment period" producer prices rose significantly faster than consumer ones. During the "quasi steady-state period" the tendency of CPI and PPI speed convergence was observed. However, in spite of this tendency producer prices were still rising faster. That is why the PPI could be considered as being the more important contributor to total inflation in Russia than CPI. This is especially valid for the inflation in Russia since 1990.

Compared to December 1990 (taken as 100%), by October 1993 the cumulative growth of the PPI is extremely higher than CPI: 235,765% and 50,357% respectively! Higher PPI growth could be explained by the fact that the initial gap between the world price level of consumer goods was remarkably lower than that for producer goods. Moreover, many of enterprises occupy monopolistic positions on the market.

CHAPTER 3

CAUSES OF INFLATION

To identify the causes of inflation is one of the most difficult and up-to-date questions. In spite of the many common causes, inflation in each country has its own specificity. This specificity is especially remarkable in the case of a transition in Russia.

In this chapter we concentrate on the economic, and not the political causes of inflation. We distinguish two groups of them: "classical" causes of inflation that are related to the rise of the money supply as well as fiscal problems, and specific causes related to the transition process of the Russian economy from a centrally-planned to a market economy.

3.1 Classical causes

3.1.1 Monetary causes

"Inflation is always and everywhere a monetary phenomenon"

Milton Friedman "Inflation: Causes and Consequences", p.17.

In accordance with the classical theory the growth of money supply is one of the key reasons of inflation. The following Russian monetary indicators are available for analysis: currency in circulation, M2 that includes currency in circulation, time and demand deposits and total credit of the Central Bank of Russia. Data on these aggregates are presented in table 6. It follows from this table that during 1992 total CBR credit has risen by more than 27 times, currency in circulation - by more

Table 6

Key Russian monetary indicators

Total CBR credit (R blns)	Change in total CBR credit (%)	Currency in circulation	Change in currency	M2	Change in M2 (%)
Dec-91 194					958
1992					
Jan 233					
Feb 325	39	209	14	1173	12
Mar 485	49	248	18	1338	14
Apr 687	42	318	28	1478	10
May 833	21	366	15	1614	9
Jun 1359	63	455	25	2067	28
Jul 2009	48	643	41	2594	26
Aug 3117	55	804	25	3396	31
Sep 3866	24	950	18	4465	31
Oct 4101	6	1146	21	5671	27
Nov 4507	10	1380	20	5969	5
Dec 6894	53	1716	24	7184	20
1993					
Jan 7573	10	1946	13	8491	18
Feb 8484	12	2322	19	9343	10
Mar 10530	24	2601	12	10932	17
Apr 11977	14	3343	29	13434	23
May 12733	6	4041	21	15982	19
Jun 14205	12	5131	27	18557	16
Jul 16220	14	6272	22	22215	20
Aug 18058	11	7449	19	25261	14
Sep 20168	12	8582	15	26099	3
Oct 21965	9	9992	16	28866	11

Source: "Russian Economic Trends", v.2 N1 p.14 and "Russian Economics Trends Monthly Update" November, 1993, p.10

than 8 times and M2 - by more than 6 times. During the first eight months of 1993 the growth rates of monetary aggregates declined, but still remained quite high.

Naturally the key question is: "What is the relation between the growth of money supply and the speed of inflation?". In order to answer this question we analyze M2 and inflation relations.

Figure 1.A (see appendix) shows correlation coefficients between M2 monthly growth rates and the CPI with lags ± 6 months. From these computations it follows that the strongest dependence exists between M2 and the CPI lagged forward by 4 months.[5] The coinciding results may be obtained by regression analysis. However, it was found that CPI dynamics may be better explained by M2 growth rate lagged by 4 months and by the CPI change in previous month. This regression generates acceptable t-statistic. The regression outcome is presented below. All coefficients, except the constant term are significant. The value of R^2-adjusted is equal to 0.65 and is relatively high.

Dependent variable: CPI		From 92:7 until 93:11		
Total # observations 17		Degrees of freedom 14		
	Lag	Coefficient	Std. error	T-statistic
1. Constant	0	4.19	3.51	1.19
2. CPI	1	0.44	0.18	2.48
3. M2	4	0.37	0.11	3.11

Regression model: $CPI_{(t)}=4.19+0.44CPI_{(t-1)}+0.37M2_{(t-4)}+\epsilon_t$

The strongest dependence between the PPI and M2 lagged within the interval ±6 months exists (as well as for the CPI, see figure 1.A in appendix) with a lag of 4 months. (Due to the low level of autocorrelation in the PPI time series previous PPI changes do not allow better explain current PPI dynamics).

It spite of the high reliability of coefficients, this regression has a rather low level of R^2-adjusted = 0.41. One possible reason for this is considered in section 3.2.1 below.

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[5] Similar results were found in several studies on Russian inflation. See for example: [4], p.20

Dependent variable: PPI		From 92:7 until 93:10		
Total # observations: 16		Degrees of freedom: 14		
	Lag	Coefficient	Std. error	T-statistic
1. Constant	0	13.34	2.91	4.58
2. M2	4	0.48	0.14	3.38
Regression equation: $PPI_{(t)} = 13.34 + 0.47M2_{(t-4)} + \epsilon_t$				

From the above analysis it is possible to conclude that inflation in Russia depends significantly on past M2 growth. This dependence is strongest for M2 lagged by 4 months.

One of the key reasons for growth of money supply in Russia is the need for covering government expenditures. In the next section we will consider the state budget deficit and government revenue from seigniorage.

3.1.1 Fiscal causes and seigniorage

Quite often, it is possible to find certain inconsistency in Russian budget statistics. The deficit of the State Budget of the Russian Federation for 1992 reported by the Russian Government in "Russian Economic Trends" is quite surprising. It is reported to be just 3.8% of the GDP in 1992. Almost all G7 countries have similar of even larger budget deficits. Moreover, in the first and second quarters of 1992 a small budget surplus was reported. For the first quarter of 1993, the budget deficit was reported to be 6% of GDP. Such a remarkably low budget deficit could explained by the fact that a considerable part of the state subsidies are paid either via extra-budgetary funds or by the Central Bank of Russia directly to enterprises via authorized commercial banks.

Table 7 presents data on distribution of the state subsidies in 1992. It follows from the table that the size of unbudgeted

subsidies in 1992 considerably exceeded the size of the budgeted ones and may be estimated to vary from 17.9% to 36.8% of GDP. It is obvious that incorporation of unbudgeted subsidies would considerably increase the size of the government budget deficit.

By the IMF estimations, state budget deficit including unbudgeted import subsidies was 10% of GDP for 1992 and 20% of GDP for 1993 (Source: World Economic Outlook, IMF, Washington, October 1993, p.86).

Table 7

RUSSIAN FEDERATION: State Subsidies in 1992

(in percent of GDP)

	Lower Bound	Upper Bound
Budgeted subsidies	**10.8**	**10.8**
Import subsidies	3.7	3.7
Unbudgeted subsidies	**17.9**	**36.8**
Import subsidies	13.8	13.8
Directed credits	4.1	23.0
Central Bank	3.2	18.0
Ministry of Finance	0.9	5.0

"The "lower bound" bases the subsidy component of credits on the difference between the Central Bank of Russia discount rate and the lower rate charged to borrowers. The "upper bond" treats the entire credit as a grant."

Source: "World Economic Outlook", IMF, Washington, 1993, p.89

The problems described above show that the budget statistics of the Russian Federation still cannot be considered as being reliable for economic analysis. Meanwhile, the IMF estimates for the budget deficit including unbudgeted import subsidies could be characterized as high, but not as an extreme one.

"A government can live for a long time, even the German government or the RUSSIAN GOVERNMENT, by printing paper money. That is to say, it can by this means secure the command over real resources, resources just as those obtained by taxation."

Keynes, J.M. (1923)
"A Tractate on Monetary Reform"
(quotation by [2] p.11)

Due to the fact that market methods for budget financing are not developed, issuing money remains one of the key methods of financing subsidies in Russia. However, in contrast to many countries, a considerable part of seigniorage revenue in Russia relates to the deposit (credit), rather than cash money creation. Total seigniorage revenue in 1992 was 42% of GDP. During this year we can observe an enormous volatility in the proportion of seigniorage revenue to GDP.[6] The lowest value of this ratio occurred in January 1992 with 11%, the highest in August with 89%.

Therefore the rise in the money supply appears to be a crucial cause of inflation in Russia. The main cause of rising money supply is the need to cover government expenditures.

A significant part of government expenditures is related to attempts at changing the structure of the economy inherited from the former system.

3.2. Specific causes

Besides these monetary causes that may be considered as one of the most important sources of inflation in Russia, we suppose it is necessary to determine specific causes related to the particular circumstances of transition from a centrally-planned to the market economy in Russia.

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[6] Data source: Russian Economic Trends, vol.2, N1, p.19

3.2.1 Structural causes

Priority to the development of heavy industry, centralization and enlarging of enterprises was one of the key features in the former centrally-planned system. This approach represented in the orientation on a so-called "industrial type of development".[7] The following table shows the growth of the share of heavy industry in the economy of the former USSR. By the end of the 80's heavy industry had dominated. A considerable part of heavy industry was involved in military production.

Initial "perestroika" targets for the restructuring of the economy and conversion were oriented towards cutting subsidies and limiting investments in military-industrial complex branches. But as experience has shown, the restructuring of economy and the conversion of the military-industrial complex required increased investments in order to maintain technological processes. That is why the restructuring of Russian economy and the conversion of military-industrial complex can be considered as an important contributor to inflation in Russia.

Table 9

Growth of share of heavy industry in the USSR

Year	Share of heavy industry in GDP
1926	39.9
1940	61.0
1960	72.5
1989	85.4

Source: "Dengy i Kredit" Moscow, 1989, N10, p.31

[7] The specificity of a centralized system is that the planning and the management of large production units is much easier than of many smaller enterprises.

Ineffective allocation of resources and lack of competition is a consequence of these problems.

3.2.1.1 High share of loss-making enterprises and soft budget constraint

In January 1993 the share of loss-making enterprises in the Russian Federation was 21% of total number of enterprises. In the Altai republic the amount of loss-making enterprises was - 37.6%, in Tomskaia oblast - 34.7%, in Tuva republic - 36.9%, Saha (Yakut) republic - 42.2%. The "record" belonged to Chukotski autonomous district, where 47.3% of all enterprises were loss-making.[8]

In monetary terms, the amount of losses done by loss-making enterprises in January 1993 was 82379.4 millions of Rubles, which is 9.9% of the amount of profit received by the other 79% of enterprises (837.7 billions of Rubles) during the same period. Data on the share of employees of these enterprises in total employment and their share in the physical volume of output are not available.

In the market system, firms making loses either have to find sources for financing, as a rule, strictly regulated by market mechanisms (own sources, bank credits etc.) or are driven out of business. In Russia, on the contrary, enterprises, that are in mass still not privatized, are accustomed to relying on state subsidies in form of direct transfers or low interest credits. In addition the problem of finding a solution for loss-making enterprises is hindered by the lack of experience in applying bankruptcy legislation and by the fear of mass unemployment and sharp decline in production shared by the general public as well as by decision-makers at all levels of government. For the above

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[8] Data source: Statisticheski bulleten N3, State Statistical Committee of the Russian Federation, Moscow 1993.

reasons, the state continues the practice of subsidizing vast bulk of enterprises and the latter expect state support and make their decisions accordingly. This constitutes a soft budget constraint. The problem is exacerbated when some profitable enterprises receive state subsidies as well.

Therefore, the soft budget constraint that a significant portion of enterprises faces is definitely one of the key specific causes of Russian inflation. This makes it more clear why the growth of PPI is higher than that of the CPI in Russian economy.

3.2.2 Transformation of repressed and hidden inflation into open form.

As we show in the first chapter high inflation emerged inside the former system, but was revealed in a considerable part in non-price forms. An important aspect is that the inflation mechanism existed as well. Inflationary tendencies rose over a long period and the economic mechanism had been adjusting to inflation. Price liberalization in January 1992 lead to the transformation of all existing forms of inflation into the market form.

Hence it was not reasonable to expect that price liberalization would immediately dismiss the inherited inflationary mechanism.

3.2.3 Shortages as a contributor to inflation.

One of the specific features of transition in Russia is that even one and a half years after price liberalization shortages still exist on the market (see table 2A on shortage dynamics in appendix). Of course shortages are much lower than before price liberalization, but they are still not overcome. There may be

several possible explanations for this phenomenon. The first is mafia control over retail trade. The mafia attempts to have a monopoly power over the market in order to obstruct the development of competition and have freedom in rising prices. The second reason is an underdeveloped trade infrastructure and trade customs. It implies low density of stores and a lack of storage capacities in existing stores. Stores are not in a position to provide a supply of non-durable goods on a permanent basis. Thus stores prefer to sell large amount of goods for a short time and at another time no goods are sold. Consumers realize this and buy goods that are in shortage in a large amounts when they are available. The third reason is underdeveloped local food industry, capacities of which are not sufficient for providing the required level of supply. A high level of inflation is an obstacle to increasing production capacities. The low local price level on basic consumer goods (in hard currency terms) creates restrictions on import.

Shortages contribute to inflation in two ways. First, shortages force buyers to purchase goods in large amounts at prices that are nominated by a store. Such a behavior makes price rises easy to implement for stores. Second, shortages distort expenditure streams that decrease the velocity of money circulation. Such a situation creates the need for additional money emission.

CONCLUSIONS

Inflation was already present before price liberalization for a long period of time during the centrally-planned era in Russia. It manifested itself considerably in non-market forms. 1990 should be considered as a year of significant acceleration of inflation in open, as well as in repressed forms. 1991 is the year of the beginning of high inflation in Russia. Price liberalization implemented in January 1992 transformed existing forms of inflation into the open form. As a consequence, in that month, huge price jumps of the PPI and the CPI were registered.

Overall dynamics of inflation after price liberalization could be divided into two periods: the "adjustment period" from January to September 1992 and the "quasi steady-state period" from October 1992 to October 1993. During the "adjustment period" the PPI and the CPI reached their absolute maximum (in January) and absolute minimum (in August). After this period inflation "stabilized", but in contrary to all Eastern European countries "stabilized" at high level: from 17% to 32% per month. Such dynamics allows us to determine the second period in inflation dynamics: "quasi steady-state period" (from October 1992 up to October 1993).

An important specific feature of inflation in Russia is the higher growth of producer prices than consumer prices, especially during the "adjustment period"[9]. Producer prices tend to increase more for raw materials and semi-finished goods than for final goods. This was especially remarkable in 1992 and was partially maintained in 1993. Such dynamics allows us to characterize inflation in Russia as being mostly cost-push rather than demand-pull inflation, especially during the first year of the reforms.

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[9] This experience is also opposite to the inflation behaviour in the East-European economies in transition.

We suppose that inflation in Russia could be categorized as a border case between high and hyperinflation, but not as hyperinflation. The duration of Russian inflation (in 1991 in high open and repressed form and in 1992 - 1993 in extreme form) allows us to characterize it as increasingly chronic inflation.

In spite of the fact that the CPI and the PPI are computed according to Western methodology, the dynamics of these indexes has considerable statistical discrepancies. We considered the most important of them in chapter two.

Determination of the causes of inflation in Russia is one of the most difficult questions. In this paper we have considered 2 groups of causes of inflation: "classical" (growth of money supply and fiscal problems) and specific. Monetary causes may be considered as one of the key sources of inflation in Russia. One of the reason for the growth of money supply is the need to cover the gap between government revenue and government expenditures[10]. Money creation still remains the key instrument for financing this gap. Revenue of the Russian government from seigniorage, as reported in Russian Economic Trends, in 1992 was 42% from GDP, with very high volatility during the year.

The second group of causes analyzed in this paper is the specific causes related to the process of transition of the Russian economy from a centrally-planned to a market economy. These are, above all, structural causes and the high proportion of loss-making enterprises. In January 1993 their share was 21% of the total number of Russian enterprises.

It is necessary to emphasize that these two groups of causes of inflation are closely related to each other.

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[10] We are not use term "budget deficit finance" because of Russian budget statistics specificity as described in section 3.1.1.

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Analysis of Russian inflation, as a case study, is important not only from the theoretical point of view but from a practical one as well since overcoming inflation constitutes one of the crucial elements of the success of transition and macroeconomic stabilization of the economy of the Russian Federation.

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STATISTICAL APPENDIX

Table 1A

RETAIL PRICE DYNAMICS IN RUSSIA
(% change over the previous period)

	State prices	Cooperative prices	Kolhoz mkt prices
1985	0.5	1.2	5.2
1986	2.2	3.4	1.1
1987	1.6	2.4	3.7
1988	0.2	0.6	2.5
1989	2.4	0.5	7.4
1990	5.2	14.1	34.3
1991	89.6	111.7	132.1

PlanEcon Report, N33, September 3, 1992, p.15

TABLE 2A

SHORTAGES IN RUSSIA'S (the USSR) ECONOMY

AVERAGE NUMBER OF DAYS PER MONTH WHEN A GOOD WAS AVAILABLE IN STORES

COMMODITIES	1984	1985	1988	1989	1990	June 91	Dec 91	Jan 92	June 92	Dec 92	April 93
flour	28.2	28.2	29.4	28.4	22.1	5.9	5.3	6	18	17.9	20.1
rice	29.8	29.7	29.5	na	13.3	8.9	3.3	8.6	14.7	19.4	26.3
bread											
-black	27.8	28.1	28.5	26.4	27	22.7	21.5	22.9	23.3	23.7	27.1
-white	28.5	28.9	29.3	29.3	25	21.5	13.1	15.6	21.2	15.5	18.4
macaroni	29.8	21.4	29.9	29.6	25.5			na		16.8	18.4
millet	22.4	21.3	26	26.2	20	18.3	13.4	13.3	13.8	12.8	23.6
meat (cumul)	15.7	14.8	14.4	15.4	12.9						
-beef	10.1	9.9	10	10.2	9.2	8.7	5	11.6	20.5	22.4	17.6
-mutton	5.7	5.2	4.8	4.7	3.9	1.6	0.8	4	6	5.85	2.6
-pork	11.2	10.3	9.5	10.1	7.8	5.6	1.5	13.9	17.7	16.1	10.8
sausage (cum.)	17.8	22.9	26.3	25.4	21						
-boiled	16.3	16.3	10.4	15.4	13.5	15.8	7.5	22.5	27.5	27.3	26.3
-frankfurter	7.1	7.5	6.4	5.5	3.5	2.6	4	14.3	12.5	8.55	13.2
-semismoked				11.4	8.7	2.1	1.6	20.6	24	25.4	26.5
-smoked				6.5	3.9	0.9	0	9.9	5	3.75	13.8
smoked meat and gammons	5.2	6.4	8.1	6.8	4.7	2.4	1.3	13.9	10.7	11.4	11.9
canned meat	14.4	15.1	12.7	12.2	8.5	2.9	0.8	4.3	na		19.8
fish (cumul.)	28.8	29.2	28.9	28.5	26	na					
filleted fish	4.5	5	5.6	6.3	5.5	2.2	0.4	3.3	na		

salt herring	27.5	23.6	27.7	27	19.4	3.9	1.9	7.3	14.7	14.9	20.7
canned fish (cum.)	29.9	29.8	30	29.2	22.2	4.1	0.4	7.4	18.3	23.9	26.3
fats											
-beef	29.6	23.4	23.8	21.6	18.3	13.7	0.8	7.6	na		
-pork	23.6	25	27.7	24	20.9	7.8	0.6	7.6	na		
-mutton	6.3	8	8.4	7.7	6.9	3.6	0.1	na	na		
margarine	29.9	29.8	29.5	28.8	27.4	10.9	2.8	5.3	22.2	20.7	24.8
vegetable oil	29.6	29.3	29.1	28.7	24.4	17.1	8.8	17.2	23.7	20.1	25.5
mayonnaise	8.4	9.3	20	13.8	7.7	3.9	0.5	11.3	16.5	15.9	13.1
milk	28.5	28.6	28.7	28.5	27.6	24.6	17.1	24.9	28.3	26.1	26.1
curds	22.5	22.9	25.8	25.1	23.3	19.9	12.9	19.2	27.7	25.7	24
cheeses	24.2	24.8	21.4	18.4	13.7	na	na	na	na		
-rennet	16.8	19	15.7	13.1	9.4	3.1	2.9	8	22.7	17	18.6
-brine	8.1	8.6	10.9	9.8	7.8	1.7	0.9	6	na		
-processed	20.2	27.2	21.3	20	15	5.3	1.1	14.6	15.5	15.8	15.3
ice-cream	25.4	26.3	26.2	26.1	24.9	21.1	14.1	18.2	na		
eggs	27.4	26.6	27.8	28.7	23.9	24.6	6.6	27.5	27.2	26.3	27.1
sugar	29.9	29.9	22.7	21.4	21.8	19.1	16.4	22.2	22.5	21	23.5
biscuits	29.1	29	26.8	26.5	22.1	14.2	2.8	12.3	25.3	27.9	28.5
wafers	27.1	27.1	22.9	19.7	14.2	7	0.6	4	na		
caramel	29.7	29.8	23.2	18.9	10.4	11.3	3.8	15.3	19	22.1	26.1
chocolate	24.9	26.2	16.3	12.9	8.8	1	0	3.6	14.3	24.5	20.5
instant coffee	10.8	10.5	3	2.4	2.3	0.1	0.1	3.3	10.3	19.1	22.4
tea (black)	29.5	29.6	27.9	22.3	23.3	15.8	9.5	15.3	26.2	23.7	25.6
vodka	29.9	29.2	19.6	na	17	17.8	11.9	16.9	22.7	16.1	23.2

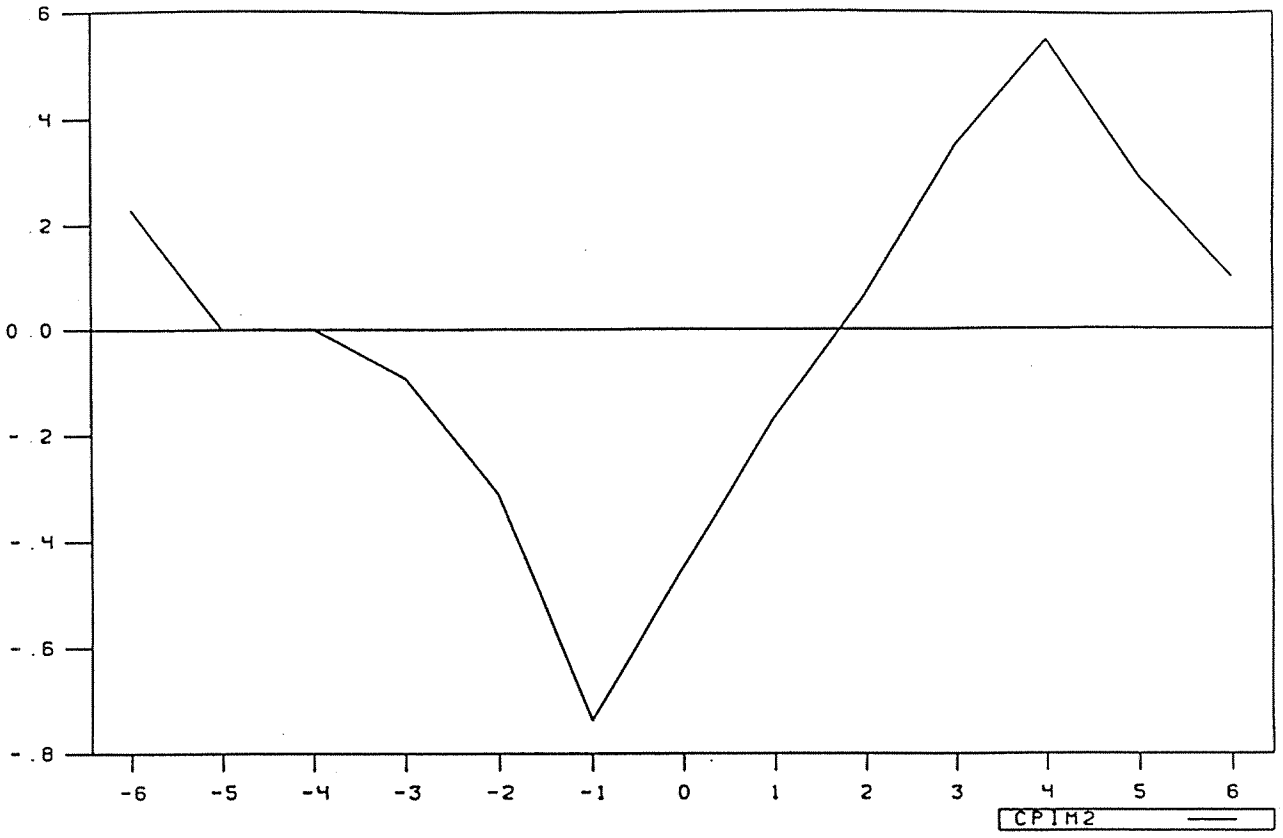
cognak	29.9	29.5	16.4	14.6	8.5	4.2	0.3	10.9	17.2	12	19.1
champange	20.6	24.4	13	9.2	5.5	1.1	0.6	9.9	10	4.95	20.6
beer	27.5	27.9	21.7	21.2	18.5	12	7.9	19.2	22.2	23.9	18.3
soft drinks	28.2	28.3	29.1	28.2	24.5	16.1	13.5	20.2	26	24.5	22.6
-kvass	13.4	7.1	17.2	21.3	18	25.2	0	na	na		
cigarettes	29.8	29.7	29.9	29.1	18.5	na	na	na	na		
-with a cardboard holder	27.7	28.1	29.4	27.7	15.5	7.3	6.4	5.6	na		16.8
--without cardboard holder	29.7	29.8	29.9	28.5	17.3	19.3	10.9	19.6	na		18.8
marmelade	18.6	21.5	18.5	17.9	13.8	1.3	0.4	1.7	9.67	16.1	18.8
fruite julces	29.7	28.7	29.7	29.6	27.7	4.2	1.9	10.6	26.5	25.4	21.4
vinegar	17.2	19.4	21.3	16.8	10.2	3.2	0	na	na	13.1	11.7
bay leaf	28.8	28.8	29.1	29	26.9	11	8.3	12.9	17.5	21.8	25
household soda	12.3	10.6	5.8	4.5	3.3	0.2	0.3	na	13	18.3	18.3
yeast	9.6	14.8	7.2	6.1	6.4	3.9	0.5	6.6	14	9.9	11.9
salt	29.9	29.9	29.9	29.7	28.6	20	16.3	18.2	27.7	25.1	24.6
matches	29.7	29.8	29.8	28.9	24.7	21.9	10.9	13.3	29.3	26.6	28.1
potato	22.5	21.9	20.9	20.4	23.6	12.6	17.6	26.5	18.8	29.1	27.1
cucumbers (fresh)	13.5	11.7	11.5	11.1	9.9	14.8	0	1.7	29.2	0.3	23.5
tomatoes (fresh)	10.1	9.3	10.3	10.4	9.2	8.8	0	na	20	3.9	5.7
apples	18.2	18.2	16.1	17.9	15	3.6	9.1	14.4	11.8	25.2	25.2
pears	2.8	2.9	2.2	0	0	0	2.1	na	0	0.6	0.6
grapes	4.1	4.2	4.9	0	0	0	na	0	0	0	1.4

PRODUCER AND CONSUMER PRICE INDEXES IN RUSSIA
(% change over the previous period)

			Price indexes for:			
	PPI	CPI	Food	Non-food consumer goods	Services	Alcohol drinks
1985	na	0.6	0.1	-0.09	na	6.2
1986	na	2.2	0.6	-0.9	na	24.7
1987	na	1.7	2.1	-1.1	na	15.4
1988	na	0.3	0.4	0.1	na	0.01
1989	1.2	2.5	0.7	3.1	na	0.01
1990	3.9	5.6	4.9	6.5	na	1.9
1991	138	95	118.7	100.7	na	26.6
1992						
January	382	245	306	211	130	301
February	75	38	20	48	87	10
March	28	30	18	42	34	13
April	17	22	17	25	31	13
May	23	12	11	12	18	11
June	36	19	13	12	39	55
July	17	11	8	10	21	14
August	13	9	6	10	11	8
September	14	12	11	13	11	8
October	27	23	26	20	29	20
November	27	26	27	26	23	28
December	20	25	26	27	16	25
1993						
January	32	26	31	16	16	22
February	30	25	27	23	23	17
March	23	20	21	21	21	9
April	24	23	17	18	na	11
May	19	19	17	15	na	12
June	17	20	23	16	na	21
July	29	22	22	19	na	23
August	27	26	21	21	na	29
September	21	21	na	na	na	na
October	19	20	na	na	na	na

These time series are combined from the following sources: [4], [5], [7] and [10]. All these sources present information of the State Statistical Committee of the Russian Federation.

Figure 1A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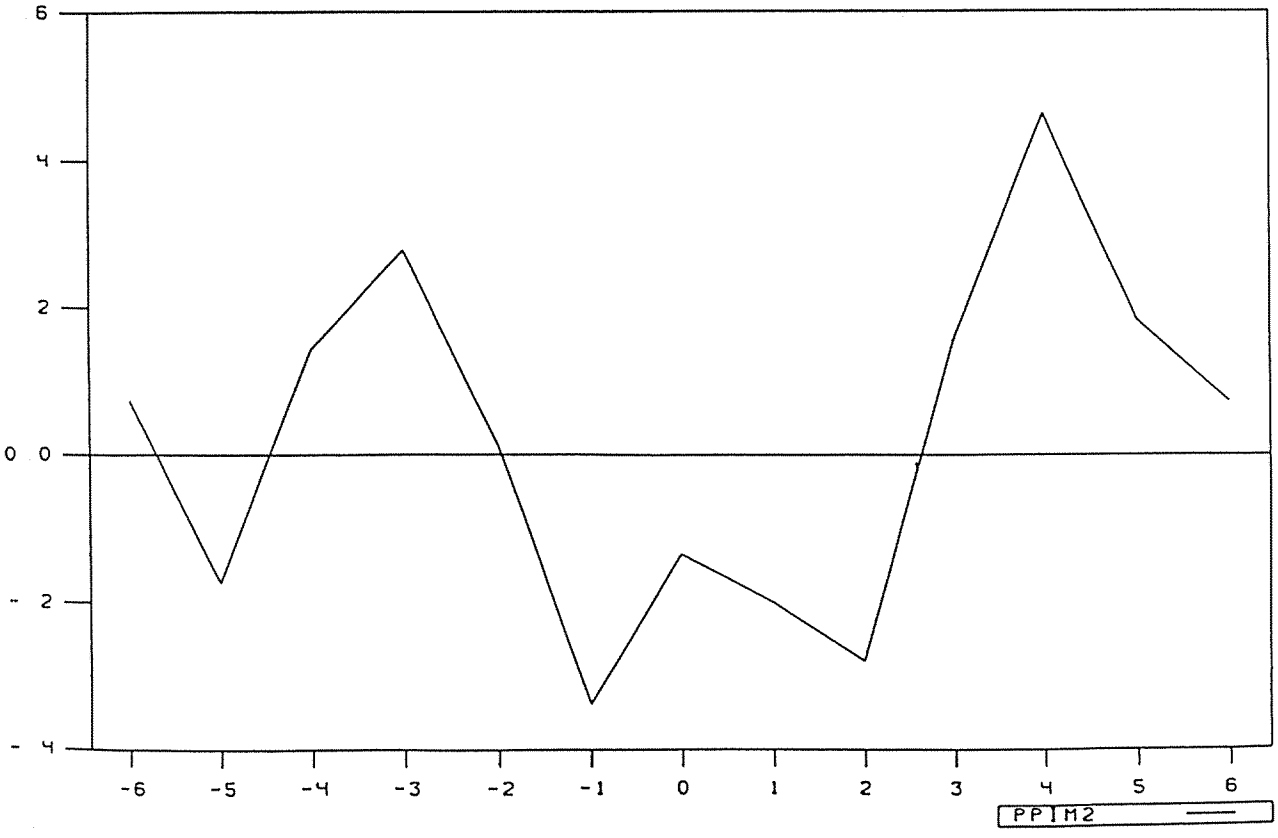
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