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Relative Price Convergence in Russia

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Abstract

Following price and exchange rate liberalization, domestic consumer prices in Russia moved closer to market levels. This paper quantifies the magnitude of the associated relative price changes. It also shows that relative price variability has been positively correlated with inflation. It is further established that convergence toward international relative and absolute price levels is far from complete, and that geographical price dispersion within Russia has declined since early 1992 but remains fairly high.

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### Summary

It is commonly accepted that relative prices in Russia were highly distorted under central planning and that liberalization prompted major shifts in the price structure. However, no systematic empirical analysis of the realignment of relative prices has yet been undertaken that would show to what extent and how fast prices have converged to some market economy benchmark since the onset of the transition. This question is explored in this paper for consumer prices, using several large data sets ranging from 1980 to 1994.

An empirical investigation confirms that after liberalization the structure of relative prices in Russia changed significantly. For goods, most of the permanent domestic realignment seems to have taken place by the end of 1992, even though some further shifts occurred in 1993 and 1994. For services, convergence to market levels is a more protracted process; by mid-1994, notwithstanding sharp increases in relative domestic terms, the prices of many important services remained far below advanced market economy levels. The gap between the domestic overall price level and the level prevailing abroad was huge in January 1992, narrowed substantially thereafter, but still loomed large in 1994. At the same time, the degree of integration of the domestic goods market, particularly for nonfood items, seems to have increased since early 1992. In addition, price-setting has become more synchronized as agents adapt to a high-inflation environment.

The large gap between domestic and international price levels that remains two to three years after price liberalization implies that convergence, inasmuch as it does proceed, will be accompanied by real exchange rate appreciation. The latter may take the form of a strengthening of the nominal exchange rate. However, the relative price of services can be expected to rise significantly in the years ahead, as cost-recovery ratios are still low for many of them. Thus, even if tight financial policies and foreign competition contain price increases in the tradable goods sector, the process of real exchange rate appreciation is likely to involve persistently higher measured inflation than in Western Europe.

## I. Introduction

High open inflation appeared in 1991 in Russia as a result of partial price reforms and the *de facto* loosening of price controls.<sup>1</sup> Following the January 2, 1992 comprehensive price liberalization and the associated price jump, monthly inflation rates remained in the double digits during most of the next three years.<sup>2</sup> By the end of 1994, consumer prices had increased by almost 2,000 times compared to December 1990 (Chart 1, top panel).

Eliminating controls allowed prices to become market determined. It is commonly accepted that relative prices were highly distorted under central planning and that liberalization prompted major shifts in the price structure. Supportive evidence typically consists of selected examples of goods (and more rarely services) for which the relative price change has been particularly conspicuous. However, to our best knowledge, no systematic empirical analysis of the realignment of relative prices has yet been undertaken showing to what extent and how fast prices in Russia have converged to some market economy benchmark.

This paper explores this question for consumer prices, using several large data sets ranging from 1980 to 1994. Price convergence can be thought of along several dimensions. Section II examines the realignment of average nationwide domestic relative prices in the wake of the freeing of prices and the associated removal of subsidies; it also documents the increasing synchronization of price-setting as agents adapt to a high inflation environment. Section III offers alternative measures of the movement of the overall price level in Russia towards international heights. Section IV discusses the evolution of regional price disparities within Russia as a way to assess market integration. Section V summarizes the main findings of the paper and outlines areas for further research. A statistical appendix presents some of the raw data.<sup>3</sup>

## II. Realignment of Domestic Relative Prices

At any level of disaggregation of the overall consumer price index (CPI) and at any frequency, it is immediately apparent that inflation rates varied a lot across items or groups of items, implying that relative domestic consumer prices changed considerably over time. This section analyzes the timing, direction, and permanence of these shifts in the structure of relative prices, and identifies a number of long-run changes and trends. In addition, some insights are offered on the short-run dynamics of open inflation.

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<sup>1</sup>Previous episodes include the hyperinflation of the early 1920s and a period of chronic high inflation in the 1930s and 1940s.

<sup>2</sup>For details, see Koen and Phillips (1993).

<sup>3</sup>The rest of the data are available from the authors on request.

1. Pre- Versus Post-Liberalization Prices

The evolution of individual relative prices suggests that during the 1980s--i.e., even before prices were liberalized--the structure of domestic administered prices was not completely frozen (Table A1, second panel). For example, the relative price of vodka surged between 1985 and 1990 in connection with the anti-alcoholic campaign launched in the early stages of *perestroika*. The April 1991 retail price adjustments translated into large increases in the relative price of a number of items (e.g., meat and meat products, butter, sugar, bread, potatoes, and many electrical appliances) and large drops in the relative price of others (e.g., vodka and construction materials). The January 1992 liberalization led to very significant changes, including large increases for some items (such as meat, canned fish, butter, cheese, sugar, refrigerators, washing machines, and construction materials), and large declines for others (such as eggs, bread, vodka, many electronic leisure goods, watches, sewing machines, and bicycles).<sup>1</sup> As a result, by 1992, the relative price of many goods had changed considerably compared with 1980 (Chart 2).<sup>2</sup>

During the 1980s and even more so in 1991, food prices on city markets, which had been free all along, typically increased faster than prices in stores for those items that were sold through both channels, reflecting repressed inflation (Table A2). In 1992, following price liberalization, food prices rose much less on city markets than in stores. While by 1991 prices in city markets were typically 2 to 4 times higher than in stores, prices in the two types of outlets broadly converged in 1992.<sup>3</sup>

It is difficult, however, to compare the overall magnitude of relative price shifts without some summary measure. One such indicator is the correlation between price structures over time (or space).<sup>4</sup> The cross-period correlation coefficients associated with Tables A1 and A2 are shown in Table 1. They confirm that relative prices changed moderately during the 1980s, that they shifted more significantly in 1991, and that the largest changes took place in 1992. The cross-correlations also suggest that the structure of relative prices in city markets was much less affected by price liberalization than that of prices in stores.<sup>5</sup>

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<sup>1</sup>Prices for December 1992 and June 1993 are also shown in Table A1, but should be interpreted with caution as some of them are subject to strong seasonal variations.

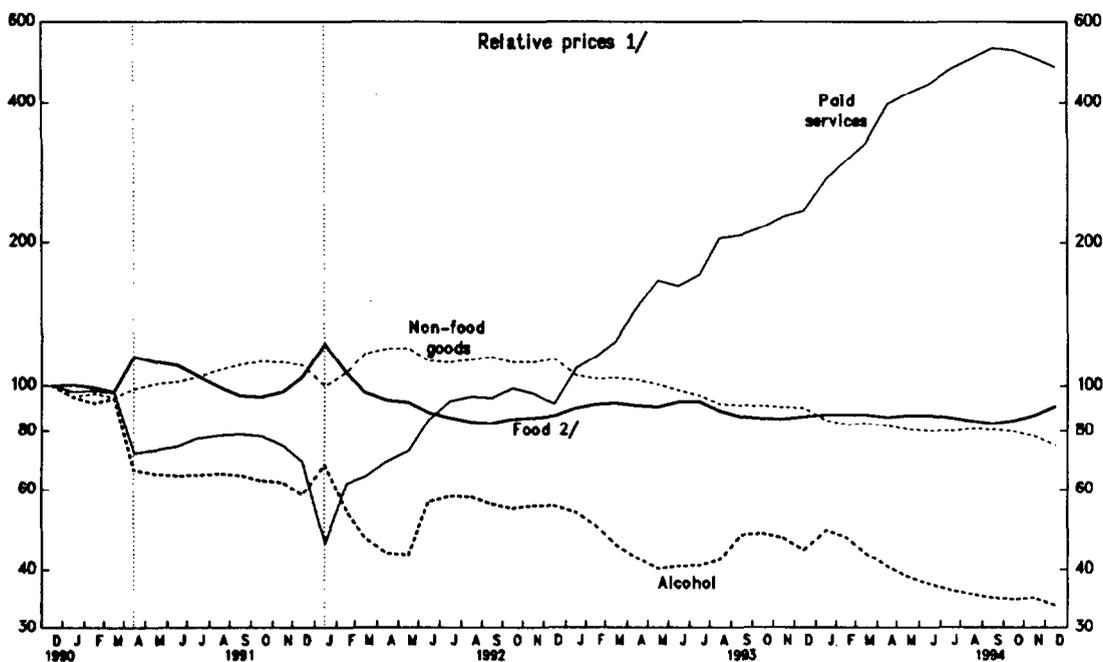
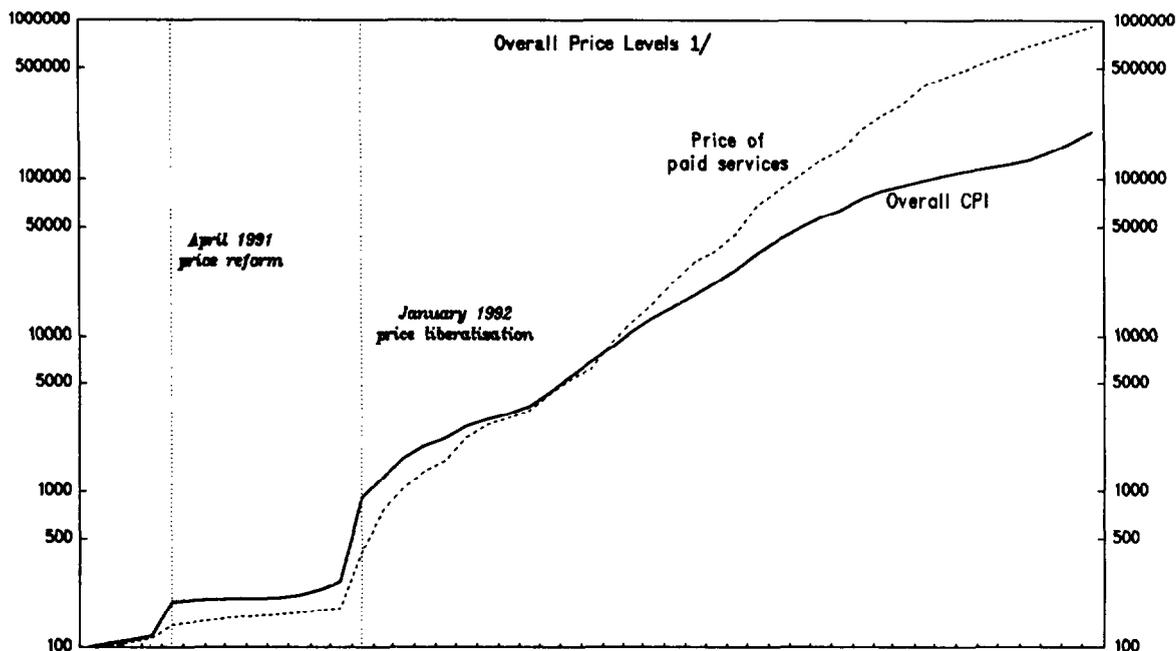
<sup>2</sup>To put the price changes into perspective, the third panel in Table A1 shows the implied evolution of the purchasing power of wages.

<sup>3</sup>The remaining spread may reflect quality differences or local price controls.

<sup>4</sup>Berg (1994) computes such a measure for Poland.

<sup>5</sup>The relative price structure in city markets was nevertheless affected because some of the items sold in city markets were also sold in stores, and because of non-zero cross-product demand elasticities.

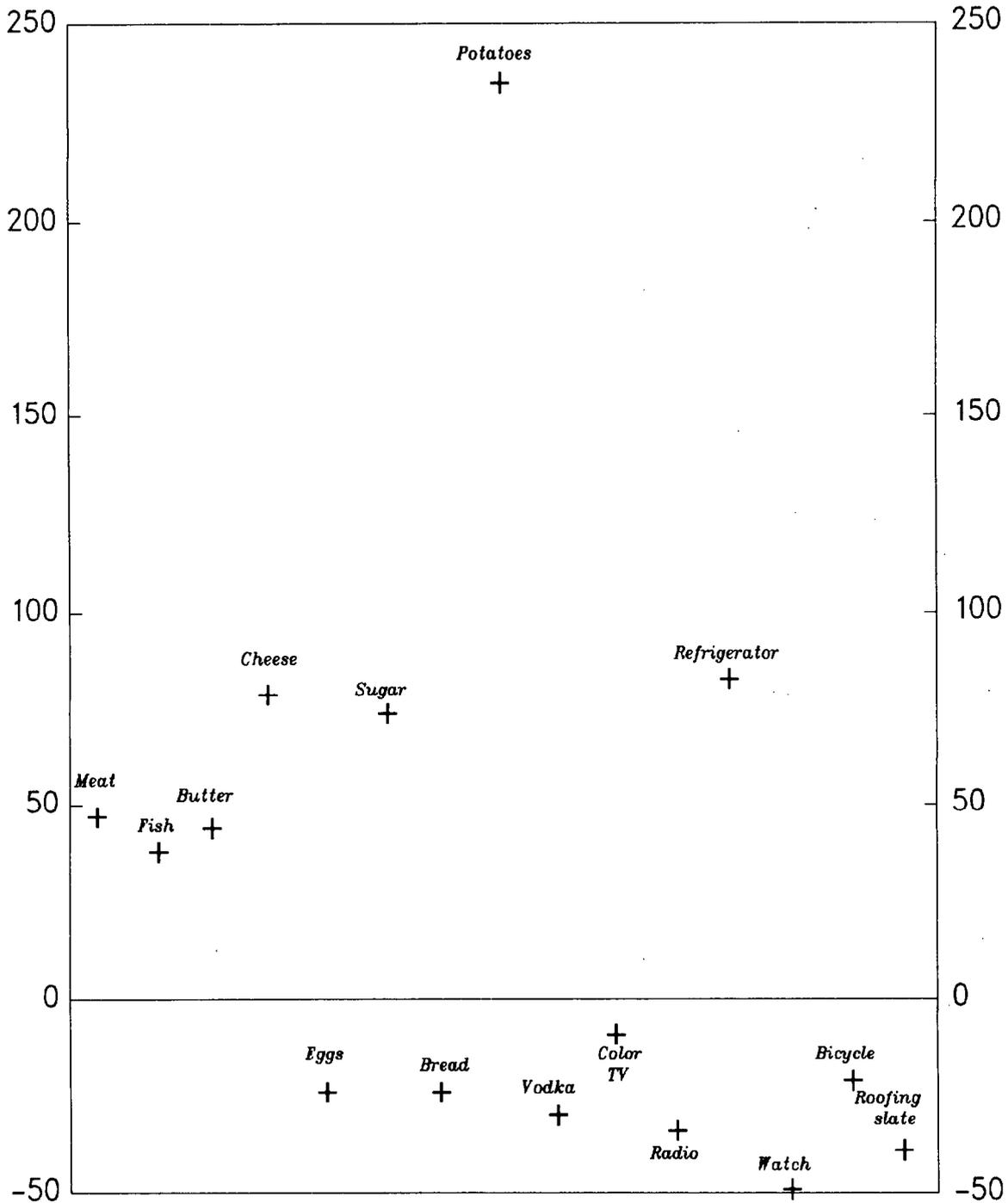
**Chart 1**  
**RUSSIA**  
**Price Levels and Relative Prices**  
 December 1990-December 1994  
 (December 1990=100, log-scale)



Sources: Goskernstat of the Russian Federation; and authors' calculations.  
 1/ Relative to the overall CPI, linking the hybrid CPI (1991-92) and the expanded CPI (1993-94).  
 2/ Excluding alcohol and tobacco.

Chart 2  
RUSSIA  
Relative Price Change for Selected Goods in Stores,  
1992 versus 1980

(In percent)



Source: Table A1.

Table 1. Russia: Cross-Correlations of Price Structures

Prices in stores

All goods	1985	1990	1991	1992	Dec. 1992	June 1993
1980	0.98	0.99	0.98	0.96	0.62	0.63
1985	1.00	0.99	0.95	0.94	0.55	0.55
1990		1.00	0.98	0.95	0.61	0.61
1991			1.00	0.96	0.68	0.68
1992				1.00	0.75	0.75
Dec. 1992					1.00	0.99

Foodstuffs	1985	1990	1991	1992	Dec. 1992	June 1993
1980	0.99	0.98	0.99	0.95	0.94	0.82
1985	1.00	0.99	0.99	0.95	0.93	0.79
1990		1.00	0.97	0.91	0.88	0.74
1991			1.00	0.95	0.94	0.79
1992				1.00	0.98	0.90
Dec. 1992					1.00	0.87

Non-food goods	1985	1990	1991	1992	Dec. 1992	June 1993
1980	0.98	0.99	0.97	0.94	0.59	0.59
1985	1.00	0.99	0.93	0.91	0.50	0.51
1990		1.00	0.97	0.92	0.56	0.57
1991			1.00	0.94	0.63	0.64
1992				1.00	0.74	0.74
Dec. 1992					1.00	0.99

Prices in city markets

Foodstuffs	1985	1990	1991	1992	Dec. 1992	June 1993
1980	0.97	0.95	0.93	0.93	0.92	0.96
1985	1.00	0.98	0.98	0.98	0.96	0.94
1990		1.00	0.99	0.97	0.98	0.92
1991			1.00	0.99	0.99	0.88
1992				1.00	0.97	0.86
Dec. 1992					1.00	0.88

As already noted, seasonality may distort comparisons involving a given month and a yearly average. Using end-1990, end-1991, end-1992, and end-1993 prices for a similar (albeit slightly different) set of goods, analogous cross-correlations controlling for potential seasonal biases corroborated the above conclusions.<sup>1</sup> Furthermore, the correlations suggest that the bulk of the relative price changes had taken place by end-1992, especially for non-food goods. They also highlight continuing changes in the structure of food prices in 1993, probably as a result of adjustments in the structure of subsidies.

Although the above correlations between price structures are informative global measures of relative price changes, they suffer from two shortcomings. First, the sample under consideration excludes services, the prices of which behaved very differently from that of goods. Second, the sample is fairly small and items are unweighted, which might produce misleading results.<sup>2</sup>

At the most aggregate level, the prices of "paid services" increased much less than that of goods in April 1991 and January 1992 (Chart 1, bottom panel).<sup>3</sup> However, a very rapid catch-up began after the early 1992 jump in the overall price level. By late 1992, the relative price of services had returned to its December 1990 level, and by late 1994, it had surged to about five times that level. In part, this process reflected the commercialization of a number of services such as child and health care, that were previously provided for a nominal fee. It also reflected the adjustment of cost recovery ratios from a very low basis, for example in the case of housing, with rents rising by almost 500 times between end-1992 and end-1994, compared to a 30-fold increase in the overall CPI. A similar U-curve pattern for the relative price of services has been observed in many other countries of the former Soviet Union.<sup>4</sup> It is also reflected in the evolution of the share of services in household expenditures, which fell through 1992 but then rebounded, although by 1994 it was still extremely low compared to market economy standards (Chart 3).<sup>5</sup>

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<sup>1</sup>The raw data appear in Goskomstat (1994). For the sake of brevity, the correlations are not reported.

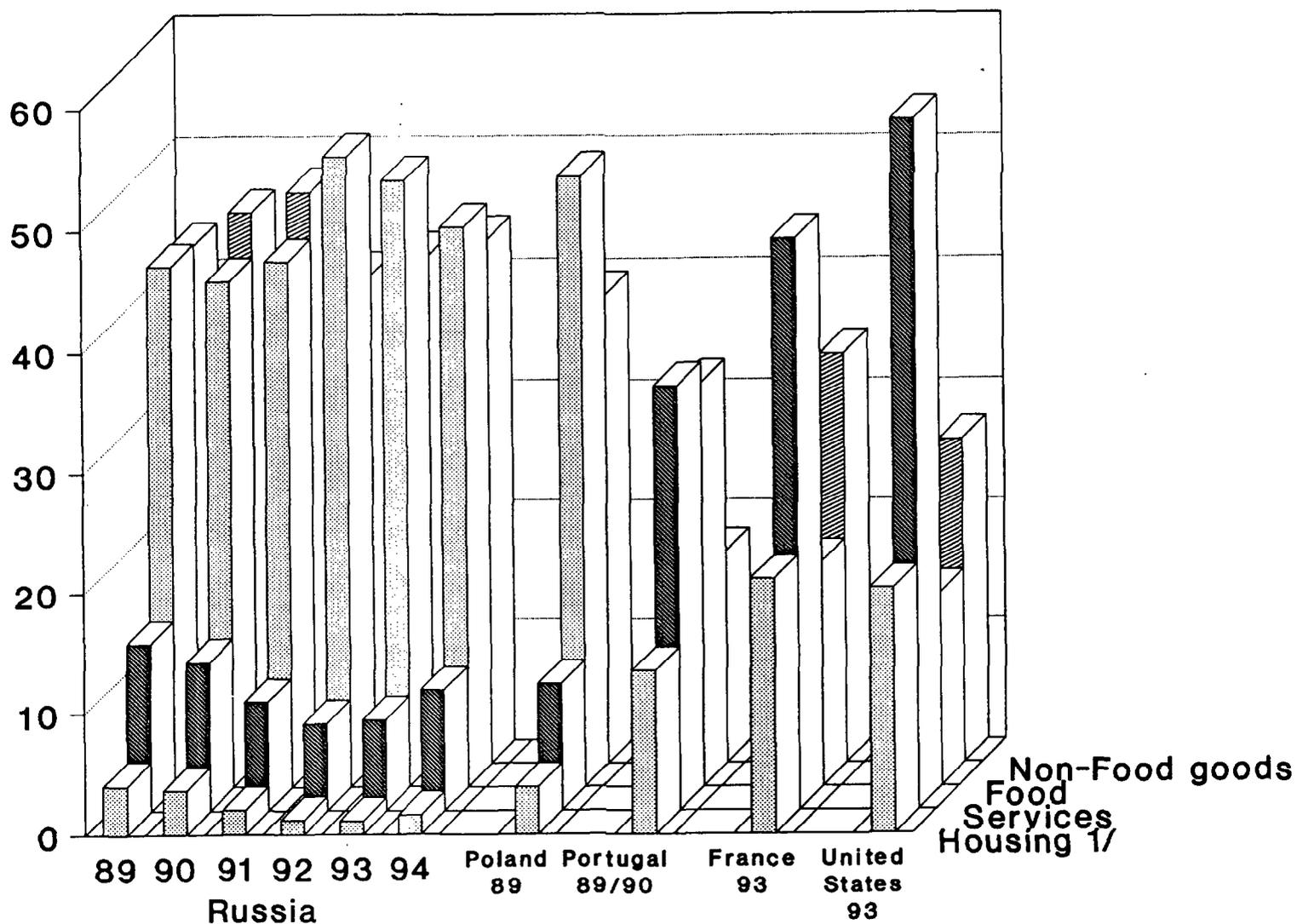
<sup>2</sup>The weights of individual items in the CPI vary considerably. Vodka by far carries the largest weight (9.34 percent, almost twice as much as the second largest element, sugar). A number of items for which no household budget survey information is available, but which are presumably small are given the minimal weight of 0.01 percent.

<sup>3</sup>Many services are (or were) public "goods" and therefore do not (or did not) appear in the CPI, hence the qualifier "paid".

<sup>4</sup>For example, in the Baltic countries, Kazakhstan, Ukraine, Armenia, Azerbaijan, and Tajikistan. See De Masi and Koen (in preparation).

<sup>5</sup>The price of services typically also rises more rapidly than the overall CPI in market economies, but not that much faster. In the United States for instance, it rose by 15.7 percent between end-1990 and end-1994, compared to an 11.9 percent increase for the overall CPI.

**Chart 3**  
**Structure of Household Consumption: International Comparison**  
 (In percent)



Sources: Goskomstat (Russia); GUS (Poland); National Statistical Institute (Portugal); INSEE (France); Bureau of Economic Analysis (United States); and authors' calculations.

1/ Including utilities.



Whereas the trends in service prices are invariant to the choice of the price index, the evolution of food prices depends on which measure of consumer prices is selected. Based on the "hybrid CPI", the price of food relative to the overall CPI declined rapidly after a spike associated with the January 1992 price jump and hovered around 85 percent of its December 1990 reference level between mid-1992 and end-1994 (Chart 1, bottom panel); based on the "urban CPI", however, the relative price of food fell less after January 1992 and remained at about 120 percent of its December 1990 level through 1994.<sup>1</sup>

Further insights into the shifts in relative prices emerge from a more disaggregated analysis. Data for the full decomposition of the CPI were obtained for July 1993 and July 1994,<sup>2</sup> and prices covering a bit more than half of the CPI were reconstructed for January and July 1992.<sup>3</sup> The trends described above are reflected in the evolution of individual prices presented in Table A3. Despite its incompleteness, it allows several interesting observations.

The magnitude of the relative price changes displayed in Table A3 confirms that the broad-based liberalization that took effect on January 2, 1992 did not instantaneously bring about a new stable relative price structure, not least because a large number of prices temporarily remained subject to federal or local price controls before they were freed. Specifically, the relative price of those items that were free of controls early on changed little from mid-1992 onwards: for example, potatoes, apples, and eggs saw their prices move broadly in line with the overall CPI.<sup>4</sup> The prices of some food items and of some medicines rose substantially more than the overall CPI once subsidies were cut. For example, the relative price of milk rose a lot during the first half of 1992 as subsidization was reduced, and grew further between mid-1993 and mid-1994 for the same reason. The relative price of bread doubled between mid-1993 and mid-1994, reflecting the sharp reduction in subsidies in the fall of 1993. At the same time, the relative price of aspirin and other analgesics rose tremendously as a result of import subsidy cuts, termination of humanitarian aid in kind, and decontrol measures. The price of electricity rose much less than the overall CPI through mid-1993 but much faster

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<sup>1</sup>The differences between the "hybrid" and "urban" CPIs are described by Koen and Phillips (1992).

<sup>2</sup>The numbers were directly provided by Goskomstat. The complete list of items appears in Russian in Goskomstat (1993) and in English in Granville and Shapiro (1994).

<sup>3</sup>Based on Goskomstat price tables published weekly by *Delovoy Mir* and on data provided directly by the Center for Economic Analysis.

<sup>4</sup>The comparison with January 1992 is difficult because of seasonality.

thereafter, reflecting a deliberate policy to raise cost recovery ratios.<sup>1</sup> A similar price path was registered for many other services.<sup>2</sup>

Other reasons underlying the instability of relative prices after January 1992 include sheer uncertainty (see below) and sectoral or aggregate demand and supply shocks causing shifts in the equilibrium relative price structure. For example, the ten-fold real exchange rate appreciation between January 1992 and mid-1994 heightened import competition and contributed to the significant relative price declines recorded for some foodstuffs (such as sugar, vegetable oil, vodka, and tea) and some non-food items (including a number of consumer durables).

Table A3 also illustrates the sensitivity of relative price measures to the level of disaggregation. In some cases, items that might have been thought of *a priori* as close substitutes for one another display very divergent price movements (e.g., high-fat versus non-fat cottage cheese, or domestic versus imported aspirin).

## 2. Short-Run Open Inflation Dynamics

Although inflation declined in the first half of 1992 following the price jump associated with generalized decontrol, macroeconomic stabilization failed and a regime of chronic high inflation set in. One way to analyze the trajectory of the price level in this context would be to relate inflation to the evolution of the potentially relevant monetary and credit aggregates, as done by Koen and Marrese (1995). A somewhat different and less conventional perspective on the dynamics of inflation involves the analysis of the link between relative price variability and overall inflation. In principle, these variables could be positively or negatively correlated, or display no stable relationship whatsoever.<sup>3</sup> In practice, the results offered by the empirical literature on this subject vary depending on the country, the period, and the level of disaggregation.

For Russia, monthly inflation rates for 66 food items and 87 non-food goods have been published by Goskomstat (1994) for the period 1992-93 (Table A4). Based on 1993 weights, these items cover 75 percent of the overall CPI (88 percent of the food, beverages, and tobacco component and 66 percent of the non-food goods component).

The measure of relative price variability used here is analogous to the indices that are traditionally used in the literature, and can be described as a weighted variance:

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<sup>1</sup>See IMF (1995).

<sup>2</sup>While strictly comparable price level information was missing for January and July 1992 for almost all services (hence the blanks in Table A3), partial information collected on the evolution of the components of the CPI in 1992-93 confirms this interpretation.

<sup>3</sup>See Fischer (1982), Goel and Ram (1993), and the references therein.

$$V \equiv \sum_{i=1}^n \omega_i \left[ \pi_i - \sum_{i=1}^n \omega_i \pi_i \right]^2 \quad (1)$$

with

$$\sum_{i=1}^n \omega_i = 1,$$

where  $\omega_i$  and  $\pi_i$  denote the weight and monthly percent change in price associated with item  $i$ . The weights used come from the 1993 CPI, thus reflecting 1992 expenditure patterns, and are normalized to sum to unity.<sup>1</sup>

Chart 4 illustrates the evolution of relative price variability for all goods as well as for food and non-food goods separately. The inflation rates shown are the weighted arithmetic averages of the inflation rates for the individual items. January 1992 is excluded because the price changes associated with the one-time jump are orders of magnitude larger and inherently different from subsequent ones.<sup>2</sup> The underlying distributions of the inflation rates across all goods in February 1992 and December 1993 for Russia are shown in the top half of Chart 5; for comparative purposes, analogous distributions for France and the United States are presented in the bottom half. Several lessons can be drawn from Charts 4 and 5.

First, while relative price variability subsided in the course of the first half of 1992, it remained very high throughout the period under consideration in comparison with market economies. Specifically, it was more than 20 times larger on average in 1993 than in the United States and France.<sup>3</sup> Even the minimum value of relative price variability in the Russian sample (reached for non-food goods in July 1992) was more than 3 times higher than the corresponding measure in the United States and France.

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<sup>1</sup>An analogous measure based on geometric rather than arithmetic averaging of item-specific price changes was also computed, but none of the results reported below was qualitatively affected.

<sup>2</sup>Relative price variability for all goods was 86 times larger in January than in February 1992, and the average January jump in the price level for goods amounted to 347 percent versus a 24 percent increase in February.

<sup>3</sup>Monthly values for variability measures analogous to those computed for Russia were calculated for the United States, based on a set of 60 food items and 60 non-food goods (using 1994 price indices from the monthly *CPI Detailed Report* and 1993 weights from the bulletin on the *Relative Importance of Components in the Consumer Price Index*, both published by the U.S. Bureau of Labor Statistics), and for France, based on a set of 79 food items and 123 non-food goods (using 1994 observations and weights as published in the INSEE's *Bulletin Mensuel de Statistique*).

Second, relative price variability for food from mid-1992 onwards was almost constantly higher than for non-food goods, the only exceptions being October and November 1992. In 1993, relative price variability for food was on average more than two times larger than for non-food goods. One plausible explanation for this apparent regularity is that seasonality affects food prices more than non-food goods prices.<sup>1</sup> In this regard, it is worth noting that in the United States and France as well, relative price variability is typically two to three times higher for food than for non-food goods.

Third, the average level of relative price variability was much lower in 1993 than in 1992. This is consistent with the earlier finding that most of the relative price changes for goods had taken place by the end of 1992. It is also consistent with the presumption that as agents became more familiar with chronic high inflation, price-setting became increasingly synchronized across goods.<sup>2</sup>

Fourth, relative price variability and inflation display a strong positive correlation, as suggested by Chart 4 and confirmed by the regressions in Table 2.<sup>3</sup> For non-food goods, the April-May 1992 spike in variability, which accounts for the poor correlation of variability and inflation during the first half of the year, is overwhelmingly caused by very large increases in the price of gasoline.<sup>4</sup> Apart from this episode, variability and inflation move closely together. Adding the change in inflation among the independent variables suggests that an acceleration in the overall price level is accompanied by greater relative price variability, and vice versa.

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<sup>1</sup>Chart 3 in Koen (1994) suggests that seasonal variations are very large for food prices on city markets. The behavior of the price of some individual food items (e.g., apples, carrots, and beets) in Table A1 also points to strong seasonal variability. Some non-food goods prices are also subject to large seasonal swings (e.g., some clothing items).

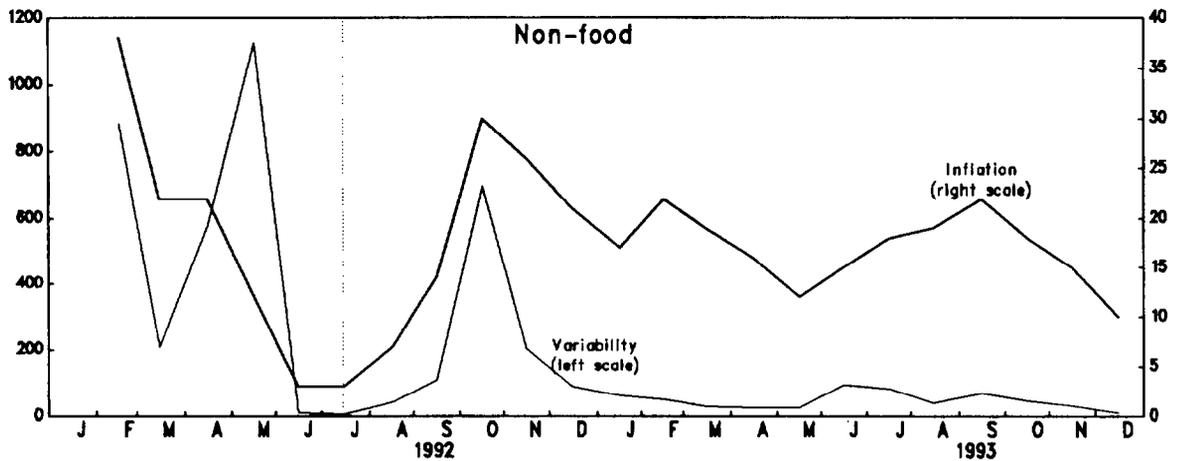
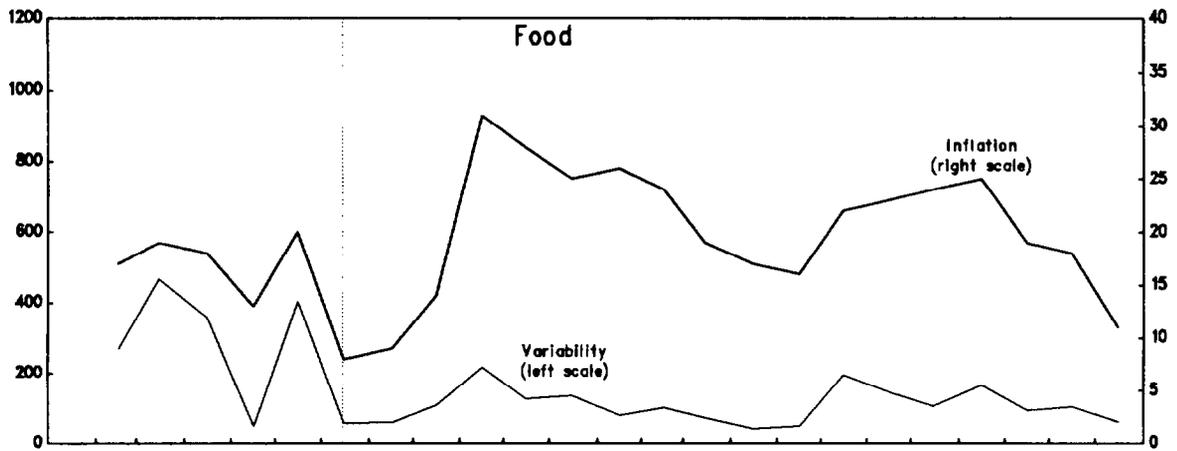
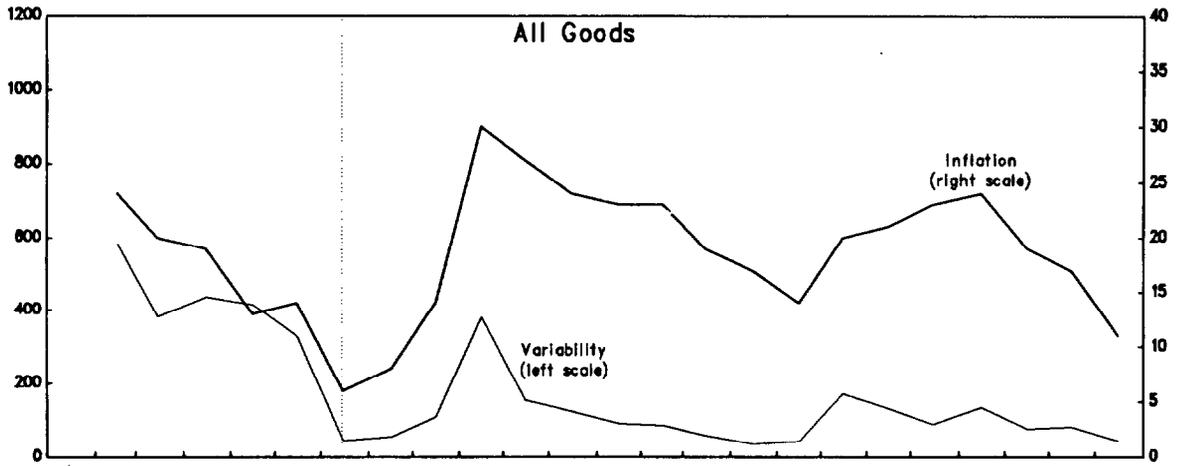
<sup>2</sup>An extension of the analysis to 1994 if and when the necessary data become available would allow to more confidently confirm or refute this conjecture.

<sup>3</sup>It could be argued that the regression equation should be specified differently as greater relative price variability may cause greater inflation, for instance because of asymmetric price responses to disturbances (in the form of downward inflexibility). However, the purpose of the regressions in Table 2 is to establish a correlation more than to test for causality.

<sup>4</sup>In April 1992, gasoline alone accounted for 67 percent of the variability of relative non-food goods prices and in May for 90 percent.

Chart 4  
RUSSIA

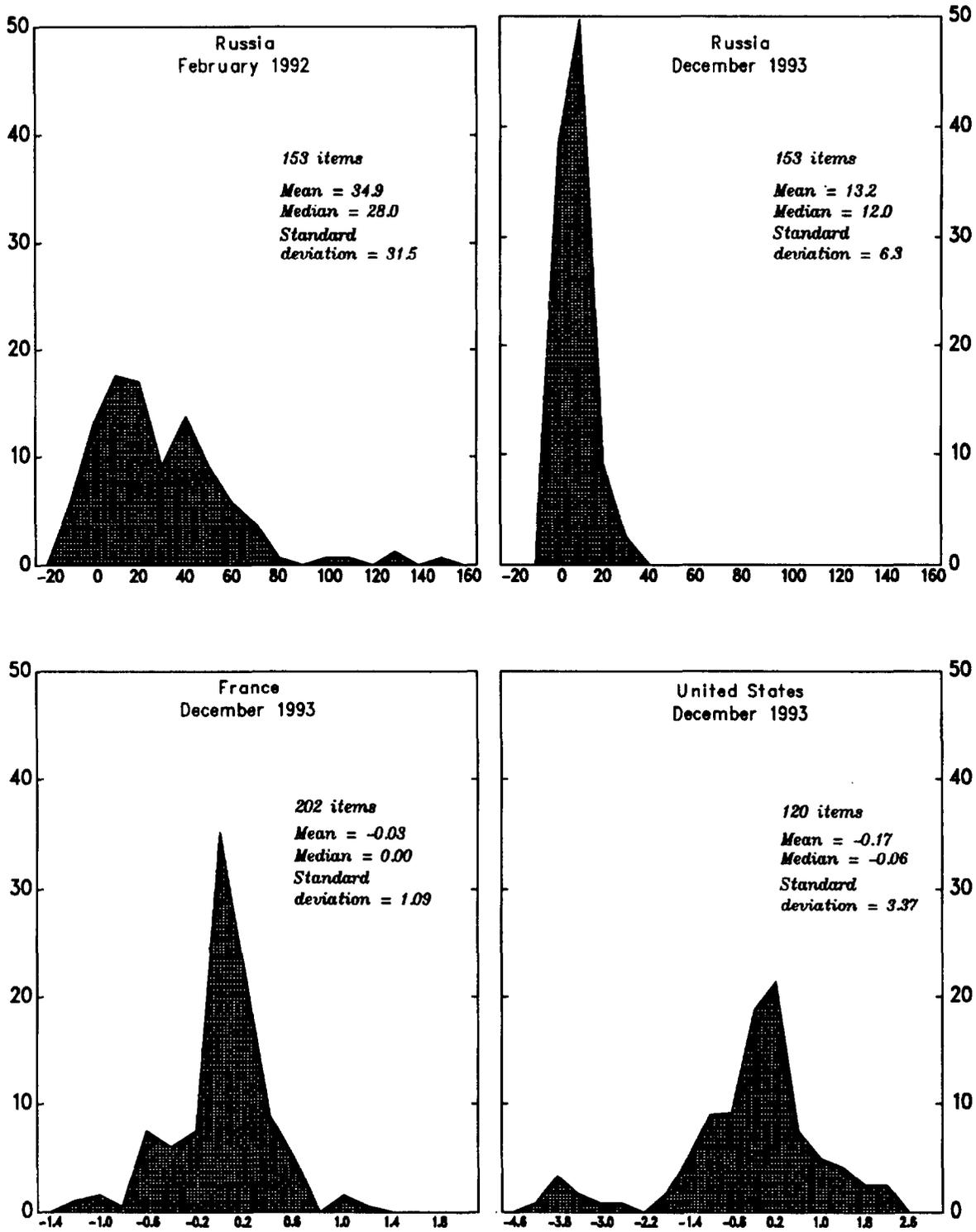
Relative Price Variability and Inflation for Goods 1/  
February 1992 - December 1993



Sources: Table A4; and authors' calculations.  
1/ Monthly inflation rates, in percent.

### Chart 5 Distribution of Inflation Rates for Goods (In percent)

*Monthly Inflation on Horizontal Axis, Proportion of Goods on Vertical Axis*



Sources: Table A1 (Russia); Bureau of Labor Statistics (U.S.); INSEE (France); and authors' calculations.

Table 2. Russia: Inflation and Relative Price Variability,  
Regression Results<sup>1</sup>

(t-statistics in parentheses)

Dependent variable: Variability <sup>2</sup>	Regressors				$\bar{R}^2$	Durbin- Watson
	Constant	Inflation	Change in inflation	Dummy <sup>3</sup>		
All goods	264.7 (5.4)	9.2 (4.1)		-331.1 (-10.5)	0.85	1.64
	328.5 (8.4)	5.1 (2.8)	8.2 (3.9)	-316.0 (-12.8)	0.89	2.35
Food	182.2 (3.2)	7.4 (2.8)		-221.9 (-5.9)	0.62	2.27
	241.7 (3.9)	4.3 (1.4)	5.9 (1.9)	-216.2 (-5.4)	0.65	2.00
Non-food goods	271.3 (1.8)	15.0 (2.6)		-428.7 (-3.8)	0.50	2.41
	465.9 (2.6)	10.6 (1.5)	16.1 (1.9)	-554.7 (-4.0)	0.43	2.66

Sources: Table A4; and authors' calculations.

<sup>1</sup>Based on monthly observations for February 1992-December 1993, and using ordinary least squares.

<sup>2</sup>As defined in equation (1).

<sup>3</sup>Dummy equals zero prior to July 1992 and 1 from July 1992 onwards.

The dummy variable introduced in the regressions captures the shift in the relationship between variability and inflation that occurred around mid-1992, and which can be thought of as a regime switch. In the immediate aftermath of the initial price jump, some prices were adjusted downwards and others increased substantially as price setters developed a perception of new overall and relative price levels (see Table A4). Some confusion about their true values persisted for several months and entailed significant further relative price adjustments.<sup>1</sup> By mid-year, however, much of this uncertainty had abated and a new regime of high, chronic inflation set in.

In the longer-run, the positive correlation between relative variability and inflation may weaken. Indeed, one would expect agents to compete away an increasing portion of relative price variability as high inflation becomes entrenched, and more vigorously so as inflation rises. Ultimately, price-setters are likely to coordinate price adjustments by responding to a visible and unambiguous high-frequency signal such as the exchange rate, and virtually all domestic prices will be moving in line with the latter.<sup>2</sup> In the extreme case of a hyperinflation, the variability of relative prices may thus turn out to be quite small.

Among the potential extensions of the regression analysis conducted here would be to relate relative price variability separately to anticipated and unanticipated inflation.<sup>3</sup> One hypothesis worth testing in such a framework would be that relative price variability is more closely linked to inflation surprises than to the expected component of inflation.<sup>4</sup>

### III. International Convergence of the Overall Price Level

The previous Section has analyzed the movements of domestic relative prices following price liberalization. This Section examines the extent to

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<sup>1</sup>This confusion is reflected in the widely different estimates for the size of the price jump and for inflation in the early months of 1992 associated with alternative retail/consumer price indices, see Koen and Phillips (1993), Table 2.

<sup>2</sup>Symptomatic is the following description of the foreign exchange market in early 1995: "Only about half an hour will pass after the beginning of tenders and thousands of pagers will beep and thousands of telephones will ring announcing the news about the new exchange rate of the dollar. A little more time will pass and the money-changing offices will post new figures on their doors and the announcers on practically all the television and radio stations will interrupt themselves in order to expressively read a couple of four-digit figures..." (*Kommersant Daily*, February 3, 1995, p.5).

<sup>3</sup>One way to distinguish between the two components of inflation would be to identify them with the fitted value and the residual respectively from a regression of inflation on lagged money or credit.

<sup>4</sup>Goel and Ram (1993) find that this is indeed the case in the United States.

which domestic price levels have converged to international levels after the freeing of prices. No attempt is made to compare the gap between domestic and foreign prices before and after January 1992 because information on pre-1992 prices is relatively scanty,<sup>1</sup> and because the complex system of multiple exchange rates in place until the end of 1991 would render such a comparison extremely difficult. Exchange rate unification only occurred in mid-1992,<sup>2</sup> implying that even the price level comparisons presented below for the first half of 1992 and based on the interbank exchange rate are somewhat perilous and tend to understate the Russian price level.

### 1. The Price of Staples

One indicator occasionally referred to in Russia to evaluate the gap between domestic and international prices is the price of a basket of 19 staples considered as a minimum food consumption standard.<sup>3</sup> This basket covers about one half of the food component of the Russian CPI at 1993 weights (excluding alcoholic drinks).<sup>4</sup> If the U.S. price of this basket is taken as a benchmark, this measure suggests that Russian prices rose from 4 percent of "international levels" in January 1992 to one fourth in December 1993, and to almost one third in December 1994 (Chart 6, bottom panel). If the price in France is used instead, the measure implies that Russian prices rose from 3 percent of "international levels" in January 1992 to close to one fifth in December 1993 and slightly above one fifth in December 1994.<sup>5</sup>

Since a number of the staples included in the basket are often subsidized by local governments in Russia, it may seem that the price level ratio derived from this basket should be viewed as a lower bound for the overall price level. While this is a plausible conjecture as far as goods prices are concerned, it is not clear *a priori* whether it would still hold if service prices are taken into account. As discussed above, the relative price of a number of important services remained extremely low throughout

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<sup>1</sup>Particularly as regards black market prices and volumes.

<sup>2</sup>See Koen and Meyermans (1994) for details.

<sup>3</sup>A narrower measure, popularized by *The Economist*, would be the price of a Big Mac sandwich at Mc Donald's; see Koen and Meyermans (1994).

<sup>4</sup>The basket reflects the minimum food consumption required for a 45-year old, able-bodied worker as defined by the former U.S.S.R. State Committee for Labor and Social Problems, and includes (with volumes expressed on an annual basis) rye bread (92 kg), wheat bread (86.7 kg), millet (18.1 kg), vermicelli (7.3 kg), sugar (24.8 kg), vegetable oil (10 kg), butter (3.6 kg), beef (42 kg), boiled sausage (2.2 kg), salami (1.1 kg), milk (184.3 liters), sour cream (4.2 kg), hard cheese (2 kg), eggs (183), potatoes (146 kg), fresh cabbage (29.8 kg), onion (10.2 kg), apples (11 kg), and cigarettes (96 packs).

<sup>5</sup>The two measures differ because the price of the basket is higher in France and because of changes in the FRF/\$ exchange rate over the period under consideration.

1992-94, meaning that the overall consumer price level in Russia was lower than what goods prices alone would indicate.

## 2. Broader Price Measures

In order to cover a more representative sample of consumer goods and services, a systematic comparison with contemporaneous French prices was attempted for all the items of the Russian CPI.<sup>1</sup> Whenever applicable, the lowest quality variety appearing in the French nomenclature was used so as to account for the likely quality differentials. Not surprisingly, matching failed for many items, mostly because of insufficiently precise specifications or absence of a counterpart. Nevertheless, the coverage was extended significantly compared with the basket of staples.

The Russian data set for January 1992 was more limited than for subsequent dates, mainly because no service prices were available for that month. Two separate comparisons were therefore conducted. The first was for goods only, starting in January 1992, with matches achieved for 74 percent of foodstuffs and 25 percent of non-food goods, jointly representing 51 percent of the overall CPI (all at 1993 Russian weights). The second comparison pertained to a broader set of goods and services, starting in July 1992, with matches achieved for the same 74 percent of food goods, 29 percent of non-food goods and 29 percent of services, altogether covering 54 percent of the overall CPI (also at 1993 Russian weights).

Cross-country price level ratios can be computed in several ways. Since the weights of the main groups of items in household expenditures are dramatically different in Russia from what they are in France (Chart 3), and since domestic relative price structures also differ enormously, one would expect the results to be sensitive to the formula that is selected. One way to measure the distance between Russian and French price levels is to define a Paasche-type index  $P$ , based on Russian weights:

$$P \equiv \frac{\sum_i p_i^R q_i^R}{\sum_i p_i^F q_i^R} = \frac{\sum_i \omega_i^R}{\sum_i \frac{p_i^F}{p_i^R} \omega_i^R} \quad (2)$$

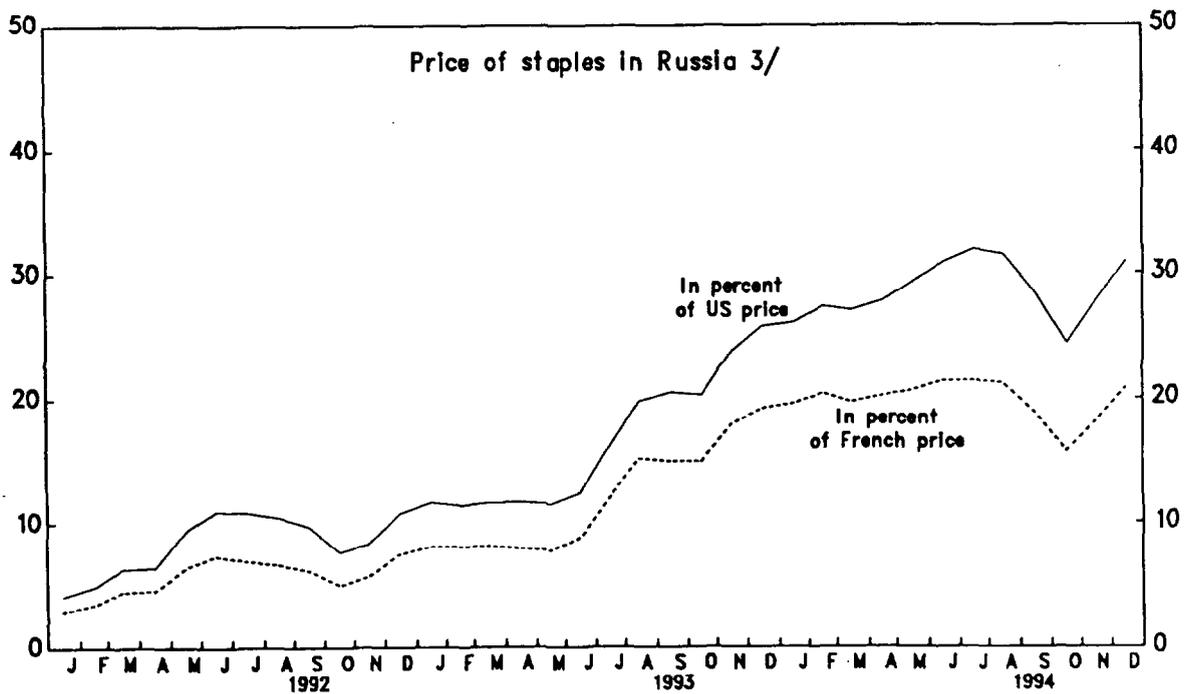
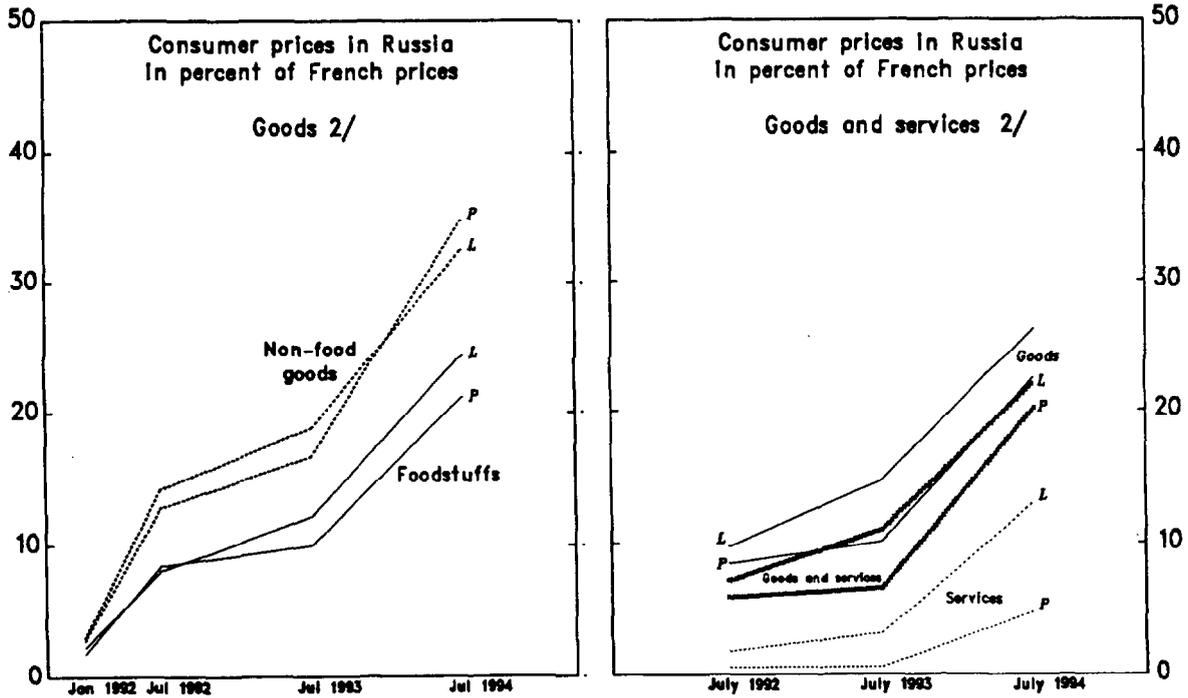
where

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<sup>1</sup>Average prices in France are published in the INSEE's *Bulletin Mensuel de Statistique*. France was selected as the comparator country because of the availability of fairly detailed price level data and the familiarity of one of the authors with the empirical content of this information.

Chart 6

INTERNATIONAL COMPARISON OF PRICE LEVELS 1/



Sources: Goskomstat of the Russian Federation; Center for Economic Analysis; INSEE; US Bureau of Labor Statistics; and authors' calculations.

1/ Using the exchange rate quoted on the MICEX.

2/ P denotes a Paasche, Russian-weighted index, and L a Laspeyres, French-weighted index.

3/ Basket of 19 staples.



$$\omega_j^R = \frac{p_j^R q_j^R}{\sum_i p_i^R q_i^R} ,$$

with  $i$  indexing the items for which matches were achieved, and  $R$  denoting Russia and  $F$  France.

An alternative approach involves the use of French rather than Russian weights, and the computation of a Laspeyres-type index, denoted  $L$ :

$$L = \frac{\sum_i p_i^R q_i^F}{\sum_i p_i^F q_i^F} = \frac{\sum_i \frac{p_i^R}{p_i^F} \omega_i^F}{\sum_i \omega_i^F} \quad (3)$$

where

$$\omega_j^F = \frac{p_j^F q_j^F}{\sum_i p_i^F q_i^F} .$$

There is no compelling reason to prefer domestic or foreign weights in a bilateral price level comparison. If a single point-estimate were to be sought, a measure such as a Fisher-type index (i.e., an equi-weighted geometric average of  $L$  and  $P$ ) would be an agnostic compromise. However, given the data limitations, it may be preferable to think of the Paasche and Laspeyres indices as delineating an estimated range for the price level ratio.

The results of the first comparison, shown in the top left panel of Chart 6, are broadly in line with those obtained above for the basket of 19 staples. The Paasche index for food prices increased from less than 2 percent in January 1992 to 8 percent in mid-1992, 10 percent in mid-1993, and 21 percent by mid-1994.<sup>1</sup> It also appeared that the domestic price of non-food goods relative to France was consistently higher than for foodstuffs but followed a similar path, rising from less than 3 percent in January 1992 to 13 percent in mid-1992, 17 percent in mid-1993, and 35 percent by mid-1994. The use of the corresponding Laspeyres indices produced very similar results.

The results of the second comparison appear in the top right panel of Chart 6. The point estimates of the level of service prices are much more

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<sup>1</sup>Richards and Tersman (1995) find that food prices in Latvia in March 1994 were about 37 percent of the Swedish level.

sensitive to the choice of the weights than for goods. Nevertheless, both the Paasche and the Laspeyres measures indicate that the domestic price of services compared to France started from an extremely low level in mid-1992, and that although it rose faster than that of goods, it remained well below the latter by mid-1994. The inclusion of services into an overall consumer price level comparison therefore brings down the ratio of Russian to French prices. Broadly speaking, consumer prices in Russia rose from about 6-7 percent of the French level in July 1992 (immediately following exchange rate unification) to 20-22 percent in July 1994. This is almost exactly in line with the estimates derived based on the basket of 19 staples, reflecting the offsetting effects of higher relative prices for non-food goods and of lower relative prices for services.

The gap between domestic and foreign prices thus narrowed between 1992 and 1994, but remained very wide by mid-1994. The relatively swift movement toward international price levels in the early phase of the transition is consistent with the pattern described by Halpern and Wyplosz (forthcoming) in their cross-country study. The persistence of a large chasm between the price level in Russia and in market economies is consistent with the well-known positive correlation between per capita income and price levels.<sup>1</sup> The law of one price clearly does not apply to non-tradeables such as services, but it also fails for tradeables insofar as the latter are subject to import or export tariffs or quotas. Even when no restrictions or taxes come into play, the price of highly tradeable items embodies a non-tradeable component in the form of distribution costs. Given the very low dollar wage levels prevailing in Russia, one would expect prices in Russia to be well below those in comparator market economies.

#### IV. Regional Disparities

Geographical price and nominal income dispersion has traditionally been very pronounced in Russia, not least due to the vastness of the country and the harshness of its climate, which implied substantial distribution costs. Unfortunately, the available data do not allow to judge whether prices across regions converged or diverged as a result of the transition.<sup>2</sup> It is nevertheless possible to examine the evolution of price dispersion measures following the January 1992 price liberalization in order to assess the evolution of market integration.

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<sup>1</sup>Rationalized by Balassa (1964) and Samuelson (1964) among others. In this respect, the selection of France influences the point estimates presented above but given the order of magnitude of the price level gap, the same qualitative results would have been obtained using other market economies as a benchmark.

<sup>2</sup>Regional inflation rates have been published but in the absence of information on regional price levels for some base period, it cannot be established whether differential price increases entailed convergence or divergence of price levels across regions.

1. Falling Geographical Dispersion

There are reasons to expect geographical price dispersion to have been high in early 1992 and to have declined thereafter. Uncertainty about actual new relative prices was probably more pronounced in the immediate aftermath of the price jump than one or two years later and may have contributed to price dispersion. In addition, remaining local subsidization or other controls differed across regions depending *inter alia* on their wealth and on local politics, but presumably declined over time.

The average coefficients of variation presented in Table 3 point to a reduction in cross-regional dispersion both for food and non-food goods prices.<sup>1</sup> Also noteworthy is the fact that the dispersion was initially larger for food than for non-food goods, probably because of more extensive residual subsidization and trade barriers for the former, but that by mid-1993, the dispersion was of the same order of magnitude for the two categories of goods.

Even by mid-1994, the level of geographic price dispersion remained on the high side compared to market economy standards.<sup>2</sup> In Canada--which among industrialized countries comes closest to Russia as far as climate and distances are concerned--the average coefficient of variation for food items was on the order of 13 percent, i.e., somewhat lower than the estimate for Russia as of mid-1994.

2. Residual Subsidization

While information on regional price disparities in general is limited, data have been published on the price of the aforementioned 19 staples basket across a large number of cities from early 1992 onwards. The coverage of outlets, however, changed in the second half of 1992, when it was extended to include city markets alongside stores. The impact of this modification on the price dispersion measures shown in Table 4 (coefficient of variation, maximum over minimum ratio, and decile ratio) is *a priori* ambiguous. Thus, the only relevant comparisons over time pertain to June versus February 1992 on the one hand, and to the end-1992, end-1993 and end-1994 on the other.<sup>3</sup>

In contrast to the result derived above for a set of broadly similar individual food items, the dispersion indicators point to a significant increase in geographical variation from end-1992 to end-1993, possibly due

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<sup>1</sup> The data sources and coverage are described in Table 3. The sub-set of foodstuffs is very similar to the one constituting the basket of 19 staples. No information on local services prices was available.

<sup>2</sup> Some dispersion is observable even in market economies, as noted long ago by Mills (1927) for the United States.

<sup>3</sup> Apart from the change in coverage, seasonality would also render the comparison with February and June 1992 hazardous.

Table 3. Russia: Geographical Price Dispersion  
for Food and Non-Food Goods<sup>1</sup>  
(Average coefficient of variation, in percent)<sup>2</sup>

	Foodstuffs <sup>3</sup>	Non-Food Goods <sup>4</sup>
March 1992	37	28
July 1993	25	25
June 1994	17	17
<i>Memorandum item:</i>		
Canada 1991 <sup>5</sup>	13	...

Sources: *Statistical Bulletin* of the Statistical Committee of the Commonwealth of Independent States (various issues); Center for Economic Analysis; Statistics Canada, *Consumer Prices and Price Indexes*, various issues; and authors' calculations.

<sup>1</sup>The statistics shown pertain to a sample of 9 cities (Moscow, Chelyabinsk, Ekaterinburg, Kazan, Nizhni-Novgorod, Novosibirsk, Saint Petersburg, Volgograd, and Voronezh). For March 1992, information was available for an extra 10 cities (Arkhangelsk, Krasnodar, Kemerovo, Pskov, Ryazan, Samara, Smolensk, Stavropol, Tambov, and Vologda) and the dispersion coefficients are 38 percent for foodstuffs and 28 percent for non-food goods.

<sup>2</sup>For Russia, weighted average of item-specific coefficients of variation, with weights reflecting the share of the items in the CPI.

<sup>3</sup>Representing about half of the weight of food items in the CPI.

<sup>4</sup>Representing about one sixth of the weight of non-food goods in the CPI.

<sup>5</sup>For Canada, equi-weighted average of item-specific coefficients of variation, based on retail prices for 60 food goods for the first week of January, April, July, and October, 1991, and covering a sample of 25 cities (St. John's (Nfld), Charlottetown, Sydney, Halifax, Moncton, Saint John (N.B.), Chicoutimi, Québec, Trois Rivières, Sherbrooke, Montréal, Hull, Ottawa, Toronto, Hamilton, London, Sudbury, Thunder Bay, Winnipeg, Regina, Saskatoon, Edmonton, Calgary, Vancouver, and Victoria).

to an increasing divergence in local subsidization levels. Consistent with the earlier results, however, they show a slight decline between end-1993 and end-1994.<sup>1</sup> To a large extent, the discrepancy between the results displayed in Tables 3 and 4 is due to the fact that the sample used in Table 3 was much smaller and did not include cities of the Far East or the Far North. Controlling for the difference in geographical coverage, as is done in the bottom line of Table 4, helps reconcile the results and suggests that after price liberalization at the federal level in early 1992, local subsidies became relatively more important in the colder and more remote parts of the country.<sup>2</sup>

Looking at the ranking of specific cities, certain patterns emerge. The highest prices were consistently registered in areas such as the Far East (e.g., Magadan and Yuzhno-Sakhalinsk), and the lowest ones in areas such as the Volga region (Ulyanovsk and Kazan), partly reflecting differences in climate and transportation costs, but also local price policies.<sup>3</sup> Notwithstanding the relative ordinal stability of the extrema, the overall cardinal ranking of cities changed substantially over time, particularly during the first half of 1992 (Table 5). In the course of 1993, significant further shifts occurred, which, as evident from Table 4, resulted in higher geographical price dispersion. During the third year following price liberalization, the ranking changed much less, as attested by the high correlation coefficient between end-1993 and end-1994 prices. The evolution over time of the relative price of staples across regions is presumably largely determined by changes in relative subsidization and administrative control levels, which in turn are conditioned by local policies and budgetary resources.

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<sup>1</sup>The max/min ratio rises a little but is a less relevant measure of dispersion than the decile ratio, which clearly drops.

<sup>2</sup>Another difference between Tables 3 and 4 is that Table 3 was for mid-year rather than end-year data, and was based on averages of individual coefficients of variation rather than coefficients of variation for the price of a basket.

<sup>3</sup>As denoted by its name, Ulyanovsk is Lenin's birth place. The local authorities took steps to limit exports of agricultural products to other regions in order to ensure local supply at low, controlled prices.

Table 4. Russia: Geographical Price Dispersion for a Basket of Staples<sup>1</sup>

	1992		1993	1994	1994	Memorandum item: Canada 1991 <sup>4</sup>
	Feb. <sup>2</sup>	June <sup>2</sup>	Dec. <sup>3</sup>	Dec. <sup>3</sup>	Dec. <sup>3</sup>	
Coefficient of variation (in percent)	18.5	18.7	22.0	34.1	30.1	6.5
Maximum/minimum	2.4	2.7	3.8	5.0	5.1	1.3
Top decile/bottom decile	1.8	2.0	2.1	2.8	2.4	1.3
Number of observations	99	91	97	62	98	25
<u>Memorandum item:</u>						
Coefficient of variation for 9 cities <sup>5</sup>	39.4	18.7	18.7	18.6	17.3	...

Sources: Goskomstat data published in *Delovoy Mir* and in the quarterly reports of the Center for Economic Analysis; Statistics Canada, *Consumer Prices and Price Indexes*, various issues; and authors' calculations.

<sup>1</sup>The sample of cities includes Abakan, Angarsk, Arkhangelsk, Arzamas, Astrakhan, Barnaul, Belgorod, Berdsk, Birobidzhan, Bryansk, Cherkessk, Chita, Divnogorsk, Dzerzhinsk, Gorno-Altaysk, Ishimbay, Izhevsk, Kaliningrad, Kaluga, Kamyshin, Kazan, Kemerovo, Kirov, Kirovo-Chepetsk, Kopeysk, Kostroma, Krasnodar, Krasnoyarsk, Kurgan, Kursk, Lipetsk, Magadan, Makhachkala, Maykop, Miass, Moscow, Murmansk, Naberezhnyye Chelny, Nalchik, Neftekamsk, Nizhni Novgorod, Nizhni Tagil, Norilsk, Novocheboksarsk, Novosibirsk, Novokuznetsk, Novorossiysk, Novyy Urengoy, Obninsk, Omsk, Orel, Orenburg, Orsk, Penza, Perm, Petropavlosk-Kamchatskiy, Petrozavodsk, Prokolyevsk, Pskov, Rostov-on-Don, Rubtsovsk, Ryazan, Rybinsk, Samara, Severodvinsk, Saint Petersburg, Salekhard, Saransk, Shakhty, Shebekino, Sovetsk, Syktyvkar, Syzran, Taganrog, Tambov, Tayshet, Tolyatti, Tomsk, Tuapse, Tula, Tver, Tyumen, Ufa, Ukhta, Ulyanovsk, Vladikavkaz, Vladimir, Vlagoveshchensk, Volgograd, Vologda, Volgodonsk, Vorkuta, Voronezh, Yaroslav, Yekaterinburg, Yakutsk, Yelets, Yoshkar-Ola, Yuzhno-Sakalinsk, but for some dates several observations were missing. The exact dates are February 18, 1992, June 23, 1992, December 8, 1992, December 28, 1993 and December 13, 1994.

<sup>2</sup>Excluding city markets.

<sup>3</sup>Including city markets.

<sup>4</sup>A Canadian basket was constructed replicating the basket described in footnote 1. The statistics shown are the averages of the statistics computed for the first week of January, April, July, and October, 1991. The geographical coverage is the same as in Table 3.

<sup>5</sup>Moscow, Chelyabinsk, Ekaterinburg, Kazan, Nizhni-Novgorod, Novosibirsk, Saint Petersburg, Volgograd, and Voronezh (same cities as in Table 3).

Table 5. Russia: Geographical Price Cross-Correlations for a Basket of Staples

	June 1992	Dec. 1992	Dec. 1993	Dec. 1994
Feb. 1992	0.51	0.47	0.35	0.29
June 1992	1.00	0.72	0.61	0.62
Dec. 1992		1.00	0.67	0.72
Dec. 1993			1.00	0.89

Sources: same as Table 4.

The level of price dispersion remained high throughout the period under consideration, as suggested by a comparison with similar indicators for Canada (last column of Table 4). By end-1994, the price of the basket stood at around 30 percent of the U.S. level on average across Russian cities, but it amounted to only 15 percent in Ulyanovsk versus 75 percent in Yuzhno-Sakhalinsk.

#### V. Conclusions

The empirical investigation conducted in this paper confirms that after their decontrol, prices in Russia moved closer to market levels. For goods, most of the permanent realignment in domestic relative prices had taken place by the end of 1992, even though some further shifts occurred in 1993-94. For services, convergence to market levels appears to be a more protracted process; by mid-1994, notwithstanding sharp increases in relative domestic terms, the prices of many important services remained far below advanced market economy levels.

Due to major discontinuities in the exchange rate regime, it remains difficult to pass judgment on the impact of the transition on the gap between the domestic overall price level and the level prevailing abroad. However, it is clear that this gap, which was huge in January 1992, has narrowed substantially. Similarly, while the effect of the transition on geographical price dispersion within Russia cannot be assessed, it was possible to establish that the degree of integration of the domestic goods market, particularly for non-food items, seems to have increased since early 1992.

It would be hazardous, however, to view these results as more than early, indicative ones. While some of the trends identified in this paper are probably robust to the use of alternative indices and superior samples, others are ambiguous and need further substantiation. In particular, the

comparison of international price levels carried out here is extremely tentative,<sup>1</sup> as is the analysis of geographical price dispersion.<sup>2</sup>

One important policy implication of the empirical analysis of price convergence which transcends potential price measurement errors and which would extend to other transition economies should be highlighted. As pointed out by Richards and Tersman (1995) for the Baltic states, the large gap between domestic and international price levels that remains two or three years after price liberalization implies that convergence, to the extent it proceeds, will be accompanied by real exchange rate appreciation. The latter could take the form of a strengthening of the nominal exchange rate. However, the relative price of services can be expected to rise significantly in the years ahead, as cost-recovery ratios are still low for many of them. Even if tight financial policies and foreign competition were to contain price increases in the tradeable goods sector, the process of real exchange rate appreciation is thus likely to involve persistently higher measured inflation in Russia than in Western Europe.

Several promising areas for further research can be identified. The first one is to expand the samples used in this paper in order to assess the robustness of its main results. In particular, the inclusion of more recent data would reveal whether the incipient trend toward greater synchronization in price setting uncovered looking at 1992-93 inflation rates continues in 1994 and beyond. Longer time series would also permit a potentially interesting investigation of the impact of seasonality on relative price variability.<sup>3</sup> Furthermore, it would be worthwhile to examine to what extent the results obtained for Russia can be generalized to other economies in transition.<sup>4</sup>

A second area for further work would involve extending the analysis to producer prices. Highly disaggregated industrial producer price data exist and could be exploited, albeit taking into account the complication of arrears. The latter have not played a large role for cash-based, retail transactions but have been ubiquitous at the non-cash, wholesale level. Based on producer prices, convergence toward international levels may well be more advanced than for consumer prices because of the larger share of non-tradeables in the CPI than in the PPI.<sup>5</sup> Indeed, the speed of

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<sup>1</sup>The European Comparison Program results for 1993, due to be released in 1996, should shed some further light on this comparison.

<sup>2</sup>Far more comprehensive data than those we had access to seem to exist at Goskomstat and would permit a more thorough investigation.

<sup>3</sup>In the United States and France, seasonality probably accounts for a quarter or more of the total relative price variability for goods at a 100-200 item level of disaggregation.

<sup>4</sup>Such an investigation is currently under way, see De Broeck, De Masi and Koen (forthcoming) and De Masi and Koen (in preparation).

<sup>5</sup>As noted by Froot and Rogoff (1994), this point was made by Keynes in his 1925 pamphlet on *The Economic Consequences of Mr. Churchill*.

convergence has been more rapid for producer prices, which rose almost twice as much as consumer prices in Russia between December 1990 and December 1994, with the bulk of the faster growth occurring in 1991-92. But in the absence of level estimates, this evidence is not sufficient to confirm that the gap between domestic and international prices is narrower for producer prices.

A third set of issues worthy of further research pertains to the pathology of inflation, as opposed to the morphological approach adopted in this paper. As longer time series become available, quantitative work could be carried out on the dynamic interaction of money and credit, arrears, relative consumer and producer prices, and the overall price level. In this context, the neutrality or influence of market structures could also be examined.

Table A1. Russia: Prices of Selected Goods or Groups of Goods  
in Stores Since 1980

	Nominal index (1980 = 1)						
	1980	1985	1990	1991	1992	Dec. 1992	June 1993
<b>Foodstuffs</b>							
Meat	1.00	1.03	1.09	2.74	55	121	451
Sausage	1.00	1.02	1.11	3.42	56	120	637
Canned meat	1.00	1.03	1.14	3.73	67	151	532
Fish	1.00	1.04	1.19	4.44	51	119	1,141
Herring	1.00	0.68	0.59	1.21	40	133	438
Canned fish	1.00	0.96	0.77	1.73	47	112	545
Butter	1.00	0.99	1.00	2.44	54	108	385
Vegetable oil	1.00	0.99	1.01	1.96	33	102	254
Cheese	1.00	1.03	1.03	2.22	67	129	519
Eggs	1.00	1.01	1.06	2.18	28	70	211
Sugar	1.00	0.98	1.03	2.44	65	160	427
Tea	1.00	1.04	1.17	2.44	34	101	375
Bread	1.00	1.03	0.97	2.28	28	75	186
Flour	1.00	1.03	1.25	3.58	37	94	200
Groats	1.00	0.98	0.98	2.73	62	159	295
Macaroni	1.00	1.02	1.04	2.87	46	106	245
Potatoes	1.00	1.08	2.15	8.38	125	123	362
Vegetables	1.00	1.03	1.56	4.46	88	179	1,797
Berries	1.00	0.99	1.44	3.65	79	...	...
Vodka	1.00	1.25	2.18	2.43	26	59	181
Wine	1.00	1.38	1.66	3.68	58	173	286
Brandy	1.00	1.20	1.62	3.09	27	81	147
Champagne	1.00	1.30	1.50	3.06	45	165	298
Beer	1.00	1.04	1.18	2.24	47	92	476
<b>Non-food goods</b>							
Color TV	1.00	0.94	1.19	2.49	34	94	251
Black and white TV	1.00	0.94	1.04	2.15	36	110	275
Radio	1.00	1.05	1.39	2.95	25	...	...
Tape recorder	1.00	1.26	1.82	3.32	21	52	163
Camera	1.00	1.01	1.30	3.70	23	134	145
Refrigerator	1.00	1.16	1.39	2.99	68	273	714
Washing machine	1.00	1.08	1.24	3.30	80	206	585
Vacuum cleaner	1.00	1.07	1.39	5.41	90	198	581
Watch	1.00	0.87	1.10	2.00	19	53	104
Sewing machine	1.00	1.15	1.37	4.01	50	169	448
Motorbike	1.00	1.23	1.27	2.39	35	...	...
Bicycle	1.00	1.03	1.10	2.93	29	145	234
Glass	1.00	1.06	1.26	1.26	23	161	492
Lumber	1.00	1.05	1.55	1.55	29	124	450
Cement	1.00	1.61	1.61	1.61	30	81	336
Roofing slate	1.00	1.20	1.22	1.22	23	160	1,302
Roll of metal	1.00	1.58	1.46	1.46	27	...	...

Table A1 (continued). Russia: Prices of Selected Goods or Groups of Goods in Stores Since 1980

	<u>Real index (1980 = 100)<sup>1</sup></u>						
	1980	1985	1990	1991	1992	Dec. 1992	June 1993
<b>Foodstuffs</b>							
Meat	100	98	92	115	147	145	171
Sausage	100	97	94	144	150	144	242
Canned meat	100	98	96	157	181	182	202
Fish	100	99	101	187	138	144	434
Herring	100	64	50	51	108	160	167
Canned fish	100	91	65	73	127	134	207
Butter	100	94	84	103	144	130	146
Vegetable oil	100	94	85	82	90	123	96
Cheese	100	98	87	94	179	155	197
Eggs	100	96	89	92	76	85	80
Sugar	100	93	87	103	174	193	162
Tea	100	99	99	103	91	122	142
Bread	100	98	82	96	76	90	71
Flour	100	98	105	151	100	114	76
Groats	100	93	82	115	165	192	112
Macaroni	100	97	88	121	124	127	93
Potatoes	100	102	182	353	335	148	137
Vegetables	100	97	132	188	235	216	683
Berries	100	94	121	154	213	...	...
Vodka	100	119	184	102	70	71	69
Wine	100	131	140	155	156	208	109
Brandy	100	114	137	130	74	98	56
Champagne	100	124	126	129	121	198	113
Beer	100	99	100	95	125	111	181
<b>Non-food goods</b>							
Color TV	100	89	100	105	91	114	95
Black and white TV	100	90	88	90	96	132	104
Radio	100	99	117	124	66	...	...
Tape recorder	100	119	154	140	56	62	62
Camera	100	96	110	156	61	161	55
Refrigerator	100	110	117	126	183	328	271
Washing machine	100	102	105	139	214	248	223
Vacuum cleaner	100	102	117	228	243	238	221
Watch	100	82	93	84	51	64	40
Sewing machine	100	109	116	169	135	204	170
Motorbike	100	116	107	101	93	...	...
Bicycle	100	98	93	123	79	175	89
Glass	100	100	106	53	63	194	187
Lumber	100	99	131	65	78	149	171
Cement	100	153	136	68	81	97	128
Roofing slate	100	114	103	51	61	193	495
Roll of metal	100	150	123	62	73	...	...

Table A1 (concluded). Russia: Prices of Selected Goods or Groups of Goods in Stores Since 1980<sup>2</sup>

	<u>In percent of average monthly wage</u>						
	1980	1985	1990	1991	1992	Dec. 1992	June 1993
<b>Foodstuffs</b>							
Meat	0.98	0.90	0.64	0.87	1.56	1.31	1.67
Sausage	1.50	1.35	1.00	1.66	2.44	1.99	3.59
Canned meat	0.50	0.45	0.34	0.59	0.97	0.83	0.99
Fish	0.44	0.40	0.31	0.63	0.66	0.58	1.88
Herring	1.10	0.66	0.39	0.43	1.28	1.61	1.80
Canned fish	0.44	0.37	0.20	0.24	0.60	0.54	0.90
Butter	1.94	1.70	1.16	1.52	3.01	2.30	2.80
Vegetable oil	0.91	0.80	0.55	0.57	0.88	1.03	0.87
Cheese	1.36	1.24	0.84	0.97	2.62	1.93	2.64
Eggs (10 pieces)	0.59	0.52	0.37	0.41	0.48	0.45	0.46
Sugar	0.50	0.43	0.31	0.39	0.93	0.88	0.79
Tea	4.08	3.75	2.87	3.20	4.02	4.57	5.73
Bread	0.20	0.18	0.12	0.15	0.17	0.17	0.14
Flour	0.20	0.18	0.15	0.23	0.22	0.21	0.15
Groats	0.25	0.21	0.14	0.22	0.44	0.44	0.27
Macaroni	0.30	0.27	0.19	0.28	0.40	0.35	0.27
Potatoes	0.07	0.07	0.09	0.20	0.26	0.10	0.10
Vegetables	0.22	0.20	0.21	0.32	0.56	0.44	1.48
Berries	0.59	0.52	0.51	0.69	1.36	...	...
Vodka	4.81	5.30	6.27	3.75	3.66	3.11	3.26
Wine	1.46	1.78	1.45	1.73	2.47	2.80	1.57
Brandy	9.89	10.49	9.61	9.83	7.89	8.87	5.44
Champagne	3.16	3.63	2.83	3.11	4.12	5.74	3.53
Beer	0.28	0.25	0.20	0.20	0.37	0.28	0.49
<b>Non-food goods</b>							
Color TV	374	310	266	300	366	390	351
Black and white TV	140	116	87	96	145	169	144
Radio	61	56	51	58	43	...	...
Tape recorder	139	154	152	149	84	79	85
Camera	39	35	30	46	26	58	21
Refrigerator	138	142	115	133	273	417	371
Washing machine	52	49	38	55	119	118	114
Vacuum cleaner	23	22	19	40	60	50	50
Watch	17	13	11	11	9	10	7
Sewing machine	77	78	63	100	112	144	130
Motorbike	425	460	324	327	428	...	...
Bicycle	49	45	32	46	42	79	43
Glass (per m <sup>2</sup> )	0.61	0.57	0.46	0.25	0.42	1.10	1.13
Lumber (per m <sup>3</sup> )	31	29	29	15	26	42	52
Cement (per ton)	19	27	18	10	17	17	24
Roofing slate (10 tiles)	0.51	0.54	0.37	0.20	0.34	0.90	2.47
Roll of metal (per ton)	176	245	154	83	139	...	...

Sources: Goskomstat, *Russian Federation in 1992, Statistical Yearbook*, Moscow, 1993 and monthly reports; and authors' calculations.

<sup>1</sup>The numéraire is the overall RPI/CPI (the retail price index through 1990 is linked with the consumer price indices for subsequent periods).

<sup>2</sup>Price per kilo, liter, or piece, unless specified otherwise.

Table A2. Russia: Prices of Selected Foodstuffs  
in City Markets Since 1980

	1980	1985	1990	1991	1992	Dec. 1992	June 1993
<u>Ratio over price in stores</u>							
Meat	4.0	3.7	4.1	4.3	1.3	1.4	1.9
Fish	...	2.8	3.1	2.2	1.3	1.5	0.8
Butter	2.0	2.4	2.8	3.6	1.1	1.2	1.0
Vegetable oil	1.6	1.8	2.6	3.9	1.3	1.0	0.9
Cheese	2.2	2.2	3.3	4.3	0.9	1.2	0.9
Eggs	1.3	1.1	1.5	2.2	0.9	1.2	1.0
Potatoes	3.7	4.1	3.5	2.5	1.1	2.2	2.4
Vegetables	3.7	4.4	4.6	3.4	1.1	1.2	0.8
Berries	2.3	2.5	2.7	3.0	0.6	...	...
<u>Nominal index (1980 = 1)</u>							
Meat	1	0.97	1.13	2.95	19	43	213
Butter	1	1.19	1.41	4.41	31	65	190
Vegetable oil	1	1.12	1.68	4.84	28	68	149
Cheese	1	1.03	1.54	4.24	27	71	197
Eggs	1	0.87	1.19	3.70	20	64	160
Potatoes	1	1.19	2.06	5.58	38	73	240
Vegetables	1	1.20	1.92	4.03	26	58	363
Berries	1	1.04	1.64	4.62	21	...	...
<u>Real index (1980 = 100)<sup>1</sup></u>							
Meat	100	92	96	124	50	52	81
Butter	100	113	119	186	83	78	72
Vegetable oil	100	107	142	204	74	82	57
Cheese	100	98	130	179	72	85	75
Eggs	100	83	101	156	54	77	61
Potatoes	100	113	174	235	101	88	91
Vegetables	100	114	162	170	70	70	138
Berries	100	99	139	195	58	...	...
<u>In percent of average monthly wage<sup>2</sup></u>							
Meat	3.91	3.35	2.65	3.70	2.11	1.87	3.12
Fish	...	1.11	0.97	1.40	0.87	0.89	1.42
Butter	3.87	4.06	3.26	5.50	3.45	2.78	2.76
Vegetable oil	1.42	1.41	1.43	2.22	1.14	1.08	0.80
Cheese	3.05	2.78	2.81	4.17	2.36	2.38	2.25
Eggs (10 pieces)	0.75	0.58	0.54	0.90	0.44	0.54	0.45
Potatoes	0.27	0.28	0.33	0.49	0.30	0.22	0.24
Vegetables	0.82	0.87	0.94	1.07	0.62	0.53	1.12
Berries	1.38	1.27	1.36	2.05	0.86	...	...

Sources: Goskomstat, *Russian Federation in 1992, Statistical Yearbook*, Moscow, 1993 and monthly reports; and authors' calculations.

<sup>1</sup>The numéraire is the overall RPI/CPI (the retail price index through 1990 is linked with the consumer price indices for subsequent periods).

<sup>2</sup>Price per kilo or liter unless specified otherwise.

Table A3. Russia: Evolution of Selected Components of the CPI,  
January 1992-July 1994(Percent change in relative price)<sup>1</sup>

	July 92/		July 93/		July 94/	
	Jan 92	Jul 92	Jan 92	Jul 93	Jul 92	Jan 92
<b>Food goods</b>						
Beef	-51	13	-45	-30	-21	-61
Pork	-47	16	-39	-25	-13	-54
Meat dumplings	-32	39	-5	-8	28	-13
Cooked sausage	-21	44	13	-22	12	-12
Partially smoked sausage	-32	39	-6	-26	2	-31
Fish, live and chilled	-32	55	5	25	93	31
Herring, salted, smoked, ivasi	4	90	98	-7	77	85
Fish canned in oil	3	36	40	-9	24	27
Fish canned in tomato juice	4	-17	-14	-12	-27	-25
Butter	-8	-23	-29	-32	-47	-51
Vegetable oil	-32	-3	-34	-10	-13	-41
Lard	13	31	48	-33	-12	-0
Margarine	-4	-5	-8	-15	-19	-22
Milk, fresh	51	9	63	34	45	119
Sour cream	-36	-19	-48	30	5	-33
Yogurt	162	6	178	49	58	314
Cottage cheese, high-fat	-53	-23	-64	53	18	-45
Cottage cheese, non-fat	17	...	...	...	94	127
Cheese, hard and soft rennet	4	2	6	-7	-5	-1
Processed cheese	-21	...	...	...	14	-10
Canned tomatoes	8	12	21	12	26	36
Fruit and berry juices	361	-5	336	-11	-16	287
Eggs	-46	9	-42	-1	8	-42
Sugar	135	-8	116	-58	-61	-9
Cookies	11	-13	-4	7	-7	2
Pryaniki	9	7	17	-20	-15	-7
Caramels, toffee	59	-23	23	-12	-32	8
Tea	46	29	89	-48	-33	-2
Salt	157	-34	71	46	-3	148
Mayonnaise	-12	...	...	...	2	-10
Flour	-21	-19	-37	37	10	-13
Rye and rye-wheat bread	93	-31	33	100	38	166
Polished rice	31	-45	-28	-9	-50	-34
Seminola	-23	-29	-46	38	-2	-25
Millet	-23	-16	-36	38	15	-12
Groats, buckwheat	72	-34	13	-29	-53	-20
Groats, oat and pearl-barley	28	-58	-47	29	-46	-31
Peas and beans	-45	62	-10	24	101	11
Macaroni products	14	-38	-30	89	17	33
Potatoes	27	2	29	-1	1	28
Cabbage, fresh, white	9	150	172	23	209	236
Bulb onion	-16	50	26	51	127	90
Beets	102	-9	83	23	12	126
Carrots	186	-15	144	47	25	259

Table A3 (continued). Russia: Evolution of Selected Components of the CPI,  
January 1992-July 1994(Percent change in relative price)<sup>1</sup>

	July 92/		July 93/		July 94/	
	Jan 92	Jul 92	Jan 92	Jul 93	Jul 92	Jan 92
Garlic	-62	24	-53	-19	0	-62
Apples	12	-6	5	2	-5	7
Mineral water	...	...	...	38	...	...
Nonalcoholic beverages, domestic	...	...	...	-20	...	...
Ice cream	...	...	...	44	...	...
Vodka	22	-44	-32	-13	-52	-41
Cigarettes [papirosy]	63	-15	39	-49	-57	-29
Cigarettes, filter, domestic	-8	-20	-27	-36	-49	-53
Cigarettes, filter, imported	...	...	...	-17	...	...
<b>Non-food goods</b>						
Fabrics, cotton	...	...	...	-21	...	...
Fabrics, suit, wool or wool blend	...	...	...	2	...	...
Fabrics, natural silk	...	...	...	-26	...	...
Fabrics, artificial silk	...	...	...	-16	...	...
Coat, men	15	-36	-26	-19	-48	-40
Suit, men	21	-9	11	-15	-22	-6
Trousers, men	3	-26	-23	8	-20	-17
Shirt, men	11	-6	5	29	21	34
Coat, women, spring/autumn, wool	33	-39	-20	5	-37	-16
Dress, women, wool	-4	8	4	34	44	39
Jacket, schoolchildren	65	-23	26	-1	-24	26
Dress, schoolgirl	-7	-28	-33	42	3	-5
Shirt, boy	29	3	32	36	40	80
Bedsheet	...	...	...	-24	...	...
Women fur headwear	...	...	...	-27	...	...
Children fur headwear	...	...	...	51	...	...
Tee-shirt/tank-top, children	22	58	93	7	68	106
Tights, women	34	-55	-40	50	-33	-10
Socks, men	31	-31	-10	22	-16	10
Socks, children	22	-31	-15	53	6	30
Tights, children	26	-35	-18	20	-22	-2
Shoes, leather, men	28	-16	7	-1	-17	7
Boots, women	35	9	47	3	13	52
Summer shoes, women	88	-38	17	-20	-50	-7
Summer shoes, children's	119	-48	13	67	-13	89
Detergents	...	...	...	77	...	...
Soap, household	...	...	...	20	...	...
Soap, bath	...	...	...	44	...	...
Perfume	...	...	...	45	...	...
Shampoo	...	...	...	24	...	...
Cream, hand or face	...	...	...	74	...	...
Toothpaste	...	...	...	-21	...	...
Deodorant	...	...	...	26	...	...
Razor blade	...	...	...	--	...	...
Umbrella	...	...	...	-16	...	...

Table A3 (continued). Russia: Evolution of Selected Components of the CPI,  
January 1992-July 1994(Percent change in relative price)<sup>1</sup>

	July 92/		July 93/		July 94/	
	Jan 92	Jul 92	Jan 92	Jul 93	Jul 92	Jan 92
Toothbrush	...	...	...	34	...	...
Yarn, wool	...	...	...	-3	...	...
Thread, sewing, cotton	...	...	...	-16	...	...
Matches, box	...	-59	...	82	-26	...
Chair	...	...	...	20	...	...
Sofa-bed	...	...	...	-20	...	...
Set of bedroom furniture	...	...	...	-44	...	...
Set of kitchen furniture	...	...	...	-16	...	...
Carpet	...	...	...	-50	...	...
Pot, steel, enameled	...	...	...	3	...	...
Meat grinder, mechanical	...	...	...	-2	...	...
Frying pan	...	...	...	27	...	...
Flatware, stainless	...	...	...	-49	...	...
Dish	...	...	...	-18	...	...
Glassware	...	...	...	2	...	...
Wristwatch	...	...	...	-20	...	...
Alarm clock	...	...	...	6	...	...
Refrigerator	132	25	191	-40	-25	74
Clothes washer	...	...	...	-12	...	...
Electric vacuum cleaner	...	...	...	-38	...	...
Electric iron	77	-14	52	-10	-23	37
Electric lamps	...	...	...	-29	...	...
School notebook	...	...	...	170	...	...
Drawing tablet	...	...	...	174	...	...
Pen, ballpoint, domestic	...	...	...	64	...	...
Marking pen	...	...	...	291	...	...
Photographic paper	...	...	...	114	...	...
Daily newspaper	...	...	...	121	...	...
Book, fiction, hard-cover	...	...	...	48	...	...
Skis	...	...	...	137	...	...
Tape recorder	...	...	...	-26	...	...
Radio	...	...	...	10	...	...
Television set, color	15	14	30	-31	-21	-10
Piano	...	...	...	-30	...	...
Guitar	...	...	...	9	...	...
Plastic toys	...	...	...	35	...	...
Toy, electromechanical, wind-up	...	...	...	-5	...	...
Still camera	...	...	...	12	...	...
Tape recorder cassette (blank)	...	...	...	-27	...	...
Phonograph records	...	...	...	76	...	...
Jewelry, gold	...	...	...	-31	...	...
Round timber, conifer	...	...	...	1	...	...
Wood particle board	...	...	...	-96	...	...
Hard fiber board	...	...	...	11	...	...
Window glass, sheet	...	...	...	60	...	...

Table A3 (continued). Russia: Evolution of Selected Components of the CPI,  
January 1992-July 1994

(Percent change in relative price)<sup>1</sup>

	July 92/		July 93/		July 94/	
	Jan 92	Jul 92	Jan 92	Jul 93	Jul 92	Jan 92
Plywood	...	...	...	3	...	...
Cement	...	...	...	99	...	...
Brick	...	...	...	14	...	...
Prepared roofing paper	...	...	...	26	...	...
Linoleum	...	...	...	-1	...	...
Wallpaper	...	...	...	159	...	...
Ceramic tile	...	...	...	11	...	...
Bleach	...	...	...	40	...	...
Cleaning agents for tubs and sinks	...	...	...	120	...	...
Bicycle, adult	...	...	...	-15	...	...
Motorcycle	...	...	...	-27	...	...
Passenger cars	...	...	...	-45	...	...
Gasoline	...	34	...	-22	5	...
Analgesic, domestic	...	...	...	335	...	...
Analgesic, imported	...	...	...	274	...	...
Aspirin, domestic	...	...	...	-25	...	...
Aspirin, imported	...	...	...	32	...	...
"No-Shpa" medicine	...	...	...	991	...	...
Coal	...	-24	...	342	237	...
Firewood	...	-24	...	214	137	...
Sewing machine, mechanical	...	...	...	-34	...	...
Shovel, rake	...	...	...	60	...	...
<b>Services</b>						
Attaching heel taps	...	...	...	78	...	...
Mending men's trousers	...	...	...	48	...	...
Sewing trousers	...	...	...	14	...	...
Repairing color television sets	...	...	...	26	...	...
Repairing refrigerators	...	...	...	-9	...	...
Car maintenance	...	...	...	18	...	...
Dry cleaning of a coat	...	...	...	74	.....	...
Clothes laundering and ironing	...	...	...	107	...	...
Painting and wallpapering	...	...	...	40	...	...
Passport photographs	...	...	...	91	...	...
Bath in a bathhouse	...	...	...	185	...	...
Fashion haircut	...	...	...	93	...	...
Grave digging	...	...	...	176	...	...
City bus	...	...	...	324	...	...
Intercity bus	...	...	...	69	...	...
Streetcar/trolley bus	...	...	...	278	...	...
Inland water transportation	...	...	...	83	...	...
Sea transportation	...	...	...	289	...	...
Commuter train	...	...	...	83	...	...
Long-distance train	...	...	...	-71	...	...
Mailing a letter	...	...	...	210	...	...
Home telephone customer charge	...	...	...	110	...	...

Table A3 (concluded). Russia: Evolution of Selected Components of the CPI,  
January 1992-July 1994

(Percent change in relative price)<sup>1</sup>

	July 92/		July 93/		July 94/	
	Jan 92	Jul 92	Jan 92	Jul 93	Jul 92	Jan 92
Municipal rents	...	...	...	460	...	...
One night's stay in a hotel	...	...	...	89	...	...
Residence in a dormitory	...	...	...	157	...	...
Charge for electricity	-18	-83	-86	772	49	22
Charge for water and sewer	...	...	...	829	...	...
Charge for piped gas	...	...	...	-36	...	...
Charge for heating	...	...	...	524	...	...
Charge for hot water supply	...	...	...	741	...	...
Childcare, municipal center	...	...	...	40	...	...
Movie ticket	...	...	...	106	...	...
Theater ticket	...	...	...	276	...	...
Museum/exhibition ticket	...	...	...	171	...	...
Boat ride (recreational)	...	...	...	189	...	...
Bus tour	...	...	...	90	...	...
Sanatorium, trade union	...	...	...	56	...	...
Stay in vacation home	...	...	...	58	...	...
Initial visit to doctor-specialist	...	...	...	104	...	...
X-ray stomach exploration	...	...	...	72	...	...
Laboratory tests	...	...	...	85	...	...
New patient exam by a dentist	...	...	...	56	...	...
Tooth extraction	...	...	...	102	...	...
Cosmetic services	...	...	...	114	...	...
Notarization of a will	...	...	...	16	...	...
Legal counseling	...	...	...	143	...	...
Fee for transfer of deposit	...	...	...	262	...	...

Sources: Goskomstat of the Russian Federation; and authors' calculations.

<sup>1</sup>Relative to the overall CPI (urban CPI for 1992, expanded CPI thereafter).

Table A4. Russia: Monthly Price Increases for a Large Selection of Goods, 1992-93  
(In percent)

Item <sup>1</sup>	Weight <sup>2</sup>	1992												1993											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
<b>Food, Alcohol and Tobacco</b>																									
Beef	0.0220	345	4	5	2	12	7	8	9	17	37	30	23	41	32	30	23	28	27	23	27	22	12	8	5
Pork	0.0109	353	8	4	3	14	8	9	13	30	31	23	22	45	34	27	22	31	26	23	25	21	13	8	6
Poultry	0.0124	388	-7	4	-2	15	14	12	9	27	36	34	24	35	30	26	21	23	33	26	23	22	17	11	7
Cooked sausage	0.0231	551	0	13	3	6	17	13	8	15	35	31	20	32	42	35	20	23	28	27	28	21	13	9	6
Cocktail sausages	0.0043	628	2	6	4	6	15	12	8	18	29	27	22	34	43	34	19	24	27	27	31	19	13	10	6
Ham, boiled pork	0.0024	449	8	9	4	4	15	7	9	20	29	29	25	37	36	27	17	22	24	27	25	22	13	11	7
Partially smoked sausage	0.0143	320	3	2	5	6	12	9	14	22	28	25	24	36	43	30	19	23	29	25	30	21	12	8	6
Canned beef, pork, mutton	0.0048	248	69	18	2	5	3	2	11	11	28	26	22	19	29	26	18	15	18	20	21	17	14	10	8
Fish, live and chilled	0.0004	276	6	8	2	4	2	3	13	25	24	30	47	36	31	32	16	11	16	20	22	18	19	20	19
Fish, frozen	0.0057	858	9	22	17	20	7	7	8	13	16	37	55	34	33	33	20	10	10	7	14	13	17	25	21
Fish, salted, marinated	0.0009	363	23	39	21	18	11	15	12	16	32	39	37	22	24	22	30	16	20	15	19	28	22	20	12
Roe, sturgeon, salmon	0.0006	91	51	16	8	4	1	4	5	13	35	38	56	22	25	22	16	17	17	15	16	22	19	13	11
Fish canned in oil	0.0026	445	24	7	22	2	4	5	3	7	13	28	63	22	25	18	22	21	19	19	17	17	16	17	12
Butter	0.0274	913	15	4	15	5	3	0	1	8	26	45	45	39	39	24	15	7	7	7	13	14	14	20	18
Vegetable oil	0.0050	235	27	50	29	17	5	2	6	13	49	39	41	22	17	17	18	10	10	15	18	24	32	27	17
Margarine	0.0043	739	34	26	23	6	11	8	4	8	30	58	49	31	29	20	12	9	17	13	13	18	25	26	18
Milk, fresh	0.0120	209	62	40	26	6	45	7	16	13	29	34	28	34	36	27	20	13	19	23	30	24	27	32	20
Sour cream	0.0082	983	-7	0	13	8	12	-1	12	16	53	39	33	30	37	28	20	14	12	15	25	19	22	29	20
Cultured milk products	0.0021	208	73	77	31	10	129	21	20	23	28	27	19	39	44	34	22	14	19	25	35	20	24	29	19
Cottage cheese	0.0032	641	-3	13	26	14	10	5	8	15	42	45	36	33	35	32	24	14	12	14	23	22	29	37	25
Cheese, rennet	0.0042	796	27	10	12	3	5	3	3	5	22	35	31	36	38	28	29	15	16	15	12	11	12	12	14
Canned vegetables	0.0002	111	10	33	11	5	4	14	1	57	24	14	12	17	20	22	15	20	14	20	26	33	30	28	11
Tomato paste, juice, sauce	0.0005	257	29	34	13	3	5	10	8	9	21	49	30	20	24	22	23	13	12	13	15	16	18	21	18
Canned fruit (except baby's)	0.0007	383	17	39	5	7	4	9	2	8	2	13	6	12	15	13	16	15	18	19	18	21	19	16	11
Eggs	0.0127	265	-6	12	35	1	-6	4	9	31	69	20	31	35	22	17	34	11	8	10	8	15	36	44	38
Sugar	0.0466	413	27	74	69	17	8	3	4	12	27	24	19	20	21	18	19	16	20	24	25	17	8	5	1
Cookies	0.0058	529	20	13	15	10	12	13	14	13	26	31	23	18	18	16	16	12	16	23	25	26	21	19	12
Pryaniki	0.0041	517	23	14	38	17	18	12	13	13	30	14	23	18	18	18	17	14	23	24	24	23	21	17	14
Caramels, toffee	0.0083	577	44	45	23	10	5	7	10	17	21	25	32	15	15	14	13	11	18	22	26	28	25	16	16
Honey	0.0028	50	67	0	50	33	2	3	13	17	23	37	23	22	22	16	15	10	15	20	41	43	27	12	7
Tea	0.0040	245	46	23	17	7	5	5	15	31	55	29	26	19	19	18	12	9	9	10	11	9	10	10	8
Coffee, ground	0.0016	1020	21	25	15	10	6	16	5	13	15	28	32	13	14	10	7	7	9	11	15	12	9	12	9
Coffee, instant	0.0016	732	43	41	12	9	7	-1	5	6	24	27	22	16	11	9	10	10	18	19	17	12	9	10	6
Salt	0.0007	332	13	84	37	13	24	6	11	11	10	20	17	13	19	20	33	19	19	25	24	28	28	22	18
Mayonnaise	0.0021	708	19	21	15	5	11	12	10	20	29	39	52	29	26	22	19	14	16	12	17	15	15	17	19
Flour	0.0067	408	50	8	22	2	6	4	14	20	68	19	11	12	12	9	8	6	10	13	21	40	54	26	15
Rye and rye-wheat bread	0.0074	184	9	41	20	21	26	15	9	24	57	15	9	11	10	7	10	12	24	24	32	43	39	40	11
Bread and bakery products	0.0270	302	22	15	17	12	81	17	11	32	63	9	10	17	12	10	13	14	20	26	30	37	37	36	14
Polished rice	0.0021	319	28	37	27	15	7	5	6	10	31	51	24	22	18	9	10	7	6	7	9	11	16	18	12
Seminola	0.0005	402	71	0	0	0	7	15	33	28	41	28	11	14	17	10	10	8	10	12	11	31	40	36	24
Millet	0.0003	472	13	65	13	5	16	7	15	5	140	32	11	13	21	9	10	7	9	7	9	10	21	35	26

Table A4 (continued). Russia: Monthly Price Increases for a Large Selection of Goods, 1992-93  
(In percent)

Item <sup>1</sup>	Weight <sup>2</sup>	1992												1993											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Buckwheat	0.0011	679	43	40	19	10	3	5	14	16	25	19	32	18	18	13	11	8	13	9	14	14	15	19	11
Oat and pearl-barley	0.0007	420	6	45	15	4	7	8	12	23	28	95	20	18	18	12	8	5	10	10	10	16	24	39	21
Peas and beans	0.0001	568	22	40	7	10	4	1	4	7	51	35	30	17	17	11	22	9	8	10	13	13	18	24	22
Macaroni products	0.0059	565	16	20	7	8	8	16	15	16	46	17	21	10	11	10	10	10	15	16	23	41	38	29	18
Potatoes	0.0099	94	12	14	24	22	25	35	26	-6	6	37	30	20	15	16	10	10	6	43	47	9	2	27	26
Cabbage	0.0029	89	14	30	49	34	-11	-13	18	12	25	14	18	31	23	32	40	41	130	25	-3	-19	-3	23	26
Bulb onion	0.0046	58	9	11	10	9	26	13	-2	14	21	13	7	16	15	18	20	19	69	124	33	16	8	6	13
Beets	0.0006	125	14	16	19	20	15	29	-7	-2	24	26	19	26	17	18	23	19	30	61	31	4	6	23	21
Carrots	0.0008	102	15	30	16	20	28	21	0	-7	10	19	14	29	20	26	27	24	42	62	14	1	4	20	21
Apples	0.0119	121	16	31	18	19	21	-12	-21	-8	25	60	59	34	27	21	17	30	67	36	-20	-3	25	34	24
Tangerines, oranges	0.0009	55	23	30	36	47	6	46	-6	12	3	23	21	14	1	3	3	23	74	33	-1	3	20	32	18
Lemons	0.0005	69	24	17	35	22	29	20	-4	44	5	2	13	12	6	6	11	22	74	33	11	9	31	25	9
Ice cream	0.0024	385	44	9	5	15	21	19	18	25	25	26	22	22	30	24	23	21	30	28	32	18	17	18	12
Coffee in a cafeteria	0.0011	239	18	19	21	12	7	9	11	20	39	30	14	17	20	15	18	17	21	21	23	28	19	17	12
Juice in a cafeteria	0.0011	239	40	8	18	6	14	12	27	20	29	9	16	7	24	19	22	22	24	24	16	16	23	12	12
Lunch, public catering	0.0182	233	35	10	12	18	17	10	15	18	23	19	18	27	28	26	30	24	29	26	29	24	20	18	13
Vodka	0.0934	272	8	4	6	21	32	5	8	6	19	25	18	23	17	9	11	11	21	23	32	45	21	14	5
Infusions, other liquors	0.0029	270	19	9	9	11	13	2	3	5	20	18	27	15	14	9	7	7	19	15	20	24	14	15	9
Grape wine	0.0083	327	18	10	11	3	8	4	6	4	24	22	42	20	13	11	10	12	16	23	20	21	16	14	10
Brandy	0.0036	128	2	32	8	3	4	1	0	7	12	36	35	11	13	13	9	10	15	17	19	21	18	13	10
Champagne	0.0024	309	21	27	19	4	8	4	6	13	38	82	58	10	4	4	3	4	11	17	24	25	22	18	13
Beer	0.0056	574	12	8	7	23	19	17	16	9	16	24	24	28	28	21	21	27	29	23	20	14	12	15	12
Cigarettes, filter, domestic	0.0035	259	22	14	18	6	7	21	31	43	27	25	23	11	10	9	8	8	12	16	25	15	13	10	8
Cigarettes, nonfilter, domestic	0.0035	533	28	7	19	10	7	18	37	54	32	28	15	16	13	12	10	8	9	12	21	19	13	10	5
Cigarettes, filter, imported	0.0028	189	6	11	26	12	12	31	38	49	30	18	15	9	12	7	7	8	17	29	23	13	12	10	10
<b>Non-food goods</b>																									
Fabrics, cotton, dress	0.0006	302	79	16	15	-1	1	3	1	2	2	8	31	9	25	28	27	12	11	15	14	14	13	14	12
Fabric, wool, dress	0.0005	156	34	41	16	2	0	1	0	2	2	9	11	11	23	20	20	11	10	13	15	18	17	21	13
Fabrics, suit	0.0006	156	34	16	6	4	0	0	0	4	3	5	11	11	21	21	12	9	8	10	11	19	19	19	12
Fabrics, coat	0.0009	152	70	21	10	1	2	0	0	2	4	10	11	13	27	19	14	8	8	6	11	18	30	24	18
Coat (short coat), men	0.0010	139	42	11	9	0	0	0	3	3	12	28	18	11	14	14	9	9	7	8	12	22	26	23	10
Suit, men	0.0036	178	33	27	5	2	0	5	2	6	15	29	20	15	26	38	22	16	13	13	12	16	16	13	10
Trousers, wool/blend, men	0.0026	117	42	17	9	3	2	3	1	5	10	25	17	18	28	26	24	18	16	15	17	21	19	19	12
Trousers, denim fabrics, men	0.0033	123	17	42	13	7	2	1	3	9	15	16	19	12	20	20	16	13	16	14	14	14	13	11	8
Shirt, men	0.0135	158	34	28	8	4	4	7	4	8	27	24	17	17	29	28	21	15	17	19	18	19	17	16	14
Coat, winter, women	0.0054	203	28	24	22	1	4	2	3	10	11	67	14	24	21	14	12	8	8	9	27	29	35	26	13
Coat, spring/autumn, women	0.0045	137	54	31	16	5	2	3	4	6	14	26	30	19	28	25	16	11	8	9	15	23	24	18	10
Coat (short coat), women	0.0054	132	48	29	22	3	1	1	14	9	22	12	13	12	20	20	16	10	8	10	15	22	18	13	8
Jacket, women	0.0046	129	59	34	16	4	1	2	1	9	12	11	10	12	17	19	15	9	9	9	15	21	18	17	10
Dress, women	0.0010	145	43	32	10	6	0	1	14	9	12	19	25	20	29	34	15	13	12	15	15	17	27	19	15
Skirt, women	0.0005	94	41	23	17	4	1	2	3	7	9	18	14	13	29	25	23	17	15	14	19	19	20	17	14
Blouse, women	0.0011	130	34	25	11	4	4	1	6	11	17	30	27	18	30	24	17	14	14	14	16	14	13	12	12

Table A4 (continued). Russia: Monthly Price Increases for a Large Selection of Goods, 1992-93  
(In percent)

Item <sup>1</sup>	Weight <sup>2</sup>	1992												1993											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Winter coat, schoolchildren	0.0020	269	56	2	2	2	1	1	4	14	9	50	16	10	9	9	9	7	8	14	16	42	38	31	15
Jacket, schoolchildren	0.0068	449	-6	20	32	3	2	3	7	13	24	15	13	12	18	19	16	13	11	13	19	27	22	15	9
Dress, schoolgirl	0.0001	93	43	28	24	7	2	7	10	8	5	14	13	16	24	26	27	22	17	20	18	21	18	15	14
Men's fur headwear	0.0045	136	52	26	18	0	2	4	8	49	36	33	20	15	13	12	7	5	12	22	28	29	22	19	10
Women's fur headwear	0.0063	136	52	26	18	0	0	6	7	48	30	34	18	12	14	11	8	8	17	23	27	26	27	21	9
Sweater, adult	0.0150	83	23	22	20	4	2	2	1	8	24	25	24	18	23	19	15	12	14	13	14	17	18	12	9
Warm-ups, children	0.0040	178	64	15	11	7	3	5	13	11	20	19	17	13	17	20	19	14	13	14	20	20	20	14	11
Tank-top, men	0.0007	369	35	20	10	1	2	2	8	8	24	13	19	29	26	29	17	20	25	26	21	24	17	14	
Underpants, women	0.0013	172	41	31	22	6	4	1	4	6	8	18	33	16	30	27	20	18	22	24	21	24	23	17	12
Tights, women	0.0019	236	79	20	23	2	1	2	3	7	8	18	14	12	20	17	15	12	13	12	17	27	25	17	11
Socks, men	0.0020	190	72	28	5	8	5	2	5	7	12	20	23	18	28	22	22	18	20	19	28	28	23	19	12
Boots, leather, men	0.0038	240	15	18	20	4	1	3	9	25	54	44	21	17	14	14	9	7	10	15	29	35	28	17	9
Shoes, leather, men	0.0081	275	17	31	7	5	5	4	10	17	30	17	15	16	20	22	23	14	13	14	18	21	17	14	9
Boots, leather, women	0.0067	265	10	10	18	4	3	3	8	33	57	27	16	14	16	11	8	7	9	19	29	41	26	16	9
Boots, autumn, women	0.0092	197	15	15	41	6	1	1	8	27	65	34	18	11	15	13	12	9	8	15	25	37	23	15	8
Summer shoes, women	0.0021	229	53	15	32	9	3	1	1	4	12	12	9	9	18	27	26	22	29	17	13	18	11	9	7
Pumps, women's, fancy	0.0089	203	27	40	20	4	1	1	3	4	11	13	27	18	25	22	17	14	13	13	11	12	9	7	5
Boots, autumn, children	0.0016	288	109	10	9	6	1	0	4	20	52	31	22	10	15	20	14	12	10	13	20	35	43	27	16
Shoes, preschooler	0.0009	281	4	29	42	5	0	1	1	16	28	16	20	10	17	22	32	15	17	21	25	28	29	18	13
Summer shoes, children	0.0009	197	21	46	17	4	6	5	3	15	14	18	20	16	15	26	36	33	37	27	28	25	20	11	9
Running shoes, adult	0.0076	279	37	4	43	2	1	0	2	6	10	11	13	12	18	20	23	21	17	17	19	26	16	12	8
Detergents	0.0015	304	214	14	16	5	3	2	3	8	15	11	15	10	19	18	23	18	21	16	25	31	27	23	18
Soap, household	0.0004	913	56	15	16	2	9	4	3	9	25	18	22	15	26	26	20	16	21	22	24	38	31	21	13
Soap, bath	0.0007	155	63	22	28	3	5	1	6	9	15	10	36	14	20	21	19	18	27	24	24	28	26	22	14
Shampoo	0.0014	248	20	23	18	2	7	2	1	7	12	20	24	10	19	20	19	14	14	13	15	14	13	14	11
Cream, hand or face	0.0009	199	43	27	28	2	2	2	2	4	2	13	25	12	21	19	19	16	17	13	14	14	14	15	15
Toothpaste	0.0010	116	56	59	28	6	2	1	6	13	24	29	52	29	31	29	34	26	20	20	17	16	16	14	10
Deodorant	0.0007	101	55	20	25	2	1	2	2	9	7	14	19	13	21	22	19	16	14	15	15	17	16	15	13
Brassiere	0.0010	136	48	7	24	2	1	8	4	9	14	13	31	20	32	26	24	21	24	21	19	21	16	12	12
Blade, safety razor	0.0001	70	33	36	16	3	4	3	8	8	7	32	57	14	27	24	18	19	26	22	23	18	20	13	10
Toothbrush	0.0001	249	45	51	33	23	25	0	3	2	6	5	10	15	27	33	43	17	40	26	24	30	23	20	19
Yarn, wool	0.0013	113	48	2	19	2	1	3	3	9	17	17	28	18	29	17	14	10	9	10	15	18	29	16	14
Writing desk	0.0006	390	30	26	11	2	4	4	10	17	14	29	16	22	23	28	19	12	17	18	22	26	21	13	15
Dresser	0.0026	391	77	15	3	0	3	8	6	11	42	26	33	26	28	20	17	10	15	18	24	22	15	16	10
Chair	0.0005	594	3	11	3	22	3	2	3	2	8	12	20	21	26	24	21	12	16	16	23	36	25	18	16
Sofa-bed	0.0031	379	63	12	12	3	4	10	6	18	34	30	26	23	28	19	15	13	13	21	20	21	20	14	12
Set of cabinets (divider)	0.0066	366	51	10	7	2	2	5	14	12	36	18	39	23	26	18	15	11	11	17	22	20	16	10	10
Set of soft furniture	0.0045	412	17	12	5	2	4	9	16	16	28	30	31	20	24	18	16	11	16	19	19	17	15	14	9
Set of bedroom furniture	0.0022	360	61	8	3	0	5	2	9	16	33	21	30	22	22	15	18	9	13	19	19	17	14	11	8
Carpet, wool/synthetic	0.0041	69	0	92	0	23	1	4	5	13	46	15	31	16	22	13	11	8	8	10	14	18	13	10	7
Reversible rug, synthetic	0.0013	77	136	7	23	4	0	1	1	19	36	39	38	15	29	14	9	9	12	17	18	18	11	7	
Dish	0.0009	313	36	9	18	6	11	2	5	16	13	20	26	15	24	27	18	12	12	14	17	17	18	17	12
Wristwatch	0.0012	124	36	39	32	8	6	5	3	13	11	31	24	16	21	21	13	14	10	13	14	16	14	13	10

Table A4 (concluded). Russia: Monthly Price Increases for a Large Selection of Goods, 1992-93  
(In percent)

Item <sup>1</sup>	Weight <sup>2</sup>	1992												1993											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Refrigerator	0.0084	252	83	30	55	1	3	2	10	11	32	36	26	14	28	22	12	10	14	17	20	21	12	10	5
Clothes washer	0.0037	683	25	26	20	3	2	2	15	3	36	32	40	19	23	18	11	11	12	16	17	19	13	12	9
Vacuum cleaner	0.0026	300	42	27	20	7	1	1	2	17	26	20	26	15	21	18	11	10	15	60	15	13	12	8	6
Electric lamps	0.0004	145	140	62	72	17	8	6	17	12	24	21	37	21	46	23	16	14	15	13	23	17	17	12	
Electric chandeliers	0.0018	256	30	30	14	3	4	3	3	6	11	18	45	22	27	22	15	13	10	14	21	15	16	14	14
School notebook	0.0011	334	49	65	18	8	18	9	9	10	9	13	9	13	9	17	17	18	23	33	63	79	41	20	17
Pen, ballpoint, domestic	0.0001	170	47	16	9	7	5	10	13	8	7	19	22	17	29	30	24	28	33	27	45	48	29	19	14
Daily newspaper, retail	0.0028	148	17	8	3	2	12	10	39	9	8	9	11	72	20	15	14	12	13	29	26	24	22	19	18
Weekly newspaper, retail	0.0013	143	5	4	8	19	15	8	4	16	30	26	8	49	24	21	23	16	18	34	27	25	30	20	14
Book, fiction, hard-cover	0.0022	115	26	34	64	30	3	5	7	24	9	15	16	21	25	24	23	14	17	22	20	17	21	18	17
Skis	0.0002	51	14	28	43	7	2	16	13	20	35	12	18	15	38	12	5	4	2	6	2	39	38	124	24
Taperecorder	0.0025	144	31	50	3	3	5	3	5	6	10	25	14	15	21	16	10	9	10	11	16	14	12	11	16
Radio	0.0002	165	18	7	15	1	0	0	14	7	14	6	18	18	17	15	15	14	26	17	15	14	13	10	
Television set, color	0.0111	281	56	12	14	2	2	2	3	9	36	42	27	20	21	16	12	7	8	15	15	18	14	10	8
Still camera	0.0005	77	41	37	34	3	16	3	6	11	13	42	20	15	13	18	14	12	10	11	12	14	12	13	9
Blank taperecorder cassette	0.0005	156	6	28	5	4	4	4	8	8	27	33	32	19	30	27	18	13	11	13	12	12	12	12	8
Lumber	0.0003	680	159	5	-1	23	2	20	1	4	11	9	8	21	25	23	21	22	22	25	30	31	20	15	13
Brick	0.0049	484	53	14	14	20	14	14	4	7	10	22	15	21	26	23	19	25	29	26	34	31	18	15	5
Wallpaper	0.0012	311	55	17	7	6	3	4	17	16	6	5	8	12	21	17	19	14	19	18	18	24	28	22	18
Bicycle	0.0040	319	27	32	10	1	5	6	11	10	13	21	15	11	26	18	21	18	23	20	19	11	12	8	5
Motorcycle	0.0083	1236	11	1	4	0	4	1	3	7	28	55	26	19	18	19	21	13	15	27	20	21	13	8	8
Passenger cars	0.0052	319	112	10	9	53	9	4	32	24	16	74	50	26	21	14	17	12	12	15	7	23	6	24	6
Gasoline	0.0097	176	0	14	123	175	10	0	1	29	141	13	5	10	19	16	11	-1	56	49	17	8	9	14	11
Aspirin, domestic	0.0001	318	8	31	18	48	36	27	46	5	20	9	78	72	140	69	48	29	42	88	39	36	24	35	27
Nitroglycerin	0.0001	311	68	5	5	3	8	2	3	14	1	8	42	57	102	58	47	43	53	41	42	64	21	49	31
Erythromycin	0.0006	381	-3	8	51	26	6	13	10	9	4	11	36	52	91	54	41	37	56	35	37	24	33	28	30
Undevit	0.0002	302	28	45	20	10	11	4	3	5	35	8	13	32	53	34	29	33	25	24	28	42	22	31	
Iodine	0.0001	1629	11	4	33	29	4	7	7	15	16	17	68	65	156	62	23	29	37	46	18	43	58	16	35

Sources: For rates of change, Goskomstat (1994); and for weights, provided directly by Goskomstat.

<sup>1</sup>For some items, the descriptors shown in this table are less precise than in the original source. The goods listed here cover 75 percent of the total CPI, 88 percent of the food (including alcohol and tobacco) category, and 66 percent of the non-food goods category (using weights reflecting consumption shares in 1992).

<sup>2</sup>Weights in the 1993 CPI, representative of 1992 consumption patterns.

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