

WP/97/158

INTERNATIONAL MONETARY FUND

Research Department

**Prices in the Transition: Ten Stylized Facts**

Prepared by Vincent Koen and Paula De Masi<sup>1</sup>

Authorized for distribution by Graham Hacche

November 1997

**Abstract**

The overall price level increased sharply in transition countries once prices were freed. Disinflation has most frequently been gradual, with prices continuing to rise rapidly in subsequent years. This paper identifies the well-known and lesser-known features of inflationary processes in central and eastern Europe, the Baltics, Russia, and other countries of the former Soviet Union on the basis of a sample of 26 countries and observations spanning the first five to seven years of transition.

JEL Classification Numbers: E31, P22, R32

Keywords: Inflation, prices, transition

Authors' E-Mail Addresses: [vincent.koen@oecd.org](mailto:vincent.koen@oecd.org); [pdemasi@imf.org](mailto:pdemasi@imf.org)

---

<sup>1</sup>Vincent Koen is a principal administrator in the Economics Department of the OECD and was a visiting scholar in the IMF Research Department at the time of writing. The views expressed in this paper should in no way be interpreted as those of the IMF or the OECD. The authors are grateful to M. De Broeck and G. Hacche for many helpful comments and suggestions and, for their generous provision of data, to A. Franz and J. Auer of the Austrian Statistical Office, to S. Varjonen of the Statistics Department of the OECD, to P. Petrovic of CESMECON, and to the national statistical offices of Albania, Armenia, Georgia, the former Yugoslav Republic of Macedonia, Romania, Russia, and the Slovak Republic. All interpretations and residual errors, however, are the authors' own.

## Contents

	Page
Summary	4
I. Introduction	5
II. Ten Stylized Facts	7
1. Price liberalization translated into a surge in the overall price level	7
2. The initial burst was followed by a prolonged period of relatively high inflation	8
3. At higher frequencies, seasonality and administrative intervention have caused potentially misleading fluctuations around “core” (dis)inflation (pseudo-turning points)	8
4. Prices of goods moved rapidly towards international levels, with the possible exception of certain staples	9
5. Service prices first lagged but then started to catch up with the prices of goods, as services became increasingly commercialized	12
6. As the structure of relative prices has become more fully market determined it has moved closer to that prevailing in advanced market economies	14
7. Relative prices have been gradually converging across transition countries	16
8. Wide price level disparities (in common currency terms) remain and may be expected to persist across transition countries	19
9. Over time, prices and inflation rates have converged across regions within countries	19
10. Full convergence of the overall price levels to those prevailing in advanced market economies can be expected only in the very long run	21
III. Scope for Further Research	24
Tables	
1. Price Level Comparison with Austria, 1993	10
2. Price Level Comparison with Turkey, 1995	11
3. Evolution of Domestic Price Structures	15
4. Cross-Correlation of Price Structures Against Austria's, 1993	18

## Figures

1.	Cumulative Increase in Aggregate Consumer Price Index During the First Five Years of Transition	6
2.	Price of Services Relative to Overall Price Level	13
3.	Price of Selected Goods and Services in Poland, 1996	17
4.	Overall Price Level Gaps, 1996	20
5.	Price and Per Capita GNP Level	22
6.	Price level, Dollar Wage and Share of Food in Consumption	23

## Appendix Tables

A1.	Consumer Price Inflation	25
A2.	Dollar Wages	29

References	30
------------	----

## SUMMARY

On the basis of a sample of 26 countries of central and eastern Europe, the Baltics, Russia, and other countries of the former Soviet Union, this paper identifies the following ten main features of inflation in transition economies:

1. Price liberalization translated into a surge in the overall price level.
2. The initial burst was followed by a prolonged period of relatively high inflation.
3. At higher frequencies, seasonality and administrative intervention have caused potentially misleading fluctuations around “core” (dis)inflation (pseudoturning points).
4. Prices of goods moved rapidly toward international levels, with the possible exception of certain staples.
5. Service prices first lagged but then started to catch up with the prices of goods, as services became increasingly commercialized.
6. As the structure of relative prices has become more fully market-determined, it has moved closer to that prevailing in advanced market economies.
7. As a corollary, relative prices have been gradually converging across transition countries.
8. Even so, wide price level disparities (in common currency terms) remain and may be expected to persist among transition countries.
9. Over time, prices and inflation rates have converged across regions within countries.
10. Full convergence of the overall price levels to those prevailing in advanced market economies can only be expected in the very long run.

## I. INTRODUCTION

Over several decades, most prices in the centrally planned economies were set administratively, with little regard for cost and demand considerations. Exceptions included farmers' markets, where various foodstuffs were sold,<sup>2</sup> and more or less clandestine parallel markets for other goods and services. Nevertheless, prices were on the whole subject to strict controls. As a result, measured inflation was most of the time low and repressed.<sup>3</sup>

One of the first steps taken once these countries embarked in earnest on the transition to a market economy was to liberalize a large proportion of producer and consumer prices. The liberalization sequence typically started with the freeing of the prices of many goods and some services, but at the consumer level the prices of staples and many other services, particularly housing and utilities, often remained controlled for several years into transition, and were adjusted only infrequently.

In the large majority of countries, price liberalization was followed by lasting, high, open inflation, degenerating in some cases into hyperinflation. Experiences varied tremendously across countries, however. The cumulative increase in the level of consumer prices during the first five years of the new price regime, including the price jump associated with the initial comprehensive liberalization, amounted to 138 percent in the Czech Republic, 1,341 percent in Poland (i.e., a 14.4-fold rise), 80 times in Latvia, close to 2,000 times in Russia, over 18,000 times in Kazakhstan, and over 86,000 times in Georgia (Figure 1).<sup>4</sup> In Serbia, the price level skyrocketed, increasing over 78,000,000,000,000,000,000 times in 25 months (January 1992 to February 1994), as the country witnessed one of the worst hyperinflations in world history (Bogetic *et al.*, 1996). Nonetheless, by the second half of 1996, the pace of consumer price inflation had come down very significantly in most of the 26 countries under consideration, averaging less than one percent a month in 15 of them.<sup>5</sup>

---

<sup>2</sup> In some localities, however, the authorities did exert some influence on prices in farmers' markets.

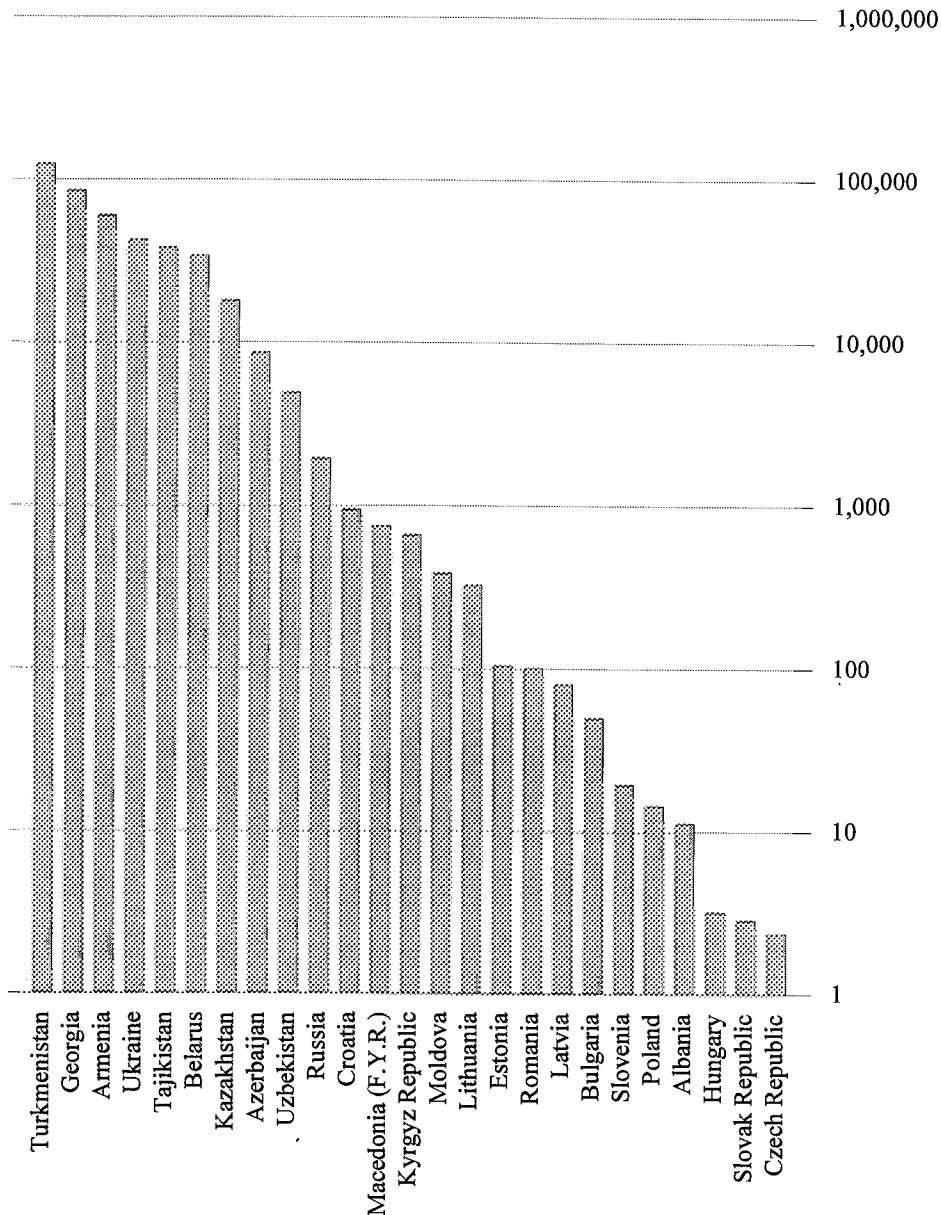
<sup>3</sup> In several instances, however, comprehensive controls proved insufficient to prevent bouts of high inflation, such as in the former Soviet Union in the 1930s and 1940s.

<sup>4</sup> Price indices continued to suffer from many biases well into transition (Koen, 1995). The data shown in this paper should therefore be interpreted as indicative of orders of magnitude rather than as point estimates. Furthermore, it should be borne in mind that for some countries (e.g., Hungary, Poland or Slovenia), using December 1989 (or, for that matter, any other single date) as the starting point is somewhat simplistic.

<sup>5</sup> The most glaring exception was Bulgaria.

**Figure 1. Cumulative Increase in Aggregate Consumer Price Index During the First Five Years of Transition<sup>1</sup>**

*(Logarithmic scale; in number of times)*



Source: Table A1.

<sup>1</sup>Base dates are as follows: December 1989 for Croatia, Hungary, the former Yugoslav Republic of Macedonia, Poland, the Slovak Republic, and Slovenia; October 1990 for Romania; December 1990 for Bulgaria, the Czech Republic, Estonia, and Latvia; January 1991 for Albania and Lithuania; December 1991 for Russia and other countries of the former Soviet Union.

Among other lessons from this wide dispersion of outcomes is that liberalization *per se* cannot be viewed as the cause of the subsequent high inflation rates. The latter are primarily driven by the fiscal travails of the transition (and in several cases, of war). Of course, they also reflect the process of relative price convergence: tradables prices have tended to increase rapidly towards international levels after price liberalization, even though nontradable prices have remained far below such levels. To some extent, measured inflation after the achievement of (near-)convergence of the price of tradables reflects a catchup of the price of nontradables.

This study draws on a broad sample of countries to bring out some of the key stylized facts pertaining to absolute and relative consumer price movements in the course of transition. As such, its objective is to serve as a concise *vade mecum* for transition country inflation watchers. The sample size varies somewhat across the different lines of inquiry owing to the inaccessibility of some of the data for some of the countries but is large enough in most cases to allow fairly solid generalizations.<sup>6</sup>

## II. TEN STYLIZED FACTS

### 1. Price liberalization translated into a surge in the overall price level

In the late 1980s-early 1990s, fiscal pressures were building up in most of the countries under consideration that would have produced high inflation had it not been for the broad-based price controls then in place. Where more than a marginal fraction of prices were free to adjust, those pressures did result in a marked pick-up in inflation (most notably, in Poland). In fact, even in the former Soviet Union, there was a detectable acceleration in prices. Already before the conventional D-days of transition (e.g., January 1, 1990 in Poland, January 2, 1992 in Russia), some important decontrol measures were taken in several major countries, causing a first series of large price increases. In most countries, a more comprehensive liberalization followed shortly thereafter, often characterized as the "Big Bang" inaugurating transition. Although such a breakpoint can be readily identified in most countries, the boldness and scope of the approach varied a lot from one to another. Indeed, some countries preferred a more piecemeal liberalization (e.g., Romania versus Poland, or Kazakhstan versus Russia). And in all countries, some prices remained administered well into transition, not least the prices of some key services.

The surge in the overall price level, as measured by the consumer price index (CPI), associated with comprehensive price liberalization was typically several orders of magnitude larger than prior and subsequent inflation rates, reflecting an abrupt, one-time adjustment. In 24 of the 26 countries, the largest single monthly increase in the CPI (marked in bold in Table A1) was indeed recorded at that time. Armenia and Serbia-Montenegro subsequently experienced larger increases, but in a different context, namely that of a hyperinflation.

---

<sup>6</sup> Data referred to in this paper but not explicitly or completely displayed are available from the authors on request.

## **2. The initial burst was followed by a prolonged period of relatively high inflation**

Even in countries with an established tradition of financial prudence (e.g., the Czech and Slovak Republics) or in countries pursuing consistently tight financial policies (e.g., Albania), inflation did not instantly settle at low levels following price liberalization. In those where a looser stance prevailed, be it as a result of economic policy failure or military conflict, inflation remained very high and in some cases degenerated into bouts of hyperinflation (Ukraine in 1993, Armenia in 1994, Georgia in 1993, Tajikistan in 1995, Bulgaria in late 1996).<sup>7</sup> The sources of inflation persistence have included money creation and wage pressures (Coorey *et al.* (1996)), indexation of nominal incomes (Pujol and Griffiths (1996), Czyzewski *et al.* (1996)), and relative price adjustments (De Masi and Koen (1996), De Broeck *et al.* (1997), IMF (1996a, b, and c), Coorey *et al.* (1996)).

## **3. At higher frequencies, seasonality and administrative intervention have caused potentially misleading fluctuations around "core" (dis)inflation (pseudo-turning points)**

Inflation in transition countries has typically been rather volatile, complicating the identification of inflation trends. In part, volatility at high frequencies (monthly observations) reflects changes in the stance of financial policy or other fundamentals. As such, it corresponds to an unstable underlying, or "core" rate of inflation. However, volatility also results from two types of seasonal variations, which could respectively be described as "natural" (weather-induced) and "artificial" (administered price-related).

The first type of seasonal variations is more important in transition economies than in advanced economies because seasonal food prices (particularly for fruits and vegetables) represent a larger share of the CPI basket, exceeding 40 percent in 1993-94 in 16 of the 21 countries for which information was available, against less than 20 percent in advanced economies. Natural seasonality proved strong enough (and core inflation low enough) in a number of countries for the aggregate price level to have declined in the summer months one or sometimes several years in a row.<sup>8</sup> In 1996, this phenomenon was observed in half of the 26 countries.

Although administrative price adjustments are not always spaced at regular intervals, first-of-month, first-of-quarter and first-of-year increases in those prices are systematic enough to be described as a second source of seasonality. Hence, in many countries, an inflationary spike materializes at the beginning of each year, which should not *ipso facto* be

---

<sup>7</sup> It remains a moot point whether the threshold of hyperinflation ought to be defined as 50 percent a month or an annualized rate of 1,000 percent, and for how long inflation should exceed that mark for the episode to be labeled as one of hyperinflation.

<sup>8</sup> For instance, in Uzbekistan, the prices of fruits and vegetables (weight in the CPI: 12 percent) sank by 30 percent in July 1995, contributing to a 6 percent drop in food prices and to a 2 percent decline in the aggregate consumer price level in that month.



viewed as a turning point in inflation. These administrative price adjustments are typically very large. For instance, in April 1995, consumer prices in the Czech Republic rose by 1.0 percent, but rail fares by 66 percent, postal charges by 40 percent, and telecommunications charges by 20 percent. To the extent that the increases in administered prices represent permanent increases in relative prices rather than a catch-up on continuously evolving market-determined prices, they are destined to become less prominent over the years, as cost-recovery ratios rise (see Fact 5). It could even be argued that the only genuine seasonal component of those price changes is the one corresponding to the short-run catch-up effect.

Recognizing the magnitude of seasonal price fluctuations and the resulting potential for confusion, the statistical authorities have started to publish seasonally adjusted CPI series in several countries (Hungary and the Czech Republic for instance), or are considering doing so (Russia). In the absence of a seasonally adjusted index, the emphasis is often placed on the 12-month rate of change in the CPI. Seasonality is indeed eliminated in that way (except to the extent that seasonality itself is not invariant over time), but the 12-month rate of inflation is a lagged measure that only gradually captures inflections in trend. When the latter are rather abrupt or frequent, this is a major drawback. Alternatively, therefore, it may be useful to monitor movements in the price of non-food goods, which is generally the least volatile component of the aggregate CPI, bearing in mind, however, that the medium-run increase in the relative price of services implies that this component tends to understate overall inflation.

#### **4. Prices of goods moved rapidly towards international levels, with the possible exception of certain staples**

The freeing of price-setting and the introduction of a market-determined exchange rate allowed the forces of international arbitrage to drive the prices of tradable goods towards those prevailing on world markets. Full convergence could, of course, not be expected in the short run since the prices of tradable goods embody a nontradable domestic distribution component, and are further influenced by taxes and subsidies (including protectionist regulations). Also, the forces of competition may not be sufficiently strong to enforce price equalization quickly. The extent of convergence is also difficult to measure precisely, not least because of quality differences that cannot be fully taken into account (Franz (1996)).

Even so, the extensive evidence gathered in the context of the 1993 round of the European Comparison Program (ECP) and the follow-up study on CIS countries (OECD (1996)) points to a fair degree of convergence of goods prices (Tables 1 and 2).<sup>9</sup>

For some highly tradable goods, prices in a number of transition countries were almost as high as in Austria (used in this paper as a benchmark advanced economy) by 1993 (e.g., gasoline in Hungary and the Czech Republic) or even higher (color TV sets in most countries shown in Table 1). In Russia, the prices of many consumer durables had risen above U.S. levels by 1995 (Goskomstat (1996a)), reflecting a combination of factors, including

---

<sup>9</sup> For details on the methodology of the ECP, see OECD (1995).

**Table 1. Price Level Comparison with Austria, 1993**  
(In percent of price in Austria)

	All Goods and Services	Food <sup>1</sup>	Clothing and Footwear	Gasoline	Color Television Set	Residential Electricity	Railway Fare	Haircut	Rents	Utilities
Belarus	6	11	8	20	25	1	1	1	1	1
Bulgaria	22	32	23	45	101	14	24	7	28	20
Croatia	47	62	57	...	...	...	...	...	19	50
Czech Republic	26	36	36	80	114	19	17	5	10	25
Estonia	19	28	23	24	121	7	4	5	11	17
Hungary	44	52	52	98	90	34	47	15	28	37
Latvia	21	30	22	31	81	18	7	5	5	20
Lithuania	14	23	18	51	127	10	5	5	3	6
Moldova	9	14	9	...	...	...	...	...	1	8
Poland	37	47	47	60	106	32	32	23	14	38
Romania	20	34	23	35	153	16	18	4	6	18
Russia	18	26	30	10	58	1	3	3	14	1
Slovak Republic	28	34	37	72	153	18	28	5	7	27
Slovenia	55	62	83	59	111	38	37	51	42	49
Ukraine	12	23	25	...	...	...	...	...	6	3

Source: European Comparison Program database, 1993.

<sup>1</sup>Including beverages and tobacco.

**Table 2. Price Level Comparison with Turkey, 1995<sup>1</sup>**  
(In percent of price in Turkey)

	All Goods and Services	Food <sup>2</sup>	Clothing and Footwear	Rent, Fuel, and Power	Major House- hold Appliances and Repairs	Transport Service
Armenia	65	64	58	56	51	51
Azerbaijan	49	60	26	2	41	31
Belarus	51	55	34	37	62	35
Georgia	65	70	36	63	41	40
Kazakhstan	62	67	52	42	59	56
Kyrgyz Republic	48	51	30	32	43	65
Russia	74	78	46	12	58	82
Tajikistan	37	40	30	6	41	29
Uzbekistan	48	51	36	6	47	57

Sources: Organization for Economic Cooperation and Development (1996), and *Main Economic Indicators*, various issues.

<sup>1</sup>In 1995, the overall price level in Turkey was 34 percent of that in Austria.

<sup>2</sup>Including beverages and tobacco.

inefficiencies in distribution enduring partly because of the ability of incumbent networks to discourage the entry of potential competitors, transportation costs, and taxation. In contrast, the prices of some staples remained much lower in transition countries e.g., bread in Albania (McNeilly and Schiesser-Gachnang (1996)), or many basic food items in Russia, the prices of which are not controlled at the federal level but are subject to regulations locally (see also Fact 9).<sup>10</sup> Prices also typically stood far below advanced economy levels for services (rents, electricity, railway fares and the quintessential nontradable, haircuts).<sup>11</sup>

##### **5. Service prices first lagged but then started to catch up with the prices of goods, as services became increasingly commercialized**

Many services were provided under central planning for a nominal fee, or none at all. When price liberalization was undertaken in earnest, in most countries a number of services were on the list of exceptions, notably housing and utilities, health care and transportation. Their prices were adjusted significantly as goods prices were set free but often by less than the latter increased. The discrete nature of administrative price changes and their political costs caused the relative prices of services in relation to goods to decline for some time. However, this trend was typically reversed within a year or two as the relative price of services started to rise with a vengeance. The resulting J-pattern was observed in 17 of the 23 countries for which data were gathered (Figure 2).<sup>12,13</sup> The most conspicuous outliers were countries where market-oriented reforms were extremely gradual (Tajikistan, Turkmenistan) or partly reversed (Bulgaria). A more intriguing outlier is the Slovak Republic, possibly reflecting a reluctance to adjust rents, or a less distorted price structure at the onset of transition.<sup>14</sup>

---

<sup>10</sup> The price of a basket of 19 basic foodstuffs was about half of the U.S. price in 1996 in Russia (annual, nationwide average).

<sup>11</sup> Rents, however, are among the most difficult areas of the ECP, meaning that the corresponding point estimates should be taken with even more than the usual grain of salt. For a discussion of these difficulties, see OECD (1995).

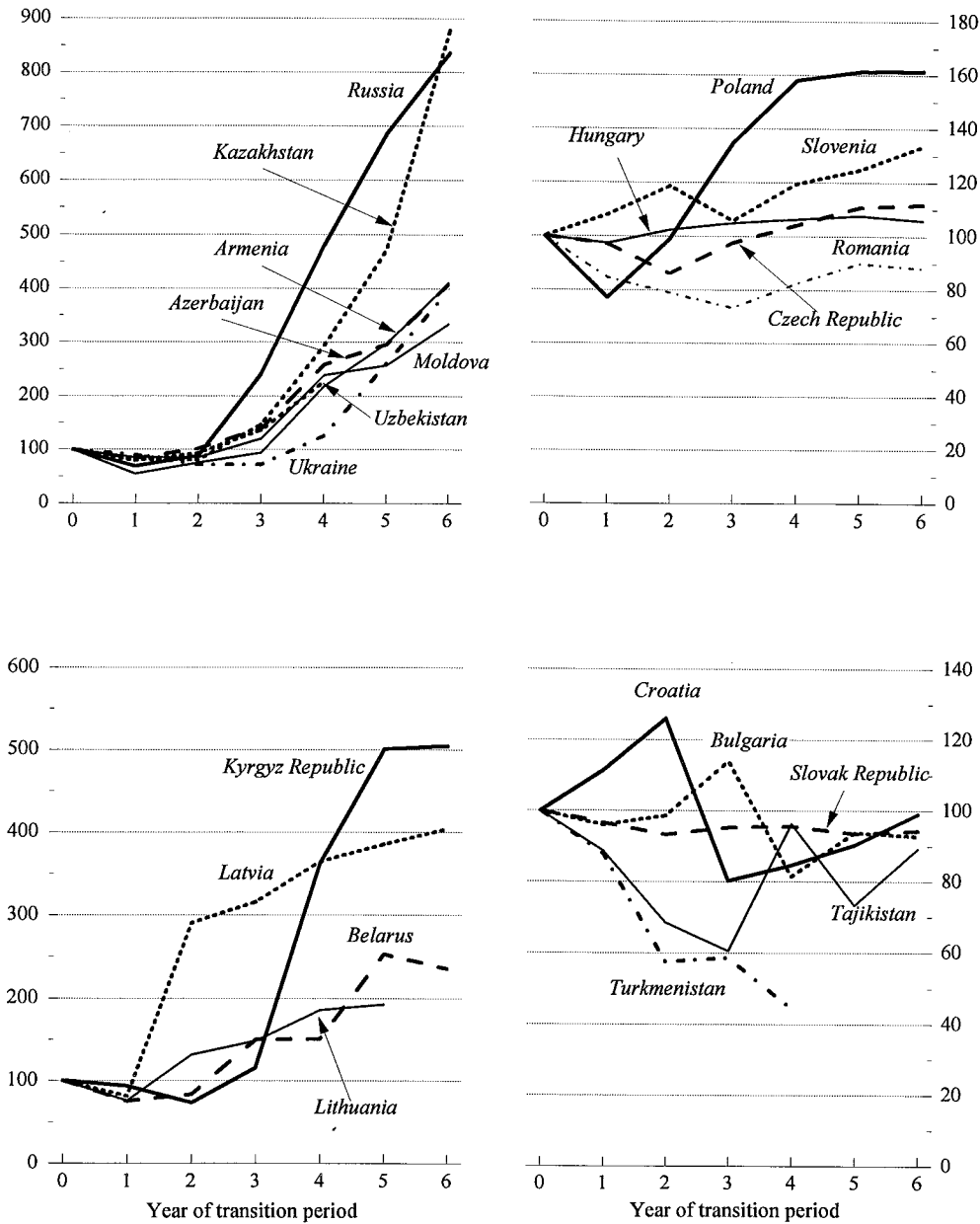
<sup>12</sup> For Albania and Estonia, a J-pattern is unambiguously implied by the available data but the latter are not complete and the relative price of services could not be graphed.

<sup>13</sup> The curvature of the hump is also influenced by what is included in "services": in some countries, housing--for which prices have often risen even more--is classified as a separate item (e.g., Czech Republic, Slovenia), or electricity and heating--the prices of which also typically rose more than proportionately--are (e.g., Hungary).

<sup>14</sup> This raises the question of what had happened to the relative price of services prior to transition. In Yugoslavia for instance, it had risen considerably during the second half of the 1980s. So it had in Hungary during the 1980s. Interestingly, the same phenomenon was observed in Russia during the 1970s and 1980s. See Goskomstat (1996a).

**Figure 2. Price of Services Relative to Overall Price Level<sup>1</sup>**

(Year averages unless otherwise noted)



Sources: National authorities; and Statistical Committee of the Commonwealth of Independent States.  
<sup>1</sup>End-year observations for Belarus, Bulgaria, Kazakhstan, Lithuania, Russia, and the Slovak Republic.  
 Base (100 and year 0) = 1988 for Poland; 1989 for Croatia, the Czech Republic, Hungary, the Slovak Republic, and Slovenia; 1990 for the Baltic countries, Russia, and other countries of the former Soviet Union; May 1990 for Bulgaria; and October 1990 for Romania.

Services largely coincide with nontradables, and one interpretation of the J-pattern runs along the lines of the Balassa-Samuelson model and has been put forward for the Baltics by Richards and Tersman (1996). Slower trend productivity growth in the nontradables sector translates into a gradual increase in the relative price of nontradables. This relative price shift will be all the stronger as many services, which were traditionally undersupplied, see their demand surge under market conditions (e.g., distribution, finance and insurance, tourism). Some have speculated, however, that productivity may not rise faster in the production of tradables than in that of services (e.g., Halpern and Wyplosz (1995)).

An alternative interpretation, dubbed the cost-recovery hypothesis, distinguishes between capital-intensive and other services (Zavoico (1995)). The former prominently include housing, utilities, and transportation, the generation of which is based on a large capital stock inherited free of debt from the pre-transition era. In the early stages of transition, the prices of those services were typically set even below maintenance costs, partly as an element of the social safety net. Over time, however, these prices are being raised very significantly, with a view to financing the upkeep and replacement of the associated capital stock.

#### **6. As the structure of relative prices has become more fully market determined it has moved closer to that prevailing in advanced market economies**

The structure of relative prices within each transition country has clearly changed over time as is shown by the evolution of cross-correlations with the base-year structure of prices for foodstuffs, non-food goods or services (Table 3)<sup>15</sup>. In most cases, these movements have been gradual and monotonic in the sense that relative prices have diverged more and more from their initial structures.<sup>16</sup> An outlier in this respect is Georgia, where the 1993 hyperinflation may have randomized the relative price structure. The magnitude of the changes in relative price structures as measured by the evolution of correlation coefficients over time is apparent when the latter are compared with their analog in the United States (memorandum item in Table 3). The gradual nature of this process is evident from the persistence of significant dispersion in item-specific inflation rates half a decade into transition, as documented *inter alia* for Russia (OECD, forthcoming). Nevertheless, relative price variability has on the whole tended to decline over time.<sup>17</sup>

---

<sup>15</sup> The Slovak Republic is again an intriguing exception here.

<sup>16</sup> The evolution of correlation coefficients should be interpreted with care, however: the fact that the correlation coefficient with year 0 would remain unchanged between year  $n$  and year  $n+i$  (i.e.,  $\rho(0,n) = \rho(0,n+i)$ ) does not imply that the structure of relative prices was stable between year  $n$  and year  $n+i$  (although the converse is true).

<sup>17</sup> This can be seen in the increase in  $\rho(n,n+1)$  as  $n$  increases (not shown in Table 3, for the sake of brevity).

**Table 3. Evolution of Domestic Price Structures<sup>1</sup>**  
(Cross-correlation with base year)

Country and Base Year	Coverage (Number of Items)	1990	1991	1992	1993	1994
Albania (1992)	Food (39)			1.00	0.89	0.86
	Nonfood goods (70)			1.00	0.94	0.82
	Services (7)			1.00	0.98	0.99
Armenia (1993)	Food (102)				1.00	0.66
	Nonfood goods (155)				1.00	0.97
	Services (55)				1.00	0.73
Bulgaria (1991)	Food (288)		1.00	0.87	0.80	0.85
	Nonfood goods (872)		1.00	0.98	0.99	0.98
	Services (194)		1.00	0.96	0.84	0.80
Georgia (1992)	Food (64)			1.00	0.36	0.44
	Nonfood goods (122)			1.00	0.71	0.86
	Services (33)			1.00	0.24	0.86
Kazakhstan (1992) <sup>2</sup>	Food (79)			1.00	0.83	0.83
Latvia (1992)	Food (88)			1.00	0.90	0.78
Macedonia, F.Y.R. (1992)	Food (120)			1.00	0.86	0.92
	Nonfood goods (194)			1.00	0.08	0.08
	Services (67)			1.00	0.95	0.96
Poland (1989)	Food (24)	0.85	0.82	0.84	0.81	0.85
	Nonfood goods (15)	0.97	0.97	0.96	0.94	0.91
	Services (25)	0.85	0.76	0.81	0.76	0.73
Romania (1990) <sup>3</sup>	Food (290)	1.00	0.84	0.79	0.77	0.75
	Nonfood goods (865)	1.00	0.92	0.88	0.87	0.89
	Services (319)	1.00	0.97	0.90	0.80	0.77
Russia (1991) <sup>4</sup>	Food (49)	1.00	0.79	0.84	0.65	0.63
	Nonfood goods (67)	1.00	0.86	0.84	0.85	0.80
	Services (39)	1.00	0.98	0.95	0.93	0.88
Slovak Republic (1991)	Food (35)		1.00	0.99	0.99	0.98
	Nonfood goods (22)		1.00	0.99	0.99	0.99
	Services (6)		1.00	0.99	0.94	0.94
<i>Memorandum item:</i>						
United States (1990)	Food (56)	1.00	0.99	0.99	0.99	0.99

Sources: National authorities; and authors' calculations.

<sup>1</sup>July observations unless noted.

<sup>2</sup>January observations.

<sup>3</sup>October for 1990, July for subsequent years.

<sup>4</sup>December observations.

The shift away from base-year patterns has brought relative prices closer into line with those prevailing in advanced economies. At an aggregate level, that is clear from the increase in the relative price of services. At a more disaggregated level, this has been confirmed for the Baltics, for instance, by the finding of a significant positive correlation between the changes in the 20 or so main components of the CPI between 1993 and 1996 and the initial 1993 price gap vis-à-vis Austria for each of those components (IMF, 1996 a,b and c). Even in the most advanced transition countries, however, the structure of relative prices remains very different from that in neighboring market economies: in Poland for example, relative prices had come much closer to German levels in 1990 than in 1987 (Berg, 1994) but they still were far from having converged by 1996 (Figure 3). This observation is consistent with the fact that price structures world-wide are correlated with purchasing-power-parity adjusted incomes per capita (Nuxoll, 1996).

Looking at relative prices within broad categories, it appears that the structure of food prices had by 1993 come much closer to market economy levels than that of services (Table 4). More extensive realignment was therefore to be expected in subsequent years among service prices than among food prices, as Table 3 confirms.

#### **7. Relative prices have been gradually converging across transition countries**

As a corollary to Fact 6, the structure of relative prices has tended to become more similar across transition countries than in the early 1990s, when progress with liberalization varied more across countries.<sup>18</sup>

The evidence supporting this contention is indirect in the case of central and eastern Europe, as it is based on the common movement towards a market economy price structure rather than on bilateral comparisons between transition countries over time.

In the case of the Baltics, Russia, and other countries of the former Soviet Union, however, more direct, albeit fragmentary, evidence is available. The dispersion of food prices across capital cities of the Baltics, Russia, and other countries of the former Soviet Union fell sharply between mid-1994 and mid-1996: the average of the coefficients of dispersion of the prices of 16 food items across 10 of these cities dropped by almost half between those two dates.<sup>19</sup> A similar trend is observable for non-food goods prices, but the monitored sample is too small for this finding to be statistically significant.

---

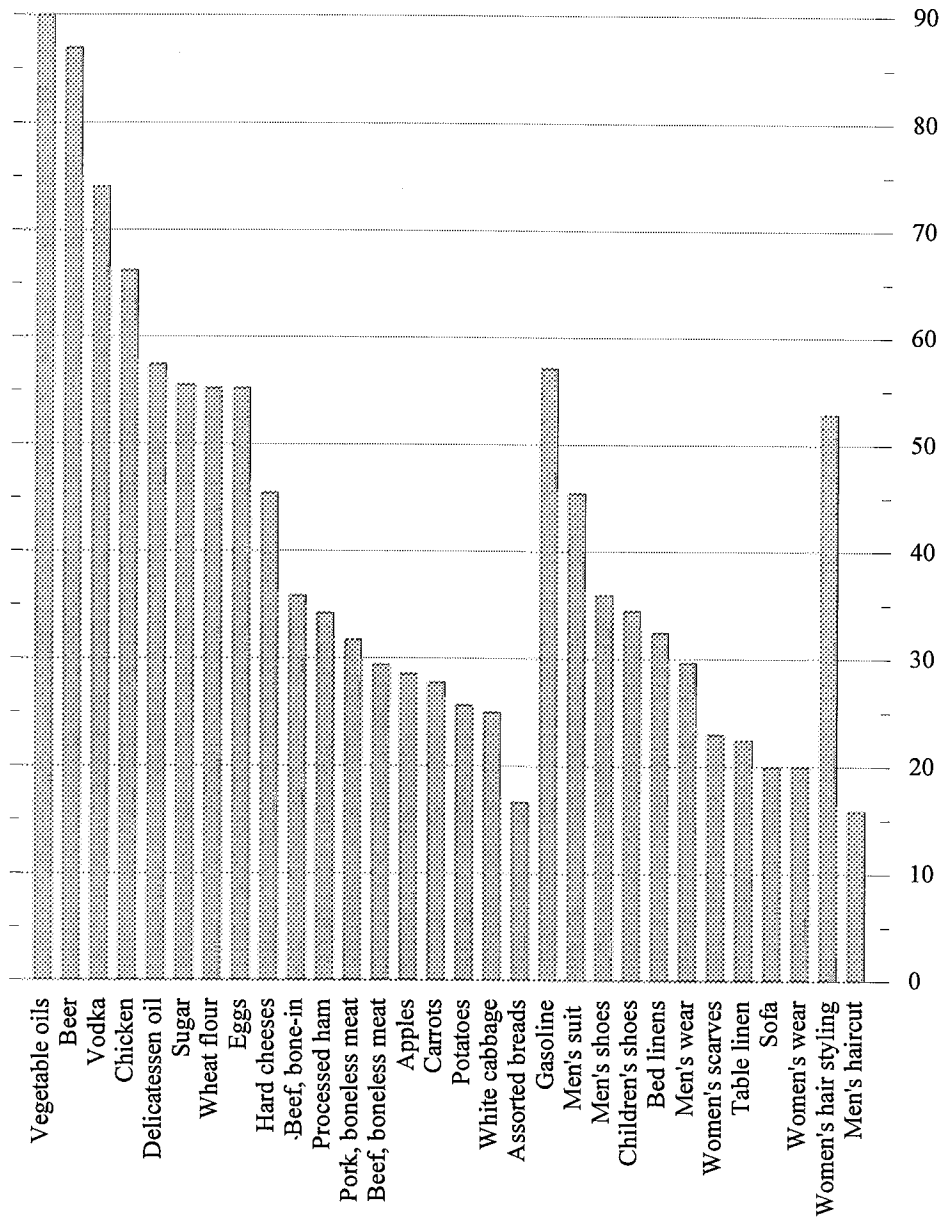
<sup>18</sup>Domestic price structures prior to transition are not considered in this paper.

<sup>19</sup> The cities are Almaty, Baku, Bishkek, Chisniau, Dushanbe, Kiev, Minsk, Moscow, Tashkent, Yerevan. The food items are beef, sausage, butter, vegetable oil, milk, cheese, eggs, sugar, flour, bread, noodles, potatoes, cabbage, onions, carrots and apples. The data are published in the bulletins of the CIS Statistical Committee. A comparison with earlier dates is hampered by too many missing observations and multiple exchange rate systems.



**Figure 3. Price of Selected Goods and Services in Poland, 1996**

*(In percent of the price in Germany)*



Source: National Bank of Poland (1996).

**Table 4. Cross-Correlation of Price Structures Against Austria's, 1993**

	Correlations		Number of Observations	
	Foodstuffs	Services	Foodstuffs	Services
Bulgaria	0.78	0.37	198	105
Czech Republic	0.80	0.52	219	125
Hungary	0.88	0.70	221	122
Poland	0.60	0.57	212	125
Romania	0.84	0.30	178	90
Slovak Republic	0.84	0.47	226	129
Slovenia	0.85	0.75	198	101
Belarus	0.73	0.35	167	113
Moldova	0.33	0.17	124	67
Russia	0.57	0.46	226	141

Sources: European Comparison Program database, 1993; and authors' calculations.

**8. Wide price level disparities (in common currency terms) remain and may be expected to persist across transition countries**

Paralleling the process of alignment of relative prices, overall consumer price levels have tended to come closer together as well across transition countries (compare the dispersion in Tables 1 and 2 with that in Figure 4).<sup>20</sup> The ranking of transition countries by price levels was somewhat unstable in the first phases of transition owing to asynchronous price liberalization and exchange rate unification measures. More recently, however, it may have started to settle closer to some equilibrium level, as market forces are becoming more generally operative. Nevertheless, substantial differences in price levels remain (Figure 4), and are likely to persist, reflecting disparate development levels (see also Fact 10). By 1996, Slovenia and Croatia clearly stood out with price levels reaching almost twice the median. Prices were well below the median in some of the countries of the former Soviet Union with the exception of Russia and Georgia. Poland, Hungary and the Baltic countries stood about mid-way between the top two and the Czech and Slovak republics, the latter representing the median.

**9. Over time, prices and inflation rates have converged across regions within countries**

Just as prices have been coming closer together across countries, they have also been converging across regions within countries. Market integration has a domestic as well as an international dimension. This phenomenon has been documented in some of the larger countries, where physical and institutional obstacles impeded market integration more conspicuously in the aftermath of initial price liberalizations.

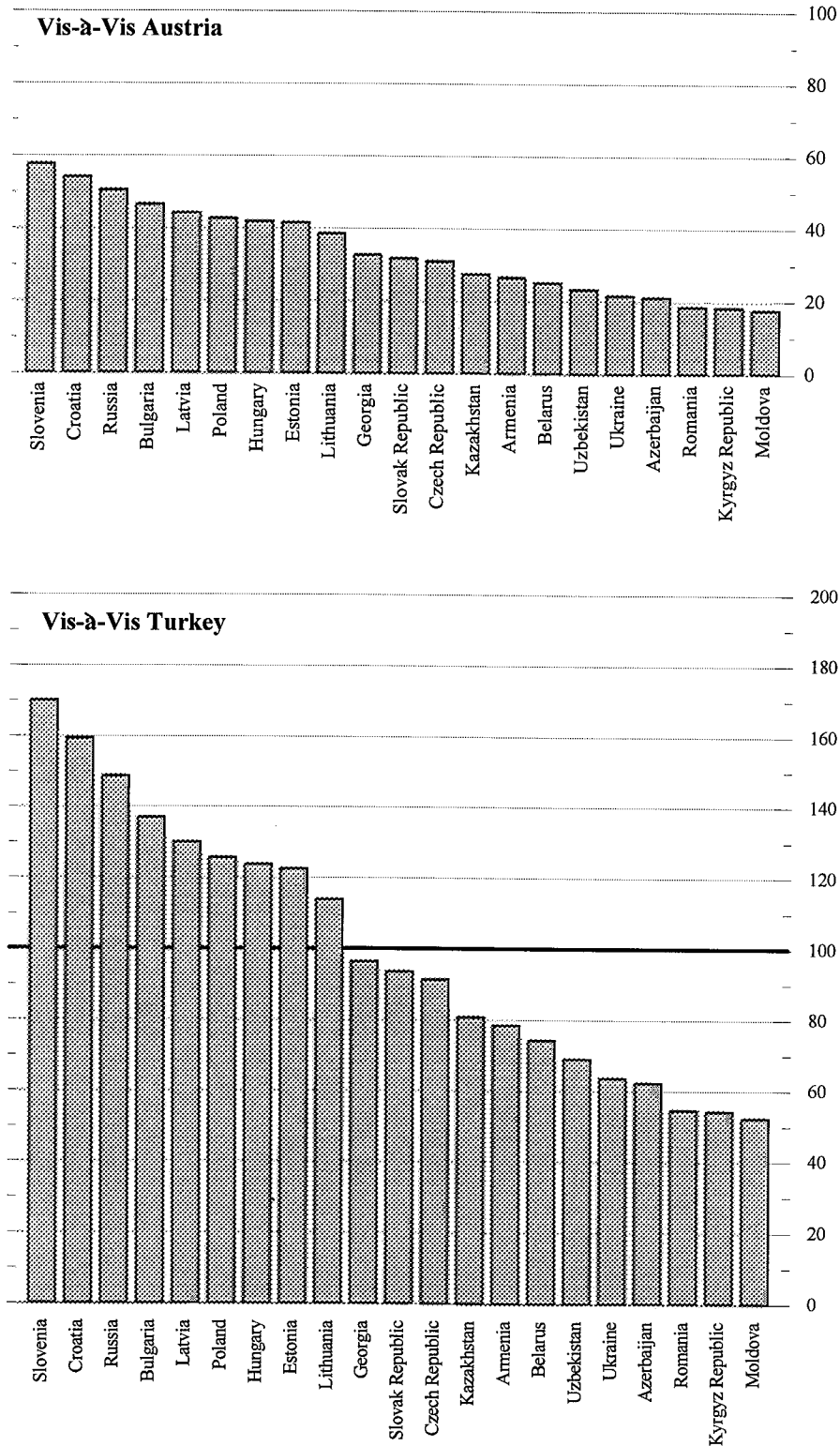
In Russia, for example, although most consumer prices were decontrolled at the federal level in early 1992, local restrictions remained for some months or even years in a number of regions (Koen and Phillips (1993)). They long persisted in some of the regions endowed with the natural or other resources making the associated subsidies fiscally sustainable, most notoriously Ulyanovsk (Lenin's birthplace) until 1996.<sup>21</sup> Nevertheless, some signs of convergence of price levels have been detected, with geographical price dispersion coming closer to the level observed in large advanced economies such as Canada (De Masi and Koen (1996)). Other evidence pointing in the same direction includes time-series analysis of the prices of food products in 25 cities of the Volga and Central regions, which shows that despite the obstacles posed by recalcitrant local governments, mafia activity, and poor infrastructure, prices and inflation rates have tended to converge across and within cities (Berkowitz *et al.* (1996)). However, significant regional price level disparities are bound to persist even in the absence of any regulatory constraints, owing to transportation costs, which

---

<sup>20</sup> See also De Broeck *et al.* (1997) on Kazakhstan and Russia.

<sup>21</sup> But by early 1997, food prices in Ulyanovsk had largely caught up with adjacent regions (*Izvestia*, March 5, 1997).

**Figure 4. Overall Price Level Gaps, 1996**  
(In percent)



Sources: Tables 1 and 2; IMF, *International Financial Statistics*, and World Economic Outlook database; and authors' computations.

given Russia's climate and the size of the country represent a substantial portion of the price of many products.

In Kazakhstan, inflation rates have also been shown to converge over time across its 20 regions, first for (more easily tradable) goods and later for (less tradable) services (De Broeck *et al.* (1997)).

In Poland, some convergence of food prices across major urban areas can also be observed. Looking at the behavior of the prices of 12 major items in 9 large cities during the first half of the 1990s, dispersion measures drop significantly, although not always monotonically, over time.<sup>22</sup> For 8 products, the coefficient of variation exhibits a declining trend, and for 9 products, the same holds for the ratio between the extreme values.<sup>23</sup>

#### **10. Full convergence of the overall price levels to those prevailing in advanced market economies can be expected only in the very long run**

By 1996, consumer price levels in transition countries had generally started to move closer to market economy comparators. The unweighted average consumer price level ratio vis-à-vis Austria rose from one-fourth in 1993 to over one-third in 1996 (for the countries appearing in Table 1).<sup>24</sup> The increase was particularly rapid in Russia, Ukraine, Belarus, the Baltics and Moldova. The residual gap nevertheless remained large, as world-wide cross-country regressions of prices on per capita incomes would predict (Richards and Tersman (1996)): on the whole, there is indeed a significant positive correlation between price and per capita income levels across transition countries (Figure 5).<sup>25</sup> The observed pattern is also broadly in line with the comparison with Turkey (Figure 4), and with the position of Portugal, shown here as the European Union member with the lowest price level.

Two additional indicators support the idea that price levels will rise as transition countries grow, namely dollar wages and the structure of consumption (Figure 6). Dollar wages are positively related to productivity and have been rising vigorously, often from very

---

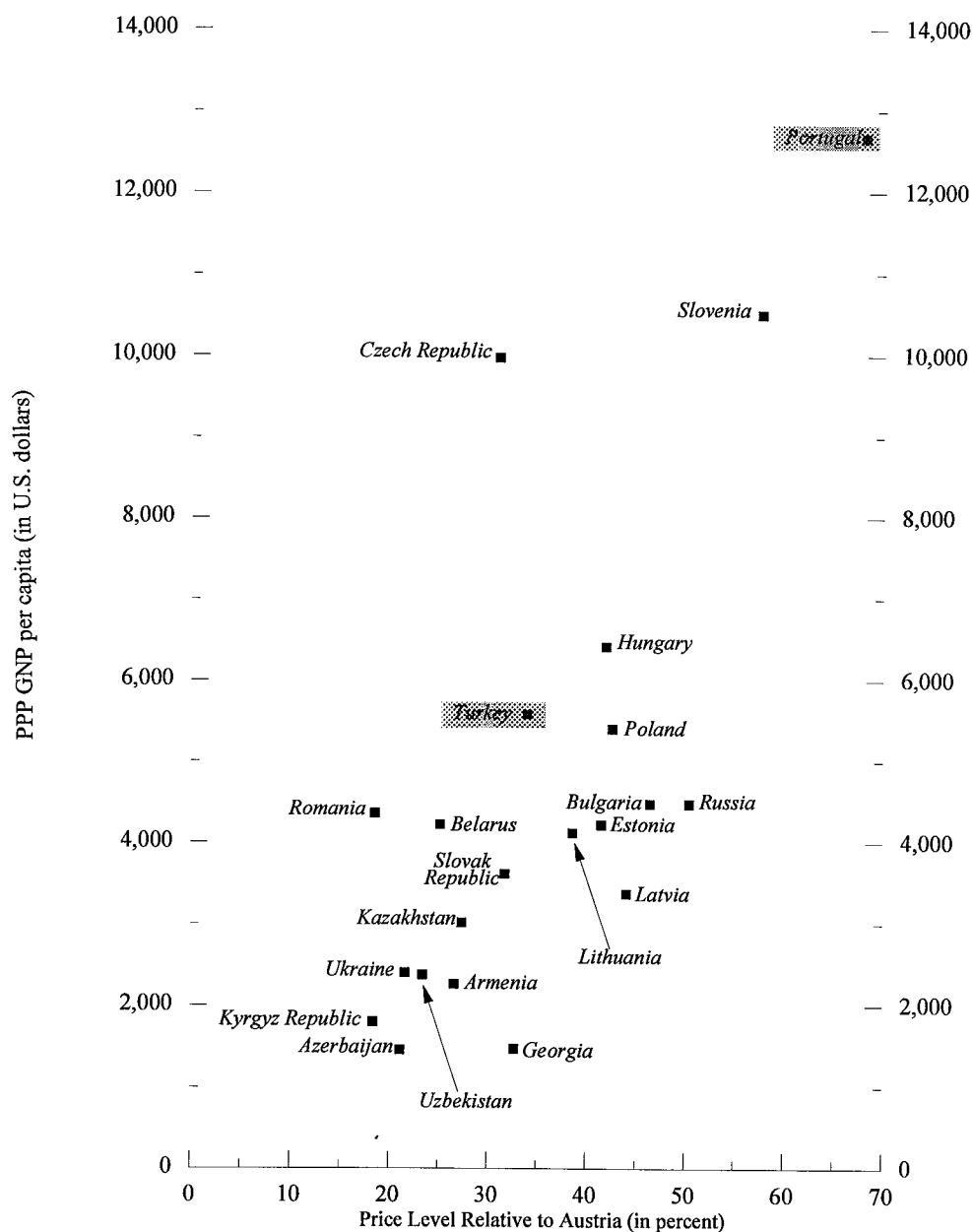
<sup>22</sup> The raw data are contained in Central Statistical Office (1995), Table 17.

<sup>23</sup> Interestingly, the max/min ratio does not exceed 1.3 in Poland (for individual items, but year averages), whereas it is around 5 in Russia (for the aforementioned basket of 19 staples, but in December).

<sup>24</sup> The 1996 numbers are obtained by extrapolating from the 1993 ECP data using overall inflation and exchange rate series. They are, therefore, less precise than those a new ECP exercise, using updated weights, would have produced.

<sup>25</sup> The high income outliers in Figure 5 are the Czech Republic (one third of Austria's price level) and Slovenia (almost two thirds).

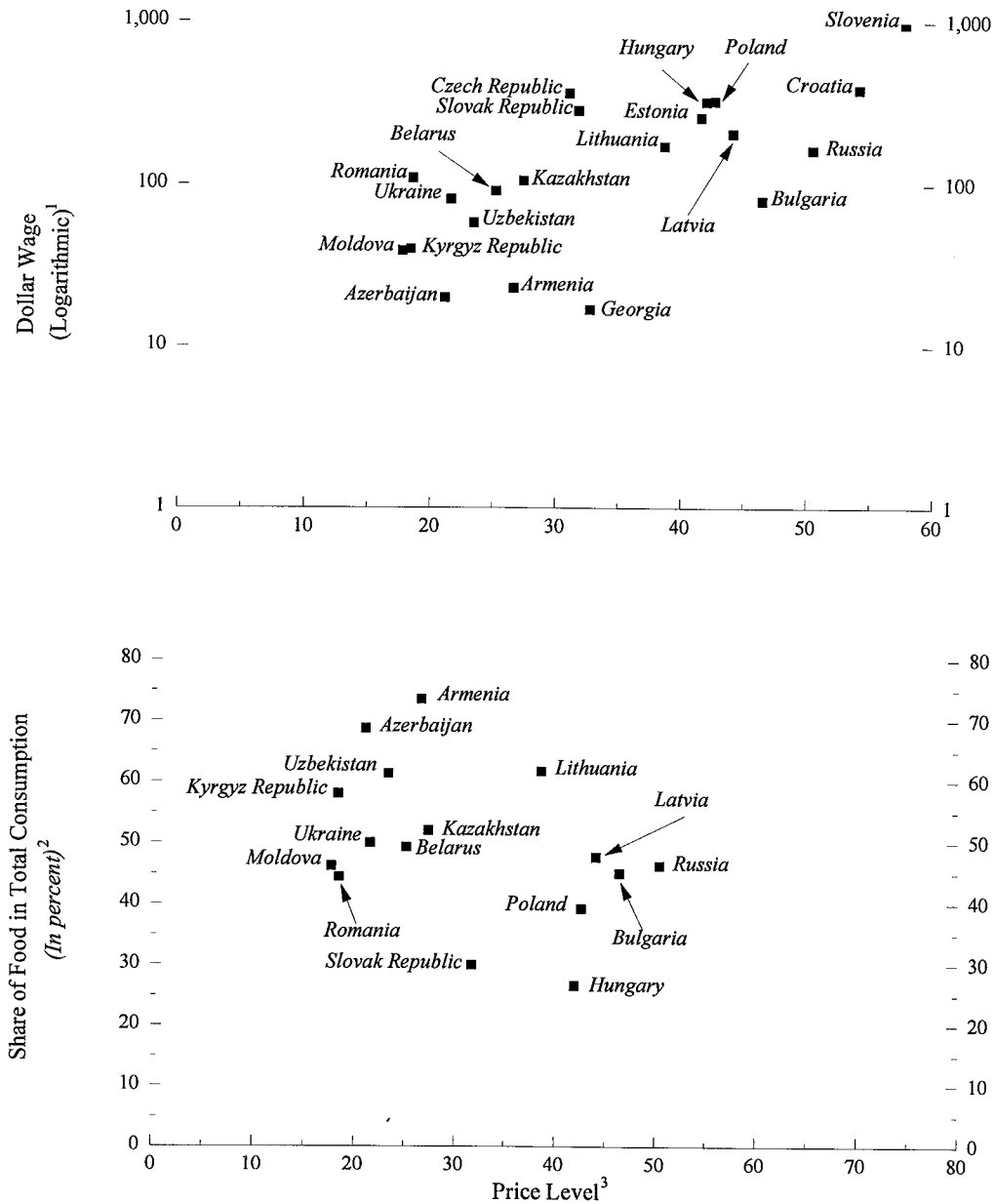
**Figure 5. Price and Per Capita GNP Level<sup>1</sup>**



Sources: World Bank, *World Bank Atlas*; European Comparison Program database, 1993; Organisation for Economic Co-operation and Development (1996); Tables 1 and 2; and authors' computations.

<sup>1</sup>1996 price level relative to Austria in percent, and 1995 per capita GNP level.

**Figure 6. Price Level, Dollar Wage and Share of Food in Consumption**



Sources: European Comparison Program database, 1993; Table A2; national authorities; and authors' computations.

<sup>1</sup>Dollar wage in July 1996.

<sup>2</sup>Percent of food in total consumption in 1993.

<sup>3</sup>Price level in 1996 as a percent of Austria's dollar wage in July 1996.

low levels (Table A2).<sup>26</sup> They are virtually bound to rise over time, as part of the region-wide catch-up process. Likewise, the structure of consumption will shift as those countries become richer, with the share of food declining and that of services increasing. However, the speed of convergence toward advanced economy levels of productivity will naturally tend to slow down as the gap diminishes.<sup>27</sup>

### III. SCOPE FOR FURTHER RESEARCH

Some of the stylized facts outlined above are by now part of conventional wisdom, but others less so. Some have been firmly established, while others have only been tentatively identified, with sample length and width too small for comfort. Moreover, the chaotic nature of the reform process in certain countries tends to overshadow some of the trends highlighted as stylized facts. There is therefore considerable room left for more thorough investigations allowing for more refined characterizations of absolute and relative price trends. Lastly, over and beyond the phenomenology of inflation undertaken in this paper, much remains to be done on its underlying causes. As time series lengthen and more disaggregated price information becomes available, more robust conclusions will be within reach.

---

<sup>26</sup> The dollar wage data need to be interpreted with extreme caution. Owing to cross-country differences in coverage (sectors, net versus gross), they are more relevant over time than across space. Even for a given country, methodological changes, variable shares of non-wage compensation, wage arrears, and evolving exchange rate systems obscure the analysis. Notwithstanding all those caveats, the variance of wages is so large that Table A2 does convey some important information about orders of magnitude.

<sup>27</sup> At least, this is what the literature on conditional convergence would suggest (see, e.g., Barro (1991)).



**Table A1. Consumer Price Inflation<sup>1</sup>**  
(Monthly percent change)

		Albania	Bulgaria	Czech Croatia	Republic	Hungary	Macedonia, F.Y.R.	Poland	Romania	Serbia- Montenegro	Slovak Republic	Slovenia
1990	Jan	...	1.9	37.2	...	9.3	38.1	<b>79.6</b>	...	35.4	3.2	<b>42.9</b>
	Feb	...	1.8	13.6	0.2	5.0	19.5	23.8	0.0	14.2	0.1	9.5
	Mar	...	1.9	4.9	0.2	2.1	3.5	4.3	0.0	3.2	0.0	4.3
	Apr	...	1.9	5.2	0.2	2.0	1.5	7.5	2.6	3.9	0.8	2.1
	May	...	1.8	2.2	-0.1	0.2	3.6	4.6	0.0	1.3	0.0	0.7
	Jun	...	4.1	-0.8	0.3	-0.2	-2.4	3.4	0.0	0.2	0.3	-1.4
	Jul	...	3.5	4.0	7.7	3.1	2.2	3.6	1.1	1.7	7.2	1.4
	Aug	...	10.9	2.1	2.6	2.2	1.1	1.8	0.0	3.3	2.2	0.0
	Sep	...	4.5	5.7	0.8	1.8	6.1	4.6	0.0	8.5	0.8	6.8
	Oct	...	4.1	1.5	1.1	1.3	9.2	5.7	0.0	11.5	1.4	7.6
	Nov	...	4.9	10.1	2.0	1.9	2.3	4.9	23.4	2.7	2.0	3.5
	Dec	...	10.4	4.1	0.0	0.7	2.6	5.9	11.6	3.2	0.0	2.3
1991	Jan	...	13.6	6.9	<b>25.5</b>	<b>9.9</b>	5.7	12.7	14.8	8.5	<b>26.3</b>	6.1
	Feb	5.9	<b>122.9</b>	9.9	6.2	4.2	9.7	6.7	7.0	14.8	8.8	7.9
	Mar	3.8	50.5	3.5	4.1	3.0	1.6	4.5	6.6	2.1	5.8	3.9
	Apr	4.5	2.5	5.6	2.4	3.1	3.5	2.7	26.5	3.6	0.8	5.1
	May	7.0	0.8	11.9	1.9	1.0	11.8	2.7	5.1	12.8	1.9	10.7
	Jun	4.1	5.9	6.1	2.2	1.1	13.3	4.9	2.0	5.8	1.9	12.0
	Jul	5.5	8.4	6.4	-0.7	2.9	4.9	0.1	9.5	2.7	0.5	5.7
	Aug	3.7	7.5	5.9	-0.4	-0.8	8.8	0.6	11.2	4.1	0.5	8.8
	Sep	3.6	3.8	10.5	-0.1	1.6	14.7	4.3	7.3	15.1	0.1	17.1
	Oct	3.5	3.3	20.8	-0.1	1.3	16.2	3.2	10.4	17.1	-0.4	21.3
	Nov	13.3	5.0	25.3	1.6	1.1	20.9	3.2	10.9	16.9	1.7	18.9
	Dec	20.1	4.9	19.8	1.3	0.2	16.0	3.1	13.7	20.4	1.9	15.5
1992	Jan	9.9	4.8	18.9	1.4	6.1	28.4	7.5	19.5	30.4	0.7	13.6
	Feb	14.2	5.8	13.0	0.8	2.7	46.0	1.8	12.5	69.8	0.3	11.0
	Mar	11.2	3.9	11.3	0.6	1.8	37.6	2.0	10.0	34.0	0.1	11.8
	Apr	9.0	3.2	13.7	0.5	1.3	<b>86.1</b>	3.7	4.7	69.7	0.1	5.4
	May	7.8	11.9	26.8	0.4	1.6	72.4	4.0	12.1	76.4	0.3	6.5
	Jun	5.8	5.8	12.8	0.9	0.5	17.0	1.6	4.3	90.8	-0.8	4.7
	Jul	6.6	2.8	19.7	0.7	0.2	8.3	1.4	3.2	54.6	0.8	2.0
	Aug	<b>45.7</b>	1.2	22.4	0.1	0.8	6.6	2.7	3.4	44.2	0.7	1.2
	Sep	7.0	3.4	28.0	1.3	2.3	16.0	5.3	10.1	73.7	1.6	2.7
	Oct	11.4	6.2	<b>38.7</b>	1.8	2.5	21.0	3.0	9.6	49.2	2.1	2.7
	Nov	3.5	6.7	29.1	2.5	1.6	10.0	2.3	13.5	36.3	1.7	3.0
	Dec	1.3	4.6	24.9	0.8	1.1	17.5	2.2	13.2	51.5	1.0	1.1
1993	Jan	6.8	6.9	31.2	9.1	6.8	15.6	4.1	11.5	101	8.9	3.7
	Feb	4.3	4.7	22.7	1.5	1.7	32.5	3.4	8.2	194	1.6	1.6
	Mar	0.9	5.6	29.6	0.6	0.8	8.5	2.1	9.2	263	1.0	1.4
	Apr	-0.1	3.9	22.9	0.6	0.8	3.4	2.3	10.0	96	1.2	1.0
	May	-0.5	5.3	23.3	0.3	0.4	8.0	1.8	30.4	224	0.5	1.4
	Jun	0.1	4.1	26.4	1.0	0.3	-0.9	1.4	5.5	341	0.4	1.5
	Jul	7.8	1.0	26.9	0.2	0.6	7.7	1.1	13.2	433	1.1	0.8
	Aug	1.3	2.6	30.6	0.2	1.7	9.5	2.3	10.8	1,791	2.4	1.7
	Sep	4.3	3.8	33.3	1.0	2.8	6.5	2.5	10.9	692	2.4	1.7
	Oct	1.9	4.2	35.1	0.9	1.6	12.1	1.9	16.3	2,050	1.4	2.9
	Nov	0.6	4.6	2.0	0.8	0.6	12.1	4.0	14.2	22,181	1.1	1.6
	Dec	0.3	3.9	0.5	1.1	1.4	13.5	5.6	7.4	283,833	0.6	1.5

(continued)

**Table A1. Consumer Price Inflation**  
(Monthly percent change)

		Albania	Bulgaria	Czech Croatia	Republic	Hungary	Macedonia, F.Y.R.	Poland	Romania	Serbia- Montenegro	Slovak Republic	Slovenia
1994	Jan	2.0	3.8	-0.2	2.4	3.2	22.0	1.8	4.9	<b>81,199,441</b>	1.4	1.5
	Feb	1.7	4.6	-1.3	0.4	1.4	6.8	1.1	5.9	2,667	0.8	1.2
	Mar	0.6	7.5	-1.0	0.2	1.0	2.4	2.0	8.3	-7.3	0.5	1.1
	Apr	9.0	21.7	-1.4	0.4	1.2	2.4	2.9	6.0	0.7	0.4	2.1
	May	1.7	7.9	-0.1	0.4	1.2	1.6	1.7	5.0	-0.9	0.6	1.0
	Jun	1.7	4.1	-0.3	1.2	1.0	2.3	2.3	2.6	-1.0	0.5	1.6
	Jul	-3.3	0.6	0.7	0.3	1.3	-0.6	1.5	1.6	-1.1	0.7	1.1
	Aug	-2.1	5.2	-0.1	0.7	1.4	0.6	1.7	1.8	-0.8	1.3	1.1
	Sep	0.1	11.0	0.5	1.3	2.3	1.8	4.5	3.9	0.2	2.4	1.6
	Oct	1.0	6.9	0.1	1.0	2.1	2.0	2.9	4.4	1.3	1.3	2.0
	Nov	0.9	5.5	-0.1	0.8	1.9	2.2	1.8	2.8	10.2	0.7	1.5
	Dec	1.9	5.0	0.2	0.7	1.5	2.9	1.9	2.1	2.8	0.6	1.1
1995	Jan	1.8	3.9	0.7	1.2	3.9	3.2	4.1	2.0	14.7	1.4	1.1
	Feb	2.3	3.8	0.1	0.9	2.8	0.2	2.1	1.4	1.1	0.5	0.9
	Mar	0.3	3.4	0.1	0.3	4.0	1.6	1.7	0.9	2.5	0.3	0.5
	Apr	1.7	1.0	0.7	1.0	2.6	0.6	2.3	1.6	8.6	0.4	-0.1
	May	-0.5	1.9	0.2	0.4	2.5	-0.9	1.8	1.1	4.0	0.3	0.5
	Jun	-1.8	0.5	-0.4	1.0	1.2	-1.7	1.0	1.3	5.0	0.1	0.7
	Jul	-3.3	1.5	0.0	0.1	0.9	0.0	-0.9	2.6	5.1	1.0	0.3
	Aug	0.8	0.5	-0.1	0.0	0.3	0.2	0.4	1.0	7.8	0.4	0.5
	Sep	1.1	4.8	1.6	0.9	2.0	0.7	3.0	1.6	10.7	1.4	1.3
	Oct	0.7	2.5	0.5	0.6	2.3	3.0	1.8	3.6	9.6	0.5	0.6
	Nov	2.3	2.6	0.1	0.6	1.6	1.6	1.3	4.1	6.9	0.4	1.3
	Dec	0.7	2.6	0.2	0.5	1.2	0.5	1.5	3.7	5.3	0.3	0.7
1996	Jan	2.0	2.3	0.2	2.3	4.4	0.3	3.4	1.2	9.2	0.7	1.0
	Feb	1.8	1.9	0.5	0.5	2.3	0.0	1.5	1.9	5.4	0.2	0.9
	Mar	1.5	1.7	-0.1	0.5	1.9	0.0	1.5	1.7	5.6	0.2	1.3
	Apr	1.5	2.9	-0.3	0.7	1.6	-0.7	2.2	1.9	4.5	0.3	1.2
	May	1.1	12.5	1.1	0.5	2.1	-1.1	1.4	5.3	1.1	0.5	0.7
	Jun	-0.8	20.3	0.5	0.8	0.9	-0.4	1.0	1.0	3.6	0.2	0.5
	Jul	2.5	23.3	0.4	1.0	0.3	-0.6	-0.1	7.5	4.8	0.3	0.5
	Aug	2.4	17.1	0.0	0.2	0.3	-0.7	0.5	3.8	2.6	0.5	0.1
	Sep	2.5	18.8	0.1	0.3	1.4	0.3	1.9	2.4	1.8	0.9	0.5
	Oct	1.5	16.7	0.6	0.5	1.3	2.6	1.4	3.4	2.7	0.7	0.5
	Nov	-0.3	9.7	0.5	0.4	0.8	0.7	1.3	5.8	2.2	0.4	0.8
	Dec	0.7	26.9	0.0	0.6	0.9	-0.1	1.3	10.3	4.6	0.3	0.7

(continued)

**Table A1. Consumer Price Inflation (continued)**  
(Monthly percent change)

		Kyrgyz														
		Armenia	Azerbaijan	Belarus	Estonia	Georgia	Kazakhstan	Republic	Latvia	Lithuania	Moldova	Russia	Tajikistan	Turkmenistan	Ukraine	Uzbekistan
1991	Jan	...	13.6	5.9	19.9	3.4	6.0	9.2	29.0	...	18.2	6.2	9.4	4.3	3.7	9.6
	Feb	...	4.4	11.5	7.8	3.2	7.5	7.5	14.2	8.4	12.7	4.8	5.5	6.1	4.7	2.6
	Mar	...	2.0	3.9	13.0	6.3	4.9	3.0	5.2	17.1	2.3	6.3	8.2	8.4	8.4	7.6
	Apr	...	58.2	50.7	19.1	42.4	83.3	42.3	15.3	27.1	44.6	63.5	62.6	66.0	66.4	77.9
	May	...	3.6	3.4	1.9	-0.2	3.7	3.0	2.2	9.6	3.7	3.0	2.8	10.4	1.2	2.9
	Jun	...	6.2	2.5	5.8	0.8	0.5	2.4	2.1	6.6	0.7	1.2	6.9	-0.5	0.8	0.8
	Jul	...	-0.1	2.0	30.1	1.4	-0.5	1.1	1.9	5.5	-0.7	0.6	2.9	-0.8	0.5	-0.4
	Aug	0.3	1.8	0.4	-0.7	0.2	-0.6	4.4	1.1	4.2	-1.8	0.5	1.7	-0.2	0.3	2.2
	Sep	-3.3	8.5	0.7	6.0	8.2	0.8	1.7	8.9	3.5	0.9	1.1	4.6	4.0	2.5	2.7
	Oct	4.8	6.7	3.7	9.2	5.5	4.4	8.0	5.5	6.0	4.3	3.5	6.0	2.5	6.3	4.9
	Nov	15.6	18.7	6.6	11.5	4.7	6.2	15.0	9.7	27.8	6.2	8.9	10.0	2.5	7.4	4.6
	Dec	30.0	12.2	10.7	28.9	13.0	6.0	12.3	49.7	53.0	12.1	12.1	6.6	4.8	10.7	5.1
1992	Jan	154.8	<b>118.1</b>	<b>158.6</b>	<b>87.5</b>	29.1	<b>212.3</b>	<b>157.0</b>	<b>64.1</b>	<b>54.0</b>	<b>196.3</b>	<b>296.0</b>	<b>213.1</b>	<b>180.0</b>	<b>285.2</b>	<b>118.4</b>
	Feb	56.2	33.3	50.5	73.9	17.5	21.0	29.4	48.6	42.4	33.5	27.3	73.1	17.9	15.3	57.4
	Mar	35.0	17.7	19.4	30.0	197.9	36.1	15.8	33.8	18.2	9.3	16.5	12.5	6.3	12.1	9.5
	Apr	23.8	17.2	16.0	10.6	48.6	40.2	17.9	11.0	10.3	15.7	17.2	8.7	7.3	7.6	27.1
	May	10.0	6.2	15.8	5.2	-20.6	14.5	4.3	13.2	6.8	9.2	10.5	1.4	7.1	14.4	8.8
	Jun	26.2	15.0	11.4	11.4	20.0	23.8	5.2	15.2	12.3	6.5	13.9	13.4	1.6	26.5	0.0
	Jul	0.3	12.9	13.1	24.3	16.8	16.2	8.2	19.6	27.2	1.6	7.1	13.0	1.8	22.1	5.8
	Aug	-2.0	9.3	8.8	17.6	6.0	11.4	4.8	16.3	14.2	5.7	8.6	17.5	21.4	8.3	5.5
	Sep	7.8	18.5	8.8	6.6	14.6	12.1	26.9	12.1	29.4	10.5	15.2	10.4	8.9	10.6	3.6
	Oct	24.5	18.5	12.6	7.7	11.6	16.7	26.3	25.1	18.9	18.7	31.1	8.0	4.9	12.4	18.2
	Nov	31.5	23.9	21.0	9.5	13.8	22.8	22.8	12.0	29.0	33.7	27.1	6.8	9.0	22.0	24.3
	Dec	32.2	59.0	30.7	3.3	35.7	44.1	22.2	2.6	27.7	22.8	25.3	13.6	14.7	35.1	14.1
1993	Jan	33.4	54.1	14.8	3.4	26.7	32.9	46.3	4.2	9.5	37.1	25.8	19.0	25.0	73.2	27.9
	Feb	41.7	14.8	19.7	1.7	37.0	31.9	39.9	2.9	10.2	17.3	24.6	24.4	29.6	28.8	17.4
	Mar	16.6	12.3	28.1	3.6	13.8	33.0	24.4	2.4	21.4	21.4	20.2	34.6	11.8	22.1	7.3
	Apr	13.7	14.4	24.8	2.3	24.7	21.4	16.6	0.3	25.0	13.8	18.8	63.5	0.6	23.6	12.5
	May	24.2	26.5	19.7	1.7	31.8	16.1	21.4	-0.3	12.7	13.6	18.1	33.7	12.5	27.6	9.3
	Jun	28.7	23.1	26.3	1.3	31.3	17.9	17.1	2.3	6.3	12.6	19.9	17.3	36.0	71.7	31.8
	Jul	11.4	9.7	23.3	2.6	39.8	21.8	16.5	0.8	2.9	18.9	22.4	31.8	11.0	37.6	14.5
	Aug	24.6	13.0	25.1	0.7	28.3	29.1	19.6	-1.7	0.9	21.0	26.0	43.0	15.2	21.7	16.0
	Sep	14.5	16.3	36.0	3.0	50.4	29.0	32.8	2.0	4.2	25.8	23.0	36.4	23.9	80.3	8.1
	Oct	55.6	22.0	44.6	2.6	66.3	38.2	33.1	3.8	7.3	18.2	19.5	25.1	24.1	66.1	29.2
	Nov	<b>437.8</b>	36.2	43.2	4.0	137.6	55.5	21.9	8.8	6.8	16.7	16.5	63.2	153.9	45.3	44.5
	Dec	106.3	64.4	45.5	4.1	67.0	34.4	15.7	5.1	6.2	31.9	12.5	176.9	17.6	90.8	40.7
1994	Jan	82.5	37.8	40.7	5.5	18	42.6	12.8	3.8	4.8	21.3	17.9	-23.2	25.5	19.2	24.3
	Feb	18.5	23.1	18.7	5.2	31	24.2	16.9	3.4	2.9	24.5	10.8	-4.4	18.8	12.6	27.5
	Mar	44.5	24.9	10.2	8.9	73	17.4	7.4	1.7	3.3	11.2	7.4	-4.2	35.0	5.7	27.2
	Apr	57.1	22.5	28.6	3.1	102	31.8	4.9	2.7	1.6	5.0	8.5	3.1	32.2	6.0	44.9
	May	56.5	43.3	28.7	1.1	21	33.8	3.4	0.2	6.2	2.7	6.9	5.1	15.0	5.2	28.9
	Jun	9.1	17.0	19.5	0.7	11	45.9	3.5	2.0	2.1	2.7	6.0	2.7	15.0	3.9	36.7
	Jul	-1.8	11.5	26.6	2.8	18	25.4	2.8	1.1	2.1	2.2	5.3	4.0	20.0	2.1	13.5
	Aug	3.7	5.9	53.4	1.0	51	13.3	1.7	1.9	2.2	-0.1	4.6	5.9	38.9	2.6	11.1
	Sep	6.3	16.6	25.5	3.2	195	9.7	0.2	1.0	2.3	2.5	7.2	3.4	25.6	7.3	19.4
	Oct	11.3	33.5	25.7	1.1	16	20.1	5.0	1.3	2.8	4.2	11.8	6.6	25.8	22.6	23.4
	Nov	14.7	52.1	40.5	1.6	-12	14.2	3.2	2.0	3.6	3.5	14.2	1.6	15.5	72.4	27.5
	Dec	60.8	55.2	31.3	1.4	4	10.2	3.6	2.4	3.8	2.9	16.7	4.7	33.4	28.4	13.3
1995	Jan	3.9	27.8	39.2	3.5	13.0	8.9	7.1	3.5	5.7	2.9	17.8	13.3	46.8	21.2	16.9
	Feb	0.7	12.5	33.7	2.9	0.8	6.7	6.8	3.2	3.9	2.3	11.0	10.9	21.1	18.1	17.8
	Mar	1.2	2.5	20.0	2.4	-3.0	5.1	1.6	2.6	1.4	0.7	8.9	17.9	18.2	11.4	7.8
	Apr	7.1	5.6	14.5	1.0	-1.0	3.2	0.8	1.9	1.4	0.6	8.5	20.9	11.7	5.8	16.7
	May	7.8	4.1	3.4	2.6	5.1	2.7	1.6	1.4	2.2	0.4	7.9	27.9	6.7	4.6	6.2
	Jun	0.6	-0.6	2.5	2.3	-1.2	2.3	0.7	1.5	1.0	0.2	6.7	8.2	-0.4	4.8	-2.1
	Jul	-4.6	-0.3	5.2	1.7	0.9	2.9	0.4	0.3	2.7	0.2	5.4	6.7	5.8	5.2	0.1
	Aug	-2.1	0.2	3.0	0.6	3.3	2.1	-0.3	-0.3	0.4	0.2	4.6	78.1	23.5	4.6	0.7
	Sep	-0.1	5.4	5.2	2.1	4.1	2.4	2.5	1.8	2.0	2.6	4.5	62.9	30.5	14.2	4.8
	Oct	4.1	1.4	3.4	3.1	23.4	4.1	1.1	1.6	3.2	2.7	4.7	56.9	32.9	9.1	5.3
	Nov	2.7	2.5	3.7	1.4	0.1	4.4	2.6	2.0	4.3	6.0	4.5	23.1	54.7	6.2	4.1
	Dec	7.6	4.7	3.9	2.0	3.4	3.6	3.4	1.7	2.7	2.9	3.2	67.5	55.7	4.6	4.0

(continued)

**Table A1. Consumer Price Inflation (continued)**  
(Monthly percent change)

		Armenia	Azerbaijan	Belarus	Estonia	Georgia	Kazakhstan	Kyrgyz Republic	Latvia	Lithuania	Moldova	Russia	Tajikistan	Turkmenistan	Ukraine	Uzbekistan
1996	Jan	3.6	2.1	5.6	3.5	2.6	4.1	3.6	3.5	3.2	3.5	4.1	10.8	62.5	9.4	5.3
	Feb	3.4	3.1	4.0	3.3	3.6	2.5	3.8	1.8	2.4	2.5	2.8	19.6	25.0	7.4	2.7
	Mar	0.2	-0.6	2.0	1.6	2.9	1.7	4.0	1.5	2.3	1.1	2.8	16.0	19.1	3.0	2.3
	Apr	-0.4	0.5	1.5	1.8	1.2	2.9	4.6	0.5	1.3	1.1	2.2	2.8	14.8	2.4	10.0
	May	0.1	-1.0	0.6	0.6	0.4	2.0	2.5	0.4	0.3	0.8	1.6	0.5	8.5	0.7	3.0
	Jun	-1.3	-2.5	2.3	0.7	0.8	2.5	1.0	1.7	0.4	0.1	1.2	-15.8	5.4	0.1	0.0
	Jul	-3.3	-0.1	2.0	0.4	-1.4	1.8	-2.1	0.3	0.1	0.1	0.7	-5.8	3.6	0.8	-3.0
	Aug	0.3	2.0	1.3	-0.3	0.0	0.7	0.5	-0.5	0.0	-0.3	-0.2	1.8	10.3	5.7	1.0
	Sep	-1.1	0.8	1.8	0.6	0.5	1.2	0.5	0.7	0.3	1.5	0.3	-2.9	9.0	2.0	2.7
	Oct	-0.2	-0.1	1.3	0.6	0.4	2.9	1.2	1.2	0.1	1.6	1.2	1.8	12.0	1.5	4.4
	Nov	2.4	0.8	3.9	0.6	1.1	2.4	6.6	0.8	1.1	1.4	1.9	2.4	12.8	1.2	10.5
	Dec	2.0	1.7	7.4	0.7	0.9	0.8	4.5	0.6	0.9	0.8	1.4	8.3	9.2	0.9	13.5

Sources: National authorities; Statistical Committee of the Commonwealth of Independent States; and CESMECON

<sup>1</sup>For each country, the largest single monthly price increase--which in most (but not all) cases coincides with the month of most comprehensive price liberalization--is marked in bold. Albania: open inflation started around mid-1990 but a monthly CPI only began to be monitored half a year later.

Belarus: hybrid CPI for 1991; CPI thereafter.

Georgia: Retail Price Index (RPI) through 1993; CPI for Tbilisi in 1994-95, CPI in 5 main cities in 1996.

Hungary: 1990 data are approximations, derived by decumulating a series based on 12-month rates of change.

Romania: the 1990 data prior to November may reflect monthly imputations based on a quarterly series.

Kyrgyz Republic: RPI through end-1994; CPI thereafter.

Lithuania: RPI until May 1992; CPI thereafter.

Moldova: RPI through late 1993; CPI since.

Russia: hybrid CPI for 1991, urban CPI for 1992; expanded average monthly CPI for 1993-94; within-month CPI for 1995-96. The estimates for September to December 1994 were subsequently revised by Goskomstat, when the within-month index was retropolated to the last four months of 1994, to 8 percent for September, 15 percent for October, 15 percent for November, and 16 percent for December (no decimals published).

Tajikistan: RPI for 1991; hybrid CPI for 1992-93; CPI thereafter.

Turkmenistan: RPI through 1992, Laspeyres CPI thereafter.

Ukraine: hybrid CPI for 1991-92; CPI thereafter.

Uzbekistan: RPI through 1993; CPI thereafter.

**Table A2. Dollar Wages**  
(Economy-wide average monthly wage as of July unless noted)<sup>1</sup>

	1990	1991	1992	1993	1994	1995	1996
Albania	...	...	18	36	54	...	...
Armenia <sup>2</sup>	...	...	9	10	6	18	23
Azerbaijan <sup>2</sup>	...	...	17	17	13	15	20
Belarus	...	...	29	29	30	72	91
Bulgaria <sup>3</sup>	...	50	100	126	94	122	80
Croatia	...	...	119	147	214	359	386
Czech Republic <sup>3</sup>	...	134	176	201	250	315	362
Estonia	...	...	56	83	144	227	258
Georgia <sup>4</sup>	...	...	7	24	3	8	17
Hungary <sup>3</sup>	209	230	285	296	327	319	322
Kazakhstan <sup>5</sup>	...	...	26	43	38	86	105
Kyrgyz Republic <sup>5</sup>	...	...	12	15	22	35	40
Latvia	...	...	34	79	141	190	206
Lithuania	...	...	47	47	92	133	172
Macedonia, F.Y.R.	...	...	...	152	190	232	225
Moldova <sup>5</sup>	...	...	19	23	28	31	39
Poland <sup>6</sup>	112	157	226	214	240	296	325
Romania	...	39	57	87	85	110	109
Russia	...	...	38	55	109	111	164
Serbia-Montenegro	...	...	62	17	120	100	140
Slovak Republic <sup>3</sup>	...	120	166	176	203	252	284
Slovenia	...	...	734	624	744	983	977
Tajikistan	...	...	12	13	18	14	9
Turkmenistan <sup>7</sup>	...	...	18	53	165	94	12
Ukraine <sup>8</sup>	...	...	38	16	28	58	81
Uzbekistan <sup>5</sup>	...	...	13	30	26	35	58

Sources: National authorities; Statistical Offices of the Commonwealth of Independent States; IMF, *International Financial Statistics*; and CESMECON.

<sup>1</sup>In most countries, this is the wage due rather than the wage actually paid out (an important distinction in the Baltic countries, Russia, and other countries of the former Soviet Union).

<sup>2</sup>Third quarter from 1994.

<sup>3</sup>In industry.

<sup>4</sup>Year average.

<sup>5</sup>Third quarter from 1995.

<sup>6</sup>Third quarter; net wage in 1990-91, gross thereafter (the wedge between gross and net wages was around 22 percent in 1992-94).

<sup>7</sup>Third quarter data from 1992. Exchange rate unification took place only at the beginning of 1996.

<sup>8</sup>Based on the auction exchange rate.

## REFERENCES

- Barro, Robert (1991), "Economic Growth in a Cross-Section of Countries," *Quarterly Journal of Economics*, Vol. 106, May, pp. 407-444.
- Berg, Andrew (1994), "Does Macroeconomic Reform Cause Structural Adjustment? Lessons from Poland," *Journal of Comparative Economics*, Vol. 18, June, pp. 376-409.
- Berkowitz, Daniel M., David N. DeJong and Steven Husted (1996), "Transition in Russia: It's Happening," University of Pittsburgh, Department of Economics, Working Paper No. 306.
- Bogetic, Zeljko, Pavle Petrovic and Zorica Vujosevic (1996), "The Yugoslav Hyperinflation of 1992-1994: Causes, Dynamics and Transmission Mechanism," mimeo, The World Bank and CESMECON, May.
- Central Statistical Office (1995), *1995 Statistical Yearbook*, Warsaw.
- Coorey, Sharmini, Mauro Mecagni and Erik Offerdal (1996), "Disinflation in Transition Economies: The Role of Relative Price Adjustment," IMF Working Paper, No. 96/138.
- Czyzewski, Adam, Witold Orłowski and Leszek Zienkowski (1996), "Inflationary Expectations in Polish Economy: An Attempt of Model Construction," *RECESS, Research Bulletin*, Vol. 5, No. 4, pp. 9-53.
- De Broeck, Mark, Paula De Masi, and Vincent Koen (1997), "Inflation Dynamics in Kazakhstan," *Economics of Transition*, Vol. 5, No.1, pp. 195-213.
- De Masi, Paula and Vincent Koen (1996), "Relative Price Convergence in Russia," *IMF Staff Papers*, Vol. 43, No. 1, pp. 97-122.
- Franz, A. (1996), "Comparisons for Countries of Central and Eastern Europe," Presented at the March 15-16 NBER Conference on Research in Income and Wealth, Arlington, VA.
- Goskomstat of the Russian Federation (1996a), *Prices in Russia*, Moscow, (In Russian).
- Goskomstat of the Russian Federation (1996b), *International Comparisons of Gross Domestic Product, 1993*, Moscow.
- Halpern, László and Charles Wyplosz (1995), "Equilibrium Real Exchange Rates in Transition," CEPR Discussion Paper, No. 1145.

- International Monetary Fund (1996a), *Estonia-Selected Issues*, IMF Staff Country Report No. 96/96.
- International Monetary Fund (1996b), *Lithuania-Recent Economic Developments*, IMF Staff Country Report No. 96/72.
- International Monetary Fund (1996c), *Latvia-Recent Economic Developments*, IMF Staff Country Report No. 96/143.
- Koen, Vincent, and Steven Phillips (1993), "Price Liberalization in Russia: Behavior of Prices, Household Incomes and Consumption in the First Year," *Occasional Paper*, No. 104, International Monetary Fund.
- Koen, Vincent (1995), "Price Measurement and Mismeasurement in Central Asia," IMF Working Paper, No. 95/82.
- McNeilly Caryl and Doris Schiesser-Gachnang (1996), "Inflation Dynamics in Albania," IMF, European I Department, mimeo.
- National Bank of Poland (1996), "Guidelines for Monetary Policy in 1997," draft, Warsaw (In Polish).
- Nuxoll, Daniel (1996), "The Convergence of Price Structures and Economic Growth," Paper presented at the March 15-16, NBER Conference on Research in Income and Wealth, Arlington, VA.
- OECD (1995), *Purchasing Power Parities for Countries in Transition: Methodological Papers*, CCET, General Distribution document (95)112.
- OECD (1996), *A Purchasing Power Parity Comparison for Ten New Independent States 1994 and 1995: Interim Report, Individual Household Consumption Expenditure*, CCET, General Distribution document (96)175.
- OECD (forthcoming), *Survey of the Russian Federation 1997*, CCET.
- Pujol, Thierry and Mark Griffiths (1996), "Moderate Inflation in Poland: A Real Story," IMF Working Paper, No. 96/57.
- Richards, Anthony, and Gunnar Tersman (1996), "Growth, Non-Tradables and Price Convergence in the Baltics," *Journal of Comparative Economics*, Vol. 23, No. 2, pp. 121-45.
- Zavoico, Basil (1995), "A Brief Note on the Inflationary Process in Transition Economies," IMF, mimeo, July 14.