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Policy Research

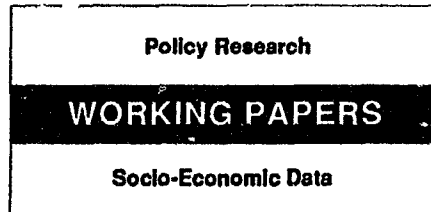**WORKING PAPERS**

Socio-Economic Data

International Economics Department
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Measuring the Incomes of Economies of the Former Soviet Union

Socio-Economic Data Division
International Economics Department

The study's estimates of income per capita for the states of the former Soviet Union, while subject to considerable uncertainty, are considered reliable enough for their primary purpose: to assign the new states of the Soviet Union to income categories for Bank analytical and operational purposes.

There is as yet no fully satisfactory way to compare income per capita of the former Soviet Union with that of other economies. Even more problematic is compiling estimates for the separate economies that have emerged with the breakup of the Soviet Union. The main problem is the isolated non-market economy of the country, compounded by the chaotic state of information services.

The results presented here, while subject to considerable uncertainty, are considered reliable enough for their primary purpose: to assign the new states of the Soviet Union to income categories for Bank analytical and operational purposes.

The main difficulty was choosing a ruble-dollar conversion factor that accords reasonably well with the Bank's *Atlas* method. Official rates cannot be used because they are as artificial and misleading as any other planned price, meaning that they diverge by a large margin from the rate effectively applied to international transactions. This study investigated three alternative conversion methods, yielding GNP per capita estimates for the former Soviet Union for 1990 ranging from $2,440 to $3,720.

The method judged most reliable (referred to as the synthetic *Atlas*-type conversion factor)

gave an estimate of $2,870. That figure is somewhat at odds with *Atlas* estimates for the former Soviet Union and other members of the Council for Mutual Economic Assistance (CMEA), which may reflect the limited applicability of the *Atlas* methods for historically planned economies. Income per capita is calculated for each of the states of the former Soviet Union and for the other European members of CMEA.

The method developed here relies on a purchasing power parity bridge from planned to market economies. Unlike conventional use of this measure, the study uses the relationship between purchasing power parity and exchange rates for comparator market economies to suggest an *Atlas*-type conversion factor. The estimations for the states of the former Soviet Union have a suggested margin of error of plus or minus 10 percent.

Incomplete reports for 1991-92 show large declines in real GDP in all countries of the former Soviet Union — as much as 25 percent in some cases. It is unlikely that mechanically extending results to 1992 will yield meaningful results, so this study is just a beginning.

Measuring the Incomes of Economies
of the former Soviet Union

Table of Contents

Executive Summary

At present,[1] there is no fully satisfactory way to compare per capita income of the former Soviet Union (FSU) with that of most other economies. Compiling estimates for the separate economies that have emerged from the FSU, which is the goal of this study, is even more problematic. The root cause is that the FSU had a non-market and exceptionally isolated economy but matters are further complicated by the chaotic state of FSU information and uncertainties about the impact of their common past on the present economies of the region. The results given here are inevitably subject to more than the usual range of uncertainty but are judged reliable enough for assigning FSU economies to income categories of analytical and operational interest to the Bank.

The main difficulty is in choosing a ruble-dollar conversion factor that makes sense and accords reasonably well with the Bank's *Atlas* method. The seemingly simple case for using official exchange rates proves untenable because, like other planned prices, such rates prove to be artificial and misleading.

Once an official conversion factor is judged to diverge by an exceptionally large margin from the rate effectively applied to international transactions, Bank procedure (as noted in *World Development Indicators*, etc.) is to devise an alternative. Three alternative conversion methods were investigated; they suggest a 1990 per capita income range of $2440-3720 for the FSU. The method that seems most viable yields $2870, and is referred to as the "synthetic *Atlas*-type conversion factor" (SACF). This figure is rather at odds with *Atlas* estimates reported for other countries of the Council for Mutual Economic Cooperation (CMEA). For some countries it gives very low GNP per capita level in percentage to FSU as compared to that of the other sources shown in Table 4, e.g., Poland (59% or $1690) for 1990-- and probably even more so for Bulgaria (69% or $1840) for 1991. Since this may reflect the limited applicability of the *Atlas* method for historically planned economies (HPEs), this report shows SACF computations for other CMEA countries. Table 1 (pages 4-5) reports 1990 estimates of $GNP per capita for each FSU economy (together with a figure for the entire FSU, for ease of reference), plus SACF-type estimates for the other European members of the CMEA, along with 1990 estimates actually reported by the Bank based on the *Atlas* method.

The SACF relies on a purchasing power parity (PPP) "bridge" to transit from planned to market economies. Unlike conventional PPPs, however, the SACF uses the relationship between PPPs and exchange rates for comparator market economies to suggest an *Atlas*-type conversion factor. To minimize distortions known to arise when comparing economies at disparate levels of income, only relationships for market economies in the same broad income range (upper middle income) were used for the SACF bridge.

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[1]This report reflects information available to the Bank by June 1992, at which time decisions had to be taken on the subject, for Bank operational purposes. This version is edited mainly to make the material more understandable to a wider audience.

New information is presented on the estimation of GNPs for individual FSU economies. It is suggested that a margin of error of +/-10% arises in apportioning income, in ruble terms, among the 15 FSU economies.

Incomplete reports for 1991-92 show that real GNP of all FSU economies declined, some by as much as 25 per cent per annum. This should be kept in mind when considering the ranking of FSU economies in Table 1, which is based on 1990.[2] Moreover, national compilers will need a workshop to digest the information collected and analyzed for this study. Even in the Bank, the task is far from complete (as is apparent from the Bank's new *Statistical Handbook: States of the former USSR*). And the collapse of the Union in 1991 shook reporting procedures as profoundly as the rest of the administrative apparatus.

Finally, these results are compared to other studies, in Table 4 (page 20). The "relativities" given here appear to be well within the bounds of other studies. It is unlikely that mechanical extensions of this study, to 1992, will produce meaningful results. This study is therefore just a start.

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[2]Estimates for 1991 were developed after this paper was prepared, by applying GDP growth rates to the 1990 figures presented here for FSU economies, and then scaling all up by the U.S. inflation rate (as measured by its GNP deflator).

Introduction

More time will be needed for more definitive results as well as to sort out unresolved factual issues. The experience of the more market-oriented economies of the post-FSU period should serve as a reality check on historical estimates. But tentative judgements must be made now, in deciding the terms under which FSU economies may borrow from the Bank. Since the results are inevitably subject to a large margin of error, the goal of this report is to allocate FSU economies to income brackets or categories used for the Bank's operational guidelines.

The most difficult aspect of assigning FSU economies to Bank lending categories is finding a ruble-dollar conversion factor that is broadly in line with usual Bank practices, or the so-called *Atlas* method. Well-known studies can be quoted that place per capita income of the FSU over $9000 or under $2000 per capita in 1989-90, primarily because of differing approaches to the ruble-dollar conversion factor. This arises mainly from oft-discussed[3] issues about how best to convert income estimates from national currencies to a common numeraire. A strong ruble and high $GNP per capita for the FSU (over $9000) emerges from official US assessments of the FSU (see US ACDA)[4] which are based strictly on a bilateral study of purchasing power parities (PPPs); a weak ruble and a low $GNP per capita ($1780 in 1989) was posited by the Houston Summit report of the Bank and other international agencies, based on a "back-cast" of the so-called commercial exchange rate, introduced in late 1990 (see IMF, World Bank, OECD and EBRD 1991).[5] The bulk of the report, Section I-III, is devoted to taking a position on this issue.

A smaller margin of error is thought to surround the underlying ruble estimates of 1990 GNP for each FSU economy (see page 18). However, subtle points of methodology become important at this level since the GNP per capita of the richest FSU economy is about four times that of the poorest. For practical reasons, this study assumes that the same conversion factor can be applied to each FSU economy. And several themes are developed in Section IV to suggest why a less sanguine view may be appropriate for more recent estimates and projections. Section V considers the relative position of the FSU and other economies, as presented here and

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[3]See, for example, a Bank working paper, *Estimating Per Capita Income*, available on request.

[4]Data accord with CIA methodology. CIA continues to report growth rates but no longer publishes dollar estimates for the FSU, given concerns about the results in the present context.

[5]The Summary and Recommendations to *The Economy of the USSR*, by the IMF, World Bank, OECD, and EBRD, reports $1780 for 1989 (page 51). Further detail was provided in the IMF, World Bank, OECD and EBRD 1991 study; hereafter referred to as JSSE.

in other international comparisons. It concludes that the relativities reported in Table 1 are within the bounds of other studies, considering how others' sources and methods are known to differ from those normally used for *Atlas* purposes. Table 4 suggests that the results are distinct from, but not out of line with, other studies that have been made with less, and less current, information.

However, this study is viewed as the beginning rather than the end of the task. It is universally agreed that more work is needed on essentially all fronts if reliable national accounts are to be compiled by all economies of the FSU region. The Bank is working closely with other international agencies as well as new member governments to provide support where needed and within Bank competencies. Section VI suggests some tasks that seem particularly important for clarifying the issue of $GNPs per capita for the FSU economies, and for which significant progress seems feasible within the next year or so.

Table 1 shows the proposed point estimates for $GNP per capita in 1990, for each FSU economy derived from the estimate of $2870 for the FSU as a whole; and comparable estimates for the other CMEA economies. The dramatic changes taking place in the FSU region make any historical exercise an uncertain guide to where the economies stand today. Apart from prospects of real GNP declines in the 20-50 per cent range in the FSU region, during 1991-92, fundamental changes are taking place in some FSU economies in the structure of domestic prices and the price of foreign currency (exchange rate).

Table 1. Basic Indicators ———— CONFIDENTIAL for former Soviet Union ————

6/17/92

	Population (millions) mid-1990	GNP per capita Dollars		Average annual growth rate (percent) 1965-90 a	Average annual rate of inflation \a (percent)		Life expectancy at birth (years) 1990	Adult illiteracy (percent)	
		1990 a	1990 @		1965-80	1980-90		Female 1990	Total 1990
Low-income economies	3,058.3 t	35		2.9 w	8.0 w	9.6 w	62 w	52 w	40 w
China and India	1,983.2 t	360		3.7 w	3.2 w	6.8 w	66 w	45 w	37 w
Other low-income	1,075.1 t	320		1.7 w	17.3 w	13.1 w	55 w	56 w	45 w
1 Mozambique	15.7	80			9.2	36.6	47	79	67
2 Tanzania b	24.5	110		-0.2	9.6	25.8	48	..	..
3 Ethiopia	51.2	120		-0.2	4.4	2.1	48	..	..
4 Somalia	7.8	120		-0.1	10.2	49.7	48	86	76
5 Nepal	18.9	170		0.5	7.8	9.1	52	87	74
6 Chad	5.7	190		-1.1	6.2	1.2	47	82	70
7 Bhutan	1.4	190		..	..	8.4	49	..	..
8 Lao PDR	4.1	200		..	..	..	49	..	..
9 Malawi	8.5	200		0.9	7.4	14.7	46	..	..
10 Bangladesh	106.7	210		0.7	15.9	9.6	52	78	65
11 Burundi	5.4	210		3.4	5.0	4.2	47	60	50
12 Zaire	37.3	220		-2.2	24.7	60.9	52	39	28
13 Uganda	16.3	220		-2.4	21.4	107.0	47	65	52
14 Madagascar	11.7	230		-1.9	7.7	17.1	51	27	20
15 Sierra Leone	4.1	240		0.0	7.9	56.1	42	89	79
16 Mali	8.5	270		1.7	9.0	3.0	48	76	68
17 Nigeria	115.5	290		-0.1	14.6	17.7	52	61	49
18 Niger	7.7	310		-2.4	7.5	2.9	46	83	72
19 Rwanda	7.1	310		1.0	12.5	4.2	48	63	50
20 Burkina Faso	9.0	330		1.3	6.3	4.5	48	91	82
21 India	849.5	350		1.9	7.5	7.9	59	66	52
22 Benin	4.7	360		-0.1	7.4	1.9	50	84	77
23 China	1,133.7	370		5.8	0.3	5.8	70	38	27
24 Haiti	6.5	370		0.2	7.2	7.2	55	53	47
25 Kenya	24.2	370		1.9	7.2	9.2	59	42	31
26 Pakistan	112.4	380		2.5	10.3	6.7	56	79	65
27 Ghana	14.9	390		-1.4	22.9	42.5	55	49	40
28 Central African Rep.	3.0	390		-0.5	8.2	5.4	50	75	62
29 Togo	3.6	410		-0.1	7.1	4.8	54	69	57
30 Zambia	8.1	420		-1.9	6.3	42.2	50	35	27
31 Guinea	5.7	440		..	..	..	43	87	76
32 Sri Lanka	17.0	470		2.9	9.4	11.1	71	17	12
33 Mauritania	2.0	500		-0.6	7.6	9.0	47	79	..
34 Lesotho	1.8	530		4.9	6.7	12.7	56	..	..
35 Indonesia	178.2	570		4.5	35.5	8.4	62	32	23
36 Honduras	5.1	590		0.5	5.7	5.4	65	29	27
37 Egypt, Arab Rep.	52.1	600		4.1	6.4	11.8	60	66	52
Middle-income economies	1,088.3 t	2,310 t		2.2 w	21.1 w	65.6 w	66 w	27 w	22 w
Lower-middle-income	629.7 t	1,530 t		1.5 w	23.6 w	64.8 w	65 w	32 w	26 w
44 Bolivia	7.2	630		-0.7	15.9	317.9	60	29	23
45 Zimbabwe	9.8	640		0.7	5.8	10.8	61	40	33
46 Senegal	7.4	710		-0.6	6.3	6.7	47	75	62
81 Mongolia	2.1		730	..	..	-1.3	64	11	10
47 Philippines	61.5	730		1.3	11.4	14.9	64	11	10
48 Cote d'Ivoire	11.9	750		0.5	9.4	2.3	55	60	46
49 Dominican Rep.	7.1	830		2.3	6.7	21.8	67	18	17
50 Papua New Guinea	3.9	860		0.1	8.1	5.3	55	62	48
51 Guatemala	9.2	900		0.7	7.1	14.6	63	53	45
52 Morocco	25.1	950		2.3	7.0	7.2	62	62	51
53 Cameroon	11.7	960		3.0	9.0	5.4	57	57	46
54 Ecuador	10.3	980		2.8	10.9	36.6	66	16	14
55 Syrian Arab Rep.	12.4	1,000		2.9	7.9	14.6	66	49	36
56 Congo	2.3	1,010		3.1	6.6	0.5	53	56	43
57 El Salvador	5.2	1,110		-0.4	7.0	17.2	64	30	27
58 Paraguay	4.3	1,110		4.6	9.3	24.4	67	12	10
>>> TAJIKISTAN	5.3		1,130				69	..	..
59 Peru	21.7	1,160		-0.2	20.5	233.9	63	21	15
60 Jordan c	3.2	1,240		..	..	..	67	30	20
61 Colombia	32.3	1,260		2.3	17.5	24.8	69	14	13
>>> UZBEKISTAN	20.5		1,340				69	..	..
62 Thailand	55.8	1,420		4.4	6.3	3.4	66	10	7
63 Tunisia	8.1	1,440		3.2	6.7	7.4	67	44	35
64 Jamaica	2.4	1,500		-1.3	12.8	18.3	73	1	..
>>> KYRGYSZTAN	4.4		1,570	..	..	..	68	..	..
65 Turkey	56.1	1,630		2.6	20.8	43.2	67	29	19
>>> AZERBAIJAN	7.2		1,640	..	..	..	70	..	..
>>> TURKMENISTAN	3.7		1,690	..	..	1.8	66	..	..
66 Romania	23.2	1,640	1,750	1.4	5.4	2.3	70	12	..
68 Panama	2.4	1,830		1.4	5.4	2.3	73	12	12

Note: For economies with populations of less than 1 million, see Box A.1; for other economies, see Box A.2.
For data comparability and coverage, see the technical notes. Figures with an asterisk are for years other than those specified.

6/17/92

			GNP per capita		Average annual growth rate (percent)	Average annual rate of inflation \a (percent)		Life expectancy at birth (years)	Adult illiteracy (percent)	
		Population (millions) mid-1990	Dollars						Female	Total
			1990 a	1990 a	1965-90 a	1965-80	1980-90	1990	1990	1990
69	Costa Rica	2.8	1,900		1.4	11.2	23.5	75	7	7
70	Chile	13.2	1,940		0.4	129.9	20.5	72	7	7
67	Poland	38.2	1,690	1,960			54.3	71		
71	Botswana	1.3	2,040		8.4	8.4	12.0	67	35	26
72	Algeria	25.1	2,060		2.1	10.9	6.6	65	55	43
>>>	GEORGIA	5.5		2,120				72	..	..
74	Mauritius	1.1	2,250		3.2	11.8	8.2	70		
75	Malaysia	17.9	2,320		-4.0	4.9	1.6	70	30	22
76	Argentina	32.3	2,370		-0.3	78.4	395.2	71	5	5
>>>	ARMENIA	3.3	..	2,380				73	..	..
>>>	MOLDOVA	4.4		2,350				69	..	..
73	Bulgaria	8.6	2,250	2,400		..	2.2	73	..	..
	Upper-middle-income	458.6 t	3,410 t		2.8 w	19.3 w	102.1 w	68 w	19 w	16 w
77	Iran, Islamic Rep.	55.8	2,490 d		0.1	13.5	13.5	66	57	46
85	Mexico	86.2	2,490		2.8	13.0	70.3	70	15	13
83	South Africa	35.9	2,530		1.3	10.3	14.4	62	..	..
>>>	UKRAINE	51.9		2,500				72		
88	Uruguay	3.1	2,560		0.8	58.2	61.4	73	4	4
87	Venezuela	19.7	2,560		-1.0	10.4	19.3	70	10	12
>>>	KAZAKHSTAN	16.8		2,600				68		
89	Brazil	150.4	2,680		3.3	31.3	284.3	66	20	19
==>>FSU<<==		299.3		2,870						
90	Hungary	10.6	2,780	2,980	..	2.6	9.0	71	..	..
91	Yugoslavia	23.8	3,060		2.9	15.2	122.9	72	12	7
>>>	BELARUS	10.3	..	3,110		..	..	72	..	..
>>>	LITHUANIA	3.7		3,110		..	..	72	..	..
92	Czechoslovakia	15.7	3,140	3,170			1.9	72	..	..
93	Gabon	1.1	3,330		0.9	12.8	-1.7	53	52	39
>>>	RUSSIA	148.3	..	3,430		..	..	70	..	..
>>>	LATVIA	2.7		3,590				70	..	..
94	Trinidad and Tobago	1.2	3,610		0.0	13.7	6.4	71	..	..
>>>	ESTONIA	1.6		4,170				70	..	..
95	Portugal	10.4	4,900		3.0	11.7	18.1	75	19	15
96	Korea, Rep.	42.8	5,400		7.1	18.4	5.1	71	7	4
97	Greece	10.1	5,990		2.8	10.3	18.0	77	11	7
98	Saudi Arabia	14.9	7,050		2.6	17.9	-4.2	64	52	38
	Lower-middle-income	4,146.6 t	890 t		2.5 w	16.7 w	61.8 w	63 w	46 w	36 w
	Sub-Saharan Africa	495.2 t	340 t		-0.2 w	11.4 w	20.0 w	51 w	62 w	50 w
	East Asia & Pacific	1,577.2 t	600 t		5.3 w	9.3 w	6.0 w	68 w	34 w	24 w
	South Asia	1,147.7 t	330 t		1.9 w	8.3 w	8.0 w	58 w	67 w	53 w
	Europe	200.4 t	..		.. w	13.9 w	38.8 w	70 w	22 w	15 w
	Middle East & N.Africa	256.4 t	..		1.8 w	13.6 w	7.5 w	61 w	60 w	47 w
	Latin America & Caribbean	432.9 t	2,190 t		1.8 w	31.4 w	192.1 w	68 w	18 w	16 w
	Severely indebted	455.5 t	2,190 t		2.1 w	27.6 w	173.5 w	67 w	24 w	21 w
	High-income economies	816.5 t	20,000 t		2.4 w	7.7 w	4.5 w	77 w	5 w	4 w
102	Ireland	3.5	9,550		3.0	11.9	6.5	74	..	..
103	+Israel	4.7	10,920		2.6	24.2	101.4	76	..	..
104	Spain	39.0	11,020		2.4	12.3	9.2	78	7	5
105	+Singapore	3.0	11,160		6.5	5.1	1.7	74	..	..
106	+Hong Kong	5.8	11,490 e		6.2	8.1	7.2	78	..	..
107	New Zealand	3.4	12,680		1.1	10.3	10.5	75	f	f
108	Belgium	10.0	15,540		2.6	6.6	4.4	76	f	f
109	United Kingdom	57.4	16,100		2.0	11.2	5.8	76	f	f
110	Italy	57.7	16,830		3.0	11.3	9.9	77	f	3
111	Australia	17.1	17,000		1.9	9.3	7.4	77	f	f
112	Netherlands	14.9	17,320		1.8	7.5	1.9	77	f	f
113	Austria	7.7	19,060		2.9	5.8	3.6	76	f	f
114	France	56.4	19,490		2.4	8.4	6.1	77	f	f
115	+United Arab Emirates	1.6	19,860				1.1	72		
116	Canada	26.5	20,470		2.7	7.1	4.4	77	f	f
117	United States	250.0	21,790		1.7	6.5	3.7	76	f	f
118	Denmark	5.1	22,080		2.1	9.3	5.6	75	f	f
119	Germany g	79.5	22,320 h		2.4 h	5.2 h	2.7 h	76	f	f
120	Norway	4.2	23,120		3.4	7.7	5.5	77	f	f
121	Sweden	8.6	23,660		1.9	8.0	7.4	78	f	f
122	Japan	123.5	25,430		4.1	7.7	1.5	79	f	f
123	Finland	5.0	26,040		3.2	10.5	6.8	76	f	f
124	Switzerland	6.7	32,680		1.6	5.3	3.7	78	f	f
	World	5,283.9 t	4,240 t		1.5 w	9.2 w	14.7 w	66 w	45 w	35 w

a Converted at the Synthetic Atlas-type Conversion Factor(SACF).
+ Economies classified by United Nations or otherwise regarded by their authorities as developing. a. See the technical notes. b. In all tables GDP and GNP data cover mainland Tanzania only. c. In all tables data for Jordan cover the East Bank only. d. Reflects last-minute revisions of population estimate (previous estimate was $2,450). e. Data refer to GDP. f. According to UNESCO, illiteracy is less than 5 percent. g. In all tables, data refer to the united Germany, unless otherwise specified. h. Data refer to the united Germany, unless otherwise specified. h. Data refer to the former German Federal Republic only.

4

I. Problems with Exchange Rate Conversion

This section reviews the kind of exchange rate conversion practices that normally suffice for Bank purposes. Conversion by the official ruble-dollar rate is judged to "egregiously" overstate FSU's per capita income; and while precedents exist for using staff estimates to deal with such problems, the ad hoc approach that has been used elsewhere seems inadequate in the present context. A more refined procedure, referred to as the Synthetic *Atlas*-type Conversion Factor (SACF) is recommended in Section II. The SACF shows promise beyond the FSU and conforms with the announced intention of the Bank staff to explore uses of purchasing power parities (PPPs). Its application to other CMEA economies is detailed in Section III.

a. Background

There are still significant gaps in our understanding of the accounting and administrative underpinnings to the formal structure of FSU exchange rates. In CMEA economies, the official rate is said to have been a simple anachronism, not unlike the gold parities of the old par value system of the West; and a clear overstatement of the value of CMEA currencies. By conventional exchange rate methods, then, it is usually considered to be the upper limit of plausible estimates. For the FSU, however, it seems to have had meaning since it was adjusted annually against a basket of Western currencies; it appreciated against the dollar in 1986 and then remained largely unchanged through 1991.

The commercial rate was as artificial as the so-called official rate that was the only acknowledged rate until late 1990. Where the official rate of 0.59 rubles per dollar is almost certainly an egregious over-valuation (yielding per capita income of $6180), a rate of almost exactly three times that (the commercial rate was pegged at 1.76 rubles per dollar in November 1990 and moved thereafter in tandem with the official rate) may be just as egregiously under-valued (yielding a per capita income of only $2070).

The FSU's commercial rate only came into existence in November 1990; it was said to have been set at a level estimated to ensure that local currency proceeds would be at least as high as domestic wholesale prices, for 90 percent of exports (see IMF, World Bank, OECD and EBRD 1991, p. 426). This could be viewed as a depreciation, relative to the erstwhile official rate, of 300 per cent. Presumably, the rate was more than high enough, perhaps much more than high enough, to achieve that result for the bulk of exports.[6] That can be easily read to mean that it undervalued the ruble. The alternative is to argue that the commercial rate was more a formal acknowledgment of schemes previously in place to achieve the same result, in terms of foreign trade price differentials (FTDs), which require some explanation (given below).

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[6] Analysis of the most detailed file available on FTDs, providing separate information by partner country and 5-digit CMEA trade classification, suggests that a rate about twice the official rate would have satisfied the 90 percent criterion specified.

More generally, application of any exchange rate such as customarily used in deriving *Atlas*-type GNP per capita measures encounters formidable difficulties because of the notable distortions in the FSU price structure, and the resultant extreme disparities from world relative prices.

b.   Attempt to Estimate Multiple Exchange Rates

As a rule, problems arise for the *Atlas* method when official market interventions drive a sizable wedge between the price of foreign currency (the conversion factor) and domestic prices. Since governments are wont to intervene in foreign currency markets, procedures have been developed to deal with the usual source of "egregiously" distorted conversion factors, where an over-valued currency is protected by exchange and payments restrictions (see Hee 1990); and the first line of defense for the *Atlas* method is to construct a trade-weighted average of the multiple exchange rates generated, implicitly if not explicitly, by the restrictive practices. These procedures presume that domestic prices are market-determined, which clearly isn't the case in planned economies like the FSU of 1990. Nonetheless, an attempt was made to follow this approach.

Experimentation with what this study calls foreign trade price differentials (FTDs), which in principle should link the commercial to the official rate, suggests a GNP per capita figure of about $3800 for the FSU. These measures are probably closer to the mark than the official exchange rate, but still too problematic to rely on for *Atlas* purposes.

An HPE's commercial exchange rate is usually said to differ from its official rate because of the operations of foreign trade organizations (FTOs) and related institutional arrangements that intervened between nonresidents and domestic producers or consumers. Briefly, FTOs were government monopolies for purchasing imports from, and selling exports to, nonresidents. They transacted with domestic economic agents in rubles at prices in line with those set by the plan for domestic agents regardless of the ruble proceeds generated by exports or the ruble outlays required to obtain imports. Such interventions between foreign prices and domestic prices of traded goods are referred to here, generically, as foreign trade price differentials (FTDs).

FSU national accounts included foreign trade at internal prices, meaning after adjustment by FTDs.[7] On that basis, some analysts derive an imputed dollar commercial rate for earlier years,[8] which may remain at about three times the official rate or vary in line with the gap between US and FSU inflation rates. Given past use of internal prices for traded goods, in national accounts, it is arguable that there was no depreciation, just an acknowledgement of the average price for foreign goods, after FTDs, that was implicit in national accounts all along.

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[7] The GNP data used for Table 1 include extra-Union exports and imports at foreign prices, i.e., foreign currency prices converted at the official devisa rate.

[8] See, for example, CSO of Estonia, 1991. The same "back-casting" logic was used in JSSE.

6

Available information on FTDs must be used advisedly in investigating this hypothesis because it only began to appear in official FSU reports in the late 1980s, when foreign trade data were reported at both internal and foreign trade prices. Moreover, there is no Western analog to FTDs, which arise as central planners try to fit world prices to those they establish in their plans. In discussions of fiscal policy they have come to be regarded as net indirect taxes; for monetary policy they are often noted as multiple currency practices. The distinction between monetary and fiscal instruments has no meaning for central planners but it does matter in deciding how to value national accounting aggregates in domestic currencies and which conversion procedures are consistent with which hypotheses about FTDs.

Table 2 reports an IECSE collation on FTDs. It summarizes foreign trade data of FSU for 1990 by individual partner country and several thousand commodity groups (to the 5-digit level of the CMEA trade classification system); with valuation both according to the foreign and internal price (as differentiated in the notes to the table). It shows the turnaround on the export side, from tax to subsidy, when minerals are excluded. For nonfuel trade, the picture that emerges is what one would expect with an over-valued currency: the effective rate for imports implies a heavy tax while the effective export rate implies a hefty subsidy, relative to the official rate.

However, FTDs don't explain the gap between the official and back-casted commercial rate for the FSU, as they should given the presumed mechanism for fixing the commercial rate, as discussed above. While it is not yet possible to fully reconcile all data, enough is known to show that the conversion factor appropriate for Bank purposes lies below the official but above the commercial (once it existed) exchange rates.

Analysis of FTDs is complicated in the case of the FSU by the predominance of petroleum on the export side-- and the de facto inclusion of what most economies would record separately as direct taxes or royalties paid to government by oil companies. As a rough compensation, an export-side adjustment of the official rate by FTDs could be envisaged exclusive of oil; which would imply an overvaluation of only 21 percent, which would produce a GNP per capita figure of about $5100 for 1990. However, that too seems colored by the as-yet unexplained taxation of machinery exports, apart from those to high income OECD countries; depending on which further disaggregations of exports one considers, discounts 30, 60, or even higher percentages might seem reasonable. The picture is somewhat clearer when the import side is taken into account. There, the overvaluation appears to average around 60 percent (again ignoring fuels), which suggests a GNP per capita of $3840.

Even this is not unambiguous, however. For example, some discount should be applied to the import-side FTD adjustment for items otherwise subject to domestic turnover taxes. Once an FTD is applied, there is no separate levying of turnover tax. In this case, the FTD adjustment is around 40 percent, that results a GNP per capita of $4350.

Table 2. Composition of FSU's Extra-Union Trade in 1990

	Exports aForeign Prices (billions of rubles)	Exports aInternal Prices (billions of rubles)	Exports FTDs + = tax (% frgn pr)	Imports aForeign Prices (billions of rubles)	Imports aInternal Prices (billions of rubles)	Imports FTDs + = tax (% frgn pr)	Net Exports aForeign Prices (billions of rubles)	Net Exports aInternal Prices (billions of rubles)	Net Exports FTDs + = tax (% frgn pr)
I-O TOTAL /1	60.40	45.63	24	68.80	114.10	66	-8.40	-68.47	46
Excluded Trade	-15.86	-15.34	3	-17.03	-36.53	115	1.17	21.19	61
DOT TOTAL (I + II)	44.54	30.29	32	51.77	77.57	50	-7.23	-47.28	42
Hi-Income OECD	22.39	15.10	33	26.24	43.79	67	-3.85	-28.69	51
HPEs	22.15	15.19	31	25.53	33.78	32	-3.38	-18.59	32
Other LDCs	3.14	2.52	30	4.59	15.21	231	-1.45	-12.69	145
I. FUELS, MINERALS /2	33.59	15.21	55	4.59	3.66	-20	29.01	11.55	46
Hi-Income OECD	17.16	7.85	54	2.03	1.76	-14	15.13	6.09	47
HPEs	14.57	6.63	55	2.18	1.61	-26	12.40	5.02	44
Other LDCs	1.86	0.74	60	0.38	0.30	-22	1.48	0.44	46
II. OTHER TRADE (A -> D)	12.80	15.82	-24	47.56	74.20	56	-34.76	-58.39	39
Hi-Income OECD	5.23	7.25	-39	24.21	42.03	74	-18.98	-34.78	54
HPEs	7.58	8.56	-13	23.35	32.17	38	-15.78	-23.61	25
Other LDCs	1.29	1.78	-39	4.22	14.92	254	-2.93	-13.13	185
A. Intermediate Goods /3	6.17	8.28	-34	6.92	10.90	58	-0.75	-2.63	14
Hi-Income OECD	3.13	4.10	-31	4.59	6.68	45	-1.46	-2.58	14
HPEs	2.46	3.43	-39	1.36	1.78	31	1.10	1.64	-14
Other LDCs	0.58	0.75	-29	0.96	2.44	153	-0.38	-1.69	85
B. Machinery, etc. /4	5.76	5.13	11	23.70	26.43	12	-17.94	-21.30	11
Hi-Income OECD	1.06	1.28	-20	11.37	13.86	22	-10.31	-12.58	18
HPEs	4.15	3.30	20	11.69	11.57	-1	-7.54	-8.27	5
Other LDCs	0.55	0.55	-1	0.64	1.00	57	-0.09	-0.45	30
C. Foodstuffs /5	0.75	1.82	-144	11.42	20.99	84	-10.68	-19.16	70
Hi-Income OECD	0.38	0.82	-116	4.58	7.96	74	-4.21	-7.14	59
HPEs	0.27	0.69	-159	5.93	8.53	44	-5.66	-7.84	35
Other LDCs	0.11	0.32	-201	0.91	4.50	393	-0.81	-4.18	331
D. Consumer Goods /6	1.42	2.37	-67	9.73	30.80	216	-8.32	-28.43	180
Hi-Income OECD	0.67	1.06	-59	3.67	13.54	269	-3.00	-12.48	219
HPEs	0.70	1.15	-64	4.37	10.28	136	-3.66	-9.13	108
Other LDCs	0.05	0.16	-223	1.70	6.98	310	-1.65	-6.81	295
Memo Item: Excluded material services	0.67	0.63	6	0.96	0.93	-3	-0.29	-0.30	1
Hi-Income OECD	0.50	0.53	-6	0.43	0.41	-5	0.07	0.12	-5
HPEs	0.17	0.10	41	0.53	0.52	-2	-0.36	-0.42	9
Other LDCs	0.10	0.06	40	0.03	0.03	0	0.07	0.03	31

Source: IECSE repackaging of direction of trade (DOT) file availabi · by five-digit CMEA item and partner country, via CIR.

/1 As reported via Intelligent Decisions Systems (IDS).
/2 CMEA category 2.
/3 CMEA categories 3 - 6.
/4 CMEA category 1.
/5 CMEA categories 7 and 8.
/6 CMEA category 9.

Notes: Foreign trade differentials (FTDs) reflect the difference between trade at foreign and internal prices. On the export side, positive amounts arise when foreign trade organizations (FTOs) receive more rubles for foreign exchange earned than they ust turn over to domestic producers of the exports, based on planned internal prices; while negative FTDs indicate that FTOs receive fewer rubles for foreign exchange earned than they must transfer to domestic producers. On the import side, positive FTDs indicate that FTOs take in more rubles from domestic users than they must turn in to settle (e.g., with V-Bank) for foreign exchange obtained; negative amounts (mainly for fuels and minerals) mean FTOs absorb part of the higher cost of imports.

FTDs column for net exports expresses the fiscal revenue generated as a percent of total trade (exports plus imports) at foreign prices. Excluded trade (the difference between totals from DOT and I-O tables) is assumed to relate to military and other security transactions but may also comprise barter transactions, exclude trans-shipments, etc.

As a source of fiscal revenue, trade in fuels is about as "efficient" as the average for nonfuel. Within nonfuel trade, the favorable treatment of industry is apparent from the limited effort to generate revenue from trade in intermediate goods or machinery, with foodstuffs and particularly consumer goods providing most of the net revenue. FTD "wedges" between trade blocs are apparent within nonfuel trade, particularly when the treatment of hi-income OECD economies is contrasted with that of other historically planned economies (HPEs). This is dramatic for machinery.

8

c.　The Ruble as a Regional Currency

An alternative explanation is that the commercial rate applies only to dollar-zone transactions; and that the official rate is relevant for transactions within the CMEA. Given the dominant role of the FSU in the CMEA, and use of the (misnamed) transferable ruble as numeraire for CMEA transactions, only ad hoc corrections could be considered for Hungary, Poland, etc., since the ruble-dollar rate had to be based mainly on perceptions of FSU's trade partners, transacting under mostly nonmarket arrangements.

No attempt was made here to account for the broken (transferable) ruble-dollar cross-rates that became increasingly clear as more CMEA members joined the Bank, on the grounds that the major unknown was the dollar-ruble rate of the FSU. The justification for inaction cannot carry much weight now. Once a uniform ruble-dollar conversion factor is estimated for the FSU, figures for other CMEA members will have to be recalibrated.

The issue was given some recognition in the Bank-sponsored publication, *Historically Planned Economies: A Guide to the Data* (see Marer et al. 1992). Building on work by outside experts, the publication develops a uniform ruble-dollar cross-rate by averaging those of all CMEA members. This does not correct for the systemic undervaluation of the ruble that many experts see in such cross-rates but it makes the point that essentially the same ruble-dollar rate should prevail in all these "markets."

Fixing such broken cross-rates for other CMEA countries was beyond the scope of this study, although recognition of the problem should add weight to the case for using the SACF for these economies as well as the FSU. Also beyond the scope of this study but potentially important for 1992 projections, there is a strong analogy in terms of trade flows and valuations, between the collapse of the CMEA and the current uncertainties about what had been inter-republic trade, among FSU economies, and the potential role of the ruble within the region.

A somewhat different approach might make sense for the FSU through 1990, given ambiguities about the role of the official and commercial rates. For example, it may be that the official rate has some meaning in trading among CMEA members, given similar planning systems; while the commercial rate makes more sense for transactions with others. This would imply an average of the official rate (weighted by CMEA trade) and the commercial rate (weighted by the rest of trade), which would produce a conversion factor of 1.13 rubles per dollar and a GNP per capita of $3220.

9

II. Synthetic Atlas-type Conversion Factor (SACF)

It is Bank practice to seek an alternative to official rates when such rates differ egregiously from effective transactions rates. Until now, alternate conversion factors have only been used by the Bank to deal with temporarily over-valued currencies defended by increasing trade and exchange restrictions. The normal method for deriving such alternates depends on there being some earlier period when the exchange rate was accepted as reasonable, and exchange and trade restriction were lighter. Under these conditions, a fairly objective alternate can be computed by moving the reasonable historical rate forward based on the difference in inflation rates between the country and the United States. This approach cannot work for the FSU since there is no earlier period of rational exchange rates and lighter restrictions.

Having found exchange rates wanting even in this historical sense, there seems no alternative to some use of PPPs in deducing *Atlas*-type estimates for the FSU economies. This requires some correction for the difference in "scale" between PPPs and *Atlas*-type conversion factors. The simplest way is to reverse the regression equation used to infer PPP-based from *Atlas*-type estimates in the 1992 edition of the Bank's *World Development Indicators* (Table 30), by adding a PPP for the FSU based on its preliminary 1990 submissions to the global International Comparisons Programme (ICP).

However, this method did not give us plausible results (see Ahmad 1992) that led this study to an approach that links PPP data from the CMEA and the global International Comparison Programme (ICP) to obtain a ruble/dollar cross-rate in PPP terms. This is then adjusted from a PPP to an Atlas-type measure by the relation of corresponding measures for available comparator countries.

a.   Role of Purchasing Power Parities (PPPs)

There is a rich literature on "short-cut" methods to deduce PPP-based estimates of per capita income from *Atlas*-type estimates. This section considers how these led to the synthetic *Atlas*-type conversion factor (SACF) proposed for the FSU, and perhaps other CMEA economies. The common characteristic is that all use the known relationship between the two types of conversion factors (*Atlas* and PPPs) for some country or countries, plus one of the two for an additional country, to deduce the other for the additional country.

Perhaps not coincidentally, the FSU and other historically planned economies had a tradition of PPP comparisons, within the CMEA. Thus, the practical constraints usually found in relating PPPs to *Atlas*-type conversion factors are reversed. National compilers and decision-makers in CMEA countries are used to PPP-based comparisons but not those based on exchange rates.

10

Three sources of PPPs for the FSU were available: as-yet unpublished results of ICP's 1990 exercise linking the FSU to Austria;[9] the 1988 multilateral exercise of the CMEA (see CMEA 1990)[10]; or a 1976 bilateral comparison performed by the U.S. Government, updated by US price trends (see US JEC 1981). A fourth possibility, a German-FSU comparison with a 1988 base, is known to exist but has proven difficult to obtain. In choosing among the available sources, there were strong *a priori* grounds for relying on ICP; however, the 1990 results of the FSU-Austria comparison proved too partial and tenuous. Hence, pending more complete ICP results for 1990, attention had to focus on the CMEA study, linked with the 1985 ICP exercise by common reporters. Poland was a full reporter in both PPP exercises and serves as the main linkage country. Partial reports for Hungary and Yugoslavia in the CMEA report serve to corroborate the results.

Dollar GNP estimates higher than those obtained by using even the official exchange rate, notably those compiled by US Government, arise from PPP comparisons with advanced economies. This study takes the position that these calculations come in so high mainly because of underlying differences in the treatment of quality and diversity of goods and services. This is usually discussed as a problem of deteriorating quality in HPEs but the case is made here that the problem is as much one of imputing to HPEs the kind of improving quality and diversity that is taken for granted in dynamic countries, but not fully washed out of OECD price measures.[11]

b.   Attempts Using Regressions

For such reasons, PPP-based estimates cannot be slipped directly into a set of *Atlas*-type estimates. The reasons for systemic differences in these scales, which seem to depend heavily on level of development, are discussed extensively in the literature. What is relevant here is that some form of regression is usually run on *Atlas* estimates to express them on an ICP scale, or

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[9]Item prices (plus separate notation of so-called quality adjustments) from 1985 comparisons with Hungary, Poland, and Yugoslavia as well as from the 1990 exercise with the FSU are in hand. The remaining details from the 1990 exercise (which also covers Czechoslovakia and perhaps Romania) should be available by end-1992, as soon as Austria has evaluated and processed the incoming data.

[10]Two additional bilateral exercises were performed by the FSU, one with Hungary based on 1985 and the other with West Germany based on 1988. Summary results of the Hungary-FSU exercise were reviewed.

[11]For example, the Volga passenger car that figured in the CIA's 1976 bilateral US-FSU comparison is basically the same as the passenger car used in ICP's Austria-FSU comparison for 1990. The ruble price for individual FSU cars is virtually the same in each comparison, which conforms with the fixity of planned prices. While the Austrian comparison of 1990 actually uses the same vehicle, the CIA comparison had to match the Volga with some US car. But any US comparator car of 1990 is fundamentally different from any comparator car of 1976, in ways that are ambiguously treated in price indicators of the US and other dynamic economies. Classic proofs concern the introduction of catalytic convertors, which can be regarded as a quality improvement or a cost increase for the same transportation "service" and the change in consumer preference in favor of lighter vehicles as energy costs rise. These considerations, and derivative issues like increased investment costs when retooling is the norm, were not relevant in the FSU of 1976-90 and so can distort US but not FSU data, per se.

11

vice-versa. The 1992 edition of *World Development Indicators* (Table 30) gives a very simple view of how this is done, using *Atlas* estimates to complete an array of ICP-based figures.

Reversing the process, estimates from ICP's 1990 Austria-FSU comparison can suggest a conversion factor to estimate $GNP per capita on the *Atlas* scale. It will be some months before complete results are available from the 1990 ICP exercise, for Czechoslovakia, Hungary, Poland, Yugoslavia, and possibly Romania (Bulgaria is joining only for 1993); as well as FSU. In the meantime, the available 1990 data from the Austria-FSU comparison (excluding comparison-resistant items and construction) and full details from the 1985 ICP exercise (which linked Hungary, Poland, and Yugoslavia to Austria) have been blended. These suggest a PPP of about 0.56 rubles per dollar; or a GNP per capita of about 6510 on an ICP scale (referred to international dollars, or I$). The subsequent regression work yields an *Atlas*-type measure of $2440 per capita for the FSU in 1990, but the regression is of doubtful validity.

This approach is not recommended here for two reasons. Only preliminary results from the 1990 ICP are currently available for the FSU, and none for other HPE participants. Also, such an operationally significant use would not seem appropriate until a sensitivity analysis of the regression technique used for WDI92 has been performed, using variants discussed in a working paper prepared on the subject (see Ahmad 1992). This is particularly necessary since the outcome may depend heavily on acceptance of any particular market exchange rate between the dollar and the currency of a "linkage" country, to convert the FSU's GNP into dollars. In effect, blending an exchange rate between two well developed economies (Austria and US) with PPPs linking one of them (Austria) to a planned economy (FSU) exacerbates some arcane but important methodological issues imbedded in PPP arithmetic.[12]

c.   Preferred Synthetic *Atlas*-type Conversion Factor (SACF)

These concerns can be mitigated by using PPP linkages first from the FSU to other CMEA economies and then from those to market economies at roughly the same level of development. There are other CMEA economies, e.g., Poland, who have participated in ICP as well as CMEA exercises;[13] such double-participation provides a bridge from planned to market economies at roughly the same level of development, within the same (PPP) methodology. Using a PPP bridge to transit from planned to market economies mitigates concerns about fundamental differences between the two conversion scales, with regard to how exchange rates and domestic prices inter-relate. It is the relationship between PPPs and

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[12]For a review of such issues see Hill, 1981.

[13]Hungary and Yugoslavia have also participated in ICP as well as CMEA exercises. However, Yugoslavia was never a full participant (since its trade arrangements with CMEA economies were similar to but outside formal CMEA mechanisms); and Hungary's last participation in the CMEA exercise was in 1983. In place of a 1988 CMEA exercise, Hungary and the FSU conducted a "dry-run" ICP exercise based on 1985; this put the FSU's GNP per capita at 110-134% of that for Hungary, depending on whether Hungarian or FSU expenditure patterns and price structures were taken as the reference.

exchange rates for comparator market economies (in the upper middle income group) that is used to suggest the kind of *Atlas*-type conversions factor the FSU or any other CMEA economy could be expected to have, given its PPP.

Having used the Polish zloty as the bridge from the ruble to the PPP-based "International dollar," one needs a link from there to the *Atlas* dollar. The approach taken here is to build the link via other upper middle income economies for which PPPs are available, through ICP.

The basic procedure involves (i) linking the PPP relationship between the currency of the country in question and that of a comparator country, with the PPP-exchange rate relationship of comparator countries for a benchmark year, and then (ii) extending the linked factor, SACF, to more recent years based on the relative inflation of the relevant country against the U.S. inflation, between the benchmark and the target year.

The SACF recommended here relies on the five other middle income countries[14] who participated in the 1985 ICP exercise (Greece, Portugal, Hungary, Yugoslavia, and Korea). Using orthodox PPP logic, separate relativities to the FSU were constructed for each of these and a geometric mean, $2870, was then computed. It uses chain-linking procedures common to PPP exercises.[15]

For the GNP per capita figures in Table 1, the ruble-dollar conversion rate is the geometric mean of rates derived through this preferred SACF approach.[16] This approach has interesting possibilities for harmonizing estimates for some other economies (e.g., Mongolia). With the 1990 FSU per capita income at $2870, the implied Atlas-type exchange rate is 1.27 rubles per dollar. That compares with an official rate of 0.59 per dollar and a commercial rate of 1.76 per dollar (for November 1990).

d.   More Narrowly Focused SACF

A more regionally focused variant was also considered, looking only at Greece and Portugal to avoid possible bias from including other CMEA economies. The 1985 ICP placed

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[14]The so-called Gershenkron effect means that countries look richer when perceived through PPP comparisons with rich than poor countries. For this and similar methodological reasons, the scale for PPP and *Atlas*-type estimates is different, and rather like in reporting temperatures it is necessary to distinguish the scale in which numbers are expressed. Thus, the term, international dollars (I$) is often used to identify PPP results expressed relative to the US. By referring only to economies at about the same level of development as the FSU, those classified as upper middle income for Bank purposes, the Gershenkron effect should be minimal.

[15]Given the extensive detail required, PPP exercises have tended to be conducted for selected countries at different times, and often with somewhat different methodologies. Connecting these, to produce a chain-linked set of PPPs for the maximum set of countries, requires some use of basic national accounting series (e.g., GDP growth rates) that are not strictly comparable. It is these procedures which are emulated here.

[16]See Annex SD/II/D for a detailed explanation of the SACF approach.

them at about the same level, at 37 and 34 percent of the US, respectively. This compared with figures of 24-30 percent for the economies that are also covered by the CMEA exercise (Hungary, Poland, and Yugoslavia). If Portugal is taken as the linkage country into the *Atlas* scale, and all (plus the FSU) are moved to 1990 by normal benchmark procedures, Hungary and Poland end up about where the *Atlas* estimates now put them; and the FSU should be about $2480. If Greece is the linkage country, FSU comes in around $3570; all others becoming proportionately higher. The widely disparate measures underscore what might have been expected: such calculations are subject to quite a range of error.

The geometric mean of the two, $2970, does not differ appreciably from the mean obtained form the preferred SACF, which covers all of upper middle income economies that participated in the 1985 ICP exercise. Including Korea (but still omitting Hungary and Yugoslavia) would yield a somewhat higher figure.

III. Implications for Other CMEA Economies

The problem of estimating a ruble-dollar conversion factor is not new. It was noted as other CMEA members joined the Bank, partly because trade with the FSU loomed so large in CMEA trade (and the so-called transferable ruble was the CMEA's unit of account) but also because of common traits in the exchange rate and domestic price regimes of CMEA members. And while the collapse of CMEA, in 1991, is formally beyond the view of this study, it should be recognized that this too is a shared experience that is likely to affect *Atlas*-type conversion factors. The question arises, then, whether SACFs would not be more appropriate for at least some, and possibly all, other CMEA economies.

Time constraints have not permitted the kind of detailed review of FTDs, etc., that was conducted for the FSU, for each other CMEA member. At the same time, it was possible to compute the $GNPs per capita that would result from application of SACFs to other CMEA members, obtaining revised estimates of GNP per capita that are consistent with the new estimate for the FSU. The revisions, presented below (and in Table 1), are invariably upwards, suggesting that all CMEA currencies were undervalued. Relative to the Bank's currently published estimates of 1990 GNP per capita, the implied upward adjustment ranges from a few percentage points for most to 16 percentage points for Poland.

The comparator countries used for calculating SACFs for Poland and Hungary are all the upper-middle income countries that were included in the 1985 benchmark ICP exercise—Hungary, Yugoslavia, Portugal, Korea and Greece. For East European countries excluded from the 1985 ICP but included in the 1988 CMEA price comparison, i.e., Bulgaria and Czechoslovakia, the relationships with the above comparator countries were indirectly established through Poland, which was included in both the ICP and CMEA comparisons. For Romania, which was included only in 1975 ICP, the relationships with the comparator countries were indirectly determined through Hungary, which was included in both 1975 and 1985 ICP.

	GNP Per Capita, Dollars, 1990	
	Previous Atlas Measures	SACF Estimate
Romania	1,640	1,750
Poland	1,690	1,960
Bulgaria	2,250	2,400
Hungary	2,780	2,930
Czechoslovakia	3,140	3,170
FSU	NA	2,870

It seems likely that the necessity for a shift to SACF will become more apparent when 1991 estimates are being prepared. Tentative figures suggest that "egregious" undervaluations will become more widespread (certainly affecting Bulgaria in 1991); that declines in nominal per capita income will far exceed what can be explained by real output 'eclines, if standard *Atlas* methodology is maintained. However, a separate study will have t be prepared on this.

IV. National Accounting Issues

The break-up of the FSU presents a rare set of problems, in estimating the relative per capita incomes of constituent states, even in ruble terms. To deal with these, the Bank commissioned two independent compilations of national accounts estimates in rubles[17] to check the international comparability of estimates provided by national authorities to Bank missions. While further work with national compilers is essential, particularly for assessments beyond 1990, the margin of error for ruble figures appear minor compared to uncertainties regarding the ruble-dollar conversion factor--in that year.

Even with the two commissioned studies, considerable work was required to assemble national accounts for each FSU economy. Positions had to be taken on traditional concerns about FSU national accounts but, insofar as possible, these are documented elsewhere (see Steinberg 1992) or relegated to Annexes to this report, in order to focus on operationally relevant concerns about transition. As the Union-wide central planning process decayed, more than the relevance of the information generated by the process declined. There is growing

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[17]In addition to Steinberg 1992, the Bank commissioned a study by the US Census Bureau's Center for International Research, which provides 1987-90 estimates using income-outlay approaches. Complete results are due by October 1992.

evidence that the reliability of such information also eroded, so that trends in indicators, from 1987 to the present, may represent genuine economic changes or effects of incomplete reports with new biases. Hence, the starting point for this study was 1987 and trends since then were analyzed with an eye on likely statistical distortions.

a.   Basic Data Issues

It is generally recognized that available sources and methods do not, for the FSU, conform with the UN System of National Accounts (SNA). The problem is more complicated however, since the new nations themselves have had little time to compile and analyze the available data, particularly information regarding so-called Union-wide enterprises and activities, which encompasses the bulk of foreign trade and defense-related activities. This may explain why data they submit to the Bank and other international agencies differ from data available to IECSE from the old FSU central records, sometimes by analytically significant amounts.

As republics distanced themselves from the Union, as penalties for noncompliance lost force, economic agents seem to have altered their reporting behavior in ways that color seemingly objective indicators for 1990-91; the picture is even cloudier when preliminary reports and projections for 1992 are considered. Nor is certain that such problems will ever be resolved for 1992--and 1993 will be problematic unless supporting actions occur soon.

The nations emerging from the FSU did not, as republics within the Union, have full access to the information used by Union-level planners; even today, it is not clear that the authorities for new nations have received and had time to digest the relevant information. To an unusual extent, staffs of international agencies have had to help national authorities assemble and analyze basic information. This study benefited from essentially all such international and national efforts, and relied heavily on data collected by Bank missions to the 15 economies.

National accounts brought back by missions tend to be based on the Material Product System (MPS) traditionally used by CMEA economies. Adjustment to international standards of the SNA have tended to be limited to "bridge tables" showing major adjustment items from an expenditure approach, to move from the Net Material Product (NMP) of the MPS to the Gross Domestic Product (GDP) measure of the SNA. Major adjustments are addition of depreciation (since NMP is a "net" and GDP is a "gross" concept) and the bulk of services (which MPS ignores because they are not "material"). This explains the paucity of details, for most FSU economies, under GDP measures reported in the Bank's new *Statistical Handbook: States of the former USSR.*

MPS concepts may have been the same throughout CMEA but there were noticeable differences in practice.[18] Such expenditure-side bridge tables are not well designed to identify

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[18]See, for example, the country practice notes in Marer et al.

differing national practices and do not permit the kind of cross-checks normally built into national accounting, by reconciling estimates from the sources (production) and income with uses (expenditure) approaches. This issue is particularly important for the FSU, given uncertainties about measurement of defense and security activities, informal markets, fiscal interventions (such as the FTDs), etc.

b.   Estimates of Outside Experts

As useful as the bridge tables are as a sign of the move towards SNA, they provide only qualified indications of SNA measures for the FSU. This was tacitly recognized by FSU compilers when they entered into detailed discussions with the US Bureau of Census' Center for International Research (CIR) about CIR's estimates of GNP for the FSU as a whole, which are built up from detailed income and outlay approaches rather than adjusting NMP with summary bridge items. While experts from the two governments were iterating towards comparable estimates, there were still noticeable differences for the FSU as a whole and clear signs that the bridge tables for individual FSU economies, which was not then an issue, would not necessarily show the same GNP/NMP relativities as prevailed for the whole.

Possible differences in choosing basic sources and methods were gauged by following two independent estimation procedures for compilation of GNP estimates in nominal rubles. One extends CIR's work to the 15 FSU economies, for 1987-90. The other provides a detailed, input-output, analysis of each FSU economy for 1987. The latter, prepared by Dmitri Steinberg of Intelligent Decisions Systems (IDS), includes adjustments from CMEA-style MPS accounting to more conventional SNA national accounts and extensive documentation (available upon request from IECSE). The attraction of this study is that it harmonizes sources and uses approaches, as well as the income approach, to measuring GNP.

This was extended forward to 1990 using national accounting time series collected during missions. For eight FSU economies (Estonia, Latvia, Lithuania, Turkmenistan, Tajikistan, Uzbekistan, Kyrgyzstan, and Ukraine), IECSE staff participated in Bank missions to promote harmonization of the benchmark and mission compilations. This combination of sources was taken as the reference point for the estimates used in this paper.

The second study supported CIR's effort to extend its FSU estimation procedures to the 15 individual FSU economies. CIR relies heavily on financial statements like reports on the cash income and outlays of the population. Its results (shown in Table 3) differ somewhat from IDS results in the common year, 1987; differences tend to increase as one moves towards 1990 (IECSE = 100). The correlation coefficients between the four set of data are all virtually one.

17

Table 3. GDP Estimates of Different Compilers, 1987 and 1990
(IECSE = 100)

Country	CIR		OFFICIAL		PlanEcon	
	1987	1990	1987	1990	1987	1990
FSU	96	101	..	..	93	95
Armenia	98	99	98	97	99	96
Azerbaijan	101	112	100	99	103	98
Belarus	96	103	..	99	105	100
Estonia	99	82	95	95	91	89
Georgia	100	109	104	101	99	101
Kazakhstan	96	82	..	82	91	83
Kyrgyzstan	97	98	94	95	94	93
Latvia	104	96	122	100	96	98
Lithuania	97	93	96	90	100	93
Moldova	101	97	95	97	104	98
Russia	99	102	..	97	95	95
Tajikistan	100	107	97	94	95	99
Turkmenistan	98	96	..	93	95	92
Ukraine	103	102	99	100	99	98
Uzbekistan	96	95	..	..	93	92

Sources: CIR: US Census' Center for International Research.
   Official: Reports to World Bank as reprinted in the Statistical Handbook of the Former USSR.
   PlanEcon: PlanEcon Report, Vol. VIII, March 27, 1992.

The use of two independent estimation procedure adopted for this study (together with estimates reported by the private concern, PlanEcon, for ease of reference) is regarded as an adequate indication of the range of uncertainty surrounding the nominal ruble accounts. There is less certainty, however, about price indicators. Since constant price national accounts are usually computed by deflating nominal values, distortions in price indices can affect estimates of growth rates. This seems to have become an increasing problem after 1989 and will add a major element of uncertainty to estimates of $GNP per capita by 1992.

c.   Treatment of Cross-Border Transactions

What had been a nation is now 15 distinct economies bound together, at least in the near-term, by complex webs of interdependence spun by decades of central planning. After the comparatively simple task of apportioning extra-Union trade among the 15, trade among what were subnational units must be reclassified as cross-border transactions. But the value assigned to such transactions depends heavily on how one interprets, for each of the 15, past FSU

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practices like segmenting markets and differentiating prices to insulate domestic economic agents from the pressures of foreign markets. This is not a trivial matter, since merchandise trade among FSU economies was about 2.5 times as large as their combined trade with the rest of the world (not unlike the importance of trade among economies of the European Community, relative to trade with others). A decision to value intra-FSU trade at prices prevailing for extra-region trade would shift positions of several FSU economies, dramatically.

The issue has no practical meaning for GNP of the FSU as a whole, in rubles or dollars, but may affect how the GNP is divided into GNPs for each economy, depending on how the GNPs are compiled in ruble terms and how they are converted to dollars. The answer hinges on whether one assumes the successor to inter-republic trade will be rather like its predecessor, like FSU trade with the rest of the world, or some hybrid shaped by the emergence of a regional currency and/or payments zone. IDS was asked to prepare its study of ruble-based accounts on the assumption that inter-republic should be valued at foreign trade rather than internal prices. However, the implied redistribution of income among FSU economies was not actually pursued for Bank purposes, in large part because of its uncertain effects on choice of conversion factor.

For practical reason, this study assumes that the same conversion factor can be applied to each FSU economy. Union-wide tax/subsidy mechanisms certainly had a different impact on each, and some (e.g., FTDs) can be interpreted as being equivalent to distinct multiple exchange rate practices in each FSU economy. The demise of such Union-wide mechanisms ends a real resource transfer mechanism, which will reduce GNP for some and raise it for other FSU economies, by several percentage points. This study regard such issues as a concern in projecting trends through 1992 but not of compiling 1990 estimates. But it is worth noting that decisions about conversion factors cannot be made independently of initial decisions by national accountants, about how they will value transactions. There is no fully satisfactory way to estimate an *Atlas*-type conversion factor where market forces are thwarted; and a clearer picture of regional economic tendencies will be needed before much can be said about the "rank" of these economies in today's world.

V. Relationship to Other Studies

As a final step, the relative position of FSU economies recommended here was compared with "relativities" suggested by other studies. Those aiming to compare economies in terms of GNP or GDP per capita (which differ little for the FSU) are given in Table 4, with estimates for all other economies expressed relative to that for the FSU (FSU=100). Major differences seem about what would be expected given differences in methods (e.g., between PPPs and exchange rate conversions) or time. Within the limits of available documentation, the estimates proposed here do not appear as outliers; it is not unreasonable to suggest that they may represent the consensus. Correlation coefficients have been estimated between the data sets. The level of correlation for SACF and Atlas was high except when compared to UNSO (0.66 and 0.70) and to USG-2/2 (0.88 and 0.89). The rest of the correlation coefficients is higher than 0.94.

Table 4. Alternate Relativities for former Soviet Union in International Comparisons of GNP/GDP Per Capita (FSU=100)

Country	1987 HDR	1988 USG-2	1989 UNSO	1990 USG-2	1990 WDI-PPP	1990 D.Bank	1990 WHO	1990 PlanEconUS	1990 CIR	1990 Economis	1990 Bolotin	1990 Illiarnov	1990 SACF	1990 Atlas	1991 SACF	1991 Atlas
Market Economie																
United States	294	225	419	239	344	...	...	...	...	550	346	370	759	759	836	836
Germany	247	225	356	176	262	...	...	...	...	480	...	282	778	778	876	876
Austria	206	160	297	...	238	...	...	...	...	487	...	255	664	664	755	755
Greece	...	59	104	...	118	...	...	...	...	...'	...	127	209	209	241	241
Korea	79	45	...	61	116	...	...	...	...	...	...	121	188	188	235	235
Portugal	...	44	75	...	128	...	...	...	...	124	...	158	171	171	208	208
Turkey	...	14	31	...	81	...	...	...	...	41	...	80	57	57	67	67
Other HPEs																
GDR	132	127	227	...	...	...	...	...	...	...	...	...	...	...	...	...
Czechoslovakia	129	101	74	89	150	186	...	...	...	80	...	137	110	111	106	91
Yugoslavia	82	29	63	58	82	129	...	...	...	...	...	91	107	102	...	...
Hungary	76	77	55	67	100	157	...	...	...	70	...	109	102	97	102	100
Bulgaria	79	68	74	61	127	129	...	...	...	56	...	98	84	81	76	68 1/
Romania	50	58	47	35	109	57	...	...	...	42	...	65	61	56	58	50
Poland	68	54	46	48	73	86	...	...	...	43	...	79	68	59	71	68
Former Soviet U	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Estonia	...	...	...	...	...	...	119	137	121	126	142	139	145	145	142	142
Latvia	...	...	...	...	...	...	124	129	120	112	125	125	125	125	126	126
Russia	...	...	...	...	...	...	119	119	121	117	115	118	120	120	119	119
Belarus	...	...	...	...	...	...	125	114	112	118	105	115	108	108	113	115
Lithuania	...	...	...	...	...	...	99	105	100	124	125	98	108	108	100	100
Kazakhstan	...	...	...	...	...	...	70	79	70	...	97	69	91	91	91	91
Ukraine	...	...	...	...	...	...	94	90	91	93	86	94	87	87	87	87
Moldova	...	...	...	...	...	...	92	86	82	84	64	77	83	83	80	80
Armenia	...	...	...	...	...	...	76	84	78	...	126	81	83	83	80	80
Georgia	...	...	...	...	...	...	79	79	80	...	112	74	74	74	61	61
Turkmenistan	...	...	...	...	...	...	60	58	60	...	75	56	59	59	63	63
Azerbijian	...	...	...	...	...	...	61	59	63	...	52	62	57	57	62	62
Kyrgyzstan	...	...	...	...	...	...	57	54	52	...	59	56	55	55	57	57
Uzbekistan	...	...	...	...	...	...	46	46	44	...	60	45	47	47	50	50
Tajikistan	...	...	...	...	...	...	45	41	41	...	53	36	39	39	39	39

Sources:

UNSO   United Nations Statistical Office, Distribution of World GDP 1970-89; w/conversion by Price Adjusted Rates of Exchange (PARE)
WHO/UNICEF The Looming Crisis in Health and the Need for International Support, Table 1.
USG-2   United States Government, Arms Control and Disarmament Agency (ACDA), World Military Expenditures and Arms Transfers

HDR   United Nations Development Program, Human Development Report (attribution to Penn World Tables).
WDI-PPP   World Bank World Development Report 1992, Table 30, based on "consistentized" ICP Phases III-V and regression fit for others.

Economist Edition of July 11-17, 1992; page 26 (chart).
Bolotin   Boris Bolotin, "Ring out the old, bring in the new," in Business in ex-USSR, January 1992
Illiarnov Vosprosy Ekonomiki, No. 4-6, 1992; Moscow
D.Bank   Deutsche Bank report on "Rebuilding Eastern Europe", 1991 March

SACF   Synthetic Atlas-type Conversion Factor developed by the World Bank's Socio-Economic Data Division

1/ An "exceptional" conversion factor was used. Otherwise, Bulgaria's GNP per capita would have fallen to 47% of the FSU figure in 1991.

Until recently, studies by the U.S. Government, here referred to as USG-2, were about the only recognized source of estimates concerning the relative economic size of the FSU. While estimates for the FSU (and US-FSU relativities) were unaffected, there was a major change in USG reporting about other CMEA economies, in 1991. USG sources report *Atlas*-type estimates for most economies but have relied on PPP-type estimates for CMEA economies. In 1991, USG shifted from PPP estimates it specially commissioned to those in line with the 1985 ICP exercise, and it is the latter that are reported in Table 4 as USG-2, for CMEA economies other than the FSU.[19] A particularly sophisticated PPP, the so-called adjusted factor cost method, has been used throughout for the FSU, which in any event did not participate in ICP before the 1990 exercise.

In down-sizing CMEA economies (other than the FSU), USG sources noted that these economies operate in a branch of ICP (called Group II) that uses "quality adjustments." Little was known about these adjustments[20] at the time and USG conjectured that this explains the down-sizing. In late 1991, however, ICP experts in Group II prepared a report on quality adjustments in Poland's 1985 ICP work; and since then, the Bank has been provided with item-level detail on prices and quality adjustments for Hungary and Yugoslavia as well as Poland. The details show that PPP-type GNPs per capita would rise perhaps 5 percent, or negligibly as percentage points of the US figure, if such quality adjustments had not been made.[21]

Basically, the present study implies that a similar down-sizing would be appropriate in USG estimates for the FSU. In effect, the FSU is the last PPP-based figure in the USG column of Table 2, which is otherwise essentially *Atlas*-type estimates. This mixing of scales is the main explanation for the differing relativities between the FSU and other historically planned economies, between USG-2 and SACF-based figures compiled for this study.

The UNDP's *Human Development Report* (HDR in Table 4) gives GDP per capita estimates that are based broadly on USG sources and methods, for CMEA economies. However, unlike USG, the underlying source (Penn World Tables) reports PPP-based estimates for all economies. These estimates can be compared with SACF only for economies at broadly similar levels of development; for higher income economies, note that HDR results are broadly in line with the Bank's published recalibration of its Atlas-type estimates to a PPP scale (WDI-PPP) in Table 4.

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[19]Since Yugoslavia was not a CMEA member, *Atlas*-type estimates were used throughout in USG reports.

[20]They are discounts applied to observed prices where ICP experts judge that there are intrinsic differences between items actually available in two economies, for international comparison. The practice is in fact widespread in ICP exercises in developing economies; the G2 exercise differs mainly in its systematic approach to such adjustments.

[21]There is a deeper problem of radically different sample frames for comparison items, between the Group II and OECD branches of ICP; and work initiated for this study strongly suggests that this could be a significant source of "quality adjustment." However, this reflects inherent differences in the economies and goes to the core of the so-called Gershekron effect and why PPP and Atlas-type conversion factors differ.

WDI-PPP recasts figures from the 1992 edition of the Bank's *World Development Indicators (WDI)*, to FSU=100. The technique used is described in Ahmad (1992).[22] The WDI did not report a figure for the FSU; for the present purpose IECSE used a preliminary PPP from the 1990 Austria-FSU work taking place under ICP auspices (somewhat under $7000, moving from schilling to dollars at prevailing exchange rates). The figures for other historically planned economies are as reported in WDI and have not been adjusted to reflect proposed revision by the SACF method.

The United Nations Statistical Division (UNSTAT) is publishing its estimates of world GDP, with country-level figures converted with its Price Adjusted Rates of Exchange (PARE). PARE is a variant on Atlas-type conversion; the main difference being that PARE relies on a longer-term averaging of apparent changes in real exchange rates. Country-level figures computed in this way are used in decisions of the UN Committee on Contributions. For the FSU, PARE seems to accept the official rate, which this study considers egregiously overvalued.

Two studies separately by Russian economists, Bolotin[23] and Illiarnov,[24] also show relative GNP per capita levels for FSU republics although little is known about their sources and methods. Bolotin describes his work as a PPP study and his FSU-US relative in GNP per capita level parallels that inferred from WDI-PPP, as noted above. Illiarnov's is likely to be a PPP study as well and differences between Bolotin and Illiarnov, for individual FSU economies, probably reflect differing ruble-based per capita GNP estimates rather than conversion issues. It is almost certain that each uses a single PPP estimate for the FSU as a whole, since there is no evidence of that the detailed price comparisons required for PPPs have been made at the republic-level. The main difference, relative to SACF figures recommended here, is that Bolotin ranks Armenia and Georgia much higher (and Lithuania and Turkmenistan somewhat higher) than we do.

A recent survey of Eastern Europe, by Deutsche Bank, seems to have used commercial exchange rates. This would explain not only why the FSU slides so far down the relativity scale but also why Bulgaria in particular looks so high in 1990, before the sharp depreciation of 1991.

VI. Directions for Near-Term Work

All data used in this study are from official FSU sources, although some of it was obtained indirectly, as a by-product of commissioning independent evaluations of national accounts. It is not certain that national officials in all 15 economies emerging from the FSU have, and have digested, all the information obtained for this study. For that reason, a special

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[22]Available on request from IECSE.

[23]See Bolotin, 1992.

[24]See Illiarnov, 1992.

effort is being made to assemble as much as possible into Supporting Documents (SDs) for this study, which would be provided to national compilers as soon as possible.

The issues discussed are complex; and few of the FSU economies have national compilers with much experience with the type of macroeconomic analysis t' is study is designed to support. Hence, a workshop for relevant authorities from the 15 FSU economies, to discuss these matters in greater detail, should be a high priority for the Bank. Quick estimates for 1991 were devised to initiate the Bank's FY93 operational guideline exercise but these estimates are subject to particularly wide margins of error. And the continued, probably sharper, decline experienced by most of these economies in 1992 means that an assessment of Bank lending terms based solely on historical standings could be misleading. A Bank effort to help national compilers with "transitional" technical assistance is urgently needed.

The two major studies of ruble-based national accounts (IDS and CIR), are available separately from IECSE. Preliminary indications are that although IDS relies more on industry reporting and CIR on financial accounts, the two reach much the same results. This is not only reassuring for the historical period; it suggests a form of cross-checking that should prove useful during the transitional period ahead.

ANNEXES

Annexes

General Explanation

Annex 1 describes how IECSE combined the IDS 1987 benchmark results with information obtained by Bank and Fund missions, in order to produce tentative time series through 1990 and sometimes 1991, for use in this study pending CIR's final report. One advantage of IDS' I-O approach is that it permitted the unwrapping of the residual category commonly found on the expenditure side of material product system (MPS) accounts, covering both government and the resource balance. This revealed an important differences in some cases, notably the treatment of FTDs among FSU economies.

Annex 2 places the *Atlas* method in a conceptual framework, identifies assumptions that don't seem applicable in the present case(s), and explains conceptual refinements that are should mitigate the problems. It also provides a rigorous explanation of the conceptual framework lying behind the traditional *Atlas* method and then attempts to identify where its applicability seems doubtful, in the case of economies with pervasive price controls.

The fact that FTDs affected individual FSU republics differently suggests that the economies emerging from each republic begins with their own "tailored" set of multiple exchange rates. Beneath what may seem like accounting issues, there were genuine transfers of resources, among the republics that formed the FSU; dissolution of the Union severed the FTD transfer mechanism. The significance of this depends on the extent to which each economy depended on inter-republic trade, as well as the extent and speed of transition to market mechanisms in each. Basic information on this is available in the study by Michalopoulos and Tarr (1992). Annex 3 recasts the underlying data to suggest how ruble-dollar conversion factors would look if each FSU economy's trade, with each other (inter-republic) and the rest of the world (extra-Union) were adjusted to just compensate for removal of FTDs. This is suggested by the variety of import and export rates computed separately for each FSU economy. The ruble-dollar rate implied by the SACF is shown across-the-board, as the rate for nontraded goods. New tools will have to be developed before the incidence of terminating Union-wide FTDs can be gauged.[1] Depending on the path taken in the coming months, it should be possible to focus on one of the "impact" statements implied by this study or to prepare somewhat more realistic "incidence" estimates using a regional input-output framework being developed as an outgrowth of this study.

Annex 4 details the SACF procedures underlying the estimates ultimately recommended in this study, which links HPEs to the rest of the world through a combination of dollar exchange rates for other upper middle income economies benchmarked in 1985, the 1985 ICP

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[1]An integrated framework of input-output tables, including bilateral trade flows among the 15 FSU economies, is in preparation. The proposal document is available on request.

results for these two linkage economies; the 1988 PPP exercise of the CMEA, which included the FSU; plus relative growth and inflation measures to move PPP results forward to 1990.

Annex 5 describes the preliminary details available from the 1990 ICP exercise, for the FSU and Austria. It explains how the matched item prices were averaged below the level for which expenditure weights are available; and the effects of using 1985 weights (and sometimes to rely on Austrian weights, where detailed FSU weights were not yet available).

Annex 6 provides basic data on the "two Austrias" that emerge for 1985 when the items priced for its OECD comparison are compared with those priced for its G2 comparisons with Eastern Europe and the FSU. Even after discounting for the far greater diversity of items priced for OECD purposes (by discarding information on VCRs, microwave ovens, etc., that were not even considered for the Group II comparison), there is a clear difference in the sample frame which systematically steers the OECD comparison towards higher, and the Group II comparison towards lower, quality goods.

Annex 7 explores the extent of overlap and deviation, at the item level, between the preliminary ICP results for 1990 and the CIA's 1976 exercise. While further documentation from Austria will be required to complete the matching process, the comparison lends credence to the hypothesis that goods in the FSU have changed far less than their US comparators; and that imputation of US price trends to constant ruble value series inserts a spurious upgrading of quality/diversity into FSU series. And while that upgrading is modest from year to year, its cumulative effect could well explain much of the difference between 1990 estimates from CIA and ICP PPP exercises.

Estimation of FSU Economies' GNPs in Ruble Terms

A. GNP Series up to 1990

1. The ruble GNP for non-Baltic economies emerging from the FSU was estimated in three steps. First "official" time series were obtained from Bank/Fund documents. Second, a set of 1987 benchmark estimates was extrapolated, based on the trends of the "official" series. Finally, the extrapolated series were adjusted to express the extra-Union trades in foreign prices, to be consistent with the concept of the System of National Accounts.

"Official" Time Series

2. For the period of 1987 - 1991, GNP data were taken from the Bank/Fund's documents. One exception is Russia, for which the missing 1987 and 1988 data were extrapolated backward from the 1989 numbers. Constant prices for some FSU economies were taken from the same source if they were available. If not, full series of NMP in constant prices were determined through extra- or interpolation, first; then the difference between GNP and NMP in the base year of 1987 was extrapolated via the capital stock series in constant prices for each FSU economy; finally these extrapolated GNP-NMP differences were added to the constant price NMPs as described above. GNP deflators were calculated from the GNP data in current and constant prices.

3. For the period of 1980-87 a different method was used. Some republics had current price data back to 1985. For others, 1980 data were available. For the missing data the following method was used. First, constant price series were prepared via backward extrapolation or interpolation, using the NMP trend at constant prices. Second, time series of GNP deflators were estimated, based on NMP deflator's trend. Current price data were then obtained by multiplying GNP series in constant prices by the corresponding deflator series.

4. For the Baltic republics, complete time series were available in current and constant prices for 1980-90; thus no estimation was necessary. All "official" GNP series as mentioned above are shown in Tables 4-6.

Benchmark Data and Extrapolation

5. For 1987, the Intelligent Decision Systems (IDS) prepared a set of GNP data for each republic (Table 7.). IDS also supplied extra-Union trade data at both domestic and foreign prices for 1987-90 by republics. These GNP data, however, include both inter-Republic and extra-Union trade values in foreign prices. To make these data conceptually consistent with the

"official" data, an adjustment was made to express the trade values in domestic prices, based on the IDS foreign trade data. Still, the adjusted GNP figures from IDS differ from the "official" data. The reasons for that lie in the different estimations of military expenditures, private sector activities and also in the estimation of foreign trade in non-material services (for data comparisons, see Summary Table).[1]

6.   The 1987 benchmark data from IDS were first extrapolated to 1988-90 via trend of the "official series. The extrapolation was done for all Republics. Then the extrapolated data were adjusted for re-evaluation of extra-Union trade from domestic to foreign prices.

7.   For 1980-86, the foreign trade adjustments for 1987 were extrapolated backward via the trend of the foreign trade of the FSU.

8.   The adjusted GNPs in constant prices were obtained by applying the deflators of the "official" time series to the current price data as obtained in paras 6-7 above. The results are shown in Tables 1-3.

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[1] For the Baltic republics, the 1987 benchmark GNP figures were adjusted only for inter-Republic trade, to make them consistent with the data from the national authorities.

Table 1   G N P (Final)
(at current prices, billions of roubles)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	678.6	709.9	755.2	786.4	815.3	830.0	851.0	855.3	907.2	973.7	1,053.8
Armenia	7.0	7.6	7.9	8.0	8.5	8.6	8.7	8.5	8.3	9.8	10.0
Azerbaijan	12.4	13.3	14.2	14.8	15.3	14.7	14.3	14.7	14.7	15.6	14.9
Belarus	25.0	27.2	26.1	28.3	29.8	31.0	32.3	32.9	34.8	38.0	40.6
Estonia	4.7	4.9	5.0	5.4	5.5	5.2	5.4	5.7	6.0	6.7	8.4
Georgia	10.9	11.9	12.5	12.5	13.4	13.8	14.2	13.7	14.1	14.0	14.7
Kazakhstan	28.8	29.4	30.6	32.7	33.5	32.9	34.7	37.8	42.2	45.6	55.2
Kyrgyzstan	5.2	5.6	5.8	6.7	7.0	6.1	6.2	6.7	7.4	8.1	8.8
Latvia	7.7	8.3	8.7	8.8	9.2	8.9	9.2	9.3	9.9	10.9	12.2
Lithuania	8.0	9.0	9.7	10.0	10.4	10.3	11.3	11.4	12.4	13.4	14.7
Moldova	8.3	8.7	9.9	10.6	10.6	9.1	9.7	9.9	10.3	11.7	13.2
Russia	414.6	429.4	461.6	477.0	495.9	516.7	529.7	525.8	559.1	598.6	646.2
Tajikistan	5.5	5.7	5.9	6.1	6.1	6.1	6.0	6.2	7.0	7.0	7.6
Turkmenistan	4.8	5.0	5.5	5.8	5.8	5.5	5.8	6.5	6.9	7.1	7.9
Ukraine	110.8	117.5	123.2	129.5	135.0	133.0	135.8	137.3	143.1	154.7	164.9
Uzbekistan	24.1	25.8	27.9	29.5	28.8	27.7	27.3	28.8	31.1	32.6	35.1

Table 2   G N P (Final)
(at constant prices, billions of 1987 roubles)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	751.7	742.5	752.6	783.6	808.9	842.1	860.1	855.3	895.0	920.5	909.5
Armenia	6.4	7.1	7.1	7.5	8.0	8.4	8.7	8.5	8.3	9.0	8.6
Azerbaijan	11.7	12.7	12.6	12.9	14.0	14.4	14.7	14.7	14.9	14.4	13.5
Belarus	25.0	27.0	27.0	28.6	30.0	31.3	32.8	32.9	34.5	37.1	36.9
Estonia	4.5	4.6	4.9	5.0	5.2	5.3	5.4	5.7	5.9	6.1	5.6
Georgia	11.0	11.5	11.5	12.0	12.7	13.9	14.7	13.7	14.8	14.7	13.6
Kazakhstan	33.0	33.4	33.2	34.7	35.0	35.9	34.1	37.8	39.8	39.8	39.4
Kyrgyzstan	5.3	5.7	5.5	5.9	6.2	6.2	6.3	6.7	7.4	7.7	8.1
Latvia	7.3	7.6	7.8	8.3	8.7	8.7	9.1	9.3	9.8	10.3	10.0
Lithuania	8.5	9.7	10.0	10.3	11.1	10.3	11.4	11.4	12.5	12.6	11.8
Moldova	8.4	8.4	9.6	10.0	10.3	9.5	10.2	9.9	10.5	11.3	11.3
Russia	480.7	461.0	470.8	488.3	503.1	529.3	539.4	525.8	550.3	565.3	556.3
Tajikistan	5.3	5.3	5.3	5.5	5.6	5.8	6.2	6.2	6.8	6.5	6.6
Turkmenistan	5.3	5.4	5.3	5.6	5.4	5.7	6.0	6.5	7.1	6.8	6.9
Ukraine	115.5	118.5	117.5	123.4	128.0	130.5	134.0	137.3	141.4	147.0	147.9
Uzbekistan	23.8	24.7	24.6	25.6	25.5	26.9	27.0	28.8	31.0	31.9	33.3

Table 3   G N P (Final)
(price deflator, 1987 = 100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	90.3	95.6	100.3	100.4	100.8	98.6	98.9	100.0	101.4	105.8	115.9
Armenia	109.0	106.3	110.7	106.6	105.7	102.5	99.8	100.0	100.0	108.9	116.6
Azerbaijan	106.0	105.5	113.5	115.1	109.6	101.8	97.6	100.0	98.8	107.9	110.9
Belarus	100.0	100.5	96.8	98.9	99.2	99.2	98.4	100.0	101.0	102.7	110.1
Estonia	104.7	106.4	102.4	106.9	106.3	97.7	100.2	100.0	102.7	110.3	150.3
Georgia	99.1	103.2	109.0	104.8	105.6	99.3	96.5	100.0	95.1	95.4	108.5
Kazakhstan	87.2	88.0	92.2	94.5	95.9	91.7	101.6	100.0	106.1	114.6	140.4
Kyrgyzstan	98.4	99.7	105.6	113.5	112.7	98.6	98.5	100.0	99.8	105.0	109.1
Latvia	105.9	108.8	111.3	106.5	104.8	102.4	100.9	100.0	101.2	105.9	122.6
Lithuania	94.3	92.9	97.0	97.4	93.5	100.6	98.6	100.0	99.1	105.6	125.2
Moldova	99.0	103.2	103.5	105.7	102.9	95.6	94.5	100.0	98.2	103.8	117.5
Russia	86.2	93.2	98.1	97.7	98.6	97.6	98.2	100.0	101.6	105.9	116.2
Tajikistan	103.5	107.2	111.3	109.4	109.1	104.2	97.5	100.0	102.5	107.2	114.8
Turkmenistan	91.7	93.2	104.0	104.7	107.7	96.5	97.0	100.0	97.7	104.8	114.3
Ukraine	96.0	99.2	104.8	105.0	105.4	101.9	101.3	100.0	101.2	105.2	111.5
Uzbekistan	101.4	104.6	113.3	115.0	113.0	103.0	101.2	100.0	100.4	102.3	105.2

Table 4   G N P ("Official")
            (at current prices, billions of roubles)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	613.2	644.5	689.8	722.5	753.0	769.1	791.5	817.7	870.9	939.1	1,018.5
Armenia	6.5	7.1	7.4	7.5	8.0	8.1	8.2	8.3	8.1	9.5	9.7
Azerbaijan	11.8	12.7	13.6	14.2	14.7	14.1	13.7	14.7	14.6	15.5	14.7
Belarus	23.0	25.2	24.2	26.4	27.9	29.2	30.5	32.5	34.4	37.7	40.1
Estonia	4.5	4.7	4.8	5.1	5.2	5.0	5.2	5.4	5.8	6.4	8.0
Georgia	10.2	11.1	11.8	11.8	12.7	13.1	13.5	14.2	14.5	14.3	14.9
Kazakhstan	27.6	28.2	29.4	31.6	32.4	31.8	33.6	35.0	39.0	42.0	51.0
Kyrgyzstan	5.0	5.4	5.6	6.5	6.8	5.9	6.0	6.3	6.9	7.6	8.3
Latvia	7.9	8.4	8.9	8.9	9.3	9.1	9.3	9.5	9.9	10.9	12.2
Lithuania	7.7	8.6	9.3	9.6	9.9	9.9	10.8	11.0	11.8	12.7	13.3
Moldova	7.8	8.1	9.3	10.0	10.1	8.6	9.1	9.4	9.8	11.2	12.8
Russia	363.6	378.5	410.7	427.2	447.4	469.2	483.4	495.7	531.2	573.2	622.0
Tajikistan	5.3	5.5	5.7	5.9	6.0	5.9	5.9	6.0	6.7	6.6	7.1
Turkmenistan	4.7	4.9	5.4	5.7	5.7	5.4	.5.7	6.1	6.5	.6.7	7.3
Ukraine	103.8	110.5	116.2	122.7	128.3	126.5	129.4	136.3	142.2	154.1	164.8
Uzbekistan	23.9	25.6	27.6	29.3	28.6	27.4	27.1	27.3	29.4	30.7	32.4

Table 5   G N P ("Official")
            (at constant prices, billions of 1987 roubles)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	678.0	673.4	686.7	719.1	746.3	779.7	799.4	817.1	855.0	879.4	868.9
Armenia	6.0	6.6	6.7	7.0	7.6	7.9	8.2	8.3	8.1	8.8	8.4
Azerbaijan	11.1	12.0	12.0	12.3	13.4	13.6	13.9	14.7	14.8	14.4	13.4
Belarus	23.0	25.1	25.0	26.7	28.1	29.5	31.0	32.5	34.0	36.6	36.4
Estonia	4.3	4.4	4.6	4.8	4.9	5.1	5.1	5.4	5.6	5.8	5.3
Georgia	10.1	10.6	10.6	11.1	11.8	13.0	13.7	14.0	15.1	14.9	13.8
Kazakhstan	31.7	32.2	32.0	33.5	33.9	34.8	33.2	35.1	37.0	37.0	36.6
Kyrgyzstan	5.0	5.4	5.3	5.7	6.0	5.9	6.1	6.2	6.9	7.2	7.5
Latvia	7.4	7.8	7.9	8.4	8.9	8.8	9.3	9.5	9.9	10.5	10.1
Lithuania	8.1	9.3	9.6	9.9	10.6	9.8	10.9	11.0	12.0	12.1	11.3
Moldova	7.5	7.5	8.7	9.1	9.5	8.6	9.3	9.1	9.7	10.4	10.3
Russia	421.7	406.3	418.8	437.4	453.8	480.7	492.3	495.7	518.8	532.9	524.4
Tajikistan	5.1	5.1	5.1	5.4	5.5	5.7	6.0	6.0	6.6	6.4	6.4
Turkmenistan	5.1	5.2	5.2	5.4	5.3	5.5	5.9	6.1	6.7	6.4	6.5
Ukraine	108.2	111.4	110.8	116.9	121.7	124.1	127.7	136.3	140.3	145.9	146.7
Uzbekistan	23.5	24.5	24.4	25.4	25.3	26.6	26.8	27.3	29.4	30.2	31.6

Table 6   G N P ("Official")
            (price deflator, 1987 = 100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Former USSR	90.4	95.6	100.4	100.4	100.8	98.6	98.9	100.0	101.8	106.7	117.1
Armenia	109.0	106.3	110.7	106.6	105.7	102.5	99.8	100.0	99.3	108.5	115.4
Azerbaijan	106.0	105.5	113.5	115.1	109.6	101.8	97.6	100.0	98.5	107.5	109.3
Belarus	100.0	100.5	96.8	98.9	99.2	99.2	98.4	100.0	101.1	103.1	110.3
Estonia	104.7	106.4	102.4	106.9	106.3	97.7	100.2	100.0	103.1	111.4	150.6
Georgia	99.1	103.2	109.0	104.8	105.6	99.3	96.5	100.0	94.4	93.9	106.0
Kazakhstan	87.2	88.0	92.2	94.5	95.9	91.7	101.6	100.0	105.7	113.9	139.8
Kyrgyzstan	98.4	99.7	105.6	113.5	112.7	98.6	98.5	100.0	99.5	104.4	108.9
Latvia	105.9	108.8	111.3	106.5	104.8	102.4	100.9	100.0	100.1	104.0	120.3
Lithuania	94.3	92.9	97.0	97.4	93.5	100.6	98.6	100.0	98.6	104.6	117.7
Moldova	99.0	103.2	103.5	105.7	102.9	95.6	94.5	100.0	98.1	104.0	118.8
Russia	86.2	93.2	98.1	97.7	98.6	97.6	98.2	100.0	102.4	107.6	118.6
Tajikistan	103.5	107.2	111.3	109.4	109.1	104.2	97.5	100.0	101.4	104.6	110.7
Turkmenistan	91.7	93.2	104.0	104.7	107.7	96.5	97.0	100.0	97.3	104.0	112.0
Ukraine	96.0	99.2	104.8	105.0	105.4	101.9	101.3	100.0	101.3	105.6	112.3
Uzbekistan	101.4	104.6	113.3	115.0	113.0	103.0	101.2	100.0	100.0	101.6	102.6

Table 7: Differences between Bank/Fund Estimates and IDS Data
GNP
(Billions of Rubles)

	Bank/Fund Estimates 1987	IDS
FSU	817.7	797.2
Armenia	8.3	8.1
Azerbaijan	14.7	14.1
Belarus	32.5	31.2
Estonia	5.4	5.5
Georgia	14.2	13.1
Kazakhstan	35.0	36.7
Kyrgyzstan	6.3	6.5
Latvia	9.5	9.0
Lithuania	11.0	11.0
Moldova	9.4	9.4
Russia	495.7	480.6
Tajikistan	6.0	6.1
Turkmenistan	6.1	6.3
Ukraine	136.3	131.1
Uzbekistan	27.3	28.6

Conceptual Approach to Converting GNP into US$ for FSU

The Atlas Method

1.   The Bank's Atlas method stipulates that when the domestic prices embodied in national GNP data are replaced by the corresponding international prices, the resulting GNP figures are comparable across countries ("law of one commodity-one price"). This procedure is equivalent to converting national currency GNP at the market exchange rate, provided that all the products included in GNP are tradables and the price system including the foreign exchange market works without government intervention. Even if the GNP includes non-tradables, the above conversion procedure would still produce internationally comparable GNP figure, when we further assume that domestic prices are undistorted and resources are efficiently allocated for production of different products (see below).

$$Q_t P_t(d) + Q_n P_n(d) = GNP(d) \quad \ldots\ldots(1)$$

where Q_t=composite quantity of tradables, $P_t(d)$= average domestic price of tradables, Q_n=composite quantity of non-tradables, $P_n(d)$=average domestic price of nontradables,
$GNP(d)$= GNP in national currency;

$$P_n(d) = K P_t(d) \quad \ldots\ldots(2)$$

where K is a parameter, which may vary with the general income level of the economy;

$$E = P_t(d)/P_t(w) \quad \ldots\ldots(3)$$

where E= free market exchange rate, $P_t(w)$= international prices of tradables in U.S. dollars.

Substituting (2) into (1),
$$Q_t P_t(d) + Q_n K P_t(d) = GNP(d) \quad \ldots\ldots(4).$$

Converting GNP(d) in (4) at E in (3),

$$GNP(d)/E = [Q_t P_t(d)]/[P_t(d)/P_t(w)] + [Q_n K P_t(d)]/[P_t(d)/P_t(w)]$$
$$= Q_t P_t(w) + Q_n K P_t(w) = GNP(w), \text{ where } GNP(w)=GNP \text{ in international prices.}$$

Conversion Method for Former Soviet Republics

2.   Obviously, the above assumptions do not hold for many economies, including former Soviet Republics. Particularly, the official exchange rate does not link closely the average domestic prices to the corresponding international prices even for tradables in many market economies. Thus, Equation 3 in para 1 above may have to be modified as follows:

$$E = Pt(d)/Pt(w) = (1+A) Eo \ldots\ldots (3'),$$ where A is the average net indirect taxes on traded goods. In this case, the conversion of GNP at Eo would result in

$$[QtPt(d) + QnKPt(d)]/Eo \text{ from (4), para 1 above}$$
$$= (1+A)[QtPt(w) + QnKPt(w)] = (1+A)GNP(w) \ldots. (5)$$

3.   The Bank's Atlas method assumes that A in Equation (5), para 2 above, is "small" for most economies and thus $(1+A)GNP(w)$ is still broadly comparable across countries. If A is considered to be "too large" for an economy, then an alternative conversion rate, which approximates E, is used for the economy.

4.   Most of domestic prices of tradables in Soviet Republics before 1992 were. administratively determined independently of their foreign prices. Thus, the official exchange rate did not link foreign currency prices of tradables to their domestic prices. Further, foreign prices of products traded with former CMEA countries were negotiated between trading parties and included substantial implicit subsidy and tax elements. They diverge significantly from the international prices. For products "traded" between Republics, their foreign prices need to be imputed. All these suggest that the official ruble-dollar exchange rate can not be used to derive Soviet Republic's GNP in dollars, which would be internationally comparable.

5.   National accounts data of former Soviet Union (FSU) on external trade suggest that FSU's official exchange rate deviated, by exceptionally large margin, from the implicit exchange rate linking the domestic prices of traded goods and the corresponding international prices. Therefore, an alternative conversion rate needs to be determined. Further, because of the seriously distorted domestic price structures, particularly highly subsidized service prices, in FSU Republics, the ratio of the average price of non-traded goods to those of traded goods may be downward-biased considerably.

6.   If some average relationships between domestic prices of traded goods and their international prices (proxy E in (3) above) and between resource costs for tradables and nontradables (proxy K in (2) above) are known, GNPs in international prices could still be estimated for these economies. The assumption that price elasticities of demands in these economies are very low simplifies the procedure. That is, when international prices are applied to tradables and service prices are adjusted for FSU Republics, there would be no need to impute quantity changes possibly responding to the hypothetical price changes.

7.   For each Republic, proxy E (E*) could be estimated, based on data from the International Comparison Program (ICP) or similar studies. Proxy K (K*) could be found from fiscal data on indirect taxes and subsidies for traded and nontraded products or GDP estimates by sectors at factor cost. More specifically,

E* can be computed as the ratio of the average domestic prices of major tradables to the average international prices:

$$E* = SUM[w_iPt(d)_i]/SUM[w_iPt(w)_i] \sim Pt(d)/Pt(w)... (6)$$
where w_i is weights defined either as $[V_i/Pt(d)_i]/SUM[V_i/Pt(d)_i]$ with V_i=ruble value of value-added for, or expenditures on, tradable group i.

K* could be established as the ratio of average "resource costs" for non-traded to traded goods:

$$Let Pn(d)\{[Vn - tn]/Vn\} = (K*) Pt(d)\{[Vt - tt]/Vt\} ... (7),$$

where Vn=ruble value of non-tradable production, tn=net indirect tax on nontradables, Vt=ruble value of tradable production, tt=net indirect tax on tradables. The assumption here is that the resource costs are much less distorted than the "established" prices in FSU Republics.

To estimate GNP(w) for a FSU Republic,
First, the value added or gross output of the nontradable sectors should be multiplied by [(Vn - tn)/Vn]/[(Vt - tt)/Vt]; i.e., $QnPn(d)\{[(Vn - tn)/Vn]/\{[Vt - tt]/Vt\}$. Let this be QnPn*(d)....(8), which is equal to $Qn(K*)Pt(d)$, from (7) above;

Second, (8) is added to the value-added or gross output of the tradable sectors:
$$QnPn*(d) + QtPt(d) = Qn(K*)Pt(d) + QtPt(d).....(9).$$

Finally, (9) is converted at E* ~ Pt(d)/Pt(w):
$$[QnPn*(d) + QtPt(d)]/E* = Qn(K*)Pt(w) + QtPt(w) = GNP(w)*.$$

8.   For practical reasons, it could be assumed that the tradables are products from agricultural, mining and manufacturing sectors and the non-tradables are those from construction and service sectors.

9.   Given the general pattern that the prevailing exchange rate tends to understate significantly the relative purchasing power of the local currency for the economies with price controls, the method discussed in paras 6 and 7 above may be considered as a special case where an alternative GNP conversion rate is sought because of the "overly" appreciated or depreciated prevailing exchange rate.

35

10.   Some considerations may be given to quality differences of traded goods, especially non-primary goods, between intra-CMEA and convertible currency areas. The proxy k could be computed for the whole union and uniformly applied to all Republics.

11.   More specifically, for the sample primary products, regardless of their destinations/origins, their international prices could be assumed to be equal to the prices in the "Western" market. For the sample manufactured goods, their international prices for trade with Western economies should be the actual transaction prices, while those for inter-Republic and intra-CMEA trade could be assumed to be equal to the quality-adjusted transaction prices in Western market. These quality-adjusted prices could be estimated, based on the 1988 study by Oblath and Tar on Hungary-USSR trade.

12.   Proxy Es could be computed for sample products taken from the final demand side in input-output tables or for sample products from the production side. In the latter case, proxy Es should be computed from the value-added estimates in domestic and international prices, where the imported raw materials as re-evaluated at international prices would be subtracted from the gross output values as re-evaluated at the international prices.

13.   Some people may consider that the above method will yield $GNP figures close to those converted at the purchasing power parity (PPP), which would be much higher than those converted at the exchange rates. Generally, the "higher" PPP-converted GNPs would result mainly from using PPPs for non-traded goods and services, which are much "lower" than those for traded goods. Even then, according to 1985 ICP data, the PPPs for tradables are significantly "lower" than the official exchange rates for most market economies (Attachment 1). This suggests that using E* directly for FSU Republics would result in overstated $GNP figures for the Republics compared to market economies. To ensure internationally comparability of $ GNP figures, E* for FSU Republics may have to be adjusted such that the adjusted E* would deviate from the PPPs for tradables to the same extent as for the "average" market economy.

14.   One option for adjusting E* is as follows:

(a) First, PPPs for tradables are computed for benchmark countries of 1985 ICP;
(b) Second, the ratios of the official exchange rates to the above PPPs are computed for the benchmark countries and simply averaged: (Eo/PPP);
(c) E* for each FSU Republic is multiplied by (Eo/PPP) from (b) above: E**=(E*)(Eo/PPP).

15.   Alternatively, E** could be approximated as follows:

E**=average of [(E*)/PPPi](Eoi)
     =average of (PPP*i)(Eoi) for comparator economy i=1,2,3...n,
   where PPP*i =PPP between FSU republic and a comparator economy i and
   Eoi=prevailing exchange rate vis-a-vis the U.S.dollar in comparator i.

Here, PPP*i could be computed from the 1988 price comparison study among former CMEA countries and also 1990 ICP data.

16. E* could be also computed from actual foreign trade statistics, where traded items are evaluated at both domestic and "foreign" prices. The foreign prices here are the actual "invoice" prices converted from foreign currencies into rubles at the official exchange rates. The estimated E* should be close to the so-called commercial exchange rate.

17. In many developing countries, the ratio of the average market prices of non-tradables to tradables may not equal to the same ratio in resource cost terms, because of various government interventions to markets. Thus, K for FSU in equation (9) in para 7 above should be also adjusted to approximate the average K value of developing economies.

Conversion Factors Adjusted by Foreign Trade Price Differentials (FTDs)

1.   The implicit ruble-dollar conversion factors adjusted by FTDs can be derived from the ratio of the trade value expressed in domestic prices to that expressed in dollar-equivalent foreign prices. Here, the domestic prices refer to the costs of production and delivery for exports, and the wholesale and retail prices paid by domestic users of imports; the foreign prices for extra-Union trade are the foreign trade prices received or paid by the foreign trade organizations in foreign currencies as converted at the official exchange rate; the foreign trade prices for inter-Republic trade are "hypothetical" trade prices of comparable products received and paid by the Union in its extra-Union trade.

2.   The Intelligent Decision Systems (IDS) has prepared the inter-Republic and extra-Union trade data in both domestic and foreign trade prices for each of the FSU Republics for 1987, 1989 and 1990. The basic data used by the IDS came from GOSCOMSTAT. The estimation of foreign trade prices for inter-Republic trades has to overcome the well-known problem of (a) assessing the comparability (particularly in quality) of goods traded among Republics with those traded with countries outside the Union and (b) determining the appropriate "international" prices for products traded among Republics. Former GOSCOMSTAT officials claim that GOSCOMSTAT had relevant information and made a good faith efforts at estimating the international prices for inter-Republic trade.

3.   Based on the foreign trade data prepared by IDS, several FTD-adjusted conversion factors (FCFs) have been derived for each FSU Republic and the Union, for 1990 (Table 1). They are for extra-Union exports and imports, inter-Republic exports and imports, and total exports and total imports combined of inter-Republic and extra-Union trade. The procedure to derive the FCF was as follows:

> FCF for extra-Union exports by Republic k for 1990
> = [Veux(d)k/Veux(f)k]*ER(fsu),

where Veux(d)k = value of Republic k's extra-Union exports in domestic prices, Veux(f)k= value of Republic k's extra-Union exports in foreign trade prices, and ER(fsu) = the official exchange rate of the Union, which was 0.59 rubles per U.S. dollar in 1990.

4.   It is noted in Table 1 that FCF for extra-Union imports is much higher than FCF for inter-Republic imports, for all Republics, while FCF for extra-Union exports is higher than FCF for inter-Republic exports only for the Baltics, Turkmenistan and Uzbekistan. These differences, of course, reflect both differences in product compositions and pricing policies between inter-republic and extra-Union trade.

Table 1: FTD-Adjusted Conversion Factors for FSU Republics
(Rubles per US$)

		FSU	EST	RUS	LTV	BLR	LTH	UKR	KZK	ARM	MLD	GRG	TKN	AZR	KYR	UZB	TAJ
Conversion factors	import-total	0.70	0.66	0.81	0.63	0.57	0.55	0.61	0.63	0.78	0.65	0.75	0.77	0.66	0.68	0.70	0.70
unweighted	Export-total	0.56	0.88	0.47	0.75	0.62	0.74	0.61	0.58	1.00	1.23	1.11	0.54	0.75	0.73	0.71	0.79
	import-extra	0.97	1.25	0.95	0.98	0.94	1.05	0.95	1.08	1.35	1.03	1.23	1.31	1.07	0.82	1.26	1.17
	Export-extra	0.44	1.00	0.40	0.84	0.52	0.61	0.54	0.51	0.87	0.80	0.50	0.88	0.45	0.60	0.85	0.51
	import-intra	0.60	0.59	0.70	0.57	0.50	0.49	0.54	0.57	0.69	0.59	0.65	0.70	0.58	0.64	0.63	0.64
	Export-intra	0.60	0.87	0.51	0.75	0.63	0.75	0.62	0.58	1.01	1.27	1.17	0.52	0.78	0.73	0.69	0.85
	Official	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59

39

Synthetic Atlas-type Conversion Factor (SAFC)

Introduction

1.   In most of the historically planned economies (HPES) including the FSU, exchange rate did not link international prices to domestic prices. The SACF method is thus designed to derive an alternative set of exchange rates per U.S. dollar for these HPEs, based on PPP relationship between individual HPE and a group of comparable market-oriented economies and the PPP-exchange rate relationship for the latter group of economies. Five market-oriented economies (Greece, Portugal, Korea, Hungary and Yugoslavia) are chosen as "linkage countries," since they are considered mostly comparable to the HPEs in Europe and the FSU and also participated in the 1985 International Comparison Programme (ICP). The PPP relationship between the FSU (Bulgaria, Czechoslovakia, Mongolia) and each of the linkage countries is indirectly determined via Poland, which participated in both the 1985 ICP and a similar price comparison among CMEA countries including the FSU (see para 2 below).

2.   The FSU, Poland, Bulgaria, Czechoslovakia and Mongolia are among the countries included in the 1988 CMEA price comparison (Attachment 1 for PPPs per ruble). Poland, Hungary, Romania, Yugoslavia as well as Greece and Portugal are among those included in the 1985 European ICP (Attachment 2 for PPPs per Austrian schilling). Poland is included in both CMEA comparison and European ICP. It thus serves as the "linkage country" between economies included in the CMEA comparison and those in the European ICP.

Estimation of FSU's Exchange Rate per US Dollar[1]

3.   First, Poland's PPPs per Greek currency and per Portuguese currency are derived from the 1985 ICP data, as the ratios of Poland's PPP per Austrian Schilling to Greece's PPP per Schilling and to Portugal's PPP per schilling respectively.

Poland-Greece PPP=[Poland's PPP per schilling]/[Greece PPP per schilling];
Poland-Portugal PPP=[Poland's PPP per schilling]/[Portugal's PPP per schilling].

4.   Second, two alternative exchange rates for Poland are computed per U.S. dollar for 1985: one based on Poland-Greece PPP and Greece's exchange rate, and the other, based on Poland-Portugal PPP and Portugal's exchange rate. The exchange rates of Greece and Portugal used here are the official ones regularly quoted per US dollar. More specifically,

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[1]   *For simplicity sake, the procedure involving only two of the five linkage countries is discussed.*

Poland's exchange rate per $ via Greece
= [Poland-Greece PPP]*[Greece's exchange rate per $];
Poland's exchange rate per $ via Portugal
=[Poland-Portugal PPP]*[Portugal's exchange rate per $].

5.   Third, the two exchange rates of Poland for 1985 as computed in para 4 above are extended to 1988, based on Poland's inflation relative to the US inflation between 1985 and 1988. Here the inflation is measured by the movement of GNP deflator. More specifically,

Poland's exchange rate for 1988 via Greece
=[Poland's 1985 exchange rate via Greece]*[(Poland's GNP deflator, 1988)/
(Poland's GNP deflator, 1985)]/[US GNP deflator, 1988)/(US GNP
deflator, 1985)];

Poland's exchange rate for 1988 via Portugal is similarly computed.

6.   Now, Poland's PPP per ruble is taken from the 1988 CMEA price comparison. This PPP is the geometric average of two sets of Poland-FSU PPPs estimated for net material product produced - one based on Poland's economic structure and the other based on the FSU's economic structure. The FSU's exchange rate per $ for 1988 via Greece is then computed as the ratio of Poland's 1988 exchange rate per $ via Greece, as computed in para 5 above, to the Poland's PPP per ruble. The FSU's exchange rate per $ for 1988 via Portugal is computed similarly. More specifically,

FSU's exchange rate per $ for 1988 via Greece
=[Poland's exchange rate per $ for 1988 via Greece]/[Poland's PPP per ruble for 1988].

FSU's exchange rate per $ for 1988 via Portugal
=[Poland's exchange rate per $ for 1988 via Portugal]/[Poland's PPP per ruble
for 1988].

7.   The FSU's 1988 exchange rates per $ via Greece and Portugal are extended to 1990 respectively, based on the FSU's inflation relative to the US inflation between 1988 and 1990.

8. Finally, a geometric average of these extrapolated exchange rates is taken as the SACF for the FSU.

Estimation of Alternative Exchange Rates for Bulgaria, Czechoslovakia and Mongolia

9.   For these countries, which were also included in the 1988 CMEA price comparison, the average 1990 exchange rate per $ was derived analogously to the case for the FSU. One additional step was to compute the PPP with Poland from the 1988 CMEA data, for each of

41

these countries. For example,

Bulgaria-Poland PPP for 1988 = [Bulgaria's PPP per ruble for 1988]/[Poland's
PPP per ruble for 1988];
Bulgaria's exchange rate per $ for 1988 via Greece
=[Bulgaria-Poland PPP for 1988]*[Poland's exchange rate per $ via Greece for 1988];
Bulgaria's exchange rate per $ for 1988 via Portugal
=[Bulgaria-Poland PPP for 1988]*[Poland's exchange rate per $ via Portugal for 1988].

Estimation of Alternative Exchange Rates for Hungary, Poland, Romania and Yugoslavia

10.   For Hungary, Poland and Yugoslavia, the alternative sets of alternative exchange rates per U.S. dollar are first derived from the 1985 ICP data via the comparator countries, extended to 1990 and then averaged. For example,

Poland-Greece PPP for 1985
=[Poland's PPP per schilling for 1985]/[Greece's PPP per schilling for 1985];
Poland's exchange rate per $ for 1985 via Greece
=[Poland-Greece PPP for 1985]*[Greece exchange rate per $ for 1985];
Poland's exchange rate per $ for 1990 via Greece
=[Poland's 1985 exchange rate per $ for 1985 via Greece]*[(Poland's GNP deflator for
1990)/(Poland's GNP deflator for 1985)]/[(U.S.GNP deflator for 1990)/(U.S. GNP
deflator for 1985)];

11.   For Romania, which was included in the 1975 ICP together with Hungary and Yugoslavia, Romania-Hungary PPP and Romania-Yugoslavia PPP are first computed from the 1975 ICP data. These two PPPs are then extended to 1985 based on Romania's inflation relative to Hungary's and Yugoslavia's during 1975-85. These extended PPPs are linked to Hungary's alternative exchange rates per U.S. dollar via comparator countries, for 1985 respectively, in order to derive Romania's alternative exchange rates per U.S. dollar for 1985. Finally, these exchange rates per U.S. dollar are extended to 1990, and then averaged.

COEFFICIENTS OF PURCHASING POWER OF CMEA MEMBER COUNTRY CURRENCIES BASED ON NATIONAL INCOME IN 1988

(Units of national currency per ruble)

	Based on the structure of national income produced 1/		Based on the structure of national income used	
	USSR	COUNTRY	USSR	COUNTRY
Bulgaria	1.42	1.37	1.43	1.34
GDR	5.12	4.29	5.14	4.28
Cuba	--	--	1.18	1.45
Mongolia	6.24	14.85	6.29	4.96
Poland	325.52	276.06	327.83	279.81
USSR	1.00	1.00	1.00	1.00
Czechoslovakia	13.67	12.59	13.74	12.79

Source: CMEA Secretariat (mimeo), undated.

1/ National Income refers to net material product.

Purchasing Power Parities per Austrian Schilling
1985

Countries	Gross Domestic Product
Greece	4.658
Portugal	3.989
Poland	4.193
Hungary	1.040
Yugoslavia	6.890

ICP 1990 Preliminary Results for Austria and the FSU

Table 1 shows how from basic price observations, a summary purchasing power parity (PPP) estimate of rubles per US dollar was made for FSU for 1990.

Starting from actual 1990 price observations in FSU and Austria for about 800 items of consumption and investment, we concentrated on a subset of tradeable items which excluded services and construction. The first step (details shown in SD/II/E) was to compute Ruble/Austrian Schilling (R/ASch) price relative for all matching items which were grouped into ICP basic headings. The price relatives were converted to rubles per US dollar via ASch/US$ exchange rate.

The second step was to aggregate these individual relatives into higher levels of aggregation. Normally, ICP would have expenditure weights at the basic heading level. However, since FSU weights were available only at a higher level of aggregation (for instance Meat rather than separately for Beef, Pork, Mutton, poultry, etc.), an estimate of PPP at this higher level was obtained using a simple geometric mean of the item price relatives appearing under the heading. These aggregates were further summarized into yet higher levels of aggregation (for instance, meat, fish, vegetables, etc into food) using the GDP expenditure weights of Austria.

The third and final step was to adjust these PPPs by a quality and diversity index (explained in SD/II/E). This index summarizes the differences in quality and diversity of products in Europe Group 2 countries (Hungary, Poland and Yugoslavia, or G2) vis-a-vis the OECD countries. The index measures the ratio of average prices in 1985 of generic items priced by Austria when it was compared with OECD countries to those priced by Austria when it was compared with the G2 countries. An index of more than 100 signifies higher quality for OECD than for G2 countries. The adjustment was done at the most detailed level possible. When aggregated using Austria's weights[1], for final household consumption the unadjusted PPP was 0.61 rubles per dollar and the adjusted PPP was 0.88 rubles per dollar.

Whether or not to use the adjusted PPP in preference to the unadjusted one is still being debated (see SD/II/E). Also, the unadjusted PPP presented here refers to tradeable goods entering into final household consumption; the PPP for final household consumption will most certainly be lower if non-tradeable items (notably services) are included in the calculation.

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[1] Only Austria's weights were used because they are the most undistorted weights available.

COUNTRY---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
FIN FINAL CONSUMPTION OF HOUSEHOLDS		0.61	138	0.88		54.3
FOOD, BEVERAGES & TOBACCO		0.62	102	0.59	13.4	21.5
FOOD		0.51	99	0.57	10.2	15.5
BREAD AND CEREALS		0.31	99	0.32	1.4	1.9
RICE	0.066	0.75	122	0.92		
FLOUR, OTHER CEREALS						
FLOUR	0.035	0.40	98	0.39		
OTHER CEREALS	0.029	0.33		0.33		
BREAD						
WHITE BREAD	0.022	0.25	98	0.25		
OTHER BREAD	0.015	0.17		0.16		
BAKERY PRODUCTS, BISCUITS, CAKE						
PERISHABLE BAKERY PRODUCTS	0.019	0.22		0.21		
UNPERISHABLE BAKERY PRODUCTS	0.035	0.40		0.39		
RUSKS						
NOODLES, MACARONI, SPAGHETTI, E	0.026	0.29	90	0.28		
CEREAL PREPARATIONS			63			
INFANT FOOD						
OTHER CEREAL PREPARATION	0.022	0.25				
MEAT		0.42	86	0.40	2.8	3.8
BEEF AND VEAL			90			
BEEF			90			
GM Beef	0.065	0.74		0.66		
GM Meat, ground	0.032	0.36		0.32		
VEAL	0.055	0.63	63	0.40		
PORK	0.116	1.31	78	1.03		
*LAMB GOAT MUTTON			105			
@LAMB & MUTTON						
FRESH LAMB & MUTTON	0.055	0.63		0.66		
FROZEN LAMB & MUTTON	0.016	0.18		0.19		
POULTRY			104			
FRESH POULTRY	0.064	0.73		0.75		
FROZEN POULTRY	0.076	0.86		0.89		
@OTHER FRESH MEAT, INCL. GOAT			100			
OFFAL						
GM Innards	0.022	0.25		0.25		
GM Meat by-products	0.029	0.33		0.33		
OTHER DOMESTIC ANIMALS						
GAMES, WILD, FOWL	0.042	0.48		0.48		
*OTHER MEAT, EXCL. GOAT						
DRIED OR PROCESSED MEAT, ETC.						
MEAT PREPARATIONS, READY TO	0.038	0.43		0.43		
DRIED, SMOKED MEAT PREPARATI						
PERISHABLE MEAT PREPARATIONS						
CANNED MEAT	0.026	0.30		0.30		
&DELICATESSEN						
FISH			107			
@FRESH/FROZEN FISH & SEAFOOD						
*FISH FRESH/FROZEN						
FRESH FISH						
GM Fish, high quality	0.018	0.20		0.21		
GM Fish, medium quality	0.028	0.32		0.34		
GM Fish, low quality	0.041	0.47		0.50		
FROZEN FISH	0.012	0.14		0.15		
&FISH DRIED/SMOKED						
PROCESSED FISH/SEAFOOD, CANNED,						
$SMOKED OR PRESERVED FISH & SEAF						
*OTHER SEAFOOODS						
MILLK, CHEESE, EGGS		0.34	93	0.31	1.8	2.5
MILK FRESH	0.035	0.39		0.37		
*MILK PRESERVED	0.017	0.19		0.18		
OTHER MILK PRODUCTS	0.027	0.31		0.29		
*CHEESE	0.021	0.24		0.23		
EGGS, EGG PRODUCTS	0.070	0.80		0.74		
OILS AND FATS		0.75	112	0.84	0.7	1.0
BUTTER	0.040	0.46	107	0.49		
$MARGARINE, EDIBLE OILS & LARD						
@MARGARINE, EDIBLE OIL						
& MARGARINE	0.058	0.66	111	0.73		
& EDIBLE OILS	0.086	0.97	117	1.14		
#LARD, EDIBLE FAT	0.093	1.06		1.24		

/1 via market exchange rate (AS11.37=$1),

COUNTRY---> UNIT OF ACCOUNT---> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
FRUITS, VEGETABLES, TUBERS		0.63	115	0.80	1.9	3.3
FRUITS						
&FRESH FRUITS			100			
%FRESH FRUITS, TROPICAL/SUBTR	0.128	1.45		1.67		
%OTHER FRESH FRUITS	0.116	1.32		1.52		
DRIED, FROZEN, PRESERVED, AS JU						
&DRIED FRUITS, NUTS	0.108	1.23		1.42		
FROZEN & PERSERVED FRUITS AN						
FROZEN FRUITS	0.035	0.40		0.46		
PRESERVED FRUITS, JUICES,	0.101	1.15		1.33		
VEGETABLES						
FRESH VEGETABLES	0.059	0.68	138	0.93		
%DRIED, FROZEN, PRESERVED VEGETA						
&DRIED VEGETABLES	0.016	0.18		0.25		
&FROZEN/PRESERVED VEGETABLES						
FROZEN VEGETABLES	0.028	0.32		0.45		
PRESERVED OR PROCESSED VEG	0.036	0.41		0.57		
TUBERS, INCLUDING POTATOES						
*POTATOES	0.051	0.58		0.80		
*MANIOC & OTHER TUBERS						
OTHER FOODS		0.70	100	0.70	1.6	2.5
COFFEE, TEA, COCOA						
COFFEE	0.132	1.51	101	1.52		
TEA	0.032	0.36	101	0.37		
COCOA	0.028	0.32	101	0.32		
SUGAR, SWEETS, SPICES						
SUGAR	0.064	0.72	100	0.72		
OTHER FOODS						
JAM, SYRUP, HONEY, & THE LIK						
HONEY	0.116	1.32		1.32		
JAM, MARMELADES, SYRUP, ET	0.048	0.55		0.55		
%SUGAR PRODUCTS, CHOCOLATE, I						
& CHOCOLATE	0.181	2.05		2.05		
& ICE CREAM & EDIBLE ICE						
& CONFECTIONRY	0.050	0.57		0.57		
CONDIMENTS, SPICES, SALT, ET	0.033	0.38		0.38		
BEVERAGES		1.03	98	1.01	1.6	5.2
NON-ALCOHOLIC BEVERAGES		1.23	112	1.38	0.3	0.2
&MINERAL WATER, SOFT DRINKS						
$MINERAL WATER	0.130	1.48		1.65		
$SOFT DRINKS	0.091	1.03		1.16		
ALCOHOLIC BEVERAGES		1.02	94	0.96	1.3	5.0
%LIQUORS & SPIRITS	0.172	1.95		1.84		
WINE, CIDER						
FRUIT WINE AND CIDER	0.076	0.86		0.81		
DESSERT WINE, VERMOUTH	0.104	1.18		1.11		
CHAMPAGNE, SPARKLING WINE	0.048	0.55		0.52		
BEER	0.091	1.03		0.97		
&OTHER ALCOHOLIC BEVERAGES						
TOBACCO		0.22	128	0.29	1.4	0.9
CIGARETTES						
CIGARETTES WITHOUT FILTER	0.013	0.15		0.19		
CIGARETTES WITH FILTER-DOMES	0.023	0.27		0.34		
CIGARETTES WITH FILTER-IMPOR	0.012	0.13		0.17		
#CIGARS, CIGARILLOS						
$OTHER TABACOO PRODUCTS & STIMUL	0.041	0.47		0.60		
CLOTHING AND FOOTWEAR		0.61	109	0.87	6.2	8.3
CLOTHING		0.61	101	0.79	5.3	6.5
%CLOTHING MATERIALS						
WOOLEN MATERIALS (100%)						
WOOLEN MATERIALS, MIXTURES						
COTTON MATERIALS (100%)						
COTTON MATERIALS, MIXTURES						
NATURAL MATERIALS INCL. MIXT	0.044	0.50		0.58		
OTHER MATERIALS	0.056	0.63		0.73		
MEN'S CLOTHING			126			
MEN'S COATS	0.102	1.16		1.45		
MEN'S SUITINGS						
MEN'S SHIRTS						
MEN'S KNITWEAR	0.065	0.74		0.93		
MEN'S UNDERWEAR	0.056	0.63		0.80		

/1 via market exchange rate (AS11.37=$1),

COUNTRY--->	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
MEN'S OTHER CLOTHING						
WOMEN'S CLOTHING			112			
WOMEN'S COATS	0.098	1.11		1.24		
WOMEN'S TWO PIECES, DRESSES	0.078	0.89		0.99		
WOMEN'S KNITWEAR	0.073	0.83		0.93		
WOMEN'S UNDERWEAR	0.081	0.92		1.03		
WOMEN'S OTHER CLOTHING						
CHILDRENS' CLOTHING						
CHILREND'S GARMENTS (3 TO 13	0.035	0.40	100	0.40		
INFANTS' CLOTHING (0 - 2 YEA						
BOYS' AND GIRLS' UNDERWEAR	0.047	0.53		0.53		
@MEN'S AND BOYS' UNDERWEAR						
@WOMEN'S AND GIRLS' UNDERWEAR						
*CLOTHING ACESSORIES						
@HABERDASHERY, MILLINERY	0.041	0.47		0.54		
CLOTHING, RENTAL AND REPAIR	0.011	0.12				
FOOTWEAR		0.60	153	1.27	1.0	1.8
FOOTWEAR, MEN'S						
MEN'S STREETSHOES	0.081	0.92		1.40		
MEN'S OTHER FOOTWEARS	0.063	0.71		1.09		
FOOTWEAR, WOMEN'S						
WOMEN'S STREETSHOES	0.082	0.93		1.42		
WOMEN'S OTHER FOOTWEARS	0.100	1.13		1.73		
FOOTWEAR, CHILDREN'S, IN						
INFANT'S FOOTWEAR						
OTHER CHILDREN'S FOOTWEAR	0.050	0.56		0.86		
REPAIRS TO FOOTWEAR	0.011	0.12				
GROSS RENT, FUEL, POWER		0.48			11.1	2.9
GROSS RENT		0.77	143	1.10	7.9	1.6
RENTS						
RENTS OF TENANTS						
IMPUTED RENTS OF OWNER-OCCUPIER						
$GROSS RENT FOR MODERN DWELLINGS						
$GROSS RENT FOR TRADITIONAL DWEL						
&RENT OF APARTMENTS						
&RENT OF HOUSES						
GM Rents in houses I	0.069	0.78		1.12		
GM Rents in houses II	0.075	0.85		1.21		
GM Rents in houses III	0.069	0.78		1.12		
GM Rents in houses IV	0.074	0.84		1.20		
REPAIR MAINTENANCE OF H						
$MATERIALS FOR INDOOR REPAIRS	0.054	0.62		0.88		
$LABOR CHARGED FOR INDOOR REPAIR	0.002	0.03				
SANITARY SERVICES & WATER CHARGES						
FUEL AND POWER		0.12			3.3	1.3
ELECTRICITY	0.022	0.25		0.35		
%GAS						
&TOWN, NATURAL GAS	0.015	0.16		0.24		
&LIQUEFIELD GAS						
LIQUID FUELS	0.005	0.06				
OTHER FUELS						
$FIREWOOD	0.002	0.03				
COAL, COKE & OTHER SOLID FUL						
COAL, COKE	0.019	0.21				
PURCHASED HEATS	0.016	0.18				
HOUSE FURNISHINGS, OPERATIONS		0.37	156	0.73	4.0	3.1
FURNITURES & APPLIANCES			181	0.81	3.0	
FURNITURES. ETC		0.41	208	0.85	1.8	1.7
FURNITURE, FIXTURES			250	1.21		
GM Kitchen furnishings	0.068	0.78		1.62		
GM Sleep set	0.058	0.65		1.36		
GM Livingroom furniture	0.070	0.80		1.66		
GM Folding furniture	0.023	0.27		0.55		
GM Mattresses	0.063	0.72		1.49		
FLOOR COVERINGS						
CARPETS & CARPET-LIKE FLOOR						
OTHER FLOOR COVERINGS						
GM Floor covering	0.100	1.13		2.36		
GM Vinyl asbestos floor cove	0.023	0.26		0.55		
$REPAIRS TO FURNITURE, FIXTURE,	0.002	0.03				
HOUSEHOLD TEXTILES			144	0.88	0.3	

/1 via market exchange rate (AS11.37=$1),

COUNTRY---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
HOUSEHOLD TEXTILES, ETC.						
UPHOLSTERY AND DECORATIVE MA	0.086	0.97		1.40		
BLANKETS, QUILTS, ETC	0.037	0.42		0.61		
BEDLINEN, TABLELINEN, TOWELS	0.049	0.55		0.80		
REPAIRS TO HOUSEHOLD TEXTILES &	0.015	0.17				
MAJOR HOUSEHOLD APPLIANCES		0.39	126	0.68	0.7	0.5
REFRIGERATORS, FREEZERS, & SIMI	0.069	0.78	141	1.10		
$WASHING & CLEANING APPLIANCE						
@WASHING APPLIANCES	0.086	0.97	111	1.08		
@CLEANING APPLIANCES						
@CLOTH DRYING, IRONING APPLIANCE						
&COOKING WASHING HEATING						
%COOKING & OTHER FOOD WARMING AP						
ELECTRIC COOKING APPLIANCES	0.044	0.50		0.63		
OTHER COOKING APPLIANCES	0.047	0.54		0.67		
OTHER:SEWING MACHINES, ELECTRIC						
OTHER HOUSEHOLD APPLIANCES	0.029	0.33		0.42		
&SEWING, KNITTING MACHINES	0.050	0.56		0.71		
$HH-TYPE ROOI CLIMATE EQUIP. CON						
ELECTRIC HEATING APPLIANCES	0.049	0.56		0.71		
OTHER HF TING APPLIANCES	0.032	0.36		0.46		
REPAIRS TO MA.)R HOUSEHOLD APPLIAN	0.002	0.03				
OTHER H'HOLD GO!)S AND SERVICES		0.29		0.46	1.0	0.9
OTHER HOUSHOL' GOODS						
%GLASSWARE, TABLEWARE, & H.H UTE						
&GLASSWARE $ TABLEWARE						
GLASSWARE	0.023	0.26		0.33		
TABLEWARE	0.065	0.74		0.94		
&CUTLERY AND FLATWARE	0.043	0.49		0.62		
&KITCHEN & DOMESTIC UTENSILS						
COOKING UTENSILS	0.021	0.24		0.31		
OTHER HOUSEHOLD UTENSILS	0.016	0.18		0.23		
REPAIRS TO GLASSWARE, TABLEW						
GARDEN APPLIANCES						
GM Gardening accessories	0.043	0.48		0.61		
GM Gardening tools	0.017	0.20		0.25		
ELECTRIC LIGHT-BULBS, POINTS, W	0.030	0.34		0.43		
HOUSEHOLD OPERATION						
NON-DURABLE HOUSEHOLD GOODS						
$PAPER PRODUCTS FOR HOUSEHOLD	0.133	1.51		1.90		
*CLEANING MAINTENANCE SUPPLIE						
GM Laundry soap	0.044	0.50		0.64		
GM Dishwashing liquid	0.033	0.38		0.47		
GM Scouring powder and shoe	0.017	0.19		0.24		
GM Cloths brush and tea towe	0.038	0.44		0.55		
&LAUNDRY, DRY CLEANING	0.014	0.16				
$OTHER NON-DURABLE HOUSEHOLD	0.022	0.24		0.31		
DOMESTIC SERVICES	0.001	0.01				
HOUSEHOLD SERVICES						
MEDICAL CARE & SERVICES (INCL PUBLIC EXP						3.2
MEDICAL & PHAMACEUTICAL PRODUCTS		0.12				
PHAMACEUTICAL PRODUCTS						
DRUGS & MEDICAL PREPARATIONS	0.015	0.17				
MEDICAL SUPPLIES	0.010	0.11				
THERAPEUTIC APPLIANCE & EQUIPMENT						
EYEGLASSES	0.013	0.15				
ORTHOPAEDIC APPLIANCES & OTHER	0.008	0.09				
HEALTH SEFVICES(INCL PUBLIC EXP)						
SERVICES OF PHYSICIANS, NURSES, &						
SERVICES OF PHYSICIANS/GENERAL						
$SERVICE OF PHYSICIANS, G						
$SERVICES OF PHYSICIAND, P						
SERVICES OF SPECIALISTS						
SERVICES OF DENTISTS						
$SERVICES OF DENTISTS, G						
$SERVICES OF DENTISTS, P						
%SERVICES OF NURSES						
%HOSPITAL SERVICES						
$HOSPITAL SERVICES, G						
$HOSPITAL SERVICES, P						
$OTHER MEDICAL SERVICES						

/1 via market exchange rate (AS11.37=$1),

COUNTRY---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
&SERVICES OF OTHER MEDICAL PRACT						
&MEDICAL ANALYSIS						
HOSPITAL CARE & THE LIKE						
&MEDICAL PERSONNEL						
PHYSICIANS, NURSES AND OTHER M						
NON-MEDICAL STAFF						
&OTHER THAN MEDICAL PERSONNEL						
GOODS AND SERVICES OF INTERMED						
DEPRECIATION						
PUBLIC MEDICAL CARE (CURRENT CONSU						
TRANSPORT AND COMMUNICATIONS		0.35				3.5
PERSONAL TRANSPORTATION EQUIPMENT		0.63	273	1.71	2.3	1.4
PASSENGER CARS	0.096	1.09	153	1.67		
OTHER PERSONAL TRANSPORT						
MOTOR BIKES, MOTORIZED BICYC	0.051	0.58	439	2.55		
BICYCLES	0.034	0.39	302	1.18		
OPERATION COSTS OF TRANSPORTATION EQ		0.22	132	0.47	5.2	0.4
TIRES, TUBES, ACCESSORIES						
GM Tires	..					
GM Car parts	0.052	0.59		0.78		
REPAIR CHARGES FOR PERSONAL TRA	0.008	0.09	.			
%FUEL & LUBRICANTS (GASOL.NE, OI						
&MOTOR FUELS	0.025	0.28	98	0.28		
&OIL, GREASE						
OTHER EXPENSES (PARKING, TOLLS,	0.012	0.14				
PURCHASED TRANSPORT		0.15	70	0.10	1.5	1.3
LOCAL TRANSPORT						
$LOCAL TAXIS	0.013	0.15		0.10		
$LOCAL BUSES, TRAMS, & THE LIKE	0.013	0.15		0.11		
$OTHER LOCAL TRANSPORTS	0.009	0.10		0.07		
LONG DISTANCE TRANSPORT						
&RAIL, BUS TRANSPORT						
%RAILWAY TRANSPORT	0.013	0.15		0.10		
%ROAD TRANSPORT (LONG TRANSPORT)	0.018	0.20		0.14		
&AIR, SEA, OTHER						
%AIR TRANSPORT	0.014	0.16		0.11		
$OTHER LONG DISTANCE TRANSPORT						
OTHER EXPENSES RELATED TO PURCHASE						
COMMUNICATIONS		0.19		0.14	1.0	0.4
POSTAL COMMUNICATION	0.031	0.35		0.25		
#TELEPHONE, TELEGRAPH						
$TELEPHONE CHARGE						
GM Telephone/telegram servic	0.016	0.18		0.13		
GM Prepaid telephone call	0.010	0.11		0.08		
$TELEGRAPH CHARGE						
RECREATION, ENTERTAINMENT, EDUCATION, &					8.4	6.3
EQUIPMENT AND SERVICES					3.2	1.8
EQUIPMENT FOR RECREATIONS & ETC.	.	4.09	141	5.78	1.4	1.0
%RADIOS, TELEVISIONS, PHONOGRAPH						
&RADIO SETS	0.671	7.63	110	8.39		
&TV SETS	0.193	2.19	182	3.98		
&RECORD-PLAYERS, TAPE & CASSE	0.354	4.03				
MUSICAL INSTRUMENTS, BOATS, AND						
MUSIC INSTRUMENTS						
OTHER MAJOR DURABLE GOODS	0.046	0.53		0.82		
PHOTOGRAPHIC, CINEMATOGRAPHIC,						
GM Cameras	0.228	2.60				
GM Photo equipment	0.060	0.68				
$SEMI & NON-DURAL GOODS						
FILMS, OTHER PHOTOGRAPHIC SU						
RECORDS, TAPES, CASSETTES &	0.041	0.47		0.73		
&SPORTS GOODS, ACCESSORIES	0.069	0.79		1.23		
GAMES, TOYS, SMALL MUSICAL I	0.033	0.38		0.59		
FLOWERS AND OTHER RECREATION	0.116	1.32		2.06		
&OTHER RECREATIONAL EQUIPMENT	0.014	0.16				
$REPAIR TO EQUIPMENT & ACCESSORI						
REPAIRS TO RADIOS, TV SETS,						
REPAIRS TO OTHER MAJOR DUABL						
REPAIRS TO OTHER RECREATIONA						
SERVICES FOR RECREATIONS & ETC.		0.17	108	0.19	1.2	0.3
PUBLIC ENTERTAINMENT						

/1 via market exchange rate (AS11.37=$1),

COUNTRY ---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
$CINEMA, THEATRE, SPORTS GROUND,						
&CINEMA, THEATRE, CONCERT						
THEATRES, CONCERTS	0.009	0.10				
CINEMA	0.008	0.09				
&OTHER (INC. STADIUM, ZOO, M						
GM Football games	0.013	0.15				
GM Outdoor recreation	0.027	0.31				
TELEVISION & RADIO LICENCE; HIR						
RADIO, TV LICENCE	0.010	0.12				
PHOTOGRAPHIC SERVICES	0.048	0.54				
OTHER ENTERTAINMENT, RELIGIOUS, R						
BOOKS, NEWSPAPERS, MAGAZINES, & OT		0.22	93	0.21	0.5	0.5
&BOOKS, BROCHURES	0.016	0.18		0.17		
&MAGAZINES, NEWSPAPERS, PER	0.024	0.27		0.25		
STATIONARY FOR EDUCATIONAL PURPOSE						
EDUCATION, INCL. PUBLIC EXPENDITURES						4.5
EDUCATION FEES						
$PRIMARY EDUCATION						
PRIMARY EDUCATION, G						
PRIMARY EDUCATION, P						
$SECONDARY EDUCATION						
$SECONDARY EDUCATION, G						
$SECONDARY EDUCATION, P						
$TERTIARY EDUCATION						
$TERTIARY EDUCATION, G						
$TERTIARY EDUCATION, P						
OTHER EDUCATION EXPENDITURES						
COMPENSATION FOR EDUCATION						
@FIRST AND SECOND LEVEL TEACH						
@COLLEGE TEACHERS						
COMMODITIES FOR EDUCATION						
@PHYSICAL FACILITIES FOR EDUC						
@EDUCATIONAL BOOKS, SUPPLIES						
@OTHER EDUCATIONAL EXPENDITUR	0.072	0.82				
EDUCATION (EXCL. PUBLIC EXPENDITURE						
EDUCATION, PUBLIC EXPENDITURES						
MISCELLANEOUS GOODS, SERVICES		0.35	172	0.61	10.0	5.4
PERSONAL CARE		0.38	172	0.67	1.5	1.5
BARBER AND BEAUTY SHOPS	0.014	0.16	150	0.24		
%TOILET ARTICLES (ALL KINDS)						
&DURABLE AND SEMI-DURABLE TOI						
COSMETIC ARTICLES	0.048	0.54		0.93		
&NON-DURABLE TOILET ARTICLES	0.035	0.40		0.68		
*JEWLLERY, WATCH, ETC. - PERSONA	0.086	0.97	102	0.99		
#OTHER PERSONAL CARE GOODS						
TRAVEL GOODS AND BAGGAGE ITE	0.046	0.52		0.90		
OTHER PERSONNAL GOODS NEC						
*STATIONERY FOR NON-EDUCATIONAL	0.016	0.18				
OTHER						
RESTAURANTS, CAFES, & HOTELS		0.34			8.5	3.9
$WORKERS' CAFETERIAS	0.021	0.24				
%RESTAURANTS, CAFES, ETC	0.027	0.30				
&RESTAURANTS, CATERING SERVICE						
HOTELS, LODGINGS						
HHOTELS, SIMILAR LODGING PLAC	0.005	0.06				
PPACKAGED TOURS						
FINANCE, OTHER SERVICES						
$FINANCIAL SERVICES (BANK SERVIC	0.159	1.80				
$SERVICES N.E.C.	0.054	0.62				
$WELFARE SERVICES						
NET EXPENDITURES OF RESIDENTS ABROAD					-3.1	
$RESIDENT PURCHASE ABROAD						
$NON-RESIDENT PURCHASE						
CAP CAPITAL FORMATION						
DOMESTIC CAPITAL FORMATION					24.9	28.9
GROSS FIXED CAPITAL FORMATION					22.7	
PRODUUCER DURABLES		0.66			10.0	11.2
MACHINERY & NON-ELECTRICAL EQUIPME		0.54			6.4	5.8
&PRODUCTS OF PROCESSING						
PRODUCTS OF PROCESSING OF ME	0.071	0.80				
PRODUCTS OF BOILER MAKING	0.016	0.18				

/1 via market exchange rate (AS11.37=$1), .

COUNTRY---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
%ENGINES, TURBINES	0.060	0.68				
*AGRICULTURAL MACHINERY						
@TRACTORS	0.049	0.56				
@OTHER AGRICULTURAL MACHINERY	0.031	0.35				
OFFICE MACHINERY & EQUIPMENT	0.075	0.86				
*METAL & WOODWORKING MACHINERY						
@METALWORKING MACHINERY						
WOODWORKING MACHINERY						
&TOOL, FINISHED METAL						
CONSTRUCTION & MINING & OILFIEL						
$CONSTRUCTION & EARTH MOVING	0.038	0.43				
$MINING & OILFIELD MACHINERY						
@SPECIAL IND.MACHINERY, INCL.WOO						
&SPECIAL IND.MACHINERY, INCL.PAP						
MACHINERY FOR FOOD, CHEMICAL &						
$FOOD MACHINERY	0.030	0.34				
$TEXTILE & LEATHER WORKING MACHI	0.104	1.18				
$CHEMICAL, PETROLEUM & RUBBER IN						
%GENERAL INDUSTRIAL MACHINERY	0.064	0.73				
%SERVICE INDUSTRIAL MACHINERY	0.051	0.58				
&OTHER MACHINERY EQUIPMENT						
&PRECISSION, OPTICAL INSTRUMENTS						
PRECISION INSTRUMENTS						
OPTICAL INSTRUMENTS & PHOTOG						
ELECTRICAL MACHINERY & APPLIANCE		1.44				1.4
&ELECTRICAL EQUIPMENT, INCL. LIG	0.352	4.00				
&ELECTRICAL EQUIPMENT FOR INDUST	0.065	0.74				
%ELECTRICAL GENERATION, TRANSMIS	0.068	0.77				
%RADIO, TC, & OTHER COMMUNICATIO	0.132	1.50				
%OTHER ELECTRICAL EQUIPMENT	0.270	3.07				
@INSTRUMENTS, TELECOMMUNICATION	0.075	0.85				
MEASURING INSTRUMENTS						
OPTICAL INSTRUMENTS, PHOTOGR						
OTHER INSTRUMENTS						
TRANSPORTATION EQUIPMENT		0.57				4.0
&MOTOR VEHICLES, ENGINES						
$RAILWAY VEHICLES	0.039	0.44				
LOCOMOTIVES, VANS & WAGONS						
@ LOCOMOTIVES						
@ OTHER RAILWAY VEHICLES						
$PASSNGER MOTOR CARS & OTHER MOT						
@PASSENGER AUTOMOBILES	0.075	0.85				
@TRUCKS, BUSES, TRAILORS						
UTILITY CARS, TRUCKS						
GM Delivery vehicles	0.075	0.86				
GM Trucks	0.053	0.61				
BUSES	0.016	0.19				
%AIRCRAFT	0.076	0.86				
%SHIPS, BOATS	0.047	0.53				
%OTHER TRANSPORT EQUIPMENT	0.057	0.64				
OTHER						
%FURNITURE, FIXTURES						
%OTHER PRODUCER DURABLE GOODS						
CONSTRUCTION						17.7
RESIDENTIAL BUILDINGS						4.6
#FAMILY DWELLINGS						
#MULTIFAMILY DWELLINGS						
OWN ACCOUNT CONSTRUCTION						
NON-RESIDENTIAL BUILDINGS						8.2
AGRICULTURAL BUILDINGS						
INDUSTRIAL BUILDINGS						
&BUILDINGS FOR MARKET SERVICE						
&BUILDINGS FOR NON-MARKET SERVIC						
$COMMERCIAL BUILDINGS (INCL. HOT						
@COMMERCIAL BUILDINGS (EXCL. HOT						
@HOTELS & OTHER NON-HOUSEKEEPING						
@OFFICE BUILDINGS						
%EDUCATIONAL BUILDINGS						
%HEALTH BUILDINGS						
%OTHER BUILDINGS						
OTHER						4.9

/1 via market exchange rate (AS11.37=$1),

COUNTRY---> UNIT OF ACCOUNT--> SOURCE----> YEAR------>	FSU R/AS ECP 1990	FSU R/$ /1 1990	Generic Quality, Diversity Adjustment	Adjusted R/$ 1990	Austria % GDP OECD 1985	FSU % GDP Goskomsta 1985
OTHER CONSTRUCTIONS						
#TRANSPORT ROUTES, ROADS, BRIDGE						
#TRANSPORT & UTILITY OTHER THAN						
#OTHER CIVIL ENGINEERING						
LAND IMPROVEMENT						
OTHER PRODUCTS						
CHANGES IN STOCKS						3.1
CHANGES IN STOCKS						
BREEDING STOCK & DAIRY CATTLE						
BREEDING STOCK AND DAIRY CATTLE						
NET FOREIGN BALANCE						1.1
NET FOREIGN BALANCE						
GOV GOVERNMENT EXPENDITURES						12.6
TOTAL GOVERNMENT EXPENDITURES						
COMPENSATION OF EMPLOYEES						
@UNSKILLED BLUE COLLAR						
@SKILLED BLUE COLLAR						
@WHITE COLLAR						
@PROFESSIONAL						
$UNSKILLED EMPLOYEE						
$SEMI-SKILLED, BLUE COLLAR OCCUP						
$SEMI-SKILLED, WHITE COLLAR OCCU						
$SKILLED EMPLOYEE						
COMMODITIES, INCL.PURCHASES OF GOODS						
NET PURCHASES OF GOODS & SERVIC						
CONSUMPTION OF FIXED ASSETS						
GENERAL PUBLIC EXPENDITURES						
COMPENSATION OF EMPLOYEES						
COMMODITIES, INCL.PURCHASES OF						
HEALTH-GENERAL ADMINISTRATION,REGULATI						
COMPENSATION OF EMPLOYEES						
COMMODITIES, INCL.PURCHASES OF						
EDUCATION-GENERAL ADMINISTRATION,REGUL						
COMPENSATION OF EMPLOYEES						
NET PURCHASE OF GOODS & SERVICE						
GRO GROSS DOMDOMESTIC PRODUCT						100.0

Quality and Diversity Adjustments

Table 2 presents the data and calculations underlying the quality and diversity index.

In order to improve comparability of items, Austria, by design, matched different sets of items in OECD and G2 countries. Austria thus has two faces, one looking west (OECD countries) an another looking east (G2 countries). A careful tabulation of matched sets indicates that in Austria the items matching with G2 countries were, by and large, cheaper than those matching with OECD countries. Since both sets of prices refer to Austria, the ratio between OECD and G2 average prices is taken as a measure of difference in quality. Column (7) of table 2 shows the geometric means of price relatives of Austria looking west, and column (9) shows those of Austria looking east. Column (8), the quality-diversity index, is the ratio of column (7) to column (9) and multiplied by 100.

It is also noticed that under each generic heading, a wider diversity of products are available in OECD countries; however, in some instances when the quality is low, the reverse situation may hold - many items that have vanished from the OECD markets (because they have been replaced by better quality items) are available in greater diversity in the G2 markets. An allowance for this could be made to the quality index. If this adjustment becomes critical in our assessment of PPPs, we will assemble detailed specifications of items priced both in OECD and G2 countries and come up with a measure of diversity. In this table, no such adjustment has been made.

Whether or not the FSU PPPs should be adjusted for this quality difference is still being debated. The price relatives are first used to estimate implicit quantity relatives. If Austria has two implicit quantities, one embodying higher quality (and lower quantity) and another lower quality (and higher quantity), clearly for G2 or FSU comparison, it is the lower quality estimate that is of relevance; the PPP and the quantity estimates are already adjusted for quality differences. If, on the other hand, FSU is compared directly (not via Austria) with another country which prices only one basket, the PPP between FSU and the country should be adjusted for quality. To compare uncorrected quantities would be clearly wrong as the countries with low quality would seem to have lower prices and higher quantities than a properly matched comparison would warrant.

If FSU were thrown in with the rest of the OECD countries and transitive multilateral indices were computed via CPD (Country-Product-Dummy method) or EKS, then FSU PPPs items will find matches with relatively lower quality items, the PPP will be unduly low and the resulting real quality estimate unduly high. It is, therefore, essential that FSU be compared via Austria and not directly with other countries.

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
FINAL CONSUMPTION OF HOUSEHOLDS	0.10	0.08					138				
Food, Beverages & Tobacco	0.14	0.11					102				
Food	0.14	0.11	0.04	0.04	0.41	2.79	99				
Bread And Cereals	0.11	0.11	0.33	0.33	3.12	21.20	99				
Rice	0.17	0.17	2.51	2.52	8.9	18.11	122				
Rice 1	0.17	0.14	2.51	2.52	8.9	18.11		14.79	Rice, lon	16.35	1.00
Rice 2				0.00	16.4				Rice, lon	12.98	0.79
Rice 3				3.64	26.6				Rice,shor	14.49	1.00
Rice 5	0.86			2.51	20.2				Rice,shor	11.90	0.82
Rice 6				5.45	44.6				Quick-coo	19.31	1.00
Rice 7				1.98	10.2						
Flour, Other Cerals	0.09	0.09	1.25	1.25	13.4	13.03	98				
Wheat Flour 1	0.09	0.10	1.25	1.25	13.4	13.03		13.26	Wheat flo	13.00	0.96
Wheat Flour 2				1.25	12.6				Wheat flo	13.53	1.00
Flaked Oats 1				1.28	7.2				Flaked oa	29.94	1.00
Flaked Oats 2				0.00	13.9						
Bread	0.12	0.12				23.63	98	24.00			
White Bread 1				0.27	1.6						
White Bread 5	0.12	0.12	2.84	2.84	23.6	23.63		24.00	White bre	24.00	0.50
Bakery Products, Biscu											
Noodles, Macaroni, Spa											
Cereal Preparations											
Crispbread				1.33	12.7						
Meat	0.11	0.13					86				
Beef And Veal	0.12	0.15					87				
Beef	0.14	0.16	19.58	29.87	156.1	121.93	90	135.37		279.10	1.00
Beef 1	0.14	0.16	19.58	29.87	156.1	121.93		135.37	Beef to f	279.10	1.00
Beef 2				19.09	123.4				Beef to f	166.93	0.60
Beef 3				18.08	124.3				Beef to f	147.38	0.53
Beef 4				31.14	166.9				Beef, sho	106.57	1.00
Beef 5				43.26	279.1				Beef, sho	104.91	0.98
Beef 7				22.38	117.7				Beef, sho	109.00	1.02
Beef 8				16.56	106.6				Beef, rou	123.45	0.95
Beef 9				9.35	89.6				Beef, rou	130.16	1.00
Beef 11				15.02	80.8				Beef, rou	124.33	0.96
Beef 12				11.45	71.6				Beef, rou	123.63	0.95
Veal							63				
Veal 2	0.08	0.13	14.26	21.10	151.8	113.73		181.77	Average a	183.83	1.00
Veal 3				9.64	85.2				Veal cutl	151.77	1.00
									Veal brea	85.22	1.00
									Veal leg,	230.79	1.00
									Veal leg,	215.66	0.93
									Veal leg,	219.00	0.95
									Veal leg,	215.66	0.93
									Veal leg,	215.66	0.93
Pork	0.11	0.14					78				
Pork 1	0.11	0.14	9.47	11.11	82.1	69.77		89.79	Pork, rou	103.50	1.00
Pork 2				8.07	59.3				Pork, rou	100.05	0.97
									Pork, rou	94.81	0.92
									average a	99.45	1.00
									Pork, sho	49.50	0.59
									Pork, sho	83.31	1.00
									average e	83.31	1.00
									Pork, cho	74.72	0.45
									Pork, cho	83.67	0.50
									Pork, cho	166.98	1.00
									average h	108.46	1.00
* Lamb Goat Mutton	0.06	0.06					105				
Lamb 1	0.06	0.06	6.56	0.00	120.5	107.84		102.23	Lamb, who	91.33	0.86
Lamb 2				18.08	98.5				Lamb, cut	110.71	1.00
Lamb 4				15.61	105.7				Lamb, who	105.67	1.00
Poultry	0.10	0.09					104				
Chicken 1	0.06	0.05	2.11	0.00	36.9	40.92	123	33.26	Fresh chi	36.00	1.00
Chicken 2				9.45	44.0				Fresh chi	30.72	0.85
Chicken 3				0.00	42.3						

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Cooked Ham	0.11	0.11	18.62	18.62	168.0	168.00	100	168.00	Pressed h	168.00	1.00
Chicken Soup	0.13	0.14	1.16	1.16	8.2	8.18	92	8.90	Chicken s	8.90	1.00
* Other Meat, Excl. Goat	0.14	0.14					100				
Beef Tongue	0.16	0.16	11.31	11.31	69.8	69.76	100	69.76	Tongue, b	69.76	1.00
Pig Liver	0.09	0.09	5.64	5.64	62.2	62.24	102	61.10	Liver, po	61.10	1.00
Beef Liver	0.13	0.13	8.77	8.77	66.3	66.30	100	66.30	Liver, be	66.30	1.00
Veal Liver	0.16	0.16	27.23	27.23	174.5	174.53	100	174.53	Liver, ve	174.53	1.00
Rabbit	0.20	0.20	18.36	18.36	94.0	94.00	100	94.00	Rabbit	94.00	1.00
Fish	0.12	0.11					107				
Cod	0.16	0.12	11.73	11.73	97.9	97.86	132	73.89	Cod (fill	73.89	1.00
Plaice	0.10	0.10	7.48	7.48	73.9	73.89	100	73.89	Plaice	73.89	1.00
Trout 1	0.11	0.11	12.20	12.20	114.9	114.89	100	114.89	Trout	114.89	1.00
Carp	0.14	0.14	11.99	11.99	87.1	87.07	100	87.07	Carp	87.07	1.00
Trout 2		0.09	4.25	4.25	46.8	46.76					
Trout 3		0.00	0.00	0.00	76.4	76.42					
Milk, Cheese, Eggs	0.12	0.13					93				
Pasteurised 1	0.09	0.11	0.92	1.07	11.6	8.34	81	10.29	Fresh mil	11.60	1.00
Pasteurised 2				0.80	6.0				Fresh mil	9.12	0.79
Chicken Eggs 1	0.16	0.15	0.35	0.19	2.5	2.28	108	2.11	Fresh egg	2.52	1.00
Chicken Eggs 2				0.22	2.6				Fresh egg	2.05	0.81
Chicken Eggs 3				0.00	1.8				Fresh egg	1.83	1.00
Oils And Fats	0.07	0.06					112				
Butter 1	0.00	0.00	0.00	2.25	22.2	88.80	107	83.22	Fresh but	88.80	1.00
									Fresh but	78.00	1.00
Margarine 1	0.04	0.03	1.27	1.31	11.6	39.68	111	35.66	Margarine	46.54	1.00
Margarine 3				1.23	8.5				Margarine	28.80	0.62
									Margarine	33.84	0.73
Olive Oil 1	0.14	0.12	9.71	9.71	82.5	82.50	117	70.35	Olive oil	70.35	1.00
Fruits, Vegetables, Tubers	0.19						115				
Fruits	0.24						100				
Oranges 1	0.15	0.12	2.11	3.93	16.6	17.00	118	14.44	Oranges	16.56	1.00
Oranges 2				0.00	14.2						
Oranges 3				5.00	28.2						
Oranges 4				0.00	12.6				Oranges	12.60	0.76
Grapefruit	0.28	0.39	3.65	3.65	9.4	9.39	72	13.00	Grapefrui	9.39	0.52
									Grapefrui	18.00	1.00
Apples 1	0.19	0.19	3.30	3.58	15.2	17.73	100	17.68			
Apples 2				0.00	15.3						
Apples 3				4.81	16.1						
Apples 4				4.12	27.0						
Apples 5				3.92	17.7				Apples	17.68	1.00
Pears 1				4.67	17.5				Pears	17.46	1.00
									Pears	15.60	0.89
Peaches	0.00	0.00	0.00	0.00	21.8	21.82	108	20.23	Peaches	21.82	1.00
									Peaches	18.75	0.86
White Grapes	0.41	0.38	6.06	6.06	16.1	16.13	110	14.70	Grapes	16.13	1.00
									Grapes	13.40	0.83
Watermelon	0.00	0.00	0.00	0.00	13.3	13.25	100	13.25	Water mel	13.25	1.00
Strawberries	0.00	0.00	0.00	0.00	46.8	46.73	100	46.73	Strawberr	46.73	1.00
Vegetables	0.18						138				
Cauliflower	0.24	0.14	3.18	3.18	23.0	22.95	174	13.15	Cauliflow	22.95	1.00
									Cauliflow	7.54	0.33
White Cabbage	0.11	0.11	0.80	0.80	7.5	7.53	100	7.53	White cab	7.53	1.00
Cabbage Lettuce	0.19	0.06	2.50	3.35	35.8	43.08	335	12.87	Lettuce	35.78	1.00
									Lettuce	4.63	0.13
Iceberg Lettuce				4.69	51.9						
Tomatoes	0.37	0.27	5.23	5.23	19.5	19.52	136	14.32	Tomatoes	19.52	1.00
									Tomatoes	10.50	0.54
Cucumber	0.28	0.16	3.39	3.39	21.2	21.21	175	12.10	Ground cu	21.21	1.00
									Ground cu-	6.90	0.33
Green Beans	0.00	0.00	0.00	0.00	27.1	27.06	118	22.85	Green bee	27.06	1.00
									Green bee	19.30	0.71
Yellow Onions	0.17	0.17	1.71	1.71	10.1	10.10	100	10.10	Onions	10.10	1.00
Carrots	0.15	0.13	1.50	1.50	11.3	11.31	110	10.26	Carrots	11.31	1.00
									Carrots	9.30	0.82
Mushrooms	0.10	0.10	7.51	0.75	7.9	78.70	100	78.65	Mushrooms	78.65	1.00
Tubers, Including Potatoes	0.19	0.19					101				
Other Foods											

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	Observed Prices AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Cocoa Powder 1	0.33	0.33	35.55	3.56	10.7	107.40	101	106.32	Cocoa pow	106.32	1.00
Granule Sugar 1	0.10	0.10	1.58	1.58	15.2	15.20	100	15.20	Sugar (co	15.20	1.00
Beverages	0.13	0.13					98				
Non-Alcoholic Beverages	0.11	0.10					112				
Cola 1	0.11	0.10	1.27	2.01	15.8	13.17	112	11.81	Coca-cola	14.83	1.00
Cola 3				0.00	38.5						
Cola 4				1.33	9.4				Coca-cola	9.40	1.00
Cola 7				1.21	9.4						
Orangeade				0.69	5.6						
Lemonade				0.80	8.1						
Orange Squash				3.02	27.7						
Alcoholic Beverages	0.14	0.14					94				
Scotch Whisky 2	0.08	0.11	22.38	22.38	199.0	198.99	71	278.83	Whisky	278.83	1.00
Local Spirit	0.23	0.23	16.31	16.31	71.4	71.36	100	71.42	National	71.42	1.00
Red Wine 1	0.18	0.13	5.65	4.06	28.1	41.99	135	31.21	Table win	46.18	1.00
Red Wine 2				5.29	32.9				Table win	28.40	0.61
Red Wine 4				8.42	80.3				Table win	23.18	0.50
White Wine 1	0.21	0.17	5.79	5.79	33.4	33.40	120	27.77	White win	44.38	1.00
									White win	24.26	0.55
									White win	19.89	0.45
Beer 98b	0.06	0.12	1.06	0.00	12.5	9.17	53	17.15			
Beer 13A				1.18	10.0						
Beer 14B				0.00	13.9						
Beer 23A				0.69	5.4						
Beer 24				0.00	7.3						
Beer 25				1.06	7.1						
Beer 26A				1.70	11.3				Beer in b	10.77	1.00
Vermouth	0.14	0.13	7.06	7.06	55.8	55.84	114	48.87	Vermouth	55.96	1.00
									Vermouth	38.11	0.68
									Vermouth	54.72	0.98
Tobacco	0.16	0.12					128				
Cigarettes 1	0.16	0.12	3.81	3.68	20.3	30.74	128	23.99	Cigarette	20.06	1.00
Cigarettes 2				3.68	28.0				Filter ci	22.18	1.00
Cigarettes 3				3.73	30.0				Filter ci	31.02	1.00
Cigarettes 5				4.08	36.0						
Cigarettes 6				3.84	31.0						
Cigarettes 8				3.84	34.0						
Cigarettes 9				3.89	45.0						
Cigarettes 10				3.84	33.0						
*				3.78	24.6						
Cigarettes 13				3.75	32.0						
Clothing And Footwear	0.10	0.09					109				
Clothing	0.11	0.10					101				
Men's Clothing	0.12	0.10					126				
Overcoat 1	0.17	0.15	360.82	378.62	2,301.7	2,470.42	114	2,158.56	Men's win	2,616.31	1.00
Overcoat 2				403.93	2,980.9				Men's win	1,780.89	1.00
Car-Coat				307.16	2,197.4						
Raincoat	0.12	0.13	225.33	225.33	1,788.8	1,788.79	98	1,831.02	Men's rai	2,136.68	1.00
									Men's rai	1,698.00	0.79
									Men's rai	1,692.00	0.79
Suit 1	0.13	0.11	321.16	374.82	3,071.8	2,801.13	116	2,410.00	Men's sui	2,734.00	1.00
Suit 2				275.19	2,554.3				Men's sui	2,465.00	1.00
									Men's sui	2,077.00	0.84
Trousers 1	0.04	0.04	27.97	95.33	734.2	650.18	100	649.58	Men's sla	767.00	1.00
Trousers 2				0.00	624.7				Men's sla	692.00	1.00
Jeans 1				75.03	573.3				Men's sla	621.88	0.90
Jeans 2				85.60	679.5				Men's sla	539.43	1.00
Jacket 1	0.16	0.13	256.86	259.06	1,878.6	1,962.42	125	1,570.14	Men's jac	2,077.55	1.00
Jacket 2				254.69	2,050.0				Men's jac	1,535.00	0.74
									Men's jac	1,657.27	1.00
									Men's jac	1,150.00	0.69
Shirt 1	0.14	0.14	43.74	34.56	207.6	319.13	104	307.99	Men's shi	200.00	1.00
Shirt 2				55.36	490.5				Men's shi	474.29	1.00
Sports Shirt 1	0.18	0.07	38.76	38.76	531.5	531.47	241	220.98	Sport shi	248.00	1.00
									Sport shi	196.90	0.79
Pyjamas 1	0.04	0.04	14.28	50.52	443.6	384.59	114	336.91	Men's pyj	438.97	1.00

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Pyjamas 2				0.00	358.1				Men's pyj	240.00	0.55
Pyjamas 3				57.65	358.1				Men's pyj	363.00	0.83
Pullover	0.13	0.07	47.53	47.53	676.4	676.41	192	352.76	Men's pul	398.39	1.00
									Men's pul	312.36	1.00
T-Shirt 1	0.13	0.09	16.30	22.34	215.4	190.79	147	130.12	T-shirt	130.12	1.00
T-Shirt 2	0.17	0.14	11.05	11.89	169.0	81.34	127	64.00			
Briefs 1				14.89	102.7				Men's bri	64.00	1.00
Briefs 2				7.98	40.5						
Briefs 3				14.18	111.1						
Briefs 4				8.24	45.6						
Overcoat	0.20	0.15	397.50	397.50	2,617.0	2,616.97	133	1,972.02	Women's w	2,640.40	1.00
									Women's w	1,777.50	0.67
									Women's w	1,634.00	0.62
Raincoat	0.11	0.13	191.26	191.26	1,501.1	1,501.09	88	1,706.88	Women's r	1,918.00	1.00
									Women's r	1,519.00	0.79
Women'S Clothing	0.11	0.10					112				
Dress 1	0.19	0.14	169.20	194.76	1,421.4	1,214.01	136	893.37	Women's d	1,897.00	1.00
Dress 2				147.00	1,036.8				Women's d	698.00	0.37
									Women's d	1,250.00	1.00
									Women's d	872.00	0.70
									Women's s	745.67	0.99
									Women's s	670.00	0.89
									Women's s	745.00	0.99
									Women's s	755.32	1.00
Skirt 1	0.16	0.15	121.98	105.53	700.9	795.78	107	744.63	Women's s	908.72	1.00
Skirt 2				140.99	903.4				Women's s	827.00	0.91
									Women's s	668.46	1.00
									Women's s	612.00	0.92
Trousers 1	0.04	0.03	21.08	106.15	705.3	634.91	119	533.25	Women's s	688.55	1.00
									Women's s	385.00	0.56
Trousers 2				88.27	571.6				Women's t	572.00	1.00
Blouse 1	0.14	0.14	52.77	52.77	375.7	375.73	100	376.38	Women's b	376.38	1.00
Pullover	0.12	0.14	67.16	67.16	482.5	482.53	89	540.10	Women's p	612.84	1.00
									Women's p	476.00	0.78
Briefs 1	0.07	0.05	4.33	10.36	70.6	80.41	127	63.08	Women's p	78.15	1.00
Briefs 2				8.15	84.0				Women's p	55.00	0.70
Briefs 3				4.15	58.2				Women's p	69.50	0.89
Briefs 4				0.00	121.1				Women's p	53.00	0.68
Childrens' Clothing	0.09	0.09					1				
Boys Jacket	0.09	0.09	59.16	59.16	648.2	648.21		648.33	Boy's coa	648.33	1.00
Footwear	0.08	0.05					153				
Classic Shoes 2	0.03	0.02	18.35	167.48	916.6	892.40	160	557.84	Classic l	917.22	1.00
Classic Shoes 3				0.00	1,426.4						
Casual Shoes 1				128.47	1,271.4				Street sh	698.00	1.00
Casual Shoes 2				96.82	740.6				Street sh	550.00	0.79
Sports Shoes 1				0.00	459.8				Street sh	275.00	0.39
Causal Shoes 1	0.17	0.12	94.55	112.31	947.4	812.10	147	553.05	Women's d	807.81	1.00
Casual Shoes 2				79.61	696.1				Women's d	600.00	0.74
									Women's d	349.00	0.43
Gross Rent, Fuel, Power	0.20	0.14									
Gross Rent	0.29	0.20					143				
Flat 1	0.29	0.20	7.38	7.65	36.8	36.85	143	25.74	Rents (be	24.80	0.56
Flat 2				6.43	27.9				Rents (19	27.66	0.63
Flat 3				4.65	21.8				Rents (af	44.18	1.00
Flat 4				6.09	26.7				Rents (be	19.49	0.44
Flat 5				5.88	26.5				Rents (19	22.85	0.52
Flat 7				9.19	39.8				Rents (af	37.62	0.85
Flat 9				7.32	31.9				Rents (be	20.73	0.47
Flat 11				5.14	24.0				Rents (19	21.61	0.49
Flat 13				6.89	27.8				Rents (af	43.37	0.98
Flat 15				6.69	31.7				Rents (be	18.02	0.41
Flat 18				9.19	62.6				Rents (19	21.74	0.49
Flat 20				10.52	62.6				Rents (af	37.36	0.85
Flat 22				7.32	53.8				Rents (an	15.06	0.34
Flat 24				6.89	39.5						
Flat 26				6.69	38.6						

Austria vs. Germany: A Two-Stage Comparison

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
COUNTRY---> CURRENCY--> SOURCE----> YEAR------>	(East) DM/AS PPP'	(West) DM/AS PPP	Geom. Mean DM	Observed Prices DM	AS/unit	Geom. Mean AS/unit	Quality & Diversity Gap (%)	Geom. Mean AS/unit	G2 Descriptor	Observed Prices AS/unit	
Flat 29				9.47	58.5						
Flat 31				11.56	58.5						
Flat 32				8.05	50.3						
Flat 33				8.56	45.9						
Flat 34				8.30	43.7						
House 1				3.94	23.0						
House 2				6.70	31.4						
House 3				6.78	31.8						
House 5				7.00	34.9						
House 7				6.78	35.2						
House 9				7.00	35.5						
House 11				8.73	40.2						
House 12				8.70	38.4						
Flat 1				7.79	36.8						
Flat 2				6.65	27.9						
Flat 3				4.67	21.8						
Flat 4				6.13	26.7						
Flat 5				5.91	26.5						
Flat 7				10.55	39.8						
Flat 9				7.89	31.9						
Flat 11				5.33	24.0						
Flat 13				7.09	27.8						
Flat 15				6.65	31.7						
Flat 18				10.55	62.6						
Flat 20				11.33	62.6						
Flat 22				7.89	53.8						
Flat 24				7.09	39.5						
Flat 26				6.65	38.6						
Flat 29				9.67	58.5						
Flat 31				11.89	58.5						
Flat 32				10.08	50.3						
Flat 33				9.58	45.9						
Flat 34				9.33	43.7						
House 1				3.91	23.0						
House 2				6.70	31.4						
House 3				6.67	31.8						
House 5				6.96	34.9						
House 7				6.67	35.2						
House 9				6.96	35.5						
House 11				8.47	40.2						
House 12				8.50	38.4						
Paint 2	0.21	0.14	22.05	22.05	154.2	154.23	144	107.45	Interior	107.45	1.00
Fuel And Power											
House Furnishings, Operations	0.07	0.03						156			
Furnitures & Appliances	0.09	0.04						208			
Furnitures, Etc	0.11	0.04						250			
Base Unit 1	0.07	0.04	88.85	126.04	1,118.3	2,241.14	173	1,280.09	Base unit	1,445.00	1.00
Base Unit 2				351.00	3,233.3				Base unit	1,134.00	0.78
Base Unit 7				436.55	4,840.6						
Base Unit 8				286.76	1,793.3						
Base Unit 9				0.00	1,801.4						
Cabinet 1				133.28	1,176.5						
Cabinet 2				193.95	1,626.9						
Cabinet 3				223.49	1,884.9						
Cabinet 4				148.01	1,368.9						
Chairs 1	1.00	0.20	436.62	351.27	2,388.3	2,186.40	500	437.00			
Chairs 3				1555.33	12,722.9						
Chairs 4				184.89	458.4				Wooden ch	437.00	1.00
Chairs 5				359.77	1,640.5						
Double Bed 1				411.19	3,457.6						
Double Bed 5				952.94	8,609.7						
Double Bed 6				0.00	11,666.9						
Drawers 1				242.99	990.8						
Garden Chair 1				311.17	2,690.0						
Garden Chair 2				116.73	945.0						
Garden Chair 4				108.21	664.0						
Garden Chair 5				216.82	1,698.0						
Garden Table 1				791.25	6,222.5						

Austria vs. Germany: A Two-Stage Comparison

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Garden Table 2				379.54	3,290.0						
Garden Table5				596.38	5,110.0						
Lamp 1				56.83	258.0						
Lamp 3				379.20	3,201.3						
Lamp 5				42.55	153.8						
Mirror 1				81.62	639.8						
Mirror 3				352.32	3,170.3						
Mirror Glass				188.55	625.4						
Rocking Chair 1				207.50	1,511.2						
Seat Unit 1				1337.92	8,018.4						
Seat Unit 9				300.48	3,423.2						
Single Bed 2				176.13	856.3						
Single Bed 3				322.89	1,840.0						
Small Table 1				307.88	2,456.9						
Sofa 1				1808.00	10,074.4						
Table 1				297.54	1,710.3						
Table 3				2200.64	15,001.2						
Tilltable Umbrel				117.72	792.9						
Wall System 1				997.14	3,989.2						
Wall System 2				1615.30	16,586.8						
Wall Unit 1	0.08	0.04	74.16	112.62	1,163.8	1,978.53	201	984.00	Wall unit	984.00	1.00
Wall Unit 2				227.81	2,087.8						
Wall Unit 7				368.70	4,222.1						
Wall Unit 8				237.19	2,485.5						
Wall Unit 9				0.00	1,189.1						
Wardrobe 1	0.03	0.01	67.99	267.59	2,284.9	5,181.50	222	2,338.69	Wardrobe,	2,693.00	1.00
Wardrobe 4				1911.09	14,029.1				Wardrobe	2,031.00	1.00
Wardrobe 5				1018.34	9,202.1						
Wardrobe 6				0.00	16,449.0						
Wardrobe 7	.			189.76	2,173.7						
Wardrobe 8				0.00	1,835.0						
Household Textiles	0.12	0.08					144				
Carpet 2				154.90	1,669.8						
Carpet 4	↖			50.67	669.6						
Carpet 5				111.74	1,369.7						
Doormat	0.17	0.11	70.32	70.32	624.4	624.40	151	413.78	Door mat	789.00	1.00
									Door mat	217.00	0.28
Floor Covering 1	0.13	0.11	28.45	29.95	195.8	259.87	115	225.80	Floor cov	140.00	0.68
Floor Covering 2				37.00	345.1				Floor cov	206.00	1.00
Floor Covering 5				25.23	211.1				Floor cov	144.00	0.70
Floor Covering 9				23.44	319.7				Floor cov	626.00	1.00
Carpet Laying 1				124.10	1,228.6						
Spring Matress 1				132.91	1,422.9						
Spring Mtress 10				356.10	3,162.0						
Polyether Mtrs 2				242.93	1,735.7						
Fabric 1				26.11	156.5						
Fabric 2				23.57	164.6						
Fabric 3				32.36	288.3						
Blanket	0.14	0.06	16.76	72.26	406.9	267.36	217	123.29	Woolen bl	401.00	1.00
									Blanket,	114.00	1.00
Plaid 1				46.79	455.5				Plaid	41.00	1.00
Plaid 2				23.31	103.1						
Bottom Sheet 1	0.20	0.18	9.53	6.51	34.0	52.14	107	48.80	White she	48.60	0.99
Bottom Sheet 2				13.95	79.9				White she	69.00	1.00
Terry Towel 1	0.04	0.02	5.04	25.25	142.2	211.76	155	137.00	Bath towe	137.00	1.00
Terry Towel 2				0.00	275.5						
Terry Towel 3				25.63	255.1						
Terry Towel 4				0.00	201.2						
Material 1				8.16	49.6						
Material 2				16.91	124.5						
Material 3				22.73	166.0						
Material 4				9.00	98.6						
Major Household Appliances	0.02	0.02					126				
Refrigerator 1	0.04	0.03	116	423.05	2,890.2	3,965	141	2,820			
Refrigerator 2	↗			0.00	3,183.8				Refrigera	18.18	0.53
Refrigerator 3				533.62	4,347.5				Refrigera	34.53	1.00
Refrigerator 4				762.85	6,177.8				Refrigera	35.72	1.00
Wash Machine 1	0.01	0.00	40	0.00	4,503.7	8,682	232	3,734	Washing m	6,452.42	0.65

Austria vs. Germany: A Two-Stage Comparison

COUNTRY---> CURRENCY---> SOURCE---> YEAR------> (1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Wash Machine 2				1030.41	6,110.3				Washing m	4,150.00	0.42
Wash Machine 4				0.00	7,211.6				Washing m	9,907.52	1.00
Wash Machine 6				2488.04	19,351.0				Washing m	2,069.90	0.21
Wash Machine 7				0.00	5,413.0				Washing m	1,322.42	0.13
Wash Machine 9				0.00	6,870.9						
Wash Machine 10				0.00	11,925.7						
Wash Machine 11				1723.09	13,177.7						
Wash Machine 12				1630.33	10,079.3						
Wash Machine 13	0.03	0.02	233	1470.36	10,758.8	9,638	111	8,709			
Dishwasher 3				985.86	7,164.6						
Dishwasher 4				1605.81	14,230.1						
Dishwasher 6				2374.92	20,180.4						
Dishwasher 9				1366.92	10,139.8						
Dishwasher 10				0.00	5,800.7						
Dishwasher 11				0.00	6,767.0				Dish wash	8,709.04	1.00
Dishwasher 13				1165.90	8,453.3						
Radiator 1	0.01	0.01	9.23	68.62	519.4	659.51	101	655.07	Room heat	805.10	1.00
Radiator 3				0.00	492.9				Room heat	533.00	0.66
Radiator 4				0.00	901.7						
Radiator 6				105.79	819.5						
Vacuum Cleaner 1	0.02	0.02	32	309.37	2,708.2	1,978	141	1,400	Vacuum cl	3,010.16	1.00
Vacuum Cleaner 2				472.85	3,908.0				Vacuum cl	1,079.00	0.36
Vacuum Cleaner 5				0.00	560.7				Vacuum cl	1,438.64	0.48
Vacuum Cleaner 6				278.15	2,168.1				Vacuum cl	821.00	0.27
Vacuum Cleaner 7				0.00	3,930.0						
Vacuum Cleanr 10				403.31	2,125.5						
Vacuum Cleanr 11				311.52	1,969.8						
Vacuum Cleanr 12				0.00	1,777.4						
Vacuum Cleanr 14				0.00	1,241.6						
Vacuum Cleanr 15				232.73	1,961.5						
Sewing Machine 1	0.03	0.04	301	0.00	2,999.0	8,230	78	10,533			
Sewing Machine 2				1489.86	12,015.9				Sewing ma	10,533.22	1.00
Sewing Machine 3				2055.75	13,991.9						
Sewing Machine 4				1559.82	11,504.4						
Sewing Machine 6				513.42	6,509.5						
Other H'Hold Goods And Servic											
Medical Care & Services (Incl P											
Transport And Communications	0.01	0.00						69			
Personal Transportation Equip	0.03	0.01						273			
Car < 1.2L 1	0.01	0.01	944	10879.64	85,409	143,114	153	93,475	Passenger	139,805	1.00
Car < 1.2L 2				11520.15	93,457				Passenger	82,627	0.59
Car < 1.2L 4				0.00	100,499				Passenger	74,990	0.54
Car < 1.2L 7				0.00	113,577				Passenger	105,000	0.75
Car < 1.2L 8				0.00	108,547				Passenger	89,700	0.64
Car < 1.2L 13				15429.27	102,914				Passenger	65,898	0.47
Car < 1.2L 16				16998.80	115,992				Passenger	65,898	0.47
Car < 1.2L 18				12938.76	93,054				Passenger	74,990	0.54
Car < 1.2L 21				13414.01	104,121				Passenger	68,100	0.49
Car < 1.2L 22				15195.93	120,217				Passenger	98,200	0.70
Car < 1.2L 23				13717.99	112,672				Passenger	76,900	0.55
Car < 1.2L 24				10490.52	85,409				Passenger	85,650	0.61
Car < 1.2L 25				0.00	90,439				Passenger	68,100	0.49
Car < 1.2L 26				14270.03	105,871				Passenger	114,600	0.82
Car < 1.2L 27				14113.11	100,499				Passenger	75,650	0.54
Car < 1.2L 29				17205.40	124,895				Passenger	122,900	0.88
Car < 1.2L 32				0.00	107,139				Passenger	76,500	0.55
Car < 1.2L 34				0.00	89,031				Passenger	144,400	1.03
Car 1.2-1.6L 1				0.00	125,649				Passenger	96,800	0.69
Car 1.2-1.6L 3				15289.22	120,519				Passenger	177,000	1.27
Car 1.2-1.6L 4				16052.36	123,729				Passenger	129,494	0.93
Car 1.2-1.6L 5				18370.44	158,919				Passenger	108,900	0.78
Car 1.2-1.6L 6				20003.64	162,936						
Car 1.2-1.6L 7				0.00	150,819						
Car 1.2-1.6L 8				16319.48	120,740						
Car 1.2-1.6L 9				19625.21	146,192						
Car 1.2-1.6L 11				16677.98	129,251						
Car 1.2-1.6L 13				0.00	121,676						
Car 1.2-1.6L 15				19473.44	147,530						

61

Austria vs. Germany: A Two-Stage Comparison

COUNTRY---> CURRENCY---> SOURCE----> YEAR------>	(East) DM/AS PPP'	(West) DM/AS PPP	Geom. Mean DM	Observed Prices DM	AS/unit	Geom. Mean AS/unit	Quality & Diversity Gap (%)	Geom. Mean AS/unit	G2 Descriptor	Observed Prices AS/unit	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Car 1.2-1.6L 16				20854.62	157,137						
Car 1.2-1.6L 17				16118.33	132,289						
Car 1.2-1.6L 18				16606.89	129,422						
Car 1.2-1.6L 19				0.00	89,132						
Car 1.2-1.6L 20				18458.91	124,241						
Car 1.2-1.6L 21				16140.83	129,472						
Car 1.2-1.6L 22				0.00	139,764						
Car 1.2-1.6L 24				15630.89	128,476						
Car 1.2-1.6L 25				0.00	111,163						
Car 1.2-1.5L 27				0.00	114,181						
Car 1.2-1.6L 28				21733.92	168,706						
Car 1.2-1.6L 29				20800.42	149,844						
Car 1.2-1.6L 30				0.00	145,870						
Car 1.2-1.6L 31				21529.98	167,781						
Car 1.2-1.6L 32				0.00	156,068						
Car 1.2-1.6L 35				21619.92	164,662						
Car 1.7L+ 1				25590.33	201,099						
Car 1.7L+ 2				19591.17	160,457						
Car 1.7L+ 4				38334.93	331,582						
Car 1.7L+ 5				0.00	304,226						
Car 1.7L+ 6				28390.46	235,806						
Car 1.7L+ 7				23771.06	183,816						
Car 1.7L+ 9				0.00	198,856						
Car 1.7L+ 12				24093.42	196,170						
Car 1.7L+ 13				30236.43	240,635						
Car 1.7L+ 14				37728.04	311,055						
Car 1.7L+ 15				29826.52	263,327						
Car 1.7L+ 16				57061.83	488,916						
Car 1.7L+ 17				0.00	226,149						
Car 1.7L+ 19				25524.00	200,999						
Motorcycle 3	0.08	0.02	718	0.00	9,643	39,360	439	8,976			
Motorcycle 5				2057.77	15,574				Motorized	9,510	1.00
Motorcycle 8				2545.86	21,331				Motorized	9,360	0.98
Motorcycle 17				3297.19	27,262				Motorized	8,900	0.94
Motorcycle 23A				3535.94	28,241				Motorized	7,650	0.80
Motorcycle 25A				3689.07	31,168				Motorized	9,650	1.01
Motorcycle 30				7909.31	68,083				Motorized	8,940	0.94
Motorcycle 33				7329.09	54,544						
Motorcycle 34				8038.06	62,275						
Motorcycle 35				9666.41	81,719						
Motorcycle 36				0.00	82,396						
Motorcycle 37				13336.82	109,575.0						
Motorcycle 38				0.00	41,482.7						
Bicycle 7	0.04	0.01	76	0.00	4,195.8	5,431	302	1,797	Men's bic	2,210	1.00
Bicycle 10				500.25	4,585.4				Men's bic	1,817	0.82
Bicycle 12				615.34	4,445.6				Men's bic	2,200	1.00
Bicycle 20				503.26	4,585.4				Men's bic	1,589	0.72
Bicycle 23				0.00	3,986.0				Men's bic	1,600	0.72
Bicycle 26				876.29	6,973.0				Men's bic	1,800	0.81
Bicycle 30				1202.60	7,517.5				Men's bic	1,500	0.68
Bicycle 32				529.58	3,890.1						
Bicycle 39				0.00	12,887.1						
Operation Costs Of Transporte	0.09	0.07						132			
Tyre 1	0.09	0.09	92	84.97	1,009.0	1,041	106	979	Tyre,radi	1,038	0.97
Tyre 2				93.18	985.1				Tyre,radi	736	0.69
Tyre 3				72.48	892.5				Tyre,radi	1,048	0.98
Tyre 4				91.39	1,023.7				Tyre,radi	1,065	1.00
Tyre 6				102.14	1,047.6				Tyre,radi	1,052	0.99
Tyre 7				113.94	1,301.2						
Tyre 8				93.14	1,026.8						
Tyre 9				93.98	1,081.2						
Car Battery 1	0.01	0.01	13	110.59	1,339.6	1,344	131	1,028	Automobil.	1,028	1.00
Car Battery 2				0.00	1,026.4						
Car Battery 4				274.62	2,125.7						
Car Battery 5				0.00	1,114.7						
Sparking Plug 1	0.07	0.05	1.52	2.99	28.7	30.85	147	20.92			
Sparking Plug 2				2.74	28.2						
Sparking Plug 3				0.00	35.0				Spark plu	25	1.00

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	AS/unit (12)
Sparking Plug 4				0.00	41.2				Spark plu	18	0.70
Sparking Plug 5				0.00	24.0						
Car Wash	0.13	0.10	5.37	5.37	52.7	52.71	132	40.00	Car wash	40	1.00
Petrol 1	0.12	0.12	1.38	1.41	11.8	11.11	98	11.33	Gasoline,	11	0.97
Petrol 2				1.42	11.6				Gasoline,	12	1.00
Petrol 5				1.40	11.3				Gasoline,	11	0.97
Diesel 1				1.34	10.5						
Diesel 2				1.34	10.3						
Engine Oil 1	0.12	0.11	10.75	9.89	89.3	96.42	112	86.30	Motor oil	86	1.00
Engine Oil 2				11.70	104.1						
Parking 2	0.23	0.10	1.62	0.77	7.0	16.62	237	7.00	Parking f	7	1.00
Parking 3				3.44	39.7						
Purchased Transport	0.14	0.18					78				
Bus Fare 1	0.11	0.16	3.49	1.40	6.0	22.07	71	31.09	Local tra	6	0.02
Bus Fare 2				1.26	6.0						
Bus Fare 3				11.52	96.0				Local tra	96	0.27
Bus Fare 4				46.06	350.0				Local tra	350	1.00
Bus Fare 5				1.40	6.5						
Bus Fare 6				2.20	18.0				Local tra	12	0.03
Bus Fare 7				2.20	18.0				Local tra	12	0.03
Domestic	0.18	0.21	84.64	84.66	407.7	407.72	86	475.20	Domestic	475	1.00
International-Eu				75.79	224.5						
Intercontinental				111.79	1,140.1						
Removal 2				687.17	3,301.7						
Left Luggage				1.92	23.8						
Communications											
Letter				0.80	4.5						
Postcard				0.90	6.5						
Parcel				6.60	32.0						
Phone Rental				22.54	165.0						
Phone Calls 1				11.42	87.5						
Phone Calls 3				20.35	122.4						
Phone Calls 4				11.42	69.9						
Phone Calls 5				0.20	1.8						
Phone Calls 6				1.10	17.5						
Phone Calls 7				1.30	12.2						
Recreation, Entertainment, Educ	0.04	0.03									
Equipment And Services	0.10	0.08					127				
Equipment For Recreations &	0.08	0.05					156				
Portable Radio 1	0.03	0.03	24.10	135.35	975.1	912.96	110	832.21	Radio por	995.85	1.00
Portable Radio 2				103.38	808.2				Radio por	695.46	1.00
Portable Radio 3				0.00	965.6						
Cassette Radio 2				327.03	4,225.5						
Cassette Radio 3				243.37	2,418.6						
Cassette Radio 4				365.39	3,378.6						
Casette Player 1	0.09	0.09	113.87	113.87	1,319.7	1,319.73	108	1,218.86	Cassette	1,218.86	1.00
Car Radio 2				0.00	4,520.5						
Car Radio 3				0.00	5,181.6						
Car Radio 6				0.00	6,103.1						
Colour Tv 1	0.02	0.01	143.04	1786.20	15,123.4	15,298.41	182	8,392.18	Color tel	9,481.23	1.00
Colour Tv 2				0.00	11,534.2				Color tel	8,347.90	0.88
Colour Tv 3				2312.19	17,931.8				Color tel	7,467.63	0.79
Colour Tv 4				0.00	19,840.1						
Colour Tv 6				1310.64	14,090.7						
Colour Tv 7				1344.83	14,289.3						
Colour Tv 9				1751.19	15,477.7						
Colour Tv 11				0.00	10,309.5						
Colour Tv 13				1966.48	23,020.9						
Video 1				1866.79	18,015.2						
Video 3				0.00	16,871.9						
Video 5				0.00	15,338.7						
Video 6				0.00	16,722.9						
Video 8				0.00	18,530.8						
Video 9				0.00	10,646.6						
Tape Deck				2712.01	24,702.9						
Record Player 1				209.64	2,521.0						
Record Player 2				367.96	4,060.9						
Turntable 2				0.00	2,641.4						

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (*)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Turntable 3				488.30	4,045.0						
Turntable 4				0.00	1,515.3						
Amplifier 1				0.00	2,328.9						
Amplifier 2				0.00	3,912.5						
Amplifier 3				0.00	2,023.8						
Amplifier 4				0.00	3,040.8						
Cassette Deck 1				0.00	2,532.3						
Loudspeaker 4	0.00	0.00	0.00	0.00	2,428.9	2,428.85	163	1,493.19	Loudspeak	1,292.12	0.55
									Loudspeak	1,088.00	0.46
									Loudspeak	2,368.19	1.00
Hi-Fi Centre 1				1408.06	10,363.2						
Hi-Fi Centre 2				0.00	18,350.1						
Hi-Fi Centre 4				1021.70	10,885.3						
Headset 1				0.00	803.4						
Headset 2				69.21	584.6						
Reflex Camera 1	0.11	0.03	182.81	782.29	8,628.7	5,763.91	337	1,711.23	Reflex ca	1,690.00	0.85
Reflex Camera 2				552.79	5,092.4				Reflex ca	1,490.00	0.75
Reflex Camera 3				781.89	6,776.0				Reflex ca	1,990.00	1.00
Reflex Camera 4				0.00	4,735.7						
Reflex Camera 5				603.88	4,511.9						
Instant Camera 1				92.07	880.8						
Instant Camera 2				91.93	1,071.4						
Pocket Camera 1				44.66	396.6						
Pocket Camera 2				107.51	1,197.1						
Cine Camera	0.42	0.17	974.24	974.24	5,637.0	5,636.95	261	2,336.25	Video cam	2,490.00	1.00
									Video cam	2,192.00	0.88
Film Projector 1	0.01	0.00	36.64	0.00	5,522.9	8,657.45	302	2,866.87	Movie pro	3,091.00	1.00
Film Projector 2				1342.77	13,570.9				Movie pro	2,659.00	0.86
Slide Projector	0.00	0.00	0.00	0.00	2,054.9	2,054.92	147	1,394.40	Slide pro	1,659.00	1.00
									Slide pro	1,172.00	0.71
Flash 1				136.21	1,390.3						
Flash 2				239.75	2,605.5						
Flash 3				0.00	2,001.9						
Flash 4				0.00	2,303.7						
Flashbulbs	0.19	0.11	7.12	7.12	65.4	65.39	172	38.05	Flash-bul	69.00	1.00
									Flash-bul	49.00	0.71
									Flash-bul	16.30	0.24
Outboard Motor 1				1293.88	12,109.9						
Outboard Motor 2				1511.16	13,168.4						
Outboard Motor 3				5394.76	46,207.5						
Electric Organ				1947.67	18,173.9						
Upright Piano				6361.75	55,549.0						
Typewriter 1	0.30	0.11	565.35	184.98	1,993.3	5,273.34	280	1,882.51	Portable	2,140.00	1.00
Typewriter 4				994.96	9,461.9				Portable	1,656.00	0.77
Typewriter 5				650.20	6,588.2						
Typewriter 7				853.70	6,223.2						
Home Computer				575.74	5,578.7						
Printer				569.46	5,699.8						
Calculator				0.00	190.9						
Electric Drill 1	0.05	0.02	40.14	240.24	2,571.2	2,311.01	283	817.79	Electric	924.00	1.00
Electric Drill 2				269.15	2,673.1				Electric	848.00	0.92
Electric Drill 4				0.00	1,795.8				Electric	698.00	0.76
Hedge Clipper 2				0.00	1,391.6						
Hedge Clipper 3				0.00	1,363.5						
Classical Lp 1	0.14	0.13	17.38	28.08	216.9	136.67	108	126.65	Phon grap	180.00	0.86
Classical Lp 2				28.08	205.0				Phonograp	209.00	1.00
Pop Record 45				6.89	57.4				Phonograp	54.00	0.26
Pop Record 33				21.83	181.7						
Pop Cassette C60	0.06	0.06	3.92	19.38	189.7	67.52	110	61.19	Cassette	72.00	1.00
Hi-Fi Cassette 1				6.77	63.5				Cassette	52.00	0.72
Hi-Fi Cassette 2				0.00	26.7						
Hi-Fi Cassette 3				0.00	65.7						
Hi-Fi Cassette 4				7.05	66.5						
Micro-Cassette 1				0.00	200.6						
Micro-Cassette 2				0.00	226.1						

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices		Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	C2 Descriptor (10)	Observed Prices	
				DM (5)	AS/unit (6)					AS/unit (11)	(12)
Micro-Cassette 3				8.63	144.7						
Video Cassette 1				29.16	206.7						
Video Cassette 3				18.40	266.9						
Game Cassette 1				0.00	307.5						
Game Cassette 2				0.00	501.5						
Game Cassette 3				0.00	566.1						
Disk Unit				805.11	6,089.0						
Football 1	0.35	0.17	179.56	179.56	1,030.5	1,030.48	200	515.00	Football	515.00	1.00
Tennis Racquet 1	0.00	0.00	10.24	371.34	2,153.1	2,351.36	99	2,364.08	Tennis ra	2,409.00	1.00
Tennis Racquet 5				0.00	2,753.0				Tennis ra	2,320.00	0.96
Tennis Racquet 6				303.29	2,017.9						
Tennis Racquet 7				0.00	2,626.3						
Tennis Racquet 8				0.00	2,288.3						
Squash Racquet				95.17	857.8						
Tennis Balls 1	0.10	0.07	7.47	31.33	99.4	104.36	143	72.80	Tennisbal	113.50	1.00
Tennis Balls 3				13.32	115.1				Tennisbal	103.00	0.91
Tennis Balls 4				0.00	99.4				Tennisbal	33.00	0.29
Alpine Skis 1				696.67	3,843.1						
Alpine Skis 2				576.75	4,005.3						
Alpine Skis 3				398.46	2,322.1						
Nordic Skis				290.60	1,510.9						
Tent 1				0.00	817.7						
Tent 2				0.00	8,132.3						
Tent 3				0.00	5,938.0						
Air-Bed				63.41	230.2						
Vacuum Flask				12.20	127.4						
Camp Stove 2	0.00	0.00	0.00	0.00	304.2	304.20	53	577.15	Camper's	539.00	0.87
									Camper's	618.00	1.00
Building Set 1				95.27	776.9						
Board Game 2				36.69	179.9						
Train Set 2				92.88	984.9						
Toy Vehicle 1				14.99	24.1						
Toy Vehicle 2				3.13	29.1						
Monocrome Film 1	0.08	0.11	6.90	7.44	62.5	60.06	73	82.00	Black & W	82.00	1.00
Monocrome Film 2				6.41	57.7						
Colour Film 1	0.12	0.07	9.10	43.03	346.1	128.66	168	76.54	Colour fi	83.00	0.72
Colour Film 2				0.00	82.7				Colour fi	54.00	0.47
Colour Film 3				10.72	106.2				Colour fi	116.00	1.00
Colour Film 4				11.55	106.2				Colour fi	66.00	1.00
Colour Film 5				11.68	109.2				Colour fi	59.00	0.89
Colour Slides 1				17.81	166.4						
Colour Slides 2				13.23	126.8						
Colour Slides 4				0.00	155.2						
Colour Slides 5				11.97	139.9						
Colour Cine-Film	0.16	0.09	17.79	17.79	203.2	203.18	183	111.00	8 colour	111.00	1.00
Azalea				49.53	182.3						
Roses Baccarat				45.62	236.0						
Roses Mercedes				34.69	193.9						
Roses Sonja				36.97	207.6						
Carnations				22.08	117.1						
Services for Recreations &	0.09	0.09				108.64					
Cinema Seat	0.14	0.14	7.73	7.73	56.9	56.90	100	56.90	Ticket fo	56.90	1.00
Football Game 1	0.18	0.15	18.31	18.31	120.0	120.00	116	103.45	Football	123.00	1.00
									Football	87.00	0.71
Devlp Clr Film 1	0.03	0.03	9.10	26.02	317.6	303.60	111	274.64	Film proc	263.60	0.92
Devlp Clr Film 2				0.00	286.2				Film proc	286.15	1.00
Devlp Clr Film 3				28.96	307.9						
Books, Newspapers, Magazine	0.16	0.17				93.49					
Novel 1	0.13	0.13	5.74	5.74	44.9	44.88	99	45.20	Crime nov	45.20	1.00
Novel 2				31.70	331.5						
Dictionary 1	0.13	0.13	29.03	29.03	220.4	220.45	99	222.00	Pocket di	222.00	1.00
Daily Paper 1	0.28	0.30	1.39	1.39	4.7	4.68	94	5.00	Daily new	5.00	1.00
Weekly Magazine	0.12	0.12	1.89	1.89	15.2	15.16	94	16.20	Magazine,	16.20	1.00
Monthly Magazine				3.96	28.1						
Road Book				41.61	365.6						
Travel Guide	0.22	0.26	39.14	39.14	149.8	149.76	83	181.11	Travel gu	205.00	1.00
									Travel gu	160.00	0.78
Language Course				8.57	70.4						

Austria vs. Germany: A Two-Stage Comparison

(1)	(East) DM/AS PPP' (2)	(West) DM/AS PPP (3)	Geom. Mean DM (4)	Observed Prices DM (5)	AS/unit (6)	Geom. Mean AS/unit (7)	Quality & Diversity Gap (%) (8)	Geom. Mean AS/unit (9)	G2 Descriptor (10)	Observed Prices AS/unit (11)	(12)
Education, Incl. Public Expen											
Miscellaneous Goods, Services	0.18	0.12					172				
Personal Care											
Other							172				
Haircut 1				20.60	187.8						
Haircut 2				19.81	185.3						
Haircut 3				14.84	95.2						
Hairdresser 1				15.73	163.0	242.90	150	162.00	Hairdress	162.00	1.00
Hairdresser 2				32.61	362.1				Hairdress	68.80	0.42
Electric Razor 1				57.20	591.8	727.66	124	589.00	Electric	589.00	1.00
Electric Razor 2				68.86	450.5						
Electric Razor 3				144.83	1,273.3						
Electric Razor 4				0.00	1,016.9						
Electric Razor 5				49.60	589.9						
Hairdryer 1				31.39	300.2	348.18	177	197.00	Electric	197.00	1.00
Hairdryer 3				27.68	299.5						
Hairdryer 5				56.67	494.8						
Hairdryer 6				39.66	330.3						
Toilet Soap 1				0.92	8.9	9.59	144	6.65	Toilet so	6.65	1.00
Toilet Soap 3				0.98	10.6						
Toilet Soap 4				0.99	9.2						
Toilet Soap 5				1.01	10.4						
Toilet Soap 6				1.02	9.0						
Toothpaste 1				2.01	16.9	15.38	80	19.11	Toothpast	19.11	1.00
Toothpaste 4				1.59	11.4						
Toothpaste 6				1.89	18.9						
Shaving Foam 1				2.93	25.8						
Shaving Cream				2.81	17.5						
Shampoo 2	0.49	0.16	4.16	4.16	26.7	26.68	316	8.43	Shampoo	8.43	1.00
Moisture Cream				2.97	22.6						
Beauty Cream 1				71.71	575.6						
Lipstick 1				19.29	137.8	155.33	275	56.55	Lipstick	56.55	1.00
Lipstick 3				22.05	175.2						
Nail Varnish 1	0.40	0.14	21.12	21.12	152.5	152.52	289	52.69	Nail poli	52.69	1.00
Eau De Cologne 2				24.05	187.4						
Eau De Cologne 3				0.00	231.0						
Eau De Cologne 5				27.42	291.0						
Eau De Toilette				84.52	728.2						
Deodorant 1	0.17	0.09	3.65	3.65	41.8	41.82	190	22.00	Deodorant	22.00	1.00
Handkerchiefs 1				2.01	17.5						
Razor Blades 1				7.64	62.3						
Dsposable Razor				0.91	9.9						
Wedding Ring 2	0.13	0.13	165.78	165.78	1,300.1	1,300.12	102	1,280.00	Wedding r	1,280.00	1.00
Travel Alarm 5				27.20	173.4						
Baby Buggy 2	0.00	0.00	0.00	0.00	1,714.4	1,714.44	96	1,790.00	Baby stro	1,790.00	1.00
Envelopes	0.04	0.08	0.81	0.81	10.3	10.33	56	18.59	Envelopes	46.71	1.00
									Envelopes	7.40	1.00
Writing Paper 1				3.38	69.9						
Writing Paper 2				3.38	58.1						
Drawing Paper 1				2.78	22.4						
Drawing Paper 2				2.23	44.8						
Ballpoint Pen 1				8.51	81.7	52.09	1367	3.81	Ballpoint	3.81	1.00
Ballpoint Pen 2				51.59	465.9						
Ballpoint Pen 3				0.60	3.7						
Staff Canteen 1				0.61	8.2						
Hotel 1				236.43	2,397.2	1,751.98	266	659.68	Hilton,In	1,068.00	1.00
Hotel 2				203.83	2,125.5				Hotel sin	654.00	1.00
Hotel 3				82.98	1,055.4				Hotel sin	411.00	0.63
Photocopies	0.17	0.17	0.57	0.57	3.3	3.35	100	3.35	Photo cop	3.35	1.00
Net Expenditures Of Residents A											
CAPITAL FORMATION											
Domestic Capital Formation											
Gross Fixed Capital Formation											
Producer Durables											
Machinery & Non-Electrical											
& Products Of Processing											
Products Of Proc											
Products Of Boil											

Austria vs. Germany: A Two-Stage Comparison

COUNTRY ---> CURRENCY --> SOURCE ----> YEAR ------>	(East) DM/AS PPP'	(West) DM/AS PPP	Geom. Mean DM	Observed Prices		Geom. Mean AS/unit	Quality & Diversity Gap (%)	Geom. Mean AS/unit	G2 Descriptor	Observed Prices	
				DM	AS/unit					AS/unit	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

% Engines, Turbines											
* Agricultural Machinery											
Office Machinery & Equ											
* Metal & Woodworking Ma											
Metalworking Mac											
Woodworking Mach											
& Tool, Finished Metal											
Construction & Mining											
a Special Ind.Machinery,											
& Special Ind.Machinery,											
Machinery For Food, Ch											
$ Food Machinery											
$ Textile & Leather Work											
$ Chemical, Petroleum &											
% General Industrial Mac											
% Service Industrial Mac											
& Other Machinery Equipm											
& Precission, Optical In											
Precision Instru											
Optical Instrume											
Electrical Machinery & Appl											
& Electrical Equipment,											
& Electrical Equipment F											
% Electrical Generation,											
% Radio, Tc, & Other Com											
% Other Electrical Equip											
a Instruments, Telecommu											
Transportation Equipment											
& Motor Vehicles, Engine											
$ Railway Vehicles											
Locomotives, Van											
$ Passnger Motor Cars &											
% Aircraft											
% Ships, Boats											
% Other Transport Equipm											
Other											
% Furniture, Fixtures											
% Other Producer Durable											
Construction											
Residential Buildings											
# Family Dwellings											
# Multifamily Dwellings											
Own Account Constructi											
Non-Residential Buildings											
Agricultural Buildings											
Industrial Buildings											
& Buildings For Market S											
& Buildings For Non-Mark											
Other											
Other Constructions											
# Transport Routes, Road											
# Transport & Utility Ot											
# Other Civil Engineerin											
Land Improvement											
Other Products											
Changes In Stocks											
Breeding Stock And Dairy Catt											
Net Foreign Balance											
Net Foreign Balance											
GOVERNMENT EXPENDITURES											
Total Government Expenditures											
Compensation Of Employees											
Commodities, Incl.Purchases O											
Net Purchases Of Goods											
Consumption Of Fixed A											
GROSS DOMESTIC PRODUCT											

Overlap Between ICP 1990 and CIA 1976 Item Prices

This note explores the extent of overlap and deviation, at the item level, between preliminary ICP results for 1990 and the CIA's 1976 exercise. While further documentation from Austria will be required to complete the matching process, the initial comparison lends credence to the hypothesis that goods in the FSU have changed far less than their US comparators; and that imputation of US price trends to constant ruble value series inserts a spurious upgrading of quality/diversity into FSU series. While that upgrading is modest from year to year, its cumulative effect could well explain much of the difference between 1990 estimates from CIA and ICP.

The PPP-based per capita GDP estimate of FSU made by CIA for 1990 is about twice as much as what is likely to come out of the ICP exercise. The CIA estimates are made by applying US price trends to constant ruble value series and then comparing the results with corresponding US current values. This note compares 1976 CIA and 1990 ICP prices of about 200 items of consumption measures the extent of price changes. The items are classified into three parts - those that are thought to match well (group 1), those that match but not so well (group 2), and the rest that are similar in nam , but do not seem to match well (group 3).

Table 3 shows the unweighted geometric means of the ratios of 1990 to 1976 prices for a total of 193 items of consumption in the three groups. It seems that the matching items registered only about 5 to 7 percent increase in prices over a period of fourteen years. Work under progress will present:

a.   revised table 3 with a more careful match of items based on detailed specifications;

b.   the result of extrapolating 1976 prices to 1990 using US price indices at the most detailed level available; and

c.   the average price relatives of the extrapolated prices to 1990 ICP prices separately for all the three classes and all of them combined.

The tables will be analyzed with a view to examining the hypothesis that FSU quantities evaluated at the extrapolated prices will tend to raise per capita GDP estimates vis-a-vis ICP.

COMPARISON OF ICP 1990 AND CIA 1976 RUBLE PRICES OF FORMER SOVIET UNION

	TOTAL	#	%	1	#	%	2	#	%	3	#	%
FOOD - 186 items												
GM	1.1867	67	36%	1.0519	25	37%	0.7302	6	9%	1.3992	36	54%
SD	2.2207			1.1158			1.1174			2.8511		
CLOTHING - 99 items												
GM	0.3978	35	35%	1.1023	18	51%	0.8022	4	11%	2.3040	13	37%
SD	1.5488			1.1116			1.1196			1.3106		
RENT, FUEL, POWER - 37 items												
GM	0.7006	4	11%	0.9937	2	50%	--		0%	0.4940	2	50%
SD	1.8650			1.0064			--			2.0748		
HOME FURNISHINGS AND FURNITURE - 117 items												
GM	1.3196	33	28%	1.0754	9	27%	0.6287	3	9%			
SD	3.9519			1.1086			1.0337			1.6015	21	64%
										5.3758		
MEDICAL PRODUCTS - 30 items												
GM	0.7664	4	13%	1.0769	1	25%	0.6667	1	25%	0.6932	2	50%
SD	2.6290			1.0000			--			3.8126		
TRANSPORT AND COMMUNICATIONS - 43 items												
GM	1.8908	16	37%	1.0770	8	50%	0.7656	3	19%	8.0042	5	31%
SD	4.6463			1.1176			1.1136			8.2331		
RECREATION - 66 items												
GM	1.4531	14	21%	1.1079	8	57%	--		0%	2.0863	6	43%
SD	1.4931			1.1058			--			1.4392		
MISCELLANEOUS GOODS AND SERVICES - 66 items												
GM	1.0918	18	27%	1.1681	7	39%	0.8000	1	6%	1.0743	10	56%
SD	1.9615			1.1092			--			2.4410		
MACHINERY - 237 items												
GM	1.5446	2	1%	0.9177	1	50%	--		0%	2.6000	1	50%
SD	1.6832			1.0000			--			1.0000		
		...			...			...			...	
TOTAL - 881		193	22%		79	41%		18	9%		96	50%

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