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Sources, Patterns and Policy Responses
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Indirect Transfers in Trade Among Former Soviet Union Republics: Sources, Patterns and Policy Responses in the Post-Soviet Period*

I. Introduction

The former Soviet Union (FSU) was composed of fifteen republics which were very unevenly endowed with human, physical and natural resources. To contain regional imbalances within the Union and to integrate all republics into a tight and centrally commanded division of labour, the Central government operated a scheme of vertical fiscal redistribution between the Union budget and the Republican budgets. Through this system poorer republics became net receivers of direct transfers and richer republics became net donors. This scheme which collapsed with the dissolution of the Union in 1991, channelled sizeable funds to the poorer Central Asian republics relative to their material product. Yet, it failed to equilibrate large existing differences between the per capita fiscal revenues of the republics [Orlowski, 1992].

Budgetary support through direct transfers, however, was not the only mechanism to redistribute income between the republics. Inter-republican trade flows in which prices for goods were set by the authorities independently from the market mechanism became the second channel of income transfers. Whenever such setting led prices to diverge from a level which would be determined by the free interaction of market forces, trade flows include a transfer element. Importers of overpriced goods "donated" parts of their income to the exporting countries. So did exporters of underpriced products vis-à-vis importers. Such implicit transfers were not unique in trade between centrally planned economies. They have sometimes also been included in trade flows between market economies.¹ Yet, contrasting to market economies, they were a central element in trade among centrally planned economies and constituted an important mechanism of inter-state income redistribution.

To abandon such a system at short notice, can result in severe adjustment problems in net recipient countries especially if import demand is price inelastic and domestic substitutes are not available. To assess the degree of adjustment requirements, it is necessary to delineate the

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¹ The arrangements of the EC with African and Caribbean sugar producers under the so-called sugar protocol of the Lomé Conventions or so-called "surprix" arrangements to overprice francophone African exports of raw materials to France and to overprice French manufactured exports to the African countries in the post-colonial period provide evidence for such transfers in market economies [Kreinin, 1973; Ndongko, 1973; Koester, Hermann, 1987].

sectoral structure of trade flows by the magnitude of deviations of domestic prices from world markets prices. For trade among the FSU republics, this is done in Section II where in particular the distinction between energy and non-energy products is highlighted. Section III discusses the regional pattern of transfers in order to identify net donors and net recipients to assess the magnitude of transfers for the individual countries. An answer to this question could allow for hints on the preference of net recipients to remain in a currency union with the net donors in order to benefit from continued direct transfers or from credits.

Having laid out the empirical evidence of indirect transfers, their underlying instruments are examined in Section IV.

Section V analyses the implications of abandoning implicit transfers in the process of economic transformation and the options which are available to facilitate adjustment towards undistorted prices. Section VI concludes on the findings and presents selected policy recommendations.

II. Indirect Transfers by Sectors

To assess the contribution of individual tradables to indirect transfers, it is necessary to relate a vector of traded quantities to vectors of both undistorted prices (preferably world market prices) and distorted prices representing domestic prices and to compare the different trade volumes.² Such a comparison is admittedly crude as it excludes reactions of purchasers to changing relative prices in terms of changing quantities supplied and demanded. Therefore, it is a "back-on-the-envelope" calculation based on a partial equilibrium analysis with fully price inelastic demand and supply.

Such an exercise was done by the former Central Statistical Office of the USSR (Goskomstat) for 1987-90 intra-Union trade in fifteen sectors. It shows to what extent intra-Union trade flows would have changed in value terms if instead of domestic prices so-called "world market" prices had been applied. It goes without saying that this approach is highly debatable for non-homogeneous goods, particularly in non-standardised manufactures in capital and intermediate goods industries. Notwithstanding such general doubts, the approach can be challenged especially for the former USSR. Due to its long-standing isolation from world markets and the political priorities under which companies had to work, these companies supplied goods for which world market prices either did not exist or were irrelevant. For instance, this held for large parts of the capital goods industry which was subordinated to the

² The term "distortions" is related solely to domestic distortions, i.e. deviations of domestic prices from world market prices. This does not exclude that world market prices might not be distorted as well, for instance, because of domestic surpluses dumped to world markets.

military-industrial complex. Thus, the exercise seems useful only for homogeneous primary commodities such as primary energy, agricultural goods, food products, and to some extent for standardised manufactures produced in light industries (textiles, footwear). However, even in these sectors the Goskomstat data should be cautiously interpreted because the price vector cannot be split between individual products. Nor do the data allow to identify exchange rates. This restricts the analysis to a plausibility test of the magnitude of differences between world market and domestic prices and their direction in individual sectors.

The matrix of intra-FSU trade flows in domestic and world market prices is reported in Appendix Table 1. The relevant extract from the raw data are averages of world market - domestic market price ratios over all republics weighted by trade volumes of individual republics in 1990 (Table 1).

Table 1 - Average World Market - Domestic Market Price Ratios in Inter-Republican Trade by Major Commodity Groups, 1990 (*)

Sectors	Ratio	Sectors	Ratio
Oil and gas	2.70	Construction materials	0.97
Electric energy	1.50	Light industry	0.33
Coal	0.94	Food industry	0.38
Other energy	0.71	Other Industrial branches	0.63
Ferrous metals	1.18	Agricultural products	0.45
Nonferrous metal	1.66	(Unprocessed)	
Chemicals and products	0.83	Communication, transpor-	1.11
Machine building	1.11	tations, services	
Wood and paper products	0.72	Total trade	0.97

(*) weighted by individual republic's trade volumes.

Source: Appendix Table 1.

Overall, the ratios display a wide spread ranging from strongly underpriced trade (relative to world market prices) in oil and gas (ratio: 2.7)³ to overpriced trade in light industries (ratio: 0.33). This spread indicates a large extent of discriminatory pricing between sectors and - as a result of that - high indirect transfers channelled from net exporters (importers) of underpriced (overpriced) goods to the net importers (exporters). In general, domestic prices

³ This ratio seems plausible in the light of estimates of the Institute of International Finance [1990] on the price of oil which the FSU charged to the CMEA members. The Institute estimated a barrel price of 5-7 US\$ compared to the world market price of 18 US\$.

differed more from world market prices in resource-based sectors including light industries and agricultural products than in manufactured goods. Given its weight in total intra-FSU trade, the oil and gas sector played a dominant role in the transfer mechanism.

Table 2 - Indirect Transfers in Inter-Republican Trade for All FSU Republics in 1990 by Major Commodity Groups (in million current rubles)

Sectors	Indirect Transfers through			
	Subsidised exports	Percentage of total	Overpriced imports	Percentage of total
Oil and gas	22552	61.5	--	--
Electric energy	966	2.6	--	--
Coal	--	--	70	0.2
Other energy (Peat)	--	--	4	0.0
Ferrous metals	2462	6.7	--	--
Nonferrous metals	3878	10.6	--	--
Chemicals and products	--	--	3216	7.5
Machine building	6333	17.3	--	--
Wood and paper products	--	--	1432	3.3
Construction materials	--	--	78	0.2
Light industry	--	--	19203	44.8
Food industry	--	--	13372	31.2
Other industrial branches	--	--	2017	4.7
Agricultural products (unprocessed)	--	--	3489	8.1
Communication, transportation, services	474	1.3	--	--
Sum of transfers	36665	100.0	42881	100.0

Data Source: Appendix Table 1.

This finding emerges from Table 2 which shows current ruble values of cumulative indirect transfers by commodity groups. In 1990, the oil and gas sector accounted for almost 61.5 per cent of transfers through underpriced exports, followed by machine building (17 per cent) and the other resource-based sectors: ferrous metals (6.7 per cent) and non-ferrous metals (10.6 per cent). The placement of machine building among sectors which domestic prices were much lower than world market prices is somewhat puzzling given the well-established myth that the former Soviet machine industry was a large recipient of transfers. But a possible explanation may lie on the side of unproportionally large direct transfers to this sector, well hidden in the military budgets and thus difficult to document. Transfers in terms of

overpriced imports concentrated on two consumer industries, i.e.: the light industry (44.8 per cent) and the food industry (31.2 per cent).

This sectoral structure of price distortions is not unique as far as its incidence is concerned. The fact that Soviet consumers carried a large burden of distortions while manufacturers of capital and consumer goods enjoyed subsidisation through easy access to cheap raw materials and intermediates can also be observed in Western economies. In these economies, the escalation of tariffs and non-tariff barriers with increasing stage of production leads to higher rates of effective protection in finished goods industries than in backward-linked industries and produces similar results. Differences between the two systems exist in the tools which they apply for achieving sectoral discrimination. While border measures prevail in Western economies, the closed economy-type of socialist economies used indirect taxes and subsidies as measures of discrimination (see below Section IV). It shall be further noted that the result of highly overpriced imports in the food and light industries may be overstated by the peculiar system of data collection and reporting in the FSU. In this system, domestic prices of export goods were in fact prices paid by trading enterprises to domestic producers (or, in other words, prices de facto received by domestic producers), while domestic prices of imported goods were actual prices paid by final domestic buyers. Thus on the export side turnover taxes are not included, while import prices included turnover taxes and other charges. A sample of recalculation aimed at eliminating this distortion is presented in Section IV of the paper.

It is noteworthy that prices for unprocessed agricultural products were closer to world market prices than prices for processed goods (food). As it is known that prices for basic food were subsidised, indirect taxation for other goods (in particular alcoholic beverages) must have been more important. It is in this sector where price comparisons become somewhat dubious because of distortions inherent in world market prices (for instance, the downward pressure on world market prices due to OECD countries' subsidised exports of their domestic surpluses).

In total, the Goskomstat figures yield that negative transfers exceeded positive transfers by about 17 per cent. The main burden of protecting domestic industries against world market competition had to be shouldered by Soviet consumers who, however, also benefited, but to a much smaller extent, from underpriced energy. The main beneficiaries of distortions were the relatively energy-intensive industries which received incentives to wastefully absorb energy. Irrespective of the regional distribution of indirect transfers among republics which is discussed in the next chapter, the results suggest a regional distribution of transfers between regions producing consumer goods and those consuming them. To some extent, these were identical regions. Consumer goods were produced mainly in and around the urban agglomerations in the European part of the Union which also hosted the largest part of the

population [Langhammer, Sagers and Lücke, 1992]. Such intra-republican flows of transfers between consumers and producers are disregarded in the following but should be taken into consideration.

III. Regional Distribution of Indirect Transfers

Indirect transfers were unevenly distributed among the FSU republics. Details of the allocations of these transfers between the republics are presented in Table 3. Without exceptions, transfers were conducted by the individual republics through underpriced exports of oil and natural gas, and overpriced imports of non-oil and gas products. On the other side, transfers were received through overpriced exports of non-oil and gas products and underpriced imports of oil and gas.

It shall be, however, noted that comparisons of domestic prices and world market prices, especially for non-oil and gas products, do not match purchasing power parity conditions since the Soviet statistical agency Goskomstat used the official Gosbank fixed exchange rate of .60 rubles per US dollar for the computation of world market prices for Soviet products [Granberg, 1992, p. 11]. Yet, the level of exchange rate does not affect the identification sectoral and regional flows of transfers since these are closely tied to distortions of Soviet relative prices as compared to world market relative prices [op.cit., p. 7].

As concerns the source and direction of indirect transfers, the FSU republics can be grouped into four boxes (Table 4). One box is filled with Russia alone as it is the only country which conceded transfers both by exporting oil and gas below world market prices and by importing non-oil and gas products above world market prices. Turkmenia and Azerbaijan as the other net exporters of underpriced oil and gas also enjoyed the receipt of transfers through their overpriced exports of non-oil and gas. They are therefore grouped in the second box but also show differences as Turkmenia was a net donor of transfers while Azerbaijan was a net recipient. Box 3 contains those four countries (Ukraine, Uzbekistan, Kazakhstan, Kirgizia) which acted as donors through importing non-oil and gas products above world market prices but also benefited from importing oil and gas (from Russia) below world market prices. For all four countries, the latter flow was quantitatively much more important so that they appeared as net recipients. Ukraine has been the most important recipient in this group so that one can conclude that the most important individual flow of indirect transfers within the FSU

Table 3 - Regional Structure of Indirect Transfers, 1990, in Millions of Current Rubles(*)

	Transfer donor through:		Transfer recipient through:		Net transfer position(**)			Net transfers as a percentage of GDP
	underpriced exports of oil & gas	overpriced imports of non-oil & gas	overpriced exports of non-oil & gas	underpriced imports of oil & gas	oil & gas	non-oil & gas	total	
Russia	15811	13867	4071	3166	12645	9796	22441	3,67
Ukraine	430	3500	2780	6979	-6549	720	-5829	(3,61)
Belorussia	1564	1281	2745	3699	-2135	-1464	-3599	(8,91)
Uzbekistan	833	2274	2113	1403	-570	161	-409	(1,26)
Kazakhstan	1672	1748	1666	1984	-312	82	-230	(0,50)
Georgia	5	917	2877	432	-427	-1960	-2387	(16,02)
Azerbaijan	936	845	2465	906	30	-1620	-1590	(10,09)
Lithuania	285	333	1479	1480	-1195	-1146	-2341	(17,09)
Moldavia	0	577	3148	532	-532	-2571	-3103	(24,05)
Latvia	7	397	1096	559	-552	-699	-1251	(10,43)
Kirgizia	24	605	516	336	-312	89	-223	(2,72)
Tadzhikistan	22	617	756	339	-317	-139	-456	(6,08)
Armenia	0	910	1439	350	-350	-529	-879	(9,16)
Turkmenia	963	583	659	98	865	-76	789	10,81
Estonia	0	329	948	287	-287	-619	-906	(12,08)

(*) There were no cases of overpriced exports(imports) of oil and gas and underpriced exports(imports) of non-oil and gas products.
(**) Positive sign indicates a net donor, negative sign a net recipient of transfer.

Source: Calculations based on data in Appendix Table 1; GNP data: Plan Econ Report, numbers: 11-13, March 24, 1992.

Table 4 - Classification of Indirect Transfers Position of the Republics Based on Underpriced Trade in Oil and Gas, and Overpriced Trade in Non-Oil and Gas Goods, 1990

		Underpriced Trade in Oil and Gas	
		Donors (Exporters)	Recipients (Importers)
Overpriced Trade in Non-oil and Gas	Donors (Importers)	Russia	Ukraine Uzbekistan Kazakhstan Kirgizia
	Recipients (Exporters)	Turkmenia Azerbaijan	Belorussia Georgia Lithuania Moldavia Latvia Tadzhikistan Armenia Estonia

Based on Data in Table 3.

was that of subsidized oil and gas products from Russia to the Ukraine.⁴ Table 3 indicates that more than 50 per cent of the Russian net transfers in oil and gas trade accrued to the Ukraine. Finally, eight former republics can be clustered into the fourth box as they were "double" recipients both by importing underpriced goods and exporting overpriced goods. Given the product composition of price-distorted trade flows, it can be assumed that these countries would be hit most by bringing domestic market prices closer to world market prices. They would have to accept much higher import prices for energy products for which domestic or non-CIS originating substitutes would not exist in the short run. On the other hand, they probably face a more price-elastic import demand of the other countries vis-à-vis their industrial exports. Thus, they would have to accept substantial barter terms of trade losses both through increased import prices and lowered export prices.

This computation, however, can only serve as a rough indicator for differences in the magnitude of transfers between the individual republics but not as a proxy for the absolute size of the transfers. Such an assessment would have to be related to the GNP in world market prices which has never been conducted by the FSU statistical authorities. A comparison of these shares (Table 3, final column) gives rise to a conclusion that a move of domestic prices

⁴ As Table 3 implies, Russia's total net subsidising position was almost as large on the side of accepting overpriced imports of non-oil and gas products as it was on the side of underpriced export of oil and gas. However, the choice of the official Gosbank exchange rate at .60 Rubles per US-Dollar had a strong impact on that balance. If the chosen rate were more realistic, i.e. assuming a much weaker ruble, the magnitude of subsidies via underpriced exports of oil versus overpriced imports of other products would be much larger.

to world market prices would result in income gains for Russia and even more substantially for Turkmenia. On the other hand, losses would occur for Lithuania, Moldavia, and Georgia.

Such effects have partly materialised in 1992 when all republics gradually moved to world market prices and when, most notably, Russia applied them to its sales of oil and natural gas to other republics as of October 1992. It is still too premature to find data assessing the degree of quantity adjustments and income shocks induced by a widespread move to world prices in inter-republican trade [Noren and Watson, 1992]. Apart from the price elasticities of demand estimates of such trade-related income shocks would have to take the following effects into consideration that, first, there would be an increase in prices of final output in each sector. This increase would be higher in relatively energy-intensive sectors than in other sectors. In any case, the net imports would decline in real terms against the net exports. Secondly, there would be changes in relative prices between former subsidised and discriminated sectors followed by a reallocation of resources between the sectors.

Since the FSU demand for oil and natural gas can be assumed highly inelastic, Russia, by moving to world prices for its resource exports has undoubtedly induced sharp real income declines in other republics. Furthermore, since deliveries of resources and intermediate materials were strictly determined before by central planners, their recipients were generally unprepared to seek alternative suppliers in open markets. This has made the internal demand for most of the products even more inelastic than one could expect in a market-driven environment and has further exposed the system to even deeper income shocks. This strong mutual interdependency of the republics on the deliveries of major products became evident in November 1992 when the Ukrainian Prime Minister Kuchma admitted that the second largest republic would continue its strong reliance on Russian oil, natural gas and wood because it was unable to finance alternative sources in its demand. On the other hand, importers of formerly overpriced industrial goods could escape to new suppliers outside the CIS and thus reap real income gains provided that they were able to either export goods to hard currency areas or to obtain credits in such currencies.

To summarise, the regional analysis of indirect transfers allows to derive the following observations:

1. Russia and Turkmenia were the only net donors of transfers mostly due to underpriced exports of oil and natural gas. They are expected to gain as a result of the move to world market prices in inter-republican trade.
2. Belorussia and Azerbaijan would incur losses due to overpriced exports of chemicals (as it is reinforced by a closer observation of data in Appendix Table 1).

3. Net exporters of food industry and unprocessed agricultural products absorbed transfers due to strong overpricing of these products. Ukraine, Kazakhstan, Georgia, and, most of all, Moldavia would be affected if the opening of markets would force them to accept lower prices.
4. Light industry exporters as Belorussia, the Baltic states and Uzbekistan could face even more adverse effects than the food-exporting countries if higher price elasticities of demand would force them to reduce their prices to the level of the foreign competitors.

IV. Dominant Causes of Indirect Transfers

The network of indirect transfers within the FSU can be attributed to at least three principal factors: the arbitrary investment policy of the central government [Seliverstov, 1992, p. 51], the system of price fixing and the allocation of turnover taxes and subsidies.

The rigid investment policy of the former Soviet authority was purely politically determined and targeted to introduce industrialisation to remote and/or backward areas of the entire FSU irrespective of high transaction costs. Consequently, Ural and Siberian iron plants became highly dependent on supplies of coal from Kazakhstan [Frantseva, 1992], the chemical industries of Belorussia and Ukraine developed a strong dependency on Russia's oil, etc. Thus, such centrally determined fixed investment projects induced trade links between areas or republics that were net importers of cheap natural resources and intermediate materials and those which designated their final output of processed goods for the domestic consumption. The former had to cope with current account deficits which were covered by net capital inflows. This led to the situation where the states of the FSU were highly integrated through the system of state planning of trade and transfers, by far more than the independent world countries of similar income-per-capita groups are expected to be [Fischer, 1992, p. 41]. This integration was not determined by the economic criteria consistent with the factor proportions theory of specialisation. On the contrary, the administrative allocation of fixed capital investment was based upon large investment programs for each individual republic. For instance, there were three major programs for Kazakhstan promoting the development of the military, other heavy industries and the space industry (in Baikonur). Due to these programs Kazakhstan, which - by market economies' standards - would enjoy a comparative advantage in land-intensive and resource-intensive goods, became a stronger player in the capital-intensive military-industrial complex.

Closely related to the investment policy was the system of central price fixing. It is commonly known that prices determined by the central government were fixed for the whole country's economic system. But their adjustments were not balanced between different economic sectors and products and thus led to significant distortions of relative prices

compared to prices on world markets. More specifically, prices of basic raw materials and unprocessed intermediate materials were reportedly kept artificially low for longer time intervals in order to ensure "rentability" of producers of processed goods, which output prices were adjusted more frequently by the central government. As a result, exporters of oil, natural gas and other intermediates soon contributed part of their income to the producers of finished goods. At the same time, the plants exporting subsidised goods were compensated for by direct transfers from either the central Soviet budget, or from the republican budgets [Orlowski, 1992, p. 4]. More specifically, these transfers were aimed at financing the delivery of the "overpriced" heavy machinery for oil and gas companies and at creating special wage incentives for workers willing to relocate to the remote areas, especially to Siberia, where vast natural resources were extracted.

In close relation to fixed prices of most of the products in the FSU economy, large transfers, both direct and indirect ones, had to be provided due to large differences in costs of production, especially between the remote areas of resource extraction and other areas. This is because most of selling prices of processed goods were administratively fixed, while costs of their production varied substantially. Consequently, enterprises of the FSU could purchase more or less "underpriced" materials. For instance, Russian chemical and energy companies in Ural enjoyed more indirect transfers through purchases of much cheaper coal from Kazakhstan than the firms in Western Russia dependent on a more expensive Ukrainian coal [Granberg, 1990, p. 78]. In fact, differences in costs of producing identical goods in various FSU regions were striking. As reported by Granberg [op.cit., p. 78] the differences in the cost of oil extraction at the end of the 1980s were as high as 5-6-fold, natural gas extraction 5-fold, iron ore 3-4-fold and logging 2-3-fold. The largest discrepancy existed in the case of coal extraction, where the cost differential was 20-fold, spreading between the low-cost surface extraction in Kazakhstan, and the expensive deep mining in Ukraine. Despite the generalised character of these data and the bias stemming from fixing of input prices, one can argue that there had to be a strong mechanism of transfer payments between the republics considering fixed and generally equalized prices of outputs.

The final key reason for indirect transfers was the uneven allocation of turnover taxes and direct subsidies between the FSU republics. More specifically, several republics allocated turnover taxes in proportion to labour expenditures in production. In this case, subsidies for consumer goods were charged to the importing republic and were counted as part of its total consumption fund. Consequently, trade in light industry products, processed food and other consumer goods led to deteriorating trade balances of importing republics. On the other side, intermediate materials were underpriced in inter-republican trade because of heavy subsidies [Langhammer, 1992, p. 255; Study of the Soviet Economy (SSE), 1991, p. 194; Granberg, 1992, p. 11]. In addition, transactions caused by visitors were assigned to the republic of permanent residence [SSE, 1991, p. 194]. For instance, food products sold by Ukrainian

travellers in Moscow were not recorded as Russia's imports. Such trading by individual visitors has been always attractive and is expected to continue as long as travelling costs on the FSU territory are low. Therefore, the requirement of adjusting domestic to world market prices varies significantly between the republics in each of the examined sectors.

Recalculation of inter-republican trade balances with the adjustment for turnover taxes, consumer subsidies, and trade by visitors was prepared by the Goskomstat SSSR for 1987 and for 1988 and reported in *Vestnik Statistiki* [3 and 4, 1990] and by Granberg [1992, p. 11]. Based upon this adjustment the 1988 inter-republican trade balance in current rubles worsened in the cases of Russia by 8.4 billion, Georgia 0.4 billion, and Armenia 0.3 billion. It remained unchanged for Ukraine and improved for all the remaining republics, most significantly for Moldavia and Kirgizia by 1.8 billion in both cases. The substantial deterioration of the adjusted balance of Russia is especially interesting. The 8.4 billion rubles reduction in the adjusted balance was primarily caused by the negative adjustments due to consumer subsidies (by 5.4 billion rubles) and turnover taxes (by 3.4 billion rubles) with a slight positive adjustment due to visitors purchases (by 0.1 billion rubles) [SSE, 1991, p. 226]. The reduction caused by payments of turnover taxes and acceptance of subsidies is understandable given the above mentioned common rule of inter-republican trade pricing that consumer subsidies on imported goods were paid by the importing republic consumption fund. Furthermore, the proportionally higher labor costs in Russia than elsewhere in the FSU, also led to increasing Russian revenues in turnover taxes.

V. The Collapse of Indirect Transfers in 1992

For all republics of the former FSU, 1992 was marked by a gradual move to what the Goskomstat estimated to be world market prices in inter-republican trade. This transformation was not caused by purely economic reasons since it would seem to be unwise for most of the republics which were net recipients of indirect transfers from Russia. Clearly, the political disintegration of the FSU has had as a powerful impact on the deterioration of trade and financial linkages between the increasingly independent states.

The move by the republics to world market prices was primarily led by Russia which, under pressure from other republics gradually introducing export and import restrictions, threatened to impose such prices for deliveries of oil, natural gas and other natural resources [see Noren, Watson, 1992, for a detailed presentation]. Ultimately, the Russian Government declared a full adaptation of what it perceived to be world market prices for exports of oil and gas in October 1992.

The introduction of world market prices for oil and gas resulted in a discontinuation of indirect transfers by the net exporters of previously underpriced resources, predominantly by

Russia. At the same time, on a somewhat more optimistic side, its government formally declared that it would not impose export taxes on the deliveries of oil and gas to other republics.

The move to world market prices has strongly promoted largely unreported barter transactions between the leading enterprises in different FSU states.⁵ This in turn has caused sizeable trade shocks within the FSU economic system. For Russia itself the estimated decline of inter-republican export in real terms in the period 1989 to 1992 reaches 22 per cent (in domestic prices), while the drop of its imports from other FSU republics is expected to be 26 per cent (according to the forecast obtained at the Forecasting Institute of the Russian Academy of Sciences). The sharp decline of trade is strongly related to the unusually high degree of inelasticity of demand for products transferred through the FSU economic network and, simultaneously, low substitution between the FSU and external goods. This inelasticity is caused by:

- large shares of standardised, thus inelastic products in total trade,
- lack of infrastructure, for instance, ports and pipelines that would bring non-Russian oil and gas to the Ukraine,
- a binding character of trade protocols between the states that still attempt fix the volumes of exchange goods,
- traditional cooperation links within the large combinats that spread their production all over the FSU territory.

But the gradual deterioration of the official reported inter-republican trade and transfers stemming from distortions of domestic prices from world market levels does not mean that the indirect transfers have been completely discontinued. They have just changed their form being now replaced by extremely large magnitudes of credit rubles and also by technical delays in clearing the payments for trade deliveries by the post-Soviet banking system that normally take between two and three months. This situation leads to a sizeable depreciation of the real value of import payables in the presence of the ruble inflation running in the second half of 1992 at the average monthly rate of 40 per cent. Needless to say, this technical bottleneck in the payment clearing system is pro-inflationary itself since many exporters

⁵ According to an estimate by the Institute of Forecasting of the Russian Academy of Sciences currently about 30% of oil deliveries from Russia to other republics are based on unreported, barter transactions between enterprises. This tendency leads to a large overestimation of the trade shock between the republics computed on the basis of official data.

attempt to set current prices at the nominal future value that incorporates the near-hyperinflation rate.

So far, indirect transfers have been sustained through the abundant ruble credit to former net recipients. The rate of increase in the Central Bank of Russia (CBR) ruble credit reached 9928 per cent or about 85 times in real terms in the period between January 1 and September 15, 1992, with the bulk of it being generated over the summer of 1992. Until June 1st the rate was "only" 2911 per cent.⁶ A reported large, yet unidentifiable portion of it was allocated to facilitate inter-state payments for trade deliveries and to clear bottlenecks related, for instance, to Russia's commercial banks which temporarily did not accept credit rubles issued by the Ukrainian Central Bank, as payments for Russian exports. Consequently, Russian exporters had to be credited Russian rubles on their accounts [CBR: Interstate Payments, 1992]. Moreover, to facilitate import payments from Russia, central banks of individual republics have also issued vast ruble credits. For instance, the overdraft on the so-called "technical" ruble credit from CBR to the Central Bank of Ukraine, allowing the latter to issue credit rubles amounting to 84.3 billion rubles in the period between January 1 and September 15, 1992, while the initial 1992 quota permitted on this account was only 15 billion [Niezawisimaia Gazeta, November 25, 1992].

If the indirect transfers were abandoned and not replaced by alternative sources of financial assistance large cuts in deliveries and trade-related income shocks could be further expected. As Table 2 implies, exports of light manufactures and processed food and imports of oil and natural gas, energy, metals and machineries would be most negatively affected.

The production of goods that would fall into either category is spread all over the FSU. However, in some republics these two categories were overproportionately represented in their trade patterns. Exports of processed food were concentrated in Ukraine, Moldavia, Azerbaijan, Latvia and Georgia (as it can be directly observed from Table 3). High shares of exports of light industry goods could be seen primarily in Russia, Belorussia, Uzbekistan, Lithuania and Estonia. These republics can be expected to experience income terms of trade losses through declining exports while other former republics such as the Ukraine, Belorussia, the Baltic states, and Kazakhstan would lose in real income by higher import bills for energy.

It is, however, very likely that some transfers to oil and gas recipients will maintain in order to stabilise production in the entire FSU. In designing the system of future cooperation between the republics this option is given a serious consideration, either directly through subsidisation or indirectly through ruble credits. On the other side, transfers to importers of

⁶ See Central Bank of Russia - Interstate Payments, Moscow, November 1992.

light industry and processed food products might be discontinued, as it appears from ongoing price liberalisation in intra-CIS trade in these goods [Noren and Watson, 1992].

VI. Concluding Remarks: Policy Solutions

Since 1992, the gradual dismantling of indirect transfers in trade among the FSU states has become a reality which provokes economic policy makers in these countries to either accept the decline of transfers and, consequently, short-term trade related shocks, or to find ways to sustain them.

The proper general message consistent with the general character of economic liberalisation seems to be to deregulate trade, to abandon the role of state intervention and allow uninhibited enterprise-to-enterprise trading. Ultimately, there will be no need for transfers compensating for distortions of prices in inter-republican trade, since these prices will gradually adjust to world market price structures. Liberalised inter-enterprise trade will be undoubtedly more efficient and, therefore, will make subsidies redundant. Accordingly, the role of currently widespread bilateral trade protocols between the republics which are supposed to have a binding impact on trade relations among them should be significantly diminished. It is imperative to note, however, that the current system of inter-republican trade is still based upon the principles of state trading. Yet, the administrative quotas are no longer set by the central government in Moscow, but by many independent state and local economic authorities. Such system causes high transaction costs and leads to the situation in which the role of official state protocols becomes obsolete, since local authorities and enterprises have no incentives to adhere to them. Thus in practice, in 1992 there have been significant problems of fulfilment in the obligatory trade, since local governments impose price controls and export quotas that reduce export incentives of enterprises [Michalopoulos and Tarr, 1992, p. 7].

The gradual decline of indirect transfers in 1992 has been, to some extent, replaced by an accelerated inter-enterprise credit, especially in the first half of 1992 [Ickes and Ryterman, 1993], followed by the massive extension of the ruble credit examined in Section V. These two substitutes to indirect transfers are inconsistent with the purpose of economic stability in programs of economic transition to market systems. They fuel inflation and prolong inefficiency by extending the "soft budget constraint" to enterprises. Consequently, the easy-access-credit policy should be phased-out and the inter-enterprise credit could be discouraged by heavy taxation. As replacements for indirect transfers aimed at sustaining trade these instruments should be ruled out. Similarly, a shift toward explicit (direct) transfers compensating for the reduction in indirect transfers is not plausible considering already existing enormous budget deficits in all of the FSU states and a limited external assistance. It

would also reinforce the role of central planning and reverse the steps toward economic liberalisation.

Some temporary measures may be considered for the period when state trading and export licensing is still maintained. Among them is a system of auctioning export licences, advocated by Michalopoulos and Tarr [1992, p. 10]. The auction would assign licences to the most efficient suppliers, thus reducing the need for sizeable subsidies and maximising the rents retained in the exporting state. But the system of auctioning export licences is a second-best solution which is inferior to a policy of removing quantitative restriction in inter-republican trade.

In order to ease the need for indirect transfers a fundamental reform of the post-Soviet trade policy should be undertaken. Almost without exceptions today's regulations of external trade in the FSU republics are based on export restraints. The role of direct import restrictions is minimal, not only in inter-CIS trade, but also in trade with convertible currency areas. Instead it can be argued that the present system indirectly restricts imports, since impediments to exports outside the ruble zone limit the inflow of foreign currency and keep the ruble excessively depreciated and discourage imports. Consequently, the desirable direction of trade reform in the FSU is to shift the role of trade policy from uncoordinated export restrictions, set primarily by local authorities, to a common tariff in trade with outside the CIS and free trade inside.⁷ But it is understandable that such a trade reform shall be undertaken only if all the CIS members introduce a far-reaching price liberalisation, at least to the same degree as Russia has attempted to do so as of July 1, 1992, and coordinate fiscal and monetary policies stabilising inflation so that the domestic price base is predictable.⁸

Along with the trade reform which is essential for diminishing the need for indirect transfers the currency reform will ensure a full convertibility of current accounts. This would remove payment bottlenecks and make compensating transfers obsolete. Enacted for this purpose the "Bishkiek Agreement" of October 9, 1992, signed by the state authorities of the CIS that calls

⁷ Michalopoulos and Tarr [1992, p. 6] argue that some export licenses and quotas, at least temporary, are justifiable in order to prevent reexporting. But these instruments are determined by local authorities and are not centrally coordinated in practice. Therefore, if local authorities wish to continue with such instruments they will allow reexporting anyway by eagerly granting export licences.

⁸ Recently, several authors have advocated a very strong tariff-based protectionism for the CIS. Specifically, McKinnon [1991] suggests to protect negative value added industries in this way on an interim basis, and Corden [1992] proposes this policy as a special case of the infant-industry argument. There are, however, no ways to judge whether any of the protected industries will truly improve their economic efficiency in this way. Most of them have received protection in the form of either direct or indirect transfers over many years of central planning. This policy did not improve the economic efficiency of the Soviet technologically stagnant industries.

for sustaining the ruble zone, bilateral clearing of inter-republican payment balances, and formation of Inter-State Bank facilitating the payment system. The Agreement is the first legislative step in the right direction, but without implementation it will remain as ineffective as many other inter-CIS agreements.

Only far-reaching, market-oriented reforms may ultimately ease up pressures on sustaining indirect transfers among the states of the former Soviet Union.

Appendix-Table 1 - Inter-Republican Exports and Imports in Domestic (DP) and World Market (WP) Prices, 1990 Data (Millions of Current Rubles)

	Russia						Ukraine					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	8612	24423	2.84	2094	5260	2.51	337	767	2.28	3797	10776	2.84
Electric energy	599	899	1.50	553	830	1.50	167	250	1.50	189	283	1.50
Coal	496	464	0.94	289	270	0.93	237	222	0.94	313	293	0.94
Other energy (peat)	1	1	1.00	10	7	0.70	0	0	-	2	2	1.00
Ferrous metals	5832	6768	1.16	5913	7083	1.20	6063	7336	1.21	2453	2836	1.16
Nonferrous metals	3323	5540	1.67	1630	2698	1.66	869	1448	1.67	2019	3367	1.67
Chemicals and products	9145	7596	0.83	5590	4654	0.83	3051	2614	0.86	4367	3610	0.83
Machine building	26091	28899	1.11	20720	22928	1.11	15500	17344	1.12	13720	15178	1.11
Wood and paper products	3724	2727	0.73	695	485	0.70	369	262	0.71	1459	1072	0.73
Construction materials	1118	1137	1.02	810	768	0.95	616	560	0.91	414	419	1.01
Light industry	7502	2272	0.30	11154	4097	0.37	2161	690	0.32	5598	1812	0.32
Food industry	2443	1114	0.46	12882	4625	0.36	6127	2801	0.46	1770	681	0.38
Other industrial branches	2648	1646	0.62	1445	948	0.66	976	592	0.61	1403	819	0.58
Agricultural products (unprocessed)	887	442	0.50	2724	1070	0.39	1529	724	0.47	500	238	0.48
Communication, transportation, services	2290	2522	1.10	774	860	1.11	317	359	1.13	984	1084	1.10
Non-oil & gas trade	66098	62027	0.94	65190	51323	0.79	37982	35202	0.93	35192	31692	0.90
Total trade	74710	86450	1.16	67284	56583	0.84	38319	35969	0.94	38989	42468	1.09
	Belorussia						Uzbekistan					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	1204	2768	2.30	1697	5396	3.18	592	1425	2.41	886	2289	2.58
Electric energy	42	62	1.48	154	231	1.50	207	311	1.50	172	258	1.50
Coal	0	0	-	40	38	0.95	8	8	1.00	48	45	0.94
Other energy (peat)	0	0	-	1	1	1.00	0	0	-	0	0	-
Ferrous metals	189	225	1.19	1333	1569	1.18	99	121	1.22	647	751	1.16
Nonferrous metals	78	131	1.68	410	685	1.67	429	711	1.66	409	679	1.66
Chemicals and products	2128	1754	0.82	1980	1615	0.82	793	606	0.76	973	806	0.83
Machine building	7856	8498	1.08	5045	5615	1.11	1051	1325	1.26	3292	3438	1.04
Wood and paper products	442	299	0.68	408	311	0.76	15	12	0.80	512	368	0.72
Construction materials	290	253	0.87	177	184	1.04	71	69	0.97	192	193	1.01
Light industry	3270	990	0.30	1552	488	0.31	3384	1542	0.46	1938	580	0.30
Food industry	984	479	0.49	909	372	0.41	810	306	0.38	1247	571	0.46
Other industrial branches	299	240	0.80	359	210	0.58	73	47	0.64	334	197	0.59
Agricultural products (unprocessed)	228	105	0.46	468	216	0.46	405	147	0.36	932	511	0.55
Communication, transportation, services	214	238	1.11	306	328	1.07	232	261	1.13	280	309	1.10
Non-oil & gas trade	16020	13275	0.83	13144	11863	0.90	7577	5464	0.72	10978	8704	0.79
Total trade	17224	16043	0.93	14841	17259	1.16	8169	6889	0.84	11864	10993	0.93

	Kazakhstan						Georgia					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	783	2455	3.14	1177	3161	2.69	5	10	2.00	284	716	2.52
Electric energy	233	350	1.50	420	630	1.50	13	19	1.46	54	81	1.50
Coal	304	284	0.93	156	146	0.94	5	4	0.80	15	14	0.93
Other energy (peat)	0	0	-	1	0	0.00	0	0	-	0	0	-
Ferrous metals	839	926	1.10	939	1098	1.17	284	341	1.20	411	486	1.18
Nonferrous metals	480	795	1.66	255	424	1.66	30	46	1.53	97	162	1.67
Chemicals and products	961	785	0.82	1522	1298	0.85	323	252	0.78	495	413	0.83
Machine building	746	895	1.20	4704	5247	1.12	757	896	1.18	1323	1401	1.06
Wood and paper products	22	17	0.77	691	480	0.69	59	41	0.69	227	166	0.73
Construction materials	114	136	1.19	296	280	0.95	47	47	1.00	101	107	1.06
Light industry	1395	346	0.25	1982	603	0.30	1225	367	0.30	809	265	0.33
Food industry	561	272	0.48	1232	467	0.38	2340	491	0.21	516	228	0.44
Other industrial branches	75	59	0.79	400	278	0.69	149	94	0.63	190	122	0.64
Agricultural products (unprocessed)	1732	909	0.52	227	88	0.39	397	139	0.35	287	148	0.52
Communication, transportation, services	198	218	1.10	315	348	1.10	92	104	1.13	140	155	1.11
Non-oil & gas trade	7660	5994	0.78	13137	11389	0.87	5719	2842	0.50	4665	3748	0.80
Total trade	8443	8449	1.00	14314	14550	1.02	5724	2852	0.50	4949	4464	0.90
	Azerbaijan						Lithuania					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	747	1683	2.25	428	1334	3.12	233	518	2.22	879	2359	2.68
Electric energy	46	70	1.52	16	25	1.56	200	300	1.50	99	148	1.49
Coal	0	0	-	5	5	1.00	0	0	-	14	13	0.93
Other energy (peat)	0	0	-	0	0	-	0	0	-	0	0	-
Ferrous metals	71	84	1.18	219	266	1.21	21	19	0.90	306	357	1.17
Nonferrous metals	80	134	1.67	101	168	1.66	7	11	1.57	158	263	1.66
Chemicals and products	518	427	0.82	488	430	0.88	370	298	0.81	735	611	0.83
Machine building	936	958	1.02	1119	1126	1.01	1832	1833	1.00	2069	2417	1.17
Wood and paper products	15	9	0.60	117	84	0.72	157	120	0.76	183	135	0.74
Construction materials	63	54	0.86	94	94	1.00	66	63	0.95	113	105	0.93
Light industry	1366	442	0.32	708	208	0.29	1394	432	0.31	664	189	0.28
Food industry	1749	365	0.21	501	247	0.49	720	341	0.47	270	103	0.38
Other industrial branches	254	161	0.63	189	118	0.62	48	36	0.75	126	86	0.68
Agricultural products (unprocessed)	134	48	0.36	146	71	0.49	205	74	0.36	118	53	0.45
Communication, transportation, services	125	141	1.13	117	133	1.14	96	108	1.13	289	328	1.13
Non-oil & gas trade	5358	2893	0.54	3819	2974	0.78	5116	3637	0.71	5143	4810	0.94
Total trade	6105	4576	0.75	4247	4308	1.01	5349	4155	0.78	6022	7169	1.19

	Moldavia						Latvia					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	0	0	-	425	957	2.25	6	13	2.17	447	1006	2.25
Electric energy	22	33	1.50	17	26	1.53	88	131	1.49	111	167	1.50
Coal	0	0	-	119	111	0.93	0	0	-	10	9	0.90
Other energy (peat)	0	0	-	0	0	-	0	0	-	0	0	-
Ferrous metals	59	72	1.22	286	335	1.17	95	115	1.21	347	415	1.20
Nonferrous metals	0	0	-	150	251	1.67	13	22	1.69	139	232	1.67
Chemicals and products	206	166	0.81	581	475	0.82	646	534	0.83	596	478	0.80
Machine building	978	974	1.00	1504	1705	1.13	1376	1566	1.14	1588	1795	1.13
Wood and paper products	81	58	0.72	205	156	0.76	115	78	0.68	136	100	0.74
Construction materials	59	63	1.07	117	110	0.94	69	50	0.72	65	68	1.05
Light industry	1166	366	0.31	769	263	0.34	888	314	0.35	617	184	0.30
Food industry	2621	661	0.25	257	118	0.46	1082	589	0.54	231	80	0.35
Other industrial branches	198	117	0.59	188	118	0.63	249	139	0.56	159	109	0.69
Agricultural products (unprocessed)	427	151	0.35	150	73	0.49	87	32	0.37	107	50	0.47
Communication, transportation, services	39	43	1.10	223	250	1.12	315	358	1.14	159	179	1.13
Non-oil & gas trade	5853	2705	0.46	4567	3990	0.87	5022	3926	0.78	4264	3867	0.91
Total trade	5853	2705	0.46	4992	4947	0.99	5028	3939	0.78	4711	4873	1.03
	Kirgizia						Tadzhikistan					
	Exports			Imports			Exports			Imports		
	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP	DP	WP	WP/DP
Oil and gas	10	34	3.40	269	605	2.25	10	32	3.20	271	610	2.25
Electric energy	67	101	1.51	34	51	1.50	63	94	1.49	71	106	1.49
Coal	22	21	0.95	38	36	0.95	5	4	0.80	8	7	0.88
Other energy (peat)	0	0	-	0	0	-	0	0	-	0	0	-
Ferrous metals	7	9	1.29	167	189	1.13	4	4	1.00	110	129	1.17
Nonferrous metals	145	235	1.62	96	156	1.63	298	496	1.66	193	322	1.67
Chemicals and products	23	19	0.83	323	269	0.83	119	91	0.76	322	258	0.80
Machine building	882	1099	1.25	879	906	1.03	228	242	1.06	796	859	1.08
Wood and paper products	4	2	0.50	114	80	0.70	3	2	0.67	124	88	0.71
Construction materials	13	13	1.00	69	64	0.93	29	28	0.97	54	54	1.00
Light industry	640	174	0.27	602	200	0.33	1061	406	0.38	558	158	0.28
Food industry	508	182	0.36	248	103	0.42	405	144	0.36	424	170	0.40
Other industrial branches	21	16	0.76	71	43	0.61	4	3	0.75	105	62	0.59
Agricultural products (unprocessed)	87	31	0.36	167	93	0.56	92	32	0.35	182	97	0.53
Communication, transportation, services	19	20	1.05	102	114	1.12	59	65	1.10	142	161	1.13
Non-oil & gas trade	2436	1920	0.79	2910	2305	0.79	2367	1611	0.68	3088	2471	0.80
Total trade	2446	1954	0.80	3179	2910	0.92	2377	1643	0.69	3359	3081	0.92

	Armenia						Turkmenia					
	DP	Exports WP	WP/DP	DP	Imports WP	WP/DP	DP	Exports WP	WP/DP	DP	Imports WP	WP/DP
Oil and gas	0	0	-	273	623	2.28	696	1659	2.38	79	177	2.24
Electric energy	6	9	1.50	18	27	1.50	67	101	1.51	10	15	1.50
Coal	0	0	-	13	12	0.92	0	0	-	5	5	1.00
Other energy (peat)	0	0	-	0	0	-	0	0	-	0	0	-
Ferrous metals	14	17	1.21	208	249	1.20	3	4	1.33	106	122	1.15
Nonferrous metals	85	137	1.61	87	143	1.64	6	10	1.67	9	15	1.67
Chemicals and products	204	175	0.86	295	239	0.81	147	152	1.03	203	169	0.83
Machine building	772	790	1.02	850	843	0.99	35	37	1.06	959	1192	1.24
Wood and paper products	9	6	0.67	100	72	0.72	0	0	-	97	64	0.66
Construction materials	44	47	1.07	57	49	0.86	28	31	1.11	50	43	0.86
Light industry	1483	484	0.33	889	275	0.31	1083	541	0.50	551	162	0.29
Food industry	404	68	0.17	368	168	0.46	206	112	0.54	445	179	0.40
Other industrial branches	376	230	0.61	199	134	0.67	1	1	1.00	180	114	0.63
Agricultural products (unprocessed)	11	4	0.36	142	74	0.52	124	44	0.35	132	70	0.53
Communication, transportation, services	19	21	1.11	217	247	1.14	74	83	1.12	98	112	1.14
Non-oil & gas trade	3428	1989	0.58	3442	2532	0.74	1773	1114	0.63	2844	2261	0.80
Total trade	3428	1989	0.58	3715	3155	0.85	2469	2773	1.12	2923	2438	0.83
	Estonia						All republics					
	DP	Exports WP	WP/DP	DP	Imports WP	WP/DP	DP	Exports WP	WP/DP	DP	Imports WP	WP/DP
Oil and gas	0	0	-	229	516	2.25	13235	35787	2.70	13235	35785	2.70
Electric energy	112	168	1.50	13	19	1.46	1932	2898	1.50	1931	2897	1.50
Coal	0	0	-	3	3	1.00	1077	1007	0.94	1076	1007	0.94
Other energy (peat)	13	9	0.69	0	0	-	14	10	0.71	14	10	0.71
Ferrous metals	6	7	1.17	140	163	1.16	13586	16048	1.18	13585	16048	1.18
Nonferrous metals	8	13	1.63	97	163	1.68	5851	9729	1.66	5850	9728	1.66
Chemicals and products	296	245	0.83	460	388	0.84	18930	15714	0.83	18930	15713	0.83
Machine building	542	559	1.03	1015	1258	1.24	59582	65915	1.11	59583	65908	1.11
Wood and paper products	128	78	0.61	74	51	0.69	5143	3711	0.72	5142	3712	0.72
Construction materials	29	27	0.93	46	42	0.91	2656	2578	0.97	2655	2580	0.97
Light industry	854	303	0.35	481	172	0.36	28872	9669	0.33	28872	9656	0.33
Food industry	632	295	0.47	291	107	0.37	21592	8220	0.38	21591	8219	0.38
Other industrial branches	70	43	0.61	94	66	0.70	5441	3424	0.63	5442	3424	0.63
Agricultural products (unprocessed)	42	16	0.38	104	47	0.45	6387	2898	0.45	6386	2899	0.45
Communication, transportation, services	168	190	1.13	111	123	1.11	4257	4731	1.11	4257	4731	1.11
Non-oil & gas trade	2900	1952	0.67	2929	2600	0.89	17530	14655	0.84	17531	14652	0.84
Total trade	2900	1952	0.67	3158	3116	0.99	18854 9 4	18233 1 8	0.97	18854 2 7	18231 9 4	0.97

Source: Own calculations based on the data from: The World Bank Statistical Handbook: States of the Former USSR; and Goskomstat SSSR.

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