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New Borders: Evidence from the Former Soviet Union

By

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Abstract

We study the effects of trade barriers and the persistence of past linkages on trade flows in the former Soviet Union (FSU). Estimating a gravity equation on 1987-1996 trade among and between nine Russian regions and fourteen FSU republics, we find that Russian regions traded 60 percent more with each other than with republics in the reform period (1994-96). In contrast, they did not trade significantly more with each other than with republics in the pre-reform period (1987-90). Our results suggest that the bias towards domestic trade in the reform period is primarily a result of tariffs. We also find that past linkages, such as infrastructure, production and consumption chains, and business networks, have limited the reorientation of trade.

Journal of Economic Literature Classification Numbers: F14, F15, P21.

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I. Introduction

Borders significantly influence trade flows, however, the reasons behind this effect remain largely unknown. Since the counter-factual (absence of borders) is typically not observable, researchers have not been able to determine whether the border effect is the result of trade barriers, past linkages, or is natural--i.e. the result of comparative advantage or tastes. The disintegration of the Soviet Union provides a unique opportunity to examine these competing hypotheses since one can observe trade flows between the same partners, both in the presence and absence of borders.

This paper offers three contributions.[1] First, we document the adjustment in trade flows in response to the collapse of the Soviet Union and quantify the border effect. We examine bilateral trade flows among nine Russian regions and fourteen republics of the former Soviet Union (FSU) before and after the Union dissolved. Estimating a gravity equation we find that regions did not trade more with each other than with republics in the pre-reform period. In the reform period, however, Russian regions traded nearly twice as much with each other as with the republics, with the domestic bias increasing over time. Thus, the disintegration of the Soviet Union has already led to a significant domestic reorientation in trade.

Second, we examine how the determinants of trade have changed since the collapse of central planning. We find that the elasticities of trade to income and distance in the pre-reform period are markedly smaller than those typically found in empirical work using the gravity equation. In the reform period, however, the elasticities are similar

[1] A companion paper, Djankov and Freund (2002), discusses the disintegration of trade linkages in the former Soviet Union in light of the trade reorientation literature in transition economies.

to those from studies of other countries. It thus appears that the decline of central planning has allowed gravity to set in, and now income and distance influence trade flows in a more standard way in the FSU.

Third, we distinguish the primary causes of the border effect. We find that the importance of the Russian border is primarily the result of trade barriers. The inclusion of tariffs in the estimation reduces the bias to where it is insignificantly different from zero. Our results also suggest that slow adjustment of production and of infrastructure has limited trade reorientation. Using past trade to proxy for linkages developed when the Soviet Union was integrated, we find that past linkages significantly influence current trade. Since past trade was centrally planned, it is unlikely that we are picking up other unobserved persistent variables such as tastes or comparative advantage. As linkages with other republics continue to atrophy, the domestic bias will increase to well over the 60 percent we estimate for trade in 1996.

Our estimate of the border effect is significantly lower than similar estimates using OECD data, despite greater trade barriers in the FSU. Using inter-provincial and province-state trade data, McCallum (1995) and Helliwell (1996) find that in 1990 Canadian provinces traded about twenty times more among themselves than with U.S. states. More recently, Helliwell (1998) estimates the bias to be twelve in 1996 following the preferential trading agreement (PTA) between the two countries.[2] Wei (1996) and Helliwell (1998) estimate that the domestic trade bias among OECD countries ranges from three to twelve. One explanation that is consistent with both sets of results is that

[2] An alternative way to evaluate the border effect is with price data. Engel and Rogers (1996) examine the relative price variability of similar goods among cities in Canada and the United States. They find that relative price variability between cities is significantly greater when a border is crossed.

past linkages have led to a continued domestic orientation in trade in the OECD, despite falling trade barriers, and sustained integration in the FSU in spite of rising trade barriers.

The paper is organized as follows. Section II reviews the literature on the border effect. Section III discusses the empirical specification. Section IV provides interpretation of the results and implications for policy. Section V concludes.

II. Why do borders matter?

Empirical studies on the effects of borders are uniform in finding a high domestic bias in trade. It remains a puzzle as to why borders matter so much. Three hypotheses have been put forward in the literature: (i) international trade barriers, (ii) natural partners, and (iii) historical linkages. The first implies borders matter because of tariffs, quotas, and other barriers to trade. Trade barriers raise the relative price of imported goods and lead to a consumption bundle biased towards domestically produced goods.

Alternatively, borders may be endogenous. Owing to comparative advantage, tastes, or technology, regions within a border may simply be natural trade partners. Borders tend to be formed around populations that are relatively homogeneous, have similar tastes, and in which the regional economies are linked. These associated regions may create borders to protect themselves from external shocks.

Finally, cross-border trade may be relatively small because past isolation has led to domestically oriented infrastructure and production. For example, highways, rail systems, legal and regulatory institutions, business networks and consumer networks, and telecommunications systems all differ across countries and thus may increase the costs of international trade relative to domestic trade. Assuming infrastructure is costly to adjust,

a history of isolation will depress trade while historical linkages to other nations will help promote current trade. Similarly, if capital adjustment across industries is costly then an economy with primarily domestically oriented industry will adjust slowly to external pressure.

A growing empirical literature finds that historical linkages are important determinants of trade. Frankel, Stein and Wei (1995) show that countries with colonial links and countries with common language trade more with each other than the gravity model predicts. De Menil and Maurel (1994) find that trade ties among former members of the Austro-Hungarian Empire remained stronger than any other commercial relationship in Europe in mid-1920s. Frankel (1997) surveys the literature on the dissolution of British and French colonial links and the breakup of the Austro-Hungarian Empire, the Malay Federation, Czechoslovakia, and the former Soviet Union and finds "a tendency for established bilateral trade ties to change relatively slowly" (p.126). He notes, however, the tenuous nature of these findings derived from trade intensity ratios which do not control for the effects of distance and income. Eichengreen and Irwin (1998) find that lagged bilateral trade is significant in determining current bilateral trade in a large cross-section of countries, after controlling for income and distance, and interpret this as evidence that past linkages adjust only slowly to new conditions. Also indicative of the importance of historical linkages, Freund (2000) finds that the founding members of the European Union created a well-integrated market among themselves and then maintained stronger trade links with each other than with countries that joined later. There was no evidence of a bias in trade towards the original members before the common market was formed.

III. Empirical specification

The FSU provides a unique case study because in the pre-reform period infrastructure and technology were uniform across regions and republics, there were no trade barriers, and trade was centrally planned. In the reform period, borders have been erected, large tariffs are in place, and central planning has been abandoned; but, transport costs, infrastructure, and technology are likely to be slow to change. This allows us to examine how past integration affects current trade and how tariffs influence trade, when there are no differences in infrastructure and history. That is, any correlation between pre-reform trade and current trade, after controlling for size and distance, must be largely a result of historical linkages and not the result of unobservables such as comparative advantage and tastes.

The Data

We examine trade among 9 regions in Russia and 14 former republics of the Soviet Union before and after disintegration. The trade data are from the State Statistical Committee of the Russian Federation (1993, 1997) and the World Bank (1992, 1993, 1994, 1996) and include bilateral trade flows among regions and republics, in U.S. dollars from 1987 to 1996. Income figures are from the World Bank and are also in U.S. dollars. Distance is taken from the Ministry of Transport of the USSR (1990) and is defined as the shortest road distance in kilometers between regional and/or republican centers. Unweighted average ad-valorem tariff rates and population figures are from the World Bank (1993, 1996).

There are two weaknesses in the data. First, because of central planning the pre-reform trade values are not market values. Since we are comparing across regions and republics, all of which are within the same country and subject to the same prices, they are nevertheless valuable estimates of relative trade between partners. The second problem is the presence of barter trade, which became quite common in the FSU in the reform period. Barter trade is recorded in the dataset, however the prices at which it is recorded are likely to be biased downwards in order to avoid taxes and tariffs. Again since we are comparing trade within the FSU, this is less of a problem because barter trade is likely to be as prevalent among regions as between regions and republics. Therefore, although the magnitudes of trade are likely to be distorted, there is no reason to think that relative trade among parties within the FSU is systematically biased. If we included non FSU countries in the study, these problems would distort relative trade as well.

Figure 1 shows each country's share of total exports that go to other FSU countries. Between 1990 and 2000 FSU export shares declined for all former members. This suggests that a significant reorientation of trade away from FSU countries has occurred since the disintegration of the FSU.

However, since our interest lies primarily in the domestic reorientation of trade within Russia, we also document the share of total FSU trade with Russia for each region and each republic. In the pre-reform period, on average sixty-five percent of each region's trade with the FSU countries was with other Russian regions and trade shares were flat (Figure 2). In the reform period, the average share of trade that is inter-regional rises to nearly eighty percent. The republics' average share of FSU trade with the Russian regions

is about fifty percent in the pre-reform period and fairly constant. In the reform period, regional trade shares decline somewhat on average.

While the movement in trade shares over time is suggestive of an increasing domestic bias in trade, shares alone do not tell us whether regions trade relatively more among themselves, we need to control for standard determinants of trade. For example, the increased Russian trade share among the regions may be the result of relatively higher income growth. Next, we use a simple gravity specification which is comparable to the models in McCallum (1995) and Helliwell (1996, 1998) to estimate the extent of the domestic bias in trade. After estimating the benchmark model, we account for trade policy and historical linkages.

The benchmark specification

We use a gravity equation to examine trade within Russia. The gravity equation describes trade between two parties as proportional to the product of their incomes divided by the distance between them. Theoretical models supporting the gravity equation are numerous. In particular, the monopolistic competition model and Heckscher-Ohlin model of trade both produce estimating equations similar to the gravity equation describing bilateral trade flows (Deardorff 1995).

We estimate a gravity equation on 1987-1990 and 1994-1996 trade flows among and between 9 Russian regions and the 14 republics of the Soviet Union. The regression equation for each year in log levels is:

$$trade_{IJ} = \beta_0 + \beta_1 y_I + \beta_2 y_2 + \beta_3 pop_i + \beta_4 pop_j + \beta_5 Dist_{ij} + \beta_6 RUSSIA + \mu_{ij}$$

where $trade_{ij}$ is the log of shipments from region i to region j, y_i and y_j are the logs of gross regional product in regions i and j respectively, pop_i and pop_j are the logs of total population of regions i and j respectively, Dist is the log of the distance from i to j, RUSSIA is a dummy equal to one for intra-Russian trade and zero for region to republic trade, and u_{ij} is the error term, which we assume is uncorrelated across observations. The RUSSIA variable pools all effects that make cross-border trade different from domestic trade.

The results are reported in Table 1. The coefficient on the RUSSIA dummy rises noticeably from the pre-reform period to the reform period. The coefficient of 0.66 on RUSSIA in 1996 is highly significant and implies that Russian regions traded 93 percent more with each other than is predicted by the model (exp(0.66) = 1.93). In the pre-reform period, the regions did not trade significantly more with each other. The insignificant bias in trade between Russian regions in the pre-reform period is not surprising given that trade was centrally planned across all of the FSU and there were no borders.

The move away from central planning is also noticeable in Table 1. In all specifications we find that the absolute value of the elasticity of trade with respect to income and distance increases after disintegration. For example, the coefficient on distance more than doubles in magnitude from -0.42 to -1.17. This change is hardly surprising - pre-reform trade over long distances was heavily subsidized. The coefficients on income also rise from the range of 0.41-0.56 to a range of 0.54-0.83. The coefficients in the reform period are much closer to the coefficients typically found on estimates of

the gravity model.[3] This suggests that gravity has set in and that trade patterns in the FSU are now determined in a similar way to the rest of the world.

In all of the regressions shown in Table 1, the coefficients on population are *positive* and highly significant. In contrast, in studies of other countries, the coefficients on population are typically found to be highly significant and *negative*, indicating that countries with higher per capita income trade more with each other. We interpret the positive coefficient on population as a result of central planning; in the former Soviet Union, production and trade were both planned by the government, according to the size of the area's population. The effect of population on trade does not change in the reform period, suggesting that these linkages are still quite important.

Estimating the effect of tariffs and adjustment costs

The benchmark model used to estimate the trade bias (equation (1)) includes distance as a proxy for transport costs and a dummy variable (RUSSIA) to estimate possible excess trade between Russian regions. The question is how to interpret the positive coefficient on the dummy variable in the reform period. It could be picking up other parts of trade costs besides distance related transport costs or it could be picking up trade barriers. Alternatively, it may represent differences in factor endowments, tastes, or technology.

In this section we attempt to examine the effect of tariffs and past linkages on trade. We incorporate tariff levels into the benchmark equation as the log of one plus the

[3] Coefficients on income are typically around 1, when population is included in the regression equation, coefficients on distance are typically around –1 and range from .5 to 1.5 (Frankel 1997).

ad-valorem tariff rate in the importer country.[4] Two PTAs were ratified in the reform period: one between Russia, Kazakhstan, and Belarus and another between Estonia, Latvia, and Lithuania, so the ad valorem tariff is zero whenever trade is between any of these country pairs or among regions. The bias towards Russian goods, either as a result of non-tariff barriers, preferences, or price and wage differentials is now controlled for by the RUSSIA dummy.

The results are reported in the first three columns of Table 2. The inclusion of the tariff variable eliminates the significance of RUSSIA. This indicates that trade policy is the main cause of lower trade among regions and republics. The coefficient can be interpreted as the elasticity of trade with respect to the tariff. The coefficients on the tariff rate of -1.2 in 1994 and -1.65 in 1996 imply that the elasticity of trade to the tariff is increasing in absolute value over time. This is consistent with there being adjustment costs in reorienting production and infrastructure. The impact on trade is relatively small when the tariff is initially imposed, as time goes on and infrastructure and production are reoriented, the magnitude of its effect rises.

Next we also include a variable describing past linkages, LINKS. Past linkages exist throughout the FSU as a result of central planning. For example, there are highly integrated production and consumption chains, infrastructure for trade, and business networks all of which are likely to change slowly, and all of which lead to greater current trade than in their absence.

We assume that the current linkage between two areas is an increasing function of their past trade, i.e. $LINKAGE = F(M_{ij,t-1}, M_{ij,t-2}, M_{ij,t-3}, ...)$. The intuition is that greater

[4] This form can be derived from a model where tariffs enter multiplicatively, such as a

trade in the past generated more investment and hence a larger capital stock (in terms of production and infrastructure) geared toward that trade. For a model that develops a similar intuition see Bougheas et. al. (1999). They show that if infrastructure lowers transport costs, then infrastructure and the volume of trade will be positively correlated in a Dornbusch-Fischer-Samuelson model. While they model specific infrastructure for transport, we have in mind a more general notion of linkages through physical infrastructure, production chains, and business contacts.

As a result of central planning, trade in the pre-reform period was very similar across years, as evidenced by Table 1. We thus assume that linkages will be positively correlated with centrally planned trade from the pre-reform period. This implies that we can include pre-reform trade patterns as a measure of current linkages for trade.

The regressions including past trade are reported in the last two columns of Table 2. The significance of 1987 trade in the regression equation for 1996 implies that a great deal of current trade is still determined by past trade patterns. That is, past linkages have limited the bias on current trade. Specifically, the results imply that 1 percent increase in trade in 1987 leads to about half of one percent increase in current trade.

When past trade is included in the regression equation, the coefficients on importer and exporter population decline markedly and are no longer significant. This is consistent with the hypothesis presented above that the positive correlation between population and trade (after controlling for income) is a result of central planning. Once we control for past linkages, population is no longer significant.

As compared with the base regression in Table 1, the coefficient on the Russia dummy changes only marginally when past trade is included (Table 2, column 4). This

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differentiated goods model.

indicates that the domestic bias in trade is a new phenomenon. Moreover, if this dynamic relationship were to hold over the long run, it would suggest that the impact of disintegration on trade will be higher, about a factor 2.6 (exp(0.57/(1-0.41)=2.63).

One problem with including past trade is that it may also be correlated with current trade because of other persistent variables that are not included in the regression equation, such as endowments or technology, but that are not related to past linkages.[5] This is likely to be less of an issue in this data because trade in the pre-reform period was centrally planned and not based on comparative advantage. In addition, the countries in our study were trade partners by default, trading little with countries outside the Union. Therefore, disintegration implies that the set of countries over which comparative advantage is determined is greater. In addition, economies have changed dramatically since 1992, some economies have grown while others have shrunk, countries now have different currencies, and prices are no longer equalized across regions and republics.

IV. Interpretation and Implications for the Future

The results in this paper show that trade has been reoriented within Russia, primarily as a result of trade barriers, and that trade flows within the FSU are still significantly impacted by past linkages. We have also shown that the elasticity of trade with respect to tariffs increases over time, likely as a result of a reorientation of production, infrastructure, and networks. This implies that the Russian bias we estimate will continue to increase over time.

[5] Wonnacott (1998) highlights this problem in his discussion of Eichengreen and Irwin's (1998) paper on trade flows, which was the first to incorporate past trade into the gravity equation.

Some evidence of this continued deterioration in trade can be seen in more recent data than is used in the empirical work. As shown in Figure 1, trade shares with other FSU countries declined from 1990 to 1997 and then fell further from 1997 to 2000 in all former members, except for Tajikistan and Turkmenistan. Decreasing trade between Russian regions and republics will affect production, infrastructure maintenance and development, and business networks. As these linkages for trade deteriorate, the cost of international trade will increase, which will cause trade between FSU countries to decline further.

At present this process is likely show up in only marginal improvements or neglect of existing infrastructure. To examine the extent to which this process has begun, we first examine passenger train speed within the FSU as a proxy for investment in infrastructure that links regions to republics, and then we discuss how nascent projects in the FSU countries are likely to alter international linkages.[6]

Using train schedules between FSU countries and Russian regions, we find that trains got faster between most Russian regions from 1989 to 1996, and trains to the former republics slowed. Table 3 reports the average percent change in time of travel between and among regions and republics from 1989 to 1996. While travel times between regions and republics and among republics lengthened; travel times among the Russian regions were nearly all shorter in 1996 as compared with 1989. For example, a train from the North region to the republics took 4.9 percent longer on average in 1996 as compared with 1989; but a train from the North to the other Russian regions took 2.0 percent less time on average in 1996 than in 1989. The largest travel time increase was between Chernozyom and Uzbekistan; it took 41 percent longer to travel between the two capitals

in 1996. The sharpest decline was between Central Russia and Chernozyom; it took 7.2 percent less time to travel between the two capitals in 1996 as compared with 1989. This suggests that trains in Chernozyom have been reoriented towards Moscow and away from the southern route to Uzbekistan.

Changes in travel times were accompanied by a change in the frequency of service. The frequency of trains traveling between Russian regions have for the most part remained constant or improved, but train service from regions to republics has become less frequent. These results suggests both that infrastructure between regions and republics is deteriorating and that connections for business travel across national borders are less frequent. While this is probably partially a result of declining trade, it is also likely to increase the costs of international trade and hence facilitate the reorientation in trade.

Reorientation of infrastructure is also evident in the new projects and agreements that have emerged in most FSU countries. One striking example is the move of the Kazakh capital from Almaty in the south to Astana in the north and the construction of a highway and a railroad to link the two cities. Latvia and Estonia are also building a fast train link between their capitals. Belarus and Russia recently agreed to deeper economic and political integration, the accord includes currency unification and enacting unified customs regulations. These projects and agreements are likely to affect trade patterns in the FSU in the years to come. As these new linkages are developed and past linkages atrophy, the domestic bias in Russian trade will surely increase.

[6] Train schedules for 1989 and 1996 are from the National Railways archives in Moscow.

V. Conclusions

In the days of the Soviet Union, trade was centrally planned, trade links between regions and republics were very strong, and the regions did not trade more with each other than with the republics. The collapse of central planning along with the disintegration of the Soviet Union have induced a change in the determinants of trade. As gravity has set in, the elasticities of trade to income and distance have risen and are now more similar to those found in the rest of the world. In addition, an increasing bias towards domestic trade in Russia has developed. Specifically, we show that Russian regions traded nearly twice as much with each other as with former republics in 1996. This bias is primarily due to the erection of tariff barriers.

The border effects we estimate are lower than in previous studies because infrastructure and production have not been domestically reorganized in the short period since the collapse of the Soviet Union. That is, the intra-national bias has been mitigated through strong historical linkages that Russian regions have to former Soviet republics and costs of adjustment to redirecting trade and building new infrastructure. The erection of political borders, however, will likely be followed by the development of new economic borders. This implies that the domestic bias in Russia and in the new republics will grow over time.

References

Bough.., 1999

Deardorff, A. (1995). Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? NBER Working paper 5377. Cambridge, Mass.

Djankov, S. and C. Freund. (forthcoming). Trade Flows in the Former Soviet Union, 1987-1996, *Journal of Comparative Economics*.

Eichengreen, B. and D. Irwin (1996). The Role of History in Bilateral Trade Flows. NBER Working paper 5565. Cambridge, Mass.

Engel, C.and J. Rogers (1996). How Wide is the Border? *American Economic Review* 86 (5): 1112-1125.

Frankel, J. (1997). *Regional Trading Blocs*. Washington, D.C.: Institute for International Economics.

Frankel, J., E. Stein, and S. Wei (1995). Trading Blocs and the Americas: The Natural, the Unnatural, and the Super-Natural. *Journal of Development Economics* 47 (1): 61-95.

Freund, C. (2000). Different Paths to Free Trade: The Gains from Regionalism. *Quarterly Journal of Economics* 115 (4): 1317-1341.

State Statistical Committee of the Russian Federation. (1993, 1997). Russian Statistical Yearbook, Moscow.

Helliwell, J. (1998) *How Much Do National Borders Matter*? Washington, D.C.: Brookings Institution Series on Integrating National Economies.

Maurel, M., and G. Cheikbossian (1998). The New Geography of Eastern European Trade. *Kyklos* 51 (1): 45-71.

McCallum, J. (1995). National Borders Matter: Canada-U.S. Regional Trade Patterns. *American Economic Review* 85 (3): 615-23.

Ministry of Transport of the USSR. (1990). The Drivers' Guide of the Soviet Union, Moscow.

Wei, S. (1996). Intra-national Versus International Trade: How Stubborn are Nations in Global Integration? NBER Working Paper 5531. Cambridge, Mass.

World Bank (1992, 1993, 1994, 1996). Foreign Trade Statistics of the Soviet Union and Its Successor Countries, Washington, D.C.

Table 1: Benchmark Specification

	1987	1988	1989	1990	1994	1995	1996
Y_i	0.41*	0.42*	0.44*		0.68*	0.64*	0.54*
	(7.72)	(7.62)	(8.10)		(8.48)	(9.25)	(7.43)
Y_j	0.53*	0.55*	0.56*		0.83*	0.72*	0.74*
	(9.83)	(10.18)	(10.17)		(12.05)	(9.56)	(9.95)
POP_i	0.41*	0.40*	0.37*		0.44*	0.49*	0.55*
	(6.74)	(6.50)	(5.94)		(5.17)	(4.53)	(5.43)
POP_j	0.30*	0.30*	0.26*		0.18*	0.30*	0.27*
	(5.13)	(4.76)	(4.36)		(2.25)	(3.43)	(3.08)
DIST	-0.42*	-0.43*	-0.42*		-0.97*	-1.06*	-1.17*
	(-12.95)	(-12.74)	(-12.7)		(-15.94)	(-17.01)	(-17.48)
RUSSIA	0.14	0.15	0.13		0.50*	0.63*	0.66*
	(1.72)	(1.90)	(1.55)		(3.51)	(4.61)	(4.70)
No. of obs.	504	502	495		492	486	487
Adj R-square	0.84	0.84	0.81		0.71	0.70	0.74

*Significant at the 5 percent level. Heteroskedasticity corrected t-statistics are in parentheses. All regressions are run with a constant, but the values for the constants are not reported.

Table 2: Estimating the Effect of Tariffs and Adjustment Costs

	1994 (OLS)	1995 (OLS)	1996 (OLS)	1996 (OLS)	1996 (OLS)
Y_i	0.67*	0.60*	0.49*	0.42*	0.39*
	(8.14)	(8.38)	(6.46)	(5.20)	(4.63)
Y_j	0.81*	0.68*	0.69*	0.59*	0.56*
	(11.46)	(8.74)	(8.94)	(7.87)	(7.22)
POP	0.45*	0.51*	0.59*	0.35*	0.40*
	(5.30)	(4.83)	(5.81)	(3.02)	(3.38)
POP	0.19*	0.32*	0.29*	0.09	0.12
	(2.32)	(3.59)	(3.30)	(0.78)	(1.05)
DIST	-0.97*	-1.06*	-1.17*	-0.99*	-1.00*
	(-16.42)	(-17.76)	(-18.30)	(-12.15)	(-12.43)
RUSSIA	0.22	0.25	0.22	0.57*	0.17
	(1.33)	(1.52)	(1.31)	(4.11)	(1.07)
PTRADE				0.41*	0.39*
				(3.37)	(3.13)
TARIFF	-1.01*	-1.44*	-1.67*		-1.52*
	(-2.49)	(3.36)	(-3.74)		(-3.35
No. of obs.	492	486	487	486	486
Adj R-square	0.71	0.73	0.74	0.75	0.76

*Significant at the 5 percent level. Heteroskedasticity corrected t-statistics are in parentheses. All regressions are run with a constant, but the values for the constants are not reported.

Figure 1: Exports to FSU Countries Relative to Total Exports, 1990, 1997, and 2000

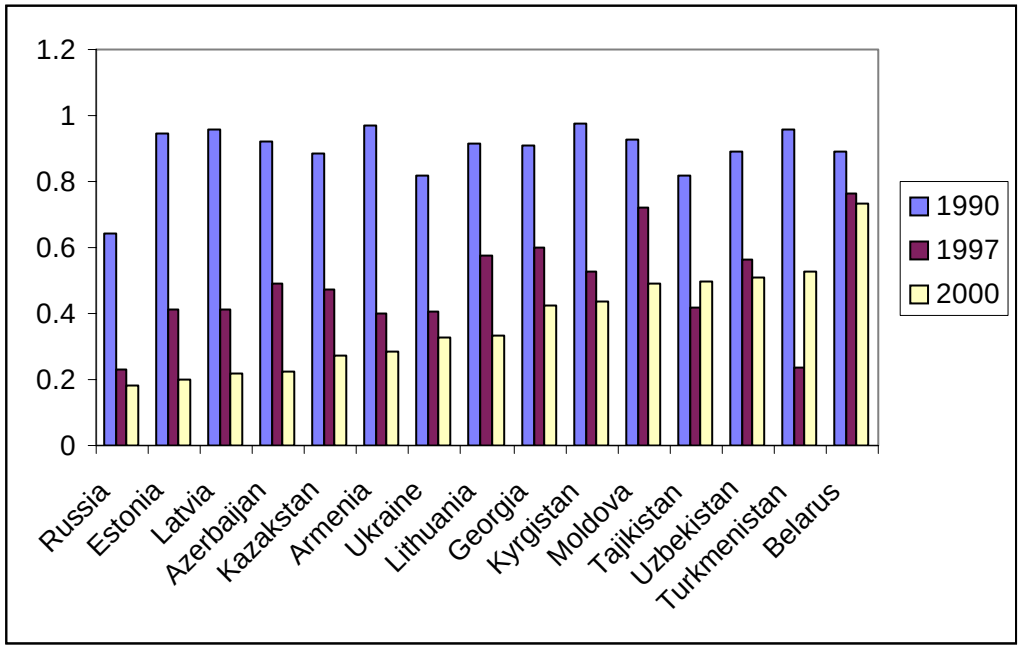

Figure 2: Share of Total FSU trade with Russia by Region and Republic

(average across regions and republics)