CONDITIONS OF INTERNATIONAL ROAD TRANSPORTATION

It is increasingly true that that nations must trade to realize economic prosperity and progress. This is particularly the case for nations which are small or medium size and have critical shortfalls with regard to many types of goods, services, resources, or technologies. The nations of the Balkans have these characteristics.

Trade, including that for most services, normally requires trans-border movements of intermediate and finished goods, raw materials, and/or people. As economies evolve from emphasis on raw materials and heavy industry towards high-valued goods, road transport of freight has becomes increasingly important. For example in the U.S., between 1950 and 1991 inter-city freight ton-kilometers by road increased 340 percent, while rail shipments increased by only 80 percent (Association of American Railroads). The shift from rail to motor carriage is even more dramatic in terms of the value of shipments. Similar trends hold for Western and, to a lesser extent, Central Europe. The primary advantages of road transport of freight are: speed, flexibility (due to the ability to ship small quantities, relative to rail or water), and the ability of motor carriers to reach virtually all points. As these advantages are most important with regard to higher valued cargoes, shortfalls in road transport not only retard overall trade, but impose particular disadvantages on areas of trade likely to be the most desirable in terms of value-added.

With its emphasis on heavy industry, under socialism rail transport of freight (and passengers) was extremely important. For example, in 1988 truck and rail accounted for equal shares of ton-kilometers of freight in Bulgaria (Ministry of Transport). By comparison in that same year, road transport in the United Kingdom accounted for over seven times the ton-kilometers as did rail (Button, p. 8). Moreover, up until the end of central planning, there were only limited indications that truck movements were becoming relatively more important (Figure 1). An indication of transport-related [and energy and environmental] costs resulting the above-described emphases is that in 1988 for each dollar of GDP, Bulgaria generated .72 ton-kilometers of freight movements, versus only .25 ton-kilometers for the United Kingdom (Holt, p. 27).

With the collapse of central planning, freight movements fell, with markedly steeper falls in rail traffic than for roadways (Figure 1). International movements also fell. For example, between 1989 and 1992 truck crossings of Bulgarian borders fell by 11 percent (Ministry of Transport). If and as Bulgaria restructures its economy along lines similar to those of Western European nations, movements of freight by road would be expected to increase sharply, while those via rail may never fully recover. Indeed, the ability of Bulgaria to transform its economy depends in part upon the ability of its transport system to transform and create efficient linkages with the transport systems of its neighbors.

Freight Rate Analysis

If roadway conditions and border crossings in Central Europe are markedly inferior to those in Western Europe and if these shortfalls impose significant costs on motor carriers, these costs ought to be reflected in their freight rates, ceteris paribus. [1] That is, freight rates for movements over Central European roadways and through Central European borders should be higher than for comparable journeys in Western Europe. If such differences are not found, it may be assumed that shortfalls in border crossing performance or roadway infrastructures are not severe or that motor carriers are, for

some reason, absorbing these costs and that these factors do not impose competitive disadvantages on the region. Following this line of reasoning, one-way freight rates were collected for international motor carriage from Bulgaria and models developed and estimated.

Model and Methodology

As is customary in studies of motor carrier freight rate determinants, freight rates are assumed to be dependent primarily upon distance, with adjustments for other factors.[2] Here, those factors are border crossings, road conditions, and the use of ferries (several of the routings involved ferry crossings across the Black Sea, Adriatic, the Channel, and the Kattegat). Another important determinant of freight movement costs and rates is the availability of complementary haulage (i.e., backhauls), see Klindworth and Brooks; Kilmer, Ramirez, and Stegelin; and Beilock, Garrod, and Miklius. Complementary haulage is not included in this study as the data employed was for carriers which customarily did not seek backhauls.[3]

Four regions are identified to account for variations in road and border crossing conditions: West Europe, Central Europe, the Former Soviet Union, and the Middle East, see Figure 2. The expectation is that both road and border crossing conditions improve as one moves from east to west. For example, while West Europe has a modern and well-integrated limited access road system, only fragments of such a system exist in Central Europe. Road conditions are reported to be poorer east than west of Moscow (Gransden et. al.). Therefore for the purpose of gauging distance-related freight rate variations, the Former Soviet Union is divided into two subregions by a line extending from the Caspian Sea, along the Volga and straight north from Moscow. These subregions are delineated by the adjectives "West" and "East." Also delays, security problems, and poor facilities can be severe problems at border crossings in Central Europe and the Former Soviet Union, see Table 1. To demonstrate better the importance in freight rate determination of border crossings and cross-region differences, three models are estimated: Distance, Distance and Border Crossings, and Distance and Border Crossings by Region. In the Distance Model, the only explanatory variables are the total one way overland and water (i.e., ferry) distances. The total number of border crossings encountered is added as an explanatory variable in the Distance and Border Crossings Model. Finally, in the Distance and Border Crossings by Region Model cross-region differences are controlled for.[1]

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[1] The empirical models estimated are:

DISTANCE MODEL

$$RATE = b_0 + b_1 LD + b_2 WD + e$$

DISTANCE AND BORDER CROSSINGS MODEL

$$RATE = b_0 + b_1 LD + b_2 WD + b_3 BDR + e$$

DISTANCE AND BORDER CROSSINGS BY REGION MODEL

$$RATE = b_0 + b_1 LD + b_2 LD_{CE} + b_3 LD_{WFSU} + b_4 LD_{EFSU} + b_5 LD_{ME} + b_6 WD + b_7 WD_{BS} + b_8 BDR + b_9 BDR_{CE} + b_{10} BDR_{FSU} + b_{11} BDR_{ME} + b_{12} WAT + e$$

Where:

LD	Land distance in kilometers.
WD	Water distance in kilometers.

In the Distance and Distance and Border Crossings Models all parameters are expected to be positive, reflecting the costs associated with increases in distance and the number of border crossings. In the Distance and Border Crossings by Region Model, the omitted region (for both distance and border crossings) is Western Europe. As conditions should be most favorable in Western Europe, it is expected that the signs of all parameter estimates will be positive or, at least, non-negative. Reflecting worsening conditions as one moves eastward, it is expected that the magnitudes of the parameter estimates associated with distance and border crossings will be larger for the more eastern than the more western regions. The parameter estimate associated with WAT is intended to capture costs related to land-water transfers and border crossings. The parameter estimate associated with WD_{BS} is intended to account for any differences in costs of using ferries between points in Western Europe, on the one hand, and those in Central Europe and the Former Soviet Union, on the other hand.

DATA

Taking advantage of its position at the crossroads of Western and Eastern Europe and the Middle East, Bulgarian firms have long been active in international motor carriage. Due to the international nature of the competition, prior to 1989 these firms operated more efficiently than was typical of firms in other industries in the region. Consequently, their transition to market economies has been relatively smooth.[4]

One-way truckload freight rates in use during Spring 1995 were collected from four of Bulgaria's largest international motor carriers. It should be noted that Spring 1995 was just prior to the implementation.

TABLE 1: CONDITIONS AT BORDER CROSSING IN CENTRAL EUROPE AND THE FORMER SOVIET UNION, 1995

BORDER	WAITING TIME	SECURITY	FACILITIES
Belarusian-Polish	1 day (max. 2 days)	adequate	adequate on Polish side
Belarusian-Russia	10 hours (max. 2 days)	poor	poor
Bulgarian-Romanian	1 day	poor	poor
Czech-German	1 day (max. 3 days)	good	adequate
Czech-Polish	10-12 hours	good	adequate

BDR Number of border crossings.

WAT Binary variable equal to 1 if a ferry is used and 0 otherwise.

CE, FSU, WFSU, EFSU, ME, BS Respectively, Central Europe, Former Soviet Union, West Former Soviet Union, East Former Soviet Union, Middle East, and Black Sea. (Western Europe is the omitted category.)

$b_0 \ldots b_{12}$ Unknown parameters.

e Random error term.

NOTE: Border crossings between regions are counted as .5 crossings for each of the regions.

Czech-Slovak	10 hours (max. 2 days)	good	adequate
Hungarian-Slovak	4-5 hours	good	adequate
Polish-German	8-10 hours (max. 2 days)	good	adequate
Polish-Lithuanian	3-4 hours (max. 1 day)	good	good on Polish side
Russian-Ukranian	10 hours (max. 2 days)	poor	poor

Source: Gransden et. al.

of the Schengen agreement to eliminate border controls between seven European Union nations.[5] Therefore, the rates should reflect costs associated with those border controls and thereby give an indication of savings associated with their elimination.

Rates were obtained for haulage from Bulgaria to 158 different destinations located in thirty-eight countries in Europe and Asia, see Appendix I. The carriers indicated that the rates were actually utilized, not merely initial quotations or benchmarks for discounting. As many of the destinations could be reached by truck-ferry combination, as well as strictly overland, there are 234 observations. The main ferry movements are from Piraeus, Greece to Piran, Slovenia and from Varna, Bulgaria to Novorossijsk, Russia.[6] Total one-way trip distances vary from 250 to 4,600 kilometers and the number of border crossings vary from one to seven.

While the sample is treated as a random sampling in the analysis, strictly speaking this is not the case and the results should be regarded with some caution. If the universe of observations is viewed as being the rates charged to all destinations in Europe and Western Asia and originating in Bulgaria, then the sample consists of those destinations served by the four largest carriers in Bulgaria. While other carriers no doubt serve additional destinations, the representativeness of the sample most likely is quite good and problems from non-randomness negligible. On the other hand, the data set is more problematic if the universe of observations is viewed as being all international truck movements originating in Bulgaria; that is, if each truck movement is an observation. In this case, the data set is, in effect, a stratified sampling of rates, with the strata being each origin-destination pair. The sampling intensity in each strata would vary inversely with the unknown number of truck movements between each origin-destination pair. In our defense, it should be noted that the use of such data sets and ignoring of potential problems is common practice in transportation studies, for example see Blair, Kasserman, and McClave; Beilock and Freeman; and Miklius..

Distance Model

Estimating freight rates using only total land and water distances, yields a highly significant equation which accounts for 55 percent of the variation from the mean (see Model 1, Table 2). As would be expected, per kilometer costs for overland transit are markedly higher than for water ($1.27 versus $.38 per kilometer).

Distance and Border Crossings Model

Recognizing that delays, taxes and other costs may be associated with border crossings, the total number of border crossings (BRD) was added as an explanatory model. The results were both surprising and somewhat disappointing (see Model 2, Table 2). The addition of BRD only marginally increased the explanatory power of the equation (R^2 increased from .55 to .58). Moreover, the parameter estimate associated with BDR was negative and highly significant.

The seemingly perverse result with respect to the parameter estimate associated with BRD may be explained by the political geography of the region. As one travels from west to east, country sizes tend to increase. This is particularly true for the Former Soviet Union and the Middle East, both of which have very large nations relative to Central and West Europe.[7] Therefore controlling for distance, the larger the number of border crossings, the more likely that the movement is in Central or West Europe. This phenomenon can be seen by examining the correlations for the routings between land distances in each region, on the one hand, and the total number of border crossings, on the other hand:

Correlation between the total number of border crossings and overland distances in:			
West Europe	Central Europe	Former Soviet Union	Middle East
.5413	.6620	-.0921	-.2176

The negative parameter estimate associated with BRD makes sense if, as is expected, transport costs are higher in the easternmost regions.

To explore this possibility, the model was re-estimated adding a slope shift parameter for distance in the two easternmost regions, $LD_{FSU\&ME}$. If the above-described explanation is correct, the parameter estimate associated with BDR should become positive. This is the case (see Table 2, Model 2A). Moreover, the explanatory power of the equation increases markedly (from an R^2 of .58 to .82), indicating the importance of accounting for cross-region differences.

Distance and Border Crossings by Region Model

In this model the cross-region differences are accounted for both with respect to border crossings and distance. The results of the estimation process are extremely good (see Table 2, Model 3). The estimated equation is highly significant and has an R^2 of .92. The signs and magnitudes of most parameter estimates are consistent with expectations.

Distance-Related Rate Changes

Land

The results suggest that truckload rates increase by $.72 per kilometer in Western Europe (parameter estimate associated with LD). Of some surprise were the negative signs for the estimates of the parameters associated with LD_{CE} and LD_{ME}, which

suggest that rate-distance gradients in Central Europe and the Middle East are lower than for Western Europe. However, neither of these estimates are significant, even at the .2 level of probability. These results may be due to a combination of factors including: lower fuel prices than in Western Europe; much of the distances in Central Europe was in Bulgaria, the home base of the firms surveyed; and most of the distances in the Middle East were in Turkey, a relatively developed nation for that region.The parameter estimates for LD_{WFSU} and LD_{EFSU} indicate that distance-related costs of using truck transport in the Former Soviet Union are fifty-to-seventy percent higher than in Western Europe. The point estimates do not indicate higher costs in the eastern than western part of the Former Soviet Union, as had been expected. Indeed, the point estimates suggest the opposite is the case, but the difference is not statistically significant.

Water

As might be expected, transport by water is less costly per unit distance than by land, at least in Western Europe. The parameter estimate associated with WD indicates a rate-distance gradient roughly half that for overland movements. Of course, the greater circuity of many of the truck-ferry routings reduces their advantage over straight truck movements.

As expected, movements in the Black Sea are more costly per kilometer than in Western Europe. However, the magnitude of the difference is surprising. The parameter estimate associated with WD_{BS} suggests a rate-distance gradient for movements in the Black Sea of $2.56 per kilometer ($2.20 + $.36), compared to $.36 per kilometer for movements in the Mediterranean. The high cost may be due to operational inefficiencies. An alternative explanation is that the high distance-rate gradient is due to capacity constraints

(which, admittedly, may be the result of inefficient utilization). The rate for crossing the Black Sea is comparable to the costs implied in the model of taking the land route. If capacity constraints exist, barge rates would be bid up to the cost of the alternative.

Border Crossing-Related Rate Changes

It is estimated that a border crossing in Western Europe increases freight rates, and presumably costs, by nearly $119 per truckload. Considering the tens of thousands of trucks moving daily across West European borders, savings from the Schengen pact and possible extensions of that agreement should be considerable.

The point estimate associated with BDR_{CE} suggests that costs from crossing Central European borders are substantially higher than in Western Europe ($253+$119=$372), as expected. However, the estimate is only significant at the .10 level of probability. The parameter estimates associated with BRD_{FSU} and BRD_{ME} are positive, large, and highly significant. For the Former Soviet Union, it is estimated that each border crossing is associated with over a $400 increase in per truckload freight rates ($298 + $119). The estimated increase in rates per border crossing is even higher for the Middle East, $869 ($750 + $119). The magnitude of these estimates are explainable largely by delays, risks associated with variations in delays, and legitimate fees (taxes, etc.) at the border. In addition, part of these estimates may reflect costs associated with bribery and security risks.

The water segments of the routings in the data set all involved international movements. WAT was included as an explanatory variable to account for any cost differences between border crossings via land and via sea. The results suggest that such differences are minor or non-existent.

Rate analysis: conclusions

The determinants of truckload freight rates for international movements in Western and Central Europe, the Former Soviet Union, and the Middle East were examined. Particular focus was on the effects of distance and border crossings across regions with markedly differing conditions.

The results indicate significant distance-related premiums are paid for movements in the Former Soviet Union relative to the other areas. For example, a 1,000 kilometer movement of general freight in the Former Soviet Union is estimated to cost between $370 and $498 more than an equivalent movement in Western Europe. These are believed to be due to inadequate infrastructure and security risks. It was estimated that for each border crossing in Western Europe, rates increase by $119 per truckload. This result implies considerable savings may be expected from the Schengen pact and that similar agreements should be strongly considered.

The estimated impacts of border crossings were much higher in Central Europe, the Former Soviet Union and the Middle East ($372, $417 and $869, respectively, per border crossing per truckload). The high costs are thought by the authors to be due to taxes and other legitimate fees, delays and variations in delays, and possibly bribery and security risks.

The goal of the rate analysis was to determine if problems related to the roadway infrastructure and border crossings result in higher freight rates and, as a result reduced trading opportunities for the nations of the Balkans. The results clearly indicate substantial distance-related transport costs in the Former Soviet Union, suggesting shortfalls in roadway infrastructures, security, and/or services; and costs related to border crossings in Central Europe, the Former Soviet Union and the Middle East impose severe costs on these societies in the form of reduced trading opportunities.

To convey better the extent of these costs, in Figure 3, the estimated premiums paid to move freight from Bulgaria throughout Europe are presented. For example, it is estimated that freight charges to Germany and most of Western Europe are between 15 and 20 percent higher than they would be if Central Europe had roadways and border crossings comparable to those in Western Europe. Freight charges to Austria, the Czech Republic, Slovakia, and Hungary are between 31 and 40 percent higher, while those to points in Romania and Greece are between 41 and 50 percent higher. Finally, it is estimated that freight charges to the Former Yugoslavia, Poland, and the Former Soviet Union are over 50 percent higher than if all of Europe had roadways and border control systems comparable with Western Europe. For some destinations, such as Moscow, freight charges are two times or more what they would be under Western European conditions. These estimates understate the handicap imposed on these societies because the delays, security risks, and rough road conditions reflected in the elevated rates impose particularly high costs on higher valued and fragile cargoes.

For Central Europe, the results suggested that shortfalls with regard to border crossings dominate any problems with regard to the road infrastructure or other conditions within the countries. For this reason and because conditions at border crossings have received relatively little attention in other studies, border crossings will be the primary focus of investigation for the balance of this study.

INTERVIEWS WITH MOTOR CARRIERS

In the summer and fall of 1996 interviews were carried out with the owner, chief executive officer, or general manager or international motor carriers with offices in Bulgaria. The purpose of these interviews was to obtain additional information regarding the environment for motor carriage in the Balkans, with particular focus on border crossings. A copy of the questionnaire is presented in Appendix II (a Bulgarian translation was employed for the actual interviews).

DATA

A total of twenty motor carriers were interviewed, ten each had their main offices in Sofia and in Varna. The carriers were selected from telephone directory listings for international motor carriage. While there are not obvious reasons to question that the sample is representative of international motor carriers operating from Bulgaria (other than the fact that those not having offices in Sofia or Varna were precluded), it cannot be claimed that this was assured by the sampling procedures.

General Characteristics

All but one carrier indicated that their firm's main headquarters was in Bulgaria. The exception was a former Bulgarian state firm which had been recently purchased by a German carrier. Just over two thirds of the carriers reported having between 1 and 25 trucks, seven had between 26 and 50 trucks, and one had between 50 and 100 trucks. Using the midpoints of these ranges, the combined fleet of the twenty motor carriers is approximately 440 trucks. Ninety percent of the carriers haul general freight, 40 percent handle containers, and 35 percent have refrigerated vehicles. Between 5 and 20 percent of the carriers reported also handling bulk dry, bulk liquid, and specialized commodities (such as automobiles). Save for three carriers, all derive at least half of their revenues from international motor carriage, with the average being 82 percent. Western Europe & Scandanavia account for just over a third of the business for these carriers, with Central Europe, the Former Soviet Union, and the Middle East each accounting for approximately equal shares of the remainder (see Figure 4).

Border Crossings

Carriers were asked about conditions at border crossings for four countries: Albania, Bulgaria; Macedonia FYR, and Romania. As only one carrier had sufficient experience with Albanian border crossings, those results are not reported. Motor carriers were asked to judge various aspects of border crossings facilities and procedures on a 0-to-10 point scale, with 10 being the standards realized in the best nation in their experience in Western Europe. For example, if a respondent believes that Germany has the best security at border crossings and security at Romanian crossings is 40 percent as good, he/she would rate the Romanian crossing as '4.' Given the small and non-random nature of the sample of respondents, no claims are made regarding the statistical significance of the results, which are summarized in Table 3 and discussed below.

Carriers clearly view conditions at border crossings in Bulgaria, Macedonia FYR, and Romania as being markedly inferior to those in Western Europe or, at least, to the best in Western Europe. Of the six items rated on the 0-to-10 scale, only the response for 'clarity and fairness of regulations' for Macedonia FYR averaged above 5. Moreover, for Romania and Bulgaria carriers report that bribes/gifts are solicited from officials approximately three out of every four crossings and for Macedonia FYR for just over half of the crossings. Carriers indicate very long delays, averaging between 20.4 and 32.5 hours at each country's worse crossing point and between 5.75 and 15.4

hours at the best crossing point in each country. In open-ended responses, crime, ineptitude, and simple laziness on the part of border officials were most often cited as the primary problems. Another strong indication of the extent of the difficulties is that 85 percent of the carriers give additional compensation to their drivers for making border crossings (carriers normally compensate drivers based upon distance covered). The extreme length of these delays is important, both with regard to their implications on carrier and shipper costs and with regard to the efficacy of costly infrastructure improvements before or without problems related to border clearance. For example, the average delay reported for Kulata was 24.5 hours. With current road conditions, it takes less than half that time to transit Bulgaria from north-to-south. Certainly there are problems with the road infrastructure. However, if the 24.5 hour estimate is remotely accurate, the primary bottleneck is at the border and improving the roadway alone does little or nothing to reduce total trip times.

TABLE 3: BORDER CROSSING CONDITIONS FOR BULGARIA, MACEDONIA FYR, AND ROMANIA

ITEM	BULGARIA	MACEDONIA, FYR	ROMANIA
Overall quality of facilities (0-to-10)	3.2	4.5	2.3
Security from theft (0-to-10)	1.8	4.5	1.9
Ease and reasonableness of processing (0-to-10)	3.7	3.8	2.1
Honesty and competence of border officials (0-to-10)	2.9	3.5	2.4
Percent of time a bribe or gift is demanded by officials	74%	54%	73%
Fairness of taxes and other charges (0-to-10)	4.6	2.5	1.8
Clarity and fairness of regulations (0-to-10)	3.9	6.0	2.4
Time to clear WORSE border crossing (average)	20.4 hours	28.6 hours	32.5 hours
Range of responses	8-to-48 hours	7.5-to-48 hours	15-to-48 hours
Most frequently mentioned crossing	Ruse	Gyueshevo	Gyurgevo & Vidin
Time to clear BEST border crossing (average)	5.75 hours	15.4 hours	6.2 hours
Range of responses	1.5-to-14 hours	7-to-15 hours	2-to-12 hours
Most frequently mentioned crossing	Kulata	Zlatarevo	Kardam

TABLE 4: ROADWAY CONDITIONS WITHIN BULGARIA, MACEDONIA FYR, AND ROMANIA

ITEM	BULGARIA	MACEDONIA,	ROMANIA

		FYR	
Overall roadway quality and capacity (0-to-10)	2.8	6.0	2.4
Security from theft (0-to-10)	1.6	4.5	2.0
Availability of services (0-to-10)	4.3	4.5	2.3
Honesty and competence of police (0-to-10)	2.7	3.7	1.9
Percent of times within the country in which a bribe or gift is demanded by officials	56%	47%	79%
Clarity and fairness of regulations (0-to-10)	5.0	3.5	3.0

It should also be noted that the extreme waiting times may explain the apparent absence of negative effects found in the rate analysis in Central Europe from roadway infrastructures. It seems likely that there are variations in waiting times at borders and that these variations follow a rough pattern (for example, Sunday mornings may be relatively fast or slow at a given crossing). As the nations are fairly small, geographically, it is more important to carriers to arrive at borders during faster crossing periods than to move at higher speeds. Indeed depending upon the distance to the next border and the expected change in processing time at that border, the carrier may be indifferent between higher and lower speeds. For example, suppose that at high speed the border is 4 hours away or 6 hours away at slow speeds. If in 6 hours the border processing time is expected to be at least 2 hours less than it will be in 4 hours, the speed the vehicle travels at has effectively no impact on the time it will enter the next country.

In most respects, conditions in Macedonia FYR appear to be better than in the other two countries. For five of the six items judged on the 0-to-10 scale, Macedonia FYR had the best average scores (ranking second only with respect to 'fairness of taxes and other charges) and had the lowest estimate for 'percent of time a bribe or gift is demanded by officials.' By the same criteria, Romania is judged to be the worse. It ranked worse with regard to five of the six 0-to-10 point scale questions and was virtually tied with Bulgaria with respect to both the remaining question ('security from theft') and the estimate of frequency of bribes/gifts.

Despite Macedonia FYR's relatively good showing with regard to measures of border crossing quality and fairness, it was a poor second with regard to average crossing time at its worse crossing point and judged to be nearly three times slower processing vehicles through its best crossing point than either Bulgaria or Romania.

Conditions Within the Countries

Carriers were asked about various aspects of conditions operating within Bulgaria, Macedonia FYR, and Romania. As with the questions about border crossings, in most cases a

0-to-10 scale was employed, with 10 being comparable to the best Western European nation in that carrier's experience. The results, summarized in Table 4, reveal an overall pattern of responses similar to that for conditions at the border. Again, the three nations are rated very poorly relative to Western Europe or, at least, the best Western European conditions and ,among the three nations, Macedonia FYR fares best in most regards and Romania the worst. The extents of the perceived shortfalls in infrastructure and regulations and high incidence of corruption are disturbing.

Conclusions

The rate analysis indicated that roadway and border crossing conditions impose very high costs on Balkan nations in terms of elevated freight rates. For some destinations these costs can result in freight rates double what they would be if West European conditions held throughout Europe. While it could not be directly measured, it seems clear that, in addition to the freight rates themselves, disadvantages borne by shippers from slower movements, uncertain delays, and rough road conditions are most severe for those with higher valued, fragile, and perishable cargoes. So overall trade is discouraged, with the penalties increasing the higher the value, fragility, and perishability of the goods.

In Central Europe itself, border crossings, but not roadway conditions, appear to elevate freight rates. The results of the interviews with motor carriers offered a possible explanation for this. Carriers reported waiting times at borders which were frequently far in excess of the time needed to cross the country. Under these conditions, variations in roadway speeds would have little impact. Indeed, if there are, as seems reasonable, systematic variations in waiting times at border points across time (such as daily and/or weekly cycles), then if queue lengths are expected to fall over the next several hours, higher road speeds going to a border would be trading less time driving for more time waiting, with little or even no reduction in total time to transit and exit a country.

All of this does is not meant to imply that improvements of internal roadway conditions are not important. However, if these improvements are accomplished without expediting processing rates at the borders, there will be modest gains, at best, for international carriers and shippers.