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EASTERN EUROPEAN EXPORT PERFORMANCE DURING THE TRANSITION

Nathan Sheets and Simona Boata

Abstract

During the past decade, Eastern European exports have undergone a deep transformation, as communist bloc trading relationships have collapsed and trade with the West has increased. The extent of this geographical re-orientation has generally exceeded the predictions of equilibrium models developed by Hamilton and Winters (1992) and Collins and Rodrik (1991), suggesting the prospect for increased export activity among the transition economies as aggregate demand in these countries strengthens and payment systems mature. Significant changes in the product composition of Eastern European exports have accompanied the geographical re-orientation. Exports of manufacturing goods to former communist countries have declined sharply, but exports to the EC across an array of goods -- including heavy machinery -- have grown robustly. Evidence suggests that the observed changes in export composition reflect the redirection of physical goods through price competiotion and the emergence of market-determined comparative advantage.

Key Words: Transition Economies, International Trade, Comparative Advantage, European Integration.

Eastern European Export Performance during the Transition

Nathan Sheets and Simona Boata*

1. Introduction

During the past decade, the structure of exports from Eastern European countries -- Poland, Hungary, Czechoslovakia, Romania and Bulgaria -- has undergone a deep transformation. Both the geographical orientation and the product composition of Eastern European exports have changed dramatically. The first part of this paper uses IMF Direction of Trade Data to examine the decline in Eastern European exports to Council for Mutual Economic Assistance (CMEA) countries and the accompanying increase in export activity with Western Europe. Notably, the magnitude of the geographical re-orientation has tended to exceed the predictions of equilibrium models developed by Hamilton and Winters (1992) and Collins and Rodrik (1991). It is thus reasonable to anticipate that trading activity between the former communist countries will rebound, as aggregate demand in these countries strengthens and payment systems continue to mature.

The second part of this paper studies the changing product composition of exports. United Nations data indicate that Eastern European manufacturing subsectors have experienced large declines in exports to the CMEA, as well as substantial increases in exports to the European Community (EC). Two further conclusions are also warranted. First, the data suggest

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*The authors are staff economist and research assistant, respectively, in the Division of International Finance, Board of Governors of the Federal Reserve System. The authors wish to acknowledge Jay Bryson, David Howard, Prakash Loungani, Stanislav Polak and David Wong for helpful comments and discussion. This paper represents the views of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or other members of its staff.

that exports from the Eastern European countries, particularly Czechoslovakia and Poland, are adjusting in a manner consistent with underlying comparative advantage. Second, there is some evidence that declines in manufacturing exports to the CMEA in a given industry are significantly related to contemporaneous increases in EC exports by the same industry, suggesting that physical goods have been redirected from CMEA to EC markets.

2. Geographical Orientation of Eastern European Exports

Through the 1980s and early 1990s, the export patterns of the Eastern European countries were significantly influenced by the structure of the trading system established by the Council for Mutual Economic Assistance.[1] Two characteristics of the CMEA trading structure were particularly significant.[2] First, the CMEA discouraged trade with the West. Second, Schrenk (1992) notes that "monopolistic domestic and regional sellers' markets removed incentives for producers to keep up with international standards of product and process technology." As a result, Eastern European countries became increasingly dependent on their CMEA partners, particularly the USSR, to purchase manufactured goods that were not competitive in world markets.

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[1]During the 1980s, the CMEA included Poland, Hungary, Bulgaria, Romania, Czechoslovakia, East Germany, USSR, Mongolia, Vietnam, and Cuba. Yugoslavia, which was an associate member, is also grouped with the CMEA in the numbers reported below.

[2]For a detailed assessment of the CMEA trading system see Schrenk (1992) and Lavigne (1995).

Table 2.1, which reports the geographical distribution of Eastern European exports from 1985-88, clearly reflects the impact of the CMEA.[3] Trade with Western industrial countries accounted for only about 35 percent of total exports from Poland, Hungary, Romania, and Czechoslovakia. Less than a quarter of Bulgarian exports went to industrial countries. By contrast, the CMEA accounted for 55 percent of the exports from Hungary, Bulgaria, and Czechoslovakia and over 40 percent of the exports from Poland and Romania.[4] Roughly half of the Eastern European countries' CMEA exports went to the USSR.

Several authors have attempted to determine what the geographical distribution of Eastern Europe's trade will look like once impediments to Western exports have been removed and the artificial dependence on the CMEA has been reversed. Two methodological approaches have been used to address this issue. The first approach, pursued by Hamilton and Winters (1992) and others [e.g., Havrylyshyn and Pritchett (1991), Wang and Winters (1991), and Baldwin (1994)] involves estimating a "gravity model" using data from a cross-section of countries. The second approach, proposed by Collins and Rodrik (1991), estimates equilibrium trade patterns using data from 1928 as a baseline.

The gravity model postulated by Hamilton and Winters (HW) assumes that exports from a given country to another country rise with the GDP of each country. Exports decline as the population of each country rises and as the distance between the two countries increases. The

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[3]The data in Table 2.1 are obtained from IMF Direction of Trade Data. The IMF converts trade flows denominated in foreign currencies into U.S. dollars using period average exchange rates.

[4]Rodrik (1992) observes that these data may overstate the magnitude of CMEA trade flows. CMEA trade was denominated in the so-called "transferrable ruble," which was maintained at artificially appreciated levels vis-a-vis the dollar.

gravity model may be interpreted as follows. Domestic GDP proxies for a country's export supply capacity, while foreign GDP is a proxy for the foreign country's demand for domestic exports. The population variables proxy for the size of a country's economy. Larger economies, holding all else equal, are generally less open than smaller economies, perhaps because larger economies are able to achieve more internal diversification. The distance between the two countries is a proxy for transactions costs, particularly the cost of transportation. HW observe that the absence of prices and exchange rates in the gravity model does not suggest that such variables are not important; instead, HW argue that the gravity model is a reduced form description of a long-run equilibrium, where prices and exchange rates are themselves determined by the variables included in the model.

Hamilton and Winters use data from 76 market economies (19 industrial countries and 57 LDCs) averaged over 1984-86 to estimate their gravity model. They assume that the model that best describes the trading patterns of the 76 market economies in their sample will also describe the long-run trading relationships of the former CMEA countries. A weakness of this approach is that the results depend on estimates of USSR and Eastern European GDP; such estimates may vary by as much as five times. Hamilton and Winters compromise on this issue by working with Heston-Summers GDP figures, which fall in the middle of the range of published estimates.

A second approach to determining the long-run trading patterns of Eastern European countries was developed by Collins and Rodrik (1991), who generate estimates using trading patterns in 1928 as a baseline. Collins and Rodrik (CR) focus on 1928 for two reasons. First, they note that 1928 is perhaps the last year that "typical" trading relations existed between

Eastern European countries and other countries. After 1928, trade was distorted by increasing protectionism, the Great Depression, and the spread of communism. Second, CR choose 1928 because the data happen to be available. A world trade matrix for 1928 was compiled by the League of Nations. (These data are summarized in Table 2.2.) Notably, 65 percent of Bulgarian exports in 1928 were directed toward today's EC countries, while only 25 percent of Hungarian exports went to the EC. Conversely, Eastern Europe accounted for one-third of Hungarian exports but only 12 percent of Bulgarian exports. The Soviet Union was not a significant trading partner of the Eastern European countries in 1928.

Using this data, Collins and Rodrik examine the following question: If the Eastern European countries had remained part of the world trading system, how would their 1989 trading patterns have differed from their 1928 trading patterns? To address this issue, CR examine the evolution of the trading patterns of six "comparator" countries -- Austria, Finland, Germany, Italy, Portugal, and Spain. CR regress these countries' 1989 trade shares with 36 countries on the corresponding 1928 trade shares and dummy variables for each partner. The partner dummy is included to capture the changing importance of some countries in world trade. For example, Japan's prominence has increased significantly since 1928, while the UK's role has declined. CR use the resulting regression equation to determine equilibrium trade shares for the Eastern European countries. This procedure has the advantage of not depending on GDP estimates for the transition economies. It may be flawed, however, if the comparator countries are not truly comparable or if 1928 trade data are not a good basis for predicting long-run trading patterns. We note that neither HW nor CR attempt to say anything about the dynamics of adjustment to the long-run equilibrium.

Tables 2.3-2.6 present the Hamilton-Winters and Collins-Rodrik predicted export shares for the five Eastern European countries with various trading partners. Actual 1994 export shares, derived from IMF Direction of Trade Data, are also reported.[5,6] Table 2.3 indicates several conclusions. First, both HW and CR predict significant increases in the share of Eastern European exports to EC countries relative to the shares reported in Table 2.1. This suggests, as hypothesized earlier, that CMEA structures diverted exports away from Western Europe. Second, HW predict significantly lower export shares to the EC for Bulgaria and Romania (due to their eastward geography) than do CR. Indeed, Bulgaria's strong export orientation toward Western Europe in 1928 leads CR to predict that Bulgaria will ship a larger share of its exports to the EC than any other Eastern European country. Third, Table 2.3 shows that the 1994 export shares for Poland and Czechoslovakia have significantly overshot the equilibrium levels forecast by HW and CR. More generally, the re-orientation of Eastern European exports from East to West appears to have been rapid and substantial. Relative to the data in Table 2.1, the EC's share of Eastern Europe's exports in 1994 more than doubled for all countries except Romania, reflecting rapid growth in the volume of exports to the EC.

The data in Table 2.4 generally support the three conclusions drawn from Table 2.3. Both HW and CR accurately predict a decline in Eastern European exports to the former CMEA countries; however, HW and CR both tend to underestimate the magnitude of the decline. The

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[5]The Collins--Rodrik estimates and the 1994 actual data include Poland, Hungary, Czechoslovakia, Bulgaria, Romania, the former Yugoslavia and the former Soviet Union as CMEA countries. The Hamilton--Winters estimates presented here differ slightly from HW (1992) because these estimates have been adjusted to include East Germany as part of the EC and Yugoslavia as part of the CMEA.

[6]1994 data for Czechoslovakia are the sum of data for the Czech Republic and the Slovak Republic, excluding trade with each other.

export shares of Poland, Romania, and Czechoslovakia to the former CMEA countries are substantially below their predicted values. Table 2.5 decomposes the difference between the equilibrium export shares predicted by CR and 1994 actual export shares into a portion attributable to Eastern Europe and a portion attributable to the former Soviet Union. (HW estimates are not sufficiently disaggregated to allow this decomposition.) The average shortfall to Eastern Europe is 4.2 percent of total exports, while the average shortfall to the FSU is 3.8 percent of total exports. This suggests the potential for expanded trading activity, both within Eastern Europe and between Eastern Europe and the former Soviet Union, as aggregate demand in these countries strengthens and payment systems mature.

Finally, the 1994 trading patterns of Czechoslovakia and Poland are strikingly similar. These countries have pursued rapid economic reform, including liberalization of their trade regimes, and appear to have successfully restructured their trading relationships. By the same token, the 1994 trading patterns of Bulgaria and Romania are also similar. These countries share eastward geography and have reformed more slowly. Notably, Table 2.6 shows that Bulgaria's and Romania's 1994 trade shares with "Other Countries" (i.e., those outside the EC and the former CMEA) are significantly larger than for the other three Eastern European countries. Bulgaria and Romania export significantly to Turkey and to countries in the Middle East and Asia.

3. The Product Composition of Eastern European Exports

In the previous section, we documented the significant and rapid geographical re-orientation of Eastern European exports that has occurred in recent years. In this section, we

examine the changing product composition of Eastern European trade, in an effort to better understand the characteristics of the geographical re-orientation. The discussion in this section is organized around three benchmark hypotheses. Each of the hypotheses offers a contrasting perspective on how the collapse of CMEA trading structures and economic liberalization potentially could affect the composition of Eastern Europe's exports. We assess the empirical validity of these hypotheses using United Nations trade data.

Hypothesis 1. It is widely believed that CMEA trading regulations significantly distorted the composition of trade between the communist countries. Sujan and Sujanova (1995) note, for example, that "trade within the former CMEA was predominantly based not on natural market principles, but rather on bureaucratic commands forcing an artificial division of labor." Several researchers have suggested, however, that the composition of trade with the West, which differed significantly from the composition of CMEA trade, may have been less affected by these regulations.[7] In other words, evidence presented above indicates that CMEA structures reduced the *volume* of trade with the West; these structures, however, may not have significantly distorted the *composition* of that trade. Collins and Rodrik (1991) note that "probably the best indicator we have of Eastern Europe's comparative advantage pattern is that reflected in its current trade with the West." It may thus be reasonable to hypothesize that the equilibrium composition of Eastern European exports will be substantially more like its pre-reform trade with the West than its pre-reform trade with the CMEA. This hypothesis, which we will adopt as one benchmark, has two empirical implications. First, if Eastern Europe's trade with the EC during

[7]See Kaminski (1993) and Bohata (1995).

the 1980s was reflective of comparative advantage, we should not observe sharp changes in the composition of Eastern European exports to the EC following the liberalization of trade. Second, over time, the composition of Eastern Europe's exports to the CMEA should become more like its exports to the EC, i.e., trade with the East should adjust in a manner consistent with comparative advantage.

Hypothesis 2. Following the collapse of the CMEA trading structures and the contemporaneous contraction in aggregate demand in the former communist countries, many Eastern European exporters, who formerly sold goods to the CMEA, may have attempted to market their products in the West. Since goods sold in the CMEA were often of lower quality than comparable Western products, this scenario suggests that either goods were sold at a discount relative to Western goods ("price competition") or that exporters restructured production to improve the quality of their products ("industrial restructuring"). This hypothesis implies that growth in exports to the EC should be concentrated in industries that experienced declining sales to the CMEA.

Hypothesis 3. The analysis in this paper has, thus far, emphasized the distortions generated by the CMEA trading regime. There were, of course, many other distortions present in the centrally planned Eastern European economies. For example, relative prices generally did not reflect underlying scarcity, and the policies implemented by central planners often created incentives that were inconsistent with economic considerations. As a result, even if the trading regime with the West did not itself introduce sizeable distortions, the economies of these

countries were sufficiently distorted in other respects that Western trade may not have reflected comparative advantage.

This hypothesis suggests that Eastern European exporters, in response to the implementation of economic reforms and international competition, will be required to search out their market-determined comparative advantage, which may not resemble previous trade with either the EC or the CMEA. Under this hypothesis, significant changes in the structure of trade with both regions should be expected, as industries possessing comparative advantage expand and develop. In addition, the composition of trade with the EC and the CMEA would likely become more similar, as trade with both partners becomes more reflective of comparative advantage.

Index of Similarity. As a measure of the similarity of the product composition of exports across trading partners and years, we introduce the following index:

$$S_{(j_1, j_2)(t_1, t_2)} = 1 - \frac{1}{2} \sum_{k=1}^{n} | \sigma_{j_1 k t_1} - \sigma_{j_2 k t_2} | \qquad (1)$$

$$\sum_{k=1}^{n} \sigma_{jkt} = 1 \qquad (2)$$

Equation (1) defines the similarity between a given country's vector of exports to country j_1 at time t_1 and its vector of exports to country j_2 at time t_2. The coefficient σ_{jkt} is commodity k's share in the exports to country j at time t. This index maps the similarity between two export vectors into the [0,1] interval. Specifically, if the two export vectors are identical, then $S=1$. If the two export vectors are completely dissimilar, i.e., all non-zero entries in each vector

correspond to zero entries in the other vector, then S=0. We note that Equation (1) is similar in spirit to an index of similarity used by Rodrik (1992) and Kaminski (1993).

Composition of Trade Data. The empirical analysis in this section uses data on the product composition of trade drawn from the United Nations "Series D" trade database. In an effort to identify broad developments in the composition of Eastern European exports, we start the analysis by examining annual data for one-digit industries. As the paper progresses, we focus on two-digit manufacturing industries.[8]

The availability of data varies somewhat across countries. For Hungary, the data run from 1985-94, for Poland from 1985-93, and for Romania from 1989-94. Reliable data for Czechoslovakia are only available for 1989-90 and 1994, while data for Bulgaria are not included in the UN dataset. The data are reported f.o.b., expressed in U.S. dollars, and are generally compatible with the IMF direction of trade data used previously. The data have been deflated by the U.S. consumer price index and are stated in terms of constant 1990 dollars. (The changes in Eastern European export patterns have been so dramatic that the paper's results are broadly unchanged, independent of whether the underlying data are expressed in current or constant dollars.)

Tables 3.1-3.4 present one-digit composition of trade data -- both levels and shares -- for each of the four countries for which data are available. Tables 3.5 and 3.6 present coefficients of similarity between vectors of exports to the EC and the CMEA. In all four countries, exports to the CMEA have fallen sharply since the implementation of market reforms, declining by over

[8]One-digit industries and two-digit manufacturing subsectors are listed in the Appendix.

60 percent. This decline has been concentrated in the three one-digit industries principally engaged in manufacturing -- Manufactured Goods, Miscellaneous Manufactures and, particularly, Machinery and Transport Equipment. The contraction in exports from these industries accounts for more than 80 percent of the decline in each country's total exports to the CMEA. On the other hand, Tables 3.1-3.4 also show striking growth in exports to the EC from Hungary, Poland and Czechoslovakia, increasing by more than 150 percent over the period. Notably, over 80 percent of the net increase in exports to the EC is attributable to the same three manufacturing industries that registered sharp declines in exports to the CMEA. We note that Romania, while experiencing reduced exports to the CMEA, similar to the other countries, did not achieve an offsetting increase in exports to the EC. This partially reflects a sharp decline in exports of Mineral Fuels but, in addition, Miscellaneous Manufactures was the only Romanian one-digit manufacturing industry that experienced meaningful growth in EC exports.

Evaluation of Hypothesis 1 and Hypothesis 3. We now use the index of similarity presented above -- Equation (1) -- to evaluate Hypothesis 1 and Hypothesis 3.[9] Under both hypotheses, the composition of exports to the EC and CMEA should become more similar over time. In addition, both hypotheses suggest that the composition of exports to the CMEA will change, as trading patterns respond to the forces of underlying comparative advantage.[10] The two

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[9]Tests of Hypothesis 2 will be developed and presented below.

[10]In testing these hypotheses, we choose a fairly strong empirical analog of comparative advantage, i.e., we require the product composition of Eastern European exports to the EC and the CMEA to become more similar. Under this interpretation, comparative advantage requires not only that Eastern Europe export the same set of goods to both partners, but also that the goods be exported in roughly equal proportions.

hypotheses differ, however, in their predictions about the behavior of exports to the EC. Under Hypothesis 1, the composition of exports to the EC should not change significantly, since EC exports were not substantially distorted by the CMEA trading system. By contrast, Hypothesis 3 envisages significant changes in EC exports; inefficiencies in the domestic economy tended to distort trading patterns, even if the trade regime itself was not distortionary.

The coefficients of similarity reported in Table 3.5 indicate that the composition of exports to the CMEA and the EC became more similar in Czechoslovakia, Poland and Hungary, consistent with the predictions of Hypothesis 1 and Hypothesis 3. The convergence between CMEA and EC trade is observed most clearly in the case of Czechoslovakia, where the similarity measure moved from 0.505 in 1989 to 0.860 in 1994. Czechoslovakia's EC and CMEA exports moved from being the least similar across these countries at the beginning of the period to being the most similar at the end of the period. Poland also registered a substantial increase in similarity, moving from 0.549 to 0.728. At the beginning of the period, Hungary's EC and CMEA trade were more similar than that of the other three countries, perhaps due to the fact that Hungary was the first to implement market reforms.[11] During succeeding years, however, the composition of Hungary's trade with the EC and the CMEA has become only slightly more similar, possibly reflecting the gradual nature of Hungarian reform.

The coefficients in Table 3.6 suggest that the structure of Czechoslovakia's EC trade was relatively stable during the period, registering a similarity coefficient of 0.851, while the structure of its CMEA trade changed significantly, with a coefficient of 0.588. Czechoslovakia's

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[11]Rodrik (1992) notes that in Hungary "considerable decentralization and market-oriented reform" began as early as 1968. By the late 1980s, central planning was "largely discarded" and enterprises had a "large degree of autonomy."

CMEA trade changed more than that of any other country, while its EC trade changed less than any other country's. By contrast, the composition of Poland's EC trade actually changed slightly more than the composition of its CMEA trade, registering a coefficient of 0.677 for the EC versus 0.703 for the CMEA.

Based on these results, the trading performance of Czechoslovakia seems well explained by Hypothesis 1. The composition of its CMEA and EC exports has become more similar, while its EC trade has remained relatively stable. This suggests that the underlying structure of Czechoslovakia's economy may have been less distorted during the CMEA period than the economies of the other countries. Poland's export performance appears consistent with Hypothesis 3. The similarity between CMEA and EC exports has increased, along with significant changes in the structure of both EC and CMEA trade. This result suggests that Poland's economy is restructuring, with exporters responding to market incentives by searching out comparative advantage in new industries. Hungary's export performance seems weakly consistent with Hypothesis 3, registering a slight increase in similarity between EC and CMEA trade and substantial changes in the composition of exports to both regions. Neither of the hypotheses seems to describe adequately the changing patterns of Romanian trade; exports to both the EC and the CMEA changed substantially, but the composition of exports to the two regions became *less* similar between 1989 and 1994.

Analysis of Two-Digit Manufacturing Data. Our analysis of the export performance of one-digit industries has shown that the manufacturing industries experienced the largest declines in exports to the CMEA and the strongest increases in exports to the EC. Given these dynamic

changes, we believe that the manufacturing subsectors are the appropriate place to look for further evidence to evaluate Hypothesis 2 and Hypothesis 3. In this section, therefore, we initiate a more detailed examination of the export performance of Eastern European manufacturers. This examination uses data from the 19 two-digit manufacturing subsectors included in the United Nations data. These subsectors are listed in the Appendix. The data are again expressed in terms of constant 1990 dollars.

Table 3.7 presents a simple cross-tab that categorizes 76 country-subsectors (i.e., 19 manufacturing subsectors in each of the four countries) based on whether they have experienced increases or decreases in exports to the CMEA and the EC during the transition period.[12] Before discussing Table 3.7, however, we provide some interpretation of each of the cross-tab's four quadrants.

Two significant factors may generate observations in the northeast quadrant of the cross-tab. First, as noted above, CMEA trading structures tended to artificially encourage trade with the CMEA and repress trade with the West. As these effects are reversed, exports to the West should rise and exports to the CMEA should fall, holding all else equal. Second, over the last several years, economic activity in many CMEA countries -- particularly those in the former Soviet Union -- has contracted sharply, causing a corresponding decline in CMEA export demand. In response, Eastern European producers have had incentives to redirect exports to the West. Weak demand in the CMEA and diversion of exports towards the EC would also cause industries to fall into the northeast quadrant of the cross-tab. In the discussion below, we will

[12]Given data constraints, the "transition period" is defined as 1985-94 for Hungary, 1985-93 for Poland, and 1989-94 for Czechoslovakia and Romania.

divide the industries in the northeast quadrant into two groups: "Group 1" includes those industries for which the increase in exports to the EC is greater in magnitude than the decrease in exports to the CMEA, and "Group 2" consists of industries for which the decline to the CMEA is larger than the increase to the EC. Group 1 industries have experienced net growth during the transition period, while Group 2 industries have contracted.

Industries may deviate from the northeast quadrant for a number of reasons. First, dynamic industries -- including those with emerging comparative advantage -- may successfully "swim up stream" and increase exports to the CMEA, despite the decline in economic activity and other factors that have tended to reduce trade with the East. These dynamic industries, which are consistent with Hypothesis 3, will fall into the northwest quadrant. Alternatively, observations may fall into the southeast quadrant -- declines in both CMEA and EC exports -- if industrial restructuring requires some industries to downsize, in order to free resources for use in more efficient sectors. Another explanation for observations in the southeast quadrant, which may be particularly applicable to Romania, is that administrative controls implemented under central planning may have encouraged excessive external trade, repressing consumption.[13] The removal of such controls may lead to across the board reductions in exports, as consumption rises. Finally, there is no compelling reason for observations to fall into the southwest quadrant. Under current circumstances, an industry that is sufficiently dynamic to increase exports to the CMEA should also be sufficiently dynamic to increase exports to the EC.

The data in Table 3.7 indicate that 50 of the 76 manufacturing industries fall into the northeast quadrant. Of these industries, 28 experienced increases in exports to the EC that were

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[13]See Williamson (1991), pp. 76-78.

greater than the decrease in exports to the CMEA; while in 22 industries, the increase in EC exports was less than the decline in CMEA exports. As mentioned above, we call the former set of industries Group 1 and the latter set of industries Group 2. These industries are listed in the first and second columns of Table 3.8.

Group 1 industries constitute a fairly diverse set. Clothing exports of all four countries registered strong increases to the EC, far offsetting declines to the CMEA. Specifically, Poland's clothing exports to the EC increased by $1.2 billion. Hungarian and Romanian clothing exports to the EC each increased by over $500 million, and Czechoslovakia experienced an increase of $250 million. Other common Group 1 industries are Furniture, Nonmetallic Mineral Manufactures, Metal Manufactures, and Miscellaneous Manufacturing. Group 1 includes eleven Hungarian industries, eight Polish industries, eight Czechoslovak industries and one Romanian industry.

Group 2 industries tend to be in heavy manufacturing and sophisticated products. For example, exports of Power Machinery, Electric Equipment, Transport Equipment, and Instruments, Watches and Clocks account for twelve of the twenty-two Group 2 country-industries. These industries generally constituted large shares of Eastern Europe's CMEA trade and tended to be overbuilt during central planning. A decline in exports from such industries may be indicative of economic restructuring. This observation, however, should not be overstated. Poland's exports to the EC of Transport Equipment grew by over $800 million, exceeding the corresponding decline in exports to the CMEA. Moreover, some of the heavy manufacturing industries in Group 2 registered sizeable increases to the EC. Czechoslovak exports to the EC of Electrical Machinery and Transport Equipment increased by $420 million

and $600 million, respectively, during the transition period, and Hungarian exports of Electrical Machinery rose by over $500 million. These increases, although somewhat smaller in magnitude than the corresponding declines to the CMEA, were still substantial.

Fifteen subsectors fall into the northwest quadrant, achieving increases in exports to both the EC and the CMEA. As shown in the third column of Table 3.8, these industries tend to be in natural resources and light manufacturing.[14] For example, three countries experienced increases in each of Wood and Cork Manufactures, Paper and Paperpoard Manufactures, and Plumbing, Heating and Lighting Equipment.[15] Two countries experienced increases in each of Leather and Dressed Fur and Non-Ferrous Metals. The strong performance of these northwest quadrant industries during the transition suggests that they may possess comparative advantage and hold the prospect for future export growth. Poland and the Czechoslovakia each have five subsectors in the northwest quadrant, while Romania has three and Hungary has two. Finally, we note that all eleven observations in the southern half of the cross-tab are Romanian industries.

Coefficients of Similarity. Coefficients of similarity calculated using two-digit manufacturing data are reported in Tables 3.9-3.10. As before, Czechoslovakia's export performance is consistent with the predictions of Hypothesis 1. Czechoslovak exports show a substantial

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[14]Data in Tables 3.1-3.4 suggest that seven one-digit country-industries achieved increased exports to both the CMEA and the EC, i.e., Food and Animals (Poland, Czechoslovakia), Beverage and Tobacco (Poland, Czechoslovakia), Animal and Vegetable Oils (Czechoslovakia, Romania), and Other Commodities (Poland). These industries tend to be involved with agriculture, food, and agricultural processing.

[15]The Plumbing, Heating and Lighting Equipment industry includes a variety of products. The plumbing products are mainly ceramic, iron and steel plumbing fixtures. Heating products are various types of central heating equipment. Lighting products include lamps, metal bases, and glassware.

increase in the similarity of EC and CMEA trade, with the composition of EC trade remaining quite stable and CMEA trade changing broadly. Poland's performance again seems best explained by Hypothesis 3. Poland experiences some increase in the similarity of its EC and CMEA exports (although not as striking as in Table 3.5) and significant changes in the structure of both its EC and CMEA trade. Hungary registers only a slight increase in the similarity of its EC and CMEA exports. The composition of its exports to the EC, however, remains more stable than any other country's. Hence, Hypothesis 1 may best describe Hungarian manufacturing export performance.[16] Romania has the same pattern of coefficients as in Table 3.5, again suggesting that its trading patterns are not well explained by either Hypothesis 1 or Hypothesis 3.

Evaluation of Hypothesis 2. We now evaluate Hypothesis 2 using the two-digit manufacturing data examined above. In the analysis that follows, we attempt to distinguish between two scenarios:

* *Price Competition.* In response to declining CMEA demand, Eastern European exporters may have attempted to market essentially the same goods in the West that they previously sold in the CMEA. This scenario suggests that physical goods were redirected from CMEA markets to EC markets and that Eastern European exporters competed primarily on the basis of price, i.e., lower prices were sufficient to compensate for lower quality. The sharp devaluation of the exchange rate, which accompanied the introduction

[16]The results for Hungary presented in Table 3.5, by contrast, were weakly consistent with Hypothesis 3.

of reform programs in many of these countries, may have facilitated this sort of price competition.

* *Industrial Restructuring.* Eastern European exporters may have concluded that the goods they sold in the CMEA were not of sufficient quality to be competitive in the EC, motivating exporters to improve the quality of their products. In this scenario, declining CMEA export demand would motivate firm restructuring that, in turn, would prepare the way for increased exports to the EC.

While there is no definitive method for differentiating between these scenarios, we implement the following test, which is based on the assumption that the restructuring necessary to raise the quality of exports to Western standards could not occur instantaneously. To the extent that fundamental restructuring has occurred, therefore, the decline in CMEA exports should be related to the expansion of EC exports with a discernible lag -- the time necessary to complete restructuring. Conversely, if the re-orientation of Eastern European trade has primarily consisted of redirecting physical goods from one market to another through price competition, there should be a roughly contemporaneous correlation between the decline in CMEA exports and the increase in EC exports, since the same goods have been shipped to different destinations.[17]

In Table 3.11, we report results obtained from the following regression:

[17]Given the necessity of establishing distribution channels and marketing, redirection of exports through price competition should generate rapid (i.e., within a year) but perhaps not instantaneous changes in the structure of exports.

$$\Delta EC_{ikt} = \phi_0 + \alpha_1 \Delta CMEA_{ikt} + \alpha_2 \Delta CMEA_{ikt-1} + \alpha_3 \Delta CMEA_{ikt-2} + \lambda_1 \Delta EC_{ikt-1} + \lambda_2 \Delta EC_{ikt-2} + \delta IndDum + \epsilon_{ijt} \quad (3)$$

The dependent variable is the change in the exports of country i to the EC in good k and year t. The independent variables are the current and lagged changes in good k exports to the CMEA, as well as two lags of the dependent variable. The regression also includes dummy variables for the Transport Equipment and Clothing industries. Other industry dummies, as well as country dummies, were insignificant in preliminary specifications and were dropped from the regression.

The results in Table 3.11 suggest that contemporaneous changes in exports to the CMEA are negatively and significantly related to increases in exports to the EC, even after controlling for lagged changes in EC exports and industry effects. The lagged changes in CMEA exports, however, are not significant. These results are clearly consistent with the price competition hypothesis discussed above. This conclusion, however, requires some qualification. First, the coefficient on contemporaneous exports to the CMEA suggests that, holding all else equal, a $1 decrease in exports to the CMEA leads to an increase in exports to the EC of only 15 cents.[18] Moreover, the adjusted R-squared coefficients for the regressions are less than 0.2.

These observations suggest that the redirection of exports through price competition is a partial explanation -- but only a partial explanation -- for Eastern European trade performance during the transition. This conclusion, however, should not be surprising. First, in light of the significant quality differentials between Western and CMEA products, a portion of Eastern goods

[18]The size of this coefficient is fairly robust, varying between -0.12 and -0.19 in a variety of specifications and across a number of data subsamples.

were probably unmarketable in the West, regardless of the price. For example, Rodrik (1992) points to computer products and manufacturing goods designed to satisfy Soviet production processes. Second, the regression specification is unable to account for the deep structural factors that determine long-run comparative advantage, which are discussed in Hypothesis 1 and Hypothesis 3. To the extent that such factors have influenced the re-orientation of Eastern European exports, the explanatory power of the regression would be expected to be low.

4. Summary and Conclusions

The discussion in this paper suggests several conclusions about Eastern European export performance during the transition. First, substantial shares of exports from these countries have been re-oriented from the CMEA to Western Europe. The extent of the geographical re-orientation has generally exceeded the predictions of models developed by Hamilton and Winters and Collins and Rodrik. It is thus reasonable to anticipate that trading activity between the transition economies will rebound, as aggregate demand in these countries strengthens and their payments systems mature. Second, evidence indicates that Czechoslovak exports to the EC in the late 1980s were broadly reflective of underlying comparative advantage, suggesting that Czechoslovakia's economy in the years preceding the introduction of economic reforms may have been comparatively free of distortions. Poland's export performance indicates that its economy is in the process of dynamic restructuring, with the emergence and development of new industries, apparently reflecting comparative advantage. Third, the behavior of Romanian exports has differed significantly from that of the other countries. For example, over half of Romania's two-digit manufacturing industries experienced decreased exports to the EC during

the transition period, but *none* of the two-digit manufacturing industries in other Eastern European countries registered similar declines. Fourth, Eastern Europe's exports of machinery and equipment to the EC have grown rapidly during the transition. Although these increases generally have been smaller in magnitude than the corresponding declines in such exports to the CMEA, they have still been significant. Finally, price competition appears to be an important -- but far from complete -- explanation for the rapid geographical re-orientation and changing product composition of Eastern European exports. Deep structural factors, identified in Hypothesis 1 and Hypothesis 3, also appear to have played a major role in affecting Eastern European export performance in recent years.

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Table 2.1: Average Export Shares, 1985-88

	Poland	Hungary	Bulgaria	Romania	Czechos.
			(percent)		
Total	100.0	100.0	100.0	100.0	100.0
Industrial Countries	37.2	32.1	24.4	34.9	32.7
EC	25.2	19.1	15.6	25.0	23.7
West Germany	10.5	9.3	2.7	7.5	15.1 1
CMEA	42.2	56.2	56.4	40.5	55.0
Poland	----	3.7	7.5	3.9	7.2
Hungary	2.4	----	4.3	2.6	4.1
Czechoslovakia	5.2	5.5	12.5	2.9	----
East Germany	4.0	5.8	NA	4.9	NA
U.S.S.R.	23.7	31.9	NA	21.8	33.9
Other Countries	11.2	11.7	19.3	22.2	12.3
Unspecified	9.3	0.0	0.0	2.3	0.0
Merno:					
Average Exports ($ billions)	12.3	9.3	2.7	11.2	13.4

1/ Includes exports to West Germany and East Germany.
Source: IMF Direction of Trade Data

Table 2.2: Export Shares in 1928

	Poland	Hungary	Bulgaria	Romania	Czechos.
			(percent)		
Total	100.0	100.0	100.0	100.0	100.0
EC	55.9	25.0	64.5	53.9	43.9
Eastern Europe	16.6	33.6	11.8	22.3	20.6
U.S.S.R.	1.7	0.4	0.0	0.0	1.3
Other Countries	25.8	41.0	23.7	23.8	34.2

Table 2.3: Eastern European Exports to EC Countries

	HW Predicted	CR Predicted	Actual 1994
(percent)			
Poland	44.1	51.2	62.7
Hungary	47.9	37.2	48.9
Bulgaria	35.8	57.1	45.6
Romania	38.5	50.0	46.0
Czechoslovakia	53.7	46.3	63.8

Table 2.4: Eastern European Exports to Former CMEA Countries

	HW Predicted	CR Predicted	Actual 1994
(percent)			
Poland	24.5	23.2	13.9
Hungary	14.4	33.0	26.2
Bulgaria	27.8	16.9	15.9
Romania	25.0	25.4	14.0
Czechoslovakia	22.2	25.1	13.2

Table 2.5: Predicted Export Shares to CMEA less 1994 Actual Shares

	HW 1/	CR
	(percent)	
Poland	10.6	9.3
Eastern Europe	—	4.7
FSU	—	4.6
Hungary	-11.8	6.8
Eastern Europe	—	4.4
FSU	—	2.4
Bulgaria	11.9	1.0
Eastern Europe	—	3.2
FSU	—	-2.2
Romania	11.0	11.4
Eastern Europe	—	4.6
FSU	—	6.8
Czechoslovakia	9.0	11.9
Eastern Europe	—	4.3
FSU	—	7.6

1/ HW data are not sufficiently disaggregated to allow decomposition between Eastern Europe and the former Soviet Union.

Table 2.6: Eastern European Exports to Other Countries

	HW Predicted	CR Predicted	Actual 1994
		(percent)	
Poland	31.4	25.6	23.4
Hungary	37.7	29.8	24.9
Bulgaria	36.4	26.0	38.5
Romania	36.5	24.6	40.0
Czechoslovakia	24.1	28.6	23.0

Table 3.1: Product Composition of Polish Exports

	EC-85	EC-93	CMEA-85	CMEA-93
	(Millions, 1990 dollars)			
Food & Animals	469	784	193	249
Beverages & Tobacco	6	10	44	102
Crude Materials	394	457	242	89
Mineral Fuels	855	588	715	190
Animal & Vegetable Oils	11	10	14	3
Chemicals	170	408	458	241
Manufactured Goods	676	2154	770	286
Machinery & Transport	318	1622	3230	395
Misc. Manufactures	252	1987	520	133
Other	0	6	0	2
Total	3152	8026	6186	1690

Product Shares:

	EC-85	EC-93	CMEA-85	CMEA-93
	(percent)			
Food & Animals	14.9	9.8	3.1	14.7
Beverages & Tobacco	0.2	0.1	0.7	6.0
Crude Materials	12.5	5.7	3.9	5.3
Mineral Fuels	27.1	7.3	11.6	11.3
Animal & Vegetable Oils	0.3	0.1	0.2	0.2
Chemicals	5.4	5.1	7.4	14.3
Manufactured Goods	21.5	26.8	12.4	16.9
Machinery & Transport	10.1	20.2	52.2	23.4
Misc. Manufactures	8.0	24.8	8.4	7.9
Other	0.0	0.1	0.0	0.1

Table 3.2: Product Composition of Hungarian Exports

	EC-85	EC-94	CMEA-85	CMEA-94
	(Millions, 1990 dollars)			
Food & Animals	464	701	927	576
Beverages & Tobacco	19	30	219	140
Crude Materials	139	308	116	71
Mineral Fuels	65	59	67	134
Animal & Vegetable Oils	15	7	54	65
Chemicals	279	418	554	340
Manufactured Goods	259	914	511	222
Machinery & Transport	189	1198	2679	488
Misc. Manufactures	220	1169	728	132
Other	16	0	75	0
Total	1666	4804	5930	2168

Product Shares:

	EC-85	EC-94	CMEA-85	CMEA-94
	(percent)			
Food & Animals	27.9	14.6	15.6	26.6
Beverages & Tobacco	1.1	0.6	3.7	6.5
Crude Materials	8.4	6.4	2.0	3.3
Mineral Fuels	3.9	1.2	1.1	6.2
Animal & Vegetable Oils	0.9	0.2	0.9	3.0
Chemicals	16.7	8.7	9.3	15.7
Manufactured Goods	15.5	19.0	8.6	10.2
Machinery & Transport	11.4	24.9	45.2	22.5
Misc. Manufactures	13.2	24.3	12.3	6.1
Other	1.0	0.0	1.3	0.0

Table 3.3: Product Composition of Czechoslovak Exports

	EC-89	EC-94	CMEA-89	CMEA-94
	(Millions, 1990 dollars)			
Food & Animals	244	305	89	214
Beverages & Tobacco	12	38	35	52
Crude Materials	186	487	174	161
Mineral Fuels	221	206	225	275
Animal & Vegetable Oils	5	9	1	9
Chemicals	399	792	411	404
Manufactured Goods	1027	2950	1130	851
Machinery & Transport	387	1787	5061	681
Misc. Manufactures	317	1182	951	389
Other	22	8	253	4
Total	2820	7765	8329	3041

Product Shares:

	EC-89	EC-94	CMEA-89	CMEA-94
	(percent)			
Food & Animals	8.6	3.9	1.1	7.0
Beverages & Tobacco	0.4	0.5	0.4	1.7
Crude Materials	6.6	6.3	2.1	5.3
Mineral Fuels	7.8	2.7	2.7	9.0
Animal & Vegetable Oils	0.2	0.1	0.0	0.3
Chemicals	14.1	10.2	4.9	13.3
Manufactured Goods	36.4	38.0	13.6	28.0
Machinery & Transport	13.7	23.0	60.8	22.4
Misc. Manufactures	11.2	15.2	11.4	12.8
Other	0.8	0.1	3.0	0.1

Table 3.4: Product Composition of Romanian Exports

	EC-89	EC-94	CMEA-89	CMEA-94
	(Millions, 1990 dollars)			
Food & Animals	182	74	146	114
Beverages & Tobacco	43	10	28	6
Crude Materials	65	55	78	28
Mineral Fuels	1137	147	48	104
Animal & Vegetable Oils	0	1	0	2
Chemicals	169	147	210	83
Manufactured Goods	547	578	664	103
Machinery & Transport	544	238	2075	198
Misc. Manufactures	685	1243	664	96
Other	0	0	0	1
Total	3372	2492	3914	736

Product Shares:

	EC-89	EC-94	CMEA-89	CMEA-94
	(percent)			
Food & Animals	5.4	3.0	3.7	15.4
Beverages & Tobacco	1.3	0.4	0.7	0.9
Crude Materials	1.9	2.2	2.0	3.8
Mineral Fuels	33.7	5.9	1.2	14.2
Animal & Vegetable Oils	0.0	0.0	0.0	0.2
Chemicals	5.0	5.9	5.4	11.3
Manufactured Goods	16.2	23.2	17.0	14.1
Machinery & Transport	16.1	9.5	53.0	26.9
Misc. Manufactures	20.3	49.9	17.0	13.0
Other	0.0	0.0	0.0	0.2

Table 3.5: Similarity between EC and CMEA Trade (One-Digit Industries)

Countries	$CMEA_0$ EC_0 1/	$CMEA_1$ EC_1 2/	Change
Poland	0.549	0.728	0.179
Hungary	0.633	0.674	0.041
Czechoslovakia	0.505	0.860	0.355
Romania	0.620	0.540	-0.080

Table 3.6: Similarity of EC and CMEA Trade (One-Digit Industries)

Countries	EC_0 EC_1	$CMEA_0$ $CMEA_1$	Difference
Poland	0.677	0.703	-0.026
Hungary	0.719	0.699	0.020
Czechoslovakia	0.851	0.588	0.263
Romania	0.623	0.670	-0.047

1/ Period "zero", i.e., the first observation, is 1985 for Poland and Hungary and 1989 for Czechoslovakia and Romania.

2/ Period "one", i.e., the last observation, is 1993 for Poland and 1994 for the other countries.

Table 3.7: Manufacturing Exports to EC and CMEA - Crosstabs

AGGREGATE

EC \ CMEA	up	down
up	15	50
down	1	10

POLAND

EC \ CMEA	up	down
up	5	14
down	0	0

HUNGARY

EC \ CMEA	up	down
up	2	17
down	0	0

CZECHOSLOVAKIA

EC \ CMEA	up	down
up	5	14
down	0	0

ROMANIA

EC \ CMEA	up	down
up	3	5
down	1	10

Table 3.8: Manufacturing Exports to EC and CMEA

INDUSTRY	Group 1: EC-UP > CMEA-DOWN	Group 2: EC-UP < CMEA-DOWN	EC-UP & CMEA-UP	EC-DOWN & CMEA-DOWN
Leather, dressed fur, etc.	Hungary, Czech.		Poland, Romania	
Rubber manufactures	Hungary, Poland		Czech.	Romania
Wood, Cork Manufactures			Hungary, Poland, Czech.	Romania
Paper, Paperboard and Manufactures			Hungary, Poland, Czech.	Romania
Textile Yarn, Fabric, etc.	Poland, Czech.	Hungary		Romania
Nonmetal Mineral Manufactures	Hungary, Poland, Czech.	Romania		
Iron and Steel	Hungary, Czech.	Poland, Romania		
Non-Ferrous Metals 1/	Hungary		Poland, Czech.	
Metal Manufactures	Hungary, Poland, Czech.			Romania
Machinery, Non-Electrical		Hungary, Poland, Czech.		Romania
Electrical Machinery		Hungary, Poland, Romania, Czech.		
Transport Equipment	Poland	Hungary, Czech.		Romania
Plumbing, Heating, Lighting Equipment	Hungary		Poland, Romania, Czech.	
Furniture	Hungary, Poland, Czech.			Romania
Travel Goods, Handbags, Luggage		Hungary, Poland, Czech.	Romania	
Clothing	Hungary, Poland, Romania, Czech.			
Footwear	Hungary	Poland, Czech., Romania		
Instruments, Watches, Clocks		Hungary, Poland, Czech.		Romania
Miscellaneous Manufactured Goods	Hungary, Poland, Czech.			Romania

1/ Romania's exports to the CMEA increased while its exports to the EC declined during the period.

Table 3.9: Similarity between EC and CMEA Trade (Two-Digit Industries)

Countries	$CMEA_0$ EC_0 1/	$CMEA_1$ EC_1 2/	Change
Poland	0.516	0.608	0.092
Hungary	0.557	0.596	0.039
Czechoslovakia	0.505	0.793	0.288
Romania	0.648	0.516	-0.132

Table 3.10: Similarity of EC and CMEA Trade (Two-Digit Industries)

Countries	EC_0 EC_1	$CMEA_0$ $CMEA_1$	Difference
Poland	0.656	0.672	-0.016
Hungary	0.809	0.721	0.088
Czechoslovakia	0.801	0.663	0.138
Romania	0.650	0.735	-0.085

1/ Period "zero", i.e., the first observation, is 1985 for Poland and Hungary and 1989 for Czechoslovakia and Romania.

2/ Period "one", i.e., the last observation, is 1993 for Poland and 1994 for the other countries.

Table 3.11: Trade Diversion Regressions

Dependent Variable: ΔEC_{ijt}

Variable	(1)	(2)	(3)
Constant	1.450 (2.60)**	1.260 (2.78)**	1.200 (2.68)**
$\Delta CMEA_{ijt}$	-.164 (-1.91)*	-.162 (-2.12)**	-.130 (-1.90)*
$\Delta CMEA_{ijt-1}$	.024 (.25)	.063 (.94)	
$\Delta CMEA_{ijt-2}$	.042 (.55)		
ΔEC_{ijt-1}	.243 (2.96)**	.289 (4.02)**	.284 (3.96)**
ΔEC_{ijt-2}	-.003 (-.03)		
Transport Equip.	4.960 (2.22)**	4.060 (2.17)**	3.810 (2.05)**
Clothing	12.800 (5.81)**	10.500 (5.73)**	10.500 (5.74)**
Adjusted R^2	.169	.161	.161
Observations	294	351	351

Note: A single (double) asterisk denotes significance at the 10 percent (5 percent) level.

Appendix

One-digit commodities

0--Food and live animals
1--Beverages and tobacco
2--Crude materials, inedible, except fuels
3--Mineral fuels, lubricants and related materials
4--Animal and vegetable oils, fats and waxes
5--Chemicals and related products
6--Manufactured goods classified chiefly by materials
7--Machinery and transport equipment
8--Miscellaneous manufactured goods
9--Commodities not classified by kind

Two-digit commodities

61--Leather,dressed fur,etc
62--Rubber manufactures
63--Wood,cork manufactures
64--Paper and paperboard
65--Textile yarn,fabric etc
66--Nonmetal mineral manufactures
67--Iron and steel
68--Non-ferrous metals
69--Metal manufactures

71--Machinery,non-electric
72--Electrical machinery
73--Transport equipment

81--Plumbing,heating,lighting equipment
82--Furniture
83--Travel goods,handbags
84--Clothing
85--Footwear
86--Instruments,watches,clocks
89--Miscellaneous manufactured goods

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