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Disintegration and Trade[∇]

Jan Fidrmuc[*]
Jarko Fidrmuc[**]

Abstract

We use the gravity model to assess the impact of disintegration on trade among the former constituent republics of three demised federations in Central and Eastern Europe: the Soviet Union, Yugoslavia and Czechoslovakia. We find evidence of a very strong home bias around the time of disintegration, with trade exceeding normal trade intensity 24 (for Slovenia and Croatia) to 43 times (the former Soviet Union and Czechoslovakia). Disintegration was followed by a sharp fall in trade intensity, although the legacy of common past remains strong. By 1998, trade relations still exceeded the normal level two times in case of Slovenia and Croatia, seven times for the former Czechoslovakia, 13 times for the Baltics and 30 times for Belarus, Russia and Ukraine. Such trade intensities surpass the effects of formal preferential trade areas such as the EU or the impact of reunification on trade between East and West Germany.

[*] Jan Fidrmuc: ECARES, Université Libre de Bruxelles, 50 Avenue F.D. Roosevelt, CP 114, 1050 Brussels, Belgium. Email: jfidrmuc@ulb.ac.be. Phone: +32-2-650-4462. Fax: +32-2-650-3369; ZEI, Universität Bonn; CEPR and WDI.

[**] Jarko Fidrmuc: Oesterreichische Nationalbank, Foreign Research Division, Otto-Wagner-Platz 3, POB 61, A-1011 Vienna, Austria. Email: Jarko.Fidrmuc@OeNB.at. Phone: +43-1 404 20 5218. Fax: +43-1 404 20 5299; and Comenius University, Faculty of Mathematics, Physics and Informatics, Department of Economic and Financial Models, Bratislava, Slovakia.

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Address of Contact Author: Jan Fidrmuc, ECARES, Université Libre de Bruxelles, 50 Avenue F.D. Roosevelt, CP 114, 1050 Brussels, Belgium, Phone: +32-2-650-4462, Fax: +32-2-650-3369, Email: JFidrmuc@ulb.ac.be.

1 Introduction

Many papers and monographs have been written recently about the implications of integration on trade. Most studies identify sizeable gains from membership in preferential trade areas (see, for example, Soloaga and Winters, 1999). In an influential study, Rose (2000) finds that two countries using the same currency on average trade three times more with each other than two comparable countries using separate currencies. The impact of political integration is even greater. McCallum (1995) finds that Canadian provinces trade approximately 20 times more among themselves than with US states of comparable economic size and distance. Wolf (2000) estimates a similar tendency for intra-union trade in the US. Helliwell (1997) and Head and Mayer (2000) estimate the home bias of OECD and European countries as, respectively, 13 and 14 times the normal trade level.

This surge of interest in economic implications of integration is not surprising, given the slow but steady intensification of integration in Europe and continuing globalization and trade liberalization throughout the world. Yet, history tells us that countries break up much more often than they unite. In fact, the number of independent countries on the face of the Earth increased more than three-fold during the last century. Although the economic consequences of disintegration are undoubtedly substantial even when the break-up is peaceful, very little research has been done on this topic and therefore our understanding of economic consequences of disintegration is rather limited. This is largely due to lack of reliable data as well as lack of suitable disintegration episodes. Among the few exceptions[1], Thom and Walsh's (2001) study is unique in that is analyzes a case where political and monetary disintegration occurred at two distinct moments – Ireland's decision to abandon the Sterling link and introduce the Punt in 1979, more than 50 years after political

independence. Quite surprisingly, and in stark contrast to Rose's (2000) finding, they conclude that monetary disintegration did not adversely affect Irish trade with the UK.

In this paper, we offer new evidence on the impact of disintegration on trade by looking at three recently demised unions in Eastern Europe: the former Soviet Union (FSU), Yugoslavia and Czechoslovakia. We use the gravity model of trade to assess the evolution of trade within former federations in the wake of disintegration (and, for the former Czechoslovakia and Yugoslavia, also immediately preceding the disintegration). By estimating the gravity equation year by year from 1990 through 1998, we are able to observe the changes in trade patterns over time. To facilitate comparison, we also assess the impact of formal preferential trade areas such as the EU or the Central European Free Trade Association (CEFTA) and the impact of reunification on trade between East and West Germany.

2 The Gravity Model

The gravity model, introduced originally by Linder (1961) and Linnemann (1966), relates trade flows between two countries to the importer's demand, the exporter's supply and the costs of engaging in trade. The demand and supply are measured by the aggregate output (GDP) of the two countries (in addition, some studies use also output per capita or land area). Trade costs (transport and transaction costs) are proxied by the distance, typically measured as the distance between capital cities of the two countries (or other measures of remoteness, see Section 6).

We estimate the gravity model in the following form:

$$M = \beta_1 + \sum_{h=X,M} \beta_h Y_h + \beta_4 d + \sum_k \beta_k D_k + \varepsilon, \qquad (1)$$

where M stands for bilateral imports[2], Y is the GDP of the exporting and the importing country (denoted by X and M, respectively), d is the distance between the capital cities of both countries,[3] and ε is the disturbance term. All these variables are in logs. In line with the terminology common in the literature using the gravity model, we refer to the level of trade predicted by the countries' economic sizes and distance as the *normal* or *potential* trade. The intensity of non-standard trade relations is measured using dummy variables, D_k, for specific pairs or groups of countries. A positive coefficient estimated on a particular dummy thus implies above-normal or preferential trade relations.

We include dummies to capture three types of trade relations. First, sharing a common border or common language obviously reduces transaction costs. Therefore, our regression equation contains a dummy for countries sharing a common border, and a dummy for English speaking countries. We do not include dummies for other languages as most of the other countries (those included in our data set) sharing a language also share borders.[4] Since the effect of language on trade is not our primary interest, we allow for the common-language effect to be picked up by the border dummy in these cases.

Second, we use dummies for formal preferential trade areas in Europe. Specifically, we include dummies for the European Union (the 12 countries that formed the EU before the last enlargement, denoted henceforth as the EU12), the EFTA, the CEFTA (Czech Republic, Hungary, Poland, Slovakia and Slovenia), the countries included in the last EU enlargement round (distinguishing trade flows between the EU12 and Austria, Finland, and Sweden, henceforth EFTA3), and the Europe Agreements between the EU and the associated countries.[5] To capture the evolution of trade relations, we use the same set of dummies for the entire period, i.e.,

also before the formal agreement was concluded. Finally, we include dummies for the successor states of former federations in Central and Eastern Europe. Because of problems with availability and reliability of the data, we are unable to include all former republics of the Soviet Union and Yugoslavia. Therefore, we only analyze trade patterns of the Baltic countries (Estonia, Latvia and Lithuania), Belarus, Russia and Ukraine, and Croatia and Slovenia. We consider the Baltics separately from the rest of the former Soviet Union because of their specific historical legacies and substantially different post-independence developments.

3 Data

Our data contain bilateral trade flows for OECD countries (excluding Iceland, Mexico and Korea), and selected Central and Eastern European countries. As we are interested in the evolution of trade relations during the processes of integration and disintegration that occurred during the last decade, we estimate a separate gravity equation for each year between 1990 and 1998. This results in 600 to 1300 bilateral trade flows per year. The sample size changes because of data availability and especially because new countries emerge in Eastern Europe during the analyzed period. The data for Bulgaria, Hungary, Poland and Romania span the entire period. In contrast, the trade data for Belarus, Croatia, Estonia, Latvia, Lithuania, Russia, Slovenia and Ukraine start as of 1992, while those for the Czech Republic and Slovakia start as of 1993. We use estimates of pre-disintegration trade flows between the Czech and Slovak Republics (for 1991-93) and Slovenia and Croatia (for 1990) where available, as described below. The source of the data on trade flows and aggregate outputs is the IMF (*Direction of Trade* for trade flows and *International Financial Statistics* for GDP). Missing data on aggregate output for some Central and Eastern European countries were taken from the EBRD Transition Report 1998.

Bilateral trade flows between constituent parts of former federations such as the Soviet Union, Yugoslavia, and Czechoslovakia were typically not reported and therefore an assessment of the intensity of trade relations prior to the break-up is difficult.[6] An exception is the trade between the Czech and Slovak Republics, where estimates of the bilateral trade flows are available for 1991-1993, the two years before the break-up and the first post break-up year.[7] Two caveats apply to these data. First, they are based on enterprise reports of shipments between the two republics, not customs statistics. Second, they include only deliveries of enterprises with 25 and more employees. Therefore, these data are not necessarily comparable with the official statistics. Nevertheless, the estimates obtained for 1993 based on both types of data are almost identical and not statistically significantly different from each other. Therefore, we believe it is instructive to use these data to assess the trade intensity before the break-up.

Similar estimates have been reported for Slovene trade with the other former republics in Yugoslavia. According to Mencinger (1998), the rest of Yugoslavia accounted for 57.7 % and 58.7 % of Slovenia's total exports and imports in 1990, respectively. Croatia was the most important trade partner (28.8 % of exports and imports) within the former federation. Stiblar (1996) reports a similar trade structure for Slovenia at the end of the 1980s. Based on this figures, along with estimates of Slovenia's total trade (without the rest of former Yugoslavia) reported by WIIW (1999), we are able to estimate the trade flows between Slovenia and Croatia in 1990, one year before independence.

Finally, we compare the trade development in these countries to trade between West Germany and the former German Democratic Republic (GDR). Our data are

based on German Statistical Office's reports of trade flows (including services) between both German regions from 1992 to 1994.[8]

4 Trade Effects of Disintegration

The number of observations[9] in our dataset nearly doubles between 1990 and 1998 as new countries arise from the ruins of the Soviet Union, Yugoslavia, and Czechoslovakia. The inclusion of additional observations of course may affect the results. Therefore, we estimate the gravity model as defined by equation (1) first with the 630 observations of bilateral trade flows, which are available throughout the entire period from 1990 to 1998. We refer to this data subset as the restricted sample, and the results are reported in Table 1. Then, we estimate the gravity model on the full sample, containing also observations for the newly created countries. The results for the full sample are reported in Table 2. Finally, we also make use of estimates of trade between the Czech and Slovak Republics, Slovenia and Croatia, and the two parts of Germany. For the sake of comparability, all results based on these alternative data sources are collected in Table 3.

The gravity model gives a very good explanation of trade patterns as evidenced by the high values of adjusted R^2, all exceeding 0.8. As expected, the effect of distance is negative and strongly significant. The coefficients estimated for GDPs of the importing and exporting countries are not significantly different from each other. This is a general property of the gravity model – the home and foreign economies have the same effects on bilateral trade flows. Although there is some variation in the coefficient estimates over time, the values for individual years are never significantly different from each other at conventional levels. Countries sharing the same border and English-speaking countries have closer trade links with each other. After transformation of logs to levels, trade between two neighboring countries exceeds the

normal level of trade (i.e., the volume of trade predicted by the countries' GDPs and the distance between them) nearly 1.5 times, and trade between English-speaking countries exceeds the *normal* level nearly three times. The effects of common border and English language also appear very stable over time.

Our primary interest concerns the trade patterns among the former constituent republics of the Soviet Union, Yugoslavia and Czechoslovakia. The intensity of trade relations among these countries is reflected in the coefficient estimates for the respective dummies (Table 2). In addition, Figure 1 depicts the evolution of these coefficients graphically, along with two-standard-error bounds.

The results are strikingly similar for the former Soviet Union, the Baltics and the former Czechoslovakia, with trade flows exceeding the *normal* level approximately 41-43 times[10] during the first year for which we have data (1991 for Czechoslovakia, and 1992 for the Baltics and Belarus-Russia-Ukraine). These results indicate a much higher home bias that what is typically found in the literature (McCallum, 1995, Helliwell, 1997, Wei 1996, and Nitsch, 2000).[11] Our findings are closer to those obtained by Helliwell (1998) for developing countries (generally exceeding the factor of 50).[12] Indeed, his estimations for two transition countries (Hungary: factor of 41.0, Poland: 48.4 in 1991) are remarkably close to our estimates.

Clearly, the intensity of trade within the former federations in Eastern Europe cannot be explained only by greater efficiency of intra-federation trade. In part, it reflected the relatively closed nature of these formerly socialist economies and the fact that during the early 1990s, their trade with Western Europe was still not very liberalized. In the case of the Baltics and Belarus-Russia-Ukraine, their relative remoteness from major Western European markets probably played a role too. In contrast to the former Soviet Union and Czechoslovakia, the trade between Slovenia

and Croatia exceeded the normal level *only* 24 times in 1990.[13] This extent of home bias, while still high, is more similar to that observed for market economies.

The intensity of trade relations fell sharply after disintegration. To some extent, the reduction in trade intensity was natural because of the extremely high inward orientation and the closed nature of these countries' economies as discussed above. Most likely, the home bias would have declined even without the break-up. Indeed, in the case of the former Czechoslovakia, the trade intensity declined slightly already between 1991 and 1992, i.e., during the two years preceding the break-up, to 32 times the normal level. Nevertheless, the timing and the steepness of the fall suggest that disintegration was an important factor.

While the decline in trade intensity occurred immediately after the break-up in the cases of Slovenia and Croatia, the Baltics, and the former Czechoslovakia, the decline of trade intensity among Belarus, Russia and Ukraine started in the earnest only in 1995. This delay probably reflects the continued existence of a common economic area and in particular the continued use of the Soviet (Russian) ruble in the FSU for an intermediate period after the break-up in 1991.

The case of the former Czechoslovakia is particularly interesting. The intensity of trade between the Czech and Slovak Republics fell sharply and uninterruptedly despite attempts by the successor countries to sustain a relatively high degree of integration. The Czech and Slovak Republics retained a customs union, a temporary clearing-account payment mechanism (until 1997) and free movement of labor (Dedek, 1996). Yet, as our results show, trade relations dropped sharply, especially during 1993 and 1994, i.e., the first two years after the division of Czechoslovakia. Bilateral trade, which still exceeded the normal level 32 times in 1992, fell to 11 times the normal level by 1994. Then, the decline slowed down but continued, falling

eventually to about seven times the normal level in 1998. Although the trade intensity as measured by the estimated coefficient on trade flows between the Czech Republic and Slovakia declined continuously, the actual volume of trade recovered slightly between 1993 and 1998. Hence, the volume of trade did not continue to decline but grew more slowly than trade with third countries.

Unlike in the former Czechoslovakia, the trade intensity among the Baltic countries and between Slovenia and Croatia picked up temporarily after the initial sharp decline of trade in the wake of the break-up, before declining further. For the Baltics, the trade intensity fell to 12 times the normal level in 1994, rising again to 23 in 1997 and finally falling to 13 times the *normal* level by 1998. The trade intensity between Slovenia and Croatia deteriorated to three times the *normal* level by 1994. After a slight recovery in 1995 and 1996 (with the home bias rising to four), it fell again to approximately two times the *normal* level by 1998.

In contrast, trade relations among Belarus, Russia and Ukraine followed a U-shaped pattern. The disintegration of the Soviet Union brought about a sharp deterioration of trade, reaching the bottom at eight times the *normal* level in 1997. However, 1998 resulted in a sharp recovery to more than 30 times the *normal* level. Besides potential political reasons, such as the attempts at re-integration between Russia and Belarus, this may have been a consequence of the Russian crisis. The crisis caused a breakdown of trade between the FSU and the developed countries, which in turn may have increased the relative importance of trade within the FSU area. In addition, this increase in trade intensity may be driven by greater prevalence of re-exports from Belarus and Ukraine to Russia that are incorrectly classified as bilateral trade.

In sum, the empirical evidence suggests that the disintegration processes in Eastern Europe brought about substantial deterioration of trade relations between the former constituent republics. Nevertheless, the trade intensity continues to be relatively high, even when controlling for common border and membership in free trade areas such as CEFTA. In fact, trade intensities in the former federations by far surpass the effects of formal preferential trade areas. For comparison, our findings indicate that trade within the EU and the CEFTA exceeds normal trade approximately one-and-a-half times and two times, respectively. This is in line with the findings of Fidrmuc (1999) who notes that Western European countries with common history and/or the same or similar languages also have more intensive bilateral trade relations.

5 German Reunification

Available trade statistics indicate that the reunification of Germany brought about a sharp increase of trade between former West Germany and the former GDR, with the bulk of this increase occurring already before the political reunification.[14] According to West German data, West German exports to former East Germany nearly tripled between 1988 and 1990. However, export growth slowed down between 1992 and 1994. The growth of West German imports from former East Germany was not nearly as dramatic as the growth of exports. By 1994, the volume of West German exports exceeded imports from the East approximately five times.

Because data pertaining to the pre-reunification period are not comparable with the later data,[15] we estimate the intensity of trade between the two German entities starting as of 1991. Moreover, we were unable to obtain any data on East-West trade after 1994. For these reasons, our analysis of intra-German post-reunification trade pertains only to the period between 1991 and 1994. As the previous discussion

suggests, the evolution of West German exports and imports differs considerably. Therefore, we estimate separate coefficients for both directions of trade flows. The distance between West and East Germany is estimated as the distance between Berlin and Frankfurt (530 km). Using different distance would change the coefficient estimates correspondingly, but not the evolution of estimated trade intensities over time. GDP estimates for former East Germany are taken from Ragnitz et al. (2000). According to Ragnitz et al. (2000) and von Hagen and Strauch (2000), transfers from West German States amounted to between 40 % and 50 % of East German GDP during the analyzed period. To account for the transfers, we reduced the estimates of East German GDP accordingly. Such adjusted GDP figures serve as a better proxy for the potential supply of goods available for West German imports from this region.

According to our estimates (see Figure 1 and Table 3), West German exports exceeded the *normal* level approximately six times in 1991. The subsequent years brought a slight decline, to five times the *normal* level in 1994. This trade intensity corresponds to the lower bound of available estimates of *home bias* in developed countries. As such, it is in fact lower than the estimate of German home bias (a factor of ten) reported by Nitsch (2000). The slight decline in the intensity of exports may reflect the gradual reduction of budgetary transfers and infrastructure investment in former East Germany during the analyzed period. On the other hand, the intensity of East German exports to West Germany increased slightly between 1991 and 1994, albeit remaining at a much lower level: 71% above the normal level in 1991 and increasing to 77% by 1994. Hence, our results suggest that the German reunification brought about a substantial increase in the intensity of West German exports to former East Germany, whereas the intensity of flows in the opposite direction increased much more modestly. Apparently, much of the increase in exports was fueled by

government transfers and infrastructure investments rather than East German demand. As transfers and investments continue to fall in the future, so may the intensity of West German exports.

6 Sensitivity Analysis—Augmented Gravity Models

We test the robustness of our results by replicating the analysis for alternative specifications of the gravity model augmented by additional explanatory variables. Besides assessing robustness, some of these variables, especially those related to exchange-rate variability, can provide additional insights on factors explaining the sharp decline of the 'home bias' in the wake of disintegration.

One of the additional variables frequently included in the gravity equation is income per capita, *y*. This variable proxies the level of economic development. According to Linder (1961), there is a strong relationship between per-capita income and the consumption patterns – in particular, he argues that demand for tradables increases with per-capita income. Therefore, income per capita should have a positive effect on trade.

Another extension of the gravity equation that we test is an alternative measure of remoteness. Deardorff (1998) argues that the volume of bilateral trade is determined not only by distance between the two countries but also by their overall geographic position relative to other countries. Given distance, two countries trade more with each other if they are both relatively far from other potential trade partners. Following this argument, Wei (1996) augments the gravity model by a weighted-average distance to other countries:

$$R_k = \sum_i w_i D_{ik} \text{ , } k = X, M, \qquad (2)$$

where X and M distinguish the exporting and importing country, respectively, and the weight w_i is the share of country i in world output.[16] As the countries under focus in this paper are generally located on the periphery (at least relative to the other countries included in our sample), former members of disintegrated countries should on average trade more intensively with each other than with similar, but more centrally located, countries.

Another extension of the gravity model aims at capturing the effects of exchange-rate volatility on trade, including the impact of currency unions on trade among the participating countries. Rose (2000), Frankel and Rose (2000) and Rose and van Wincoop (2001) estimate that countries with a common currency trade substantially more with each other than similar countries with different currencies. In particular, they estimate that common currency increases trade between 2.5 and three times. Unfortunately, in our study we cannot separate the effects of currency separation from those of political disintegration because the two events typically unfolded (nearly) simultaneously. Nevertheless, we can assess the impact of increased exchange-rate volatility on bilateral trade in the wake of disintegration. Following Rose (2000), we measure exchange-rate volatility by standard deviation of monthly bilateral exchange rate (first difference of logs), s_{ij}, in respective years. Furthermore, following Wei (1996), we measure the average exchange rate volatility of each country vis-à-vis the remaining n countries as: $s_i = \sum_j^n s_{ij} \Big/ n$.

The results reported in the literature are mixed. Rose (2000) finds that although the impact of bilateral exchange-rate volatility on trade is statistically significant, the effect of currency unions goes beyond what can be attributed to the elimination of exchange-rate volatility. Wei (1996), in contrast, fails to find any significant and theory-consistent effect of exchange-rate volatility on trade flows. De Grauwe and

Skudelny (2000) obtain substantially different, and in the case of France and Italy insignificant, coefficients for exchange-rate volatility for individual EU countries.

Thus, our augmented gravity model includes the following additional variables: the per-capita income of both countries, y_k (with $k=X, M$ denoting the exporting and the importing country, respectively), the remoteness measure, R_i, defined by equation (2) above, the bilateral exchange-rate volatility, s_{ij}, and the average exchange rate volatility, s_l:

$$M = \beta_1 + \sum_{h=X,M} \beta_h Y_h + \beta_4 d + \sum_{k=X,M} \beta_k y_k + \beta_7 s_{ij} + \sum_{l=X,M} \beta_l s_l + \sum_{r=X,M} \beta_r \log(R_i) + \sum_d \beta_d D_d + \varepsilon . \quad (3)$$

The results obtained with the augmented gravity model are reported in Table 4. Income per capita of the importing country appears positive and significant during the early 1990s, but negative (and significant) later. Income per capita of the exporting country, in contrast, is positive and significant almost during the entire period (except 1993 and 1994). Both exporter and importer remoteness appear with the correct (positive) sign and is significant.

While the effect of average exchange-rate volatility of both exporter and importer appears negative and significant for several years, our results do not show any consistent effect of the bilateral exchange rate variability on trade flows. In fact, the effect of bilateral exchange-rate volatility turns out significant and positive in two years (1995 and 1996) and significantly negative in one year (1991). This can be due to the inclusion of the newly formed Central and Eastern European countries, with high trade growth and high exchange-rate fluctuations. Indeed, bilateral exchange rate has the correct (negative) sign when we estimate (3) with the restricted sample at the beginning of the analyzed period, although the estimated coefficient turns insignificant again in the subsequent years.

Importantly, the inclusion of additional variables has little effect on our estimates of the home bias within former federations in Eastern Europe (and especially so for Slovenia-Croatia and the former Czechoslovakia). For most of the analyzed period, the estimates of the home bias differ little whether estimated with the traditional or the augmented gravity model. Hence, the relative remoteness of these countries and the increased exchange-rate volatility in the wake of the break-up do not explain away the size of this bias. Our major results remain also largely unchanged also when estimated in panel specifications, which are available upon request.

7 Conclusions

In contrast to the impact of integration, the economic consequences of disintegration have been little explored in the literature. We study three recent disintegration episodes in Europe – the break-ups of the Soviet Union, Yugoslavia and Czechoslovakia between 1991 and 1993. Using the gravity model of trade, we assess the evolution of trade relations among the former constituent republics of these federations in the wake of disintegration. We find evidence of a strong home bias in the former federations: around the time of disintegration: trade between the constituent parts of Czechoslovakia, Soviet Union (represented in our data by Belarus, Russia and Ukraine) and the Baltic countries was 41-43 times greater than trade with third countries (controlling for GDP, distance and common border). The home bias was lower in Slovenia and Croatia, with their bilateral trade exceeding the normal extent of trade 24 times in 1990. Disintegration was followed by a sharp deterioration of this home bias. Nevertheless, traditional relations die hard and by 1998, trade within the former federations exceeded normal trade twice for Slovenia and Croatia, seven times for the former Czechoslovakia, 13 times for the Baltics and 30 times for Belarus-Russia-Ukraine.

Unfortunately, our analysis does not allow us to distinguish between trade effects of monetary and political disintegration, as these two events nearly perfectly overlapped in the episodes that we study. Rose (2000) and Rose and van Wincoop (2001) find, using cross-section data, that countries using the same currency trade on average between 2.5 and 3 times more with each other than with similar countries that use separate currencies. In contrast, Thom and Walsh (2001) find in a time-series framework that Ireland's decision to abandon the currency union with the UK had no significant effect on Irish trade. Hence, it seems that the effects of common currency are relatively modest (increasing bilateral trade by up to a factor of three) compared to the internal home bias that we measured for the former federations or that was obtained elsewhere in the literature. Considering these findings together, it seems that much of the deterioration in trade relations that we observe for the former federation in Central and Eastern Europe was due to political rather than monetary disintegration.

Furthermore, we compare the trade effects of disintegration episodes with the effects of integration. We find that, not surprisingly, German reunification was followed by an increase in bilateral trade. However, the home bias obtained for trade between the former West Germany and East Germany is dwarfed by the figures reported above for the former federations in Eastern Europe. In fact, our estimate of inter-German home bias even falls short of the West German home bias estimated by Nitsch (2000).

These results suggest that although disintegration was followed by a sharp deterioration of bilateral trade intensity, the relations between former constituent parts of a federation retain some of their specific nature years after the break-up. In fact, even more than half a decade after disintegration, trade relations between the former

republics (with the exception of Slovene-Croatian trade) remain more intense than those within the EU. The outside economic and political environment seems to matter as well though. The Czech and Slovak Republics, which enjoy greater proximity to Western Europe, experienced a deeper collapse of bilateral trade than the Baltics or Belarus, Russia and Ukraine, despite generally lower barriers to trade within the former Czechoslovakia. The prospects of an early EU membership for the Czech Republic, Slovenia and Estonia also may have contributed to the further deterioration of trade with their traditional partners in the late 1990s. By contrast, trade intensity among Belarus, Russia and Ukraine actually increased in 1998, possibly as a consequence of the Russian crisis, and efforts towards re-unification between Russia and Belarus. Hence, while disintegration matters, the overall context is important as well.

References

Boss, Helene and Peter Havlik, "Russia, Ukraine and Belarus: Output Slump and Trade Breakdown set the Stage for Policy Changes," Research Report 204, The Vienna Institute for International Economic Studies, Vienna, 1994.

Baldwin, Richard E., *Towards an Integrated Europe*, London: CEPR, 1994.

Cheikbossian, Guillaume and Mathilde Maurel, "The New Geography of East European Trade," *Kyklos* 51 (1998):45-71.

Deardorff, Allan V., "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?" in Frankel, Jeffrey A. (Ed.), *The Regionalization of the World Economy*, Chicago: University of Chicago Press, 1998.

de Grauwe, Paul and Frauke Skudelny, "The Impact of EMU on Trade Flows," *Weltwirtschaftliches Archiv* 136 (2000):381-402.

De Ménil, Georges and Mathilde Maurel, "Breaking up a Customs Union: The Case of the Austro-Hungarian Empire in 1919," *Weltwirtschaftliches Archiv*; 130 (1994): 553-75.

Dedek, Oldrich (Ed.), *The Break-up of Czechoslovakia: An In-depth Economic Analysis*. Avebury, UK: Aldershot, 1996.

Djankov, Simeon and Caroline Freund, "Trade Flows in the Former Soviet Union, 1987 to 1996," *Journal of Comparative Economics* 30 (2002):76-90.

Fidrmuc, Jarko, "Trade Diversion in 'Left-Outs' in Eastward Enlargement of European Union, The Case of Slovakia," *Europe-Asia Studies* 51 (1999):633-45.

Frankel, Jeffrey A. and Andrew K. Rose, "Estimating the Effects of Currency Unions on Trade and Output," Working Paper 7857, NBER Cambridge, 2000.

Haschke, Ingrid, "Der innerdeutsche Handel im Strukturwandel," *Konjunkturbericht* Nr. 5-6 (1993), Halle: Institut für Wirtschaftsforschung: 13-19.

Head, Keith and Thierry Mayer, "Non-Europe: The Magnitude and Causes of Market Fragmentation in the EU," *Weltwirtschaftliches Archiv* 136 (2000):284-314.

Helliwell, John F., "Do National Borders Matter for Quebec's Trade," Working Paper 5215, NBER Cambridge, 1995.

___, "National Borders, Trade and Migration," Working Paper 6027, NBER Cambridge, 1997.

___, *How Much Do National Borders Matter?*, Washington DC: The Brookings Institution, 1998.

___ and Geneviève Verdier, "Measuring Internal Trade Distances: A New Method Applied to Estimate Provincial Border Effects in Canada," *Canadian Journal of Economics* 34 (2001):1025-41.

Linder, Staffan, *An Essay on Trade and Transformation*, Uppsala: Almqvist and Wiksells, 1961.

Linnemann, Hans, *An Econometric Study of International Trade Flows*, Amsterdam: North Holland, 1966.

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

Mencinger, Joze, "Slovenia: The Economic Situation," in Heuberger, Valeria, Henriette Riegler and Hermine Vidovic (Eds.), *At the Crossroads: Disaster or Normalization? The Yugoslav Successor States in the 1990s*, Vienna: Peter Lang Verlag, 1997: 79-90.

Nitsch, Volker, "National Borders and International Trade: Evidence from the European Union", *Canadian Journal of Economics* 33 (2000):1091-1105.

Obstfeld, Maurice and Kenneth Rogoff, "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" Working Paper 7777, Cambridge NBER, 2000.

Ragnitz, Joachim; Christian Dreger, Walter Komar and Gerald Müller, *Simulationsrechnungen zu den Auswirkungen einer Kürzung von Transferleistungen für die neuen Bundesländer*, Halle: Institut für Wirtschaftsforschung, 2000.

Rose, Andrew K., "One Money, One Market: Estimating the Effect of Common Currencies on Trade," *Economic Policy: A European Forum* 15 (April 2000):7-45.

___, and Eric van Wincoop, "National Money as a Barrier to International Trade: The Real Case for Currency Union," *American Economic Review: Papers and Proceedings* 91 (2001):386-90.

Soloaga, Isidro and L. Alan Winters, *Regionalism in the Nineties: What Effect on Trade?*, Discussion Paper 2183, CEPR London, 1999.

Stein, Ernesto and Diana Weinhold, "Border Efects and the Gravity Model of Trade," manuscript, London School of Economics, 1999.

Stiblar, Franjo, "Potencialni pomen trgov ex-Jugoslavije za Slovenijo," *Gospodarska Gibanja* 267 (1996):23-43.

Thom, Rodney and Brendan Walsh, "The Effects of a Common Currency on Trade The Ending of the Ireland's Sterling Link as a Case Study", manuscript, NBER and University College Dublin, 2001.

von Hagen, Jürgen and Rolf R. Strauch, "East Germany: Transition with Unification—Experiments and Experiences," Discussion Paper 2386, CEPR London, 2000.

Wei, Shang-Jin, "Intra-national Versus International Trade: How Stubborn Are Nations in Global Integration?," Working Paper 5531, NBER Cambridge, 1996.

Wolf, Holger C., "Intranational Home Bias in Trade", *Review of Economics and Statistics* 82 (2000):555-63.

WIIW, *Countries in Transition 1999*, The Vienna Institute for International Economic Studies, Vienna, 1999.

Endnotes

[1] See also De Ménil and Maurel (1994) who assess the effects of disintegration of the Austro-Hungarian Empire in 1918 on the subsequent trade patterns and Cheikbossian and Maurel (1998) who analyze the consequences of the CMEA (Council of Mutual Economic Assistance) collapse. Djankov and Freund (2002) estimate the home bias in trade among selected Russian regions before the onset of economic reforms (1987–1990) and a few years after the disintegration of the Soviet Union (1994–1996). Helliwell (1995) discusses the possible implications of independence for Quebec.

[2] For various reasons, the data on bilateral trade flows as reported by the two respective countries often differ. To ensure consistency, we use trade flows as reported by the importing country.

[3] We are grateful to Robert Holzmann and Katerzyna Zukowska-Gagelmann for sharing with us their distance matrix. As in their paper, we use the center of a triangle defined by Frankfurt, Munich, and Berlin rather than the capital as the reference point for Germany.

[4] For example, Austria, Germany and Switzerland, Belgium and France, or Belgium and the Netherlands. The main exception is Canada and the French-speaking countries.

[5] Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

[6] According to Djankov and Freund (2002), inter-republic trade flows were not reported for the former Soviet Union between 1990 and 1993. Boss and Havlik (1994) report several estimates of trade flows among selected FSU countries at the beginning of the 1990s. However, these data are hardly comparable to later trade flows due to high inflation rate in the successor countries. Furthermore, the range of their estimates makes any comparisons questionable, although they generally confirm a significant decline of trade.

[7] The sources of the data are: *Vzajomne dodavky medzi SR a CR: 1.-4. stvrtrok 1992*, Statistical Office of the Slovak Republic, 1993; and *Predaj tovarov medzi SR a CR v roku 1993 podla stvrtrokov*, Statistical Office of the Slovak Republic, 1994.

[8] See *Vierteljahresergebnisse der Inlandsproduktsberechnung, 1991 bis 1994, Früheres Bundesgebiet*, Statistisches Bundesamt Wiesbaden, September 1997, p. 23.

[9] We succeeded to collect nearly all data on trade flows among countries of our sample. For example, we have only 23 missing or zero-trade observations for 1997. Therefore, the possibility of a bias due to truncated data is not important in this case (Baldwin, 1994; and Head and Mayer, 2000).

[10] The coefficient estimates for the first year are between 3.71 and 3.77. The corresponding multiplicative factors are exp(3.71)= 40.9 and exp(3.77)= 43.4.

[11] Obstfeld and Rogoff (2000) provide a survey of estimates of the home bias in several countries.

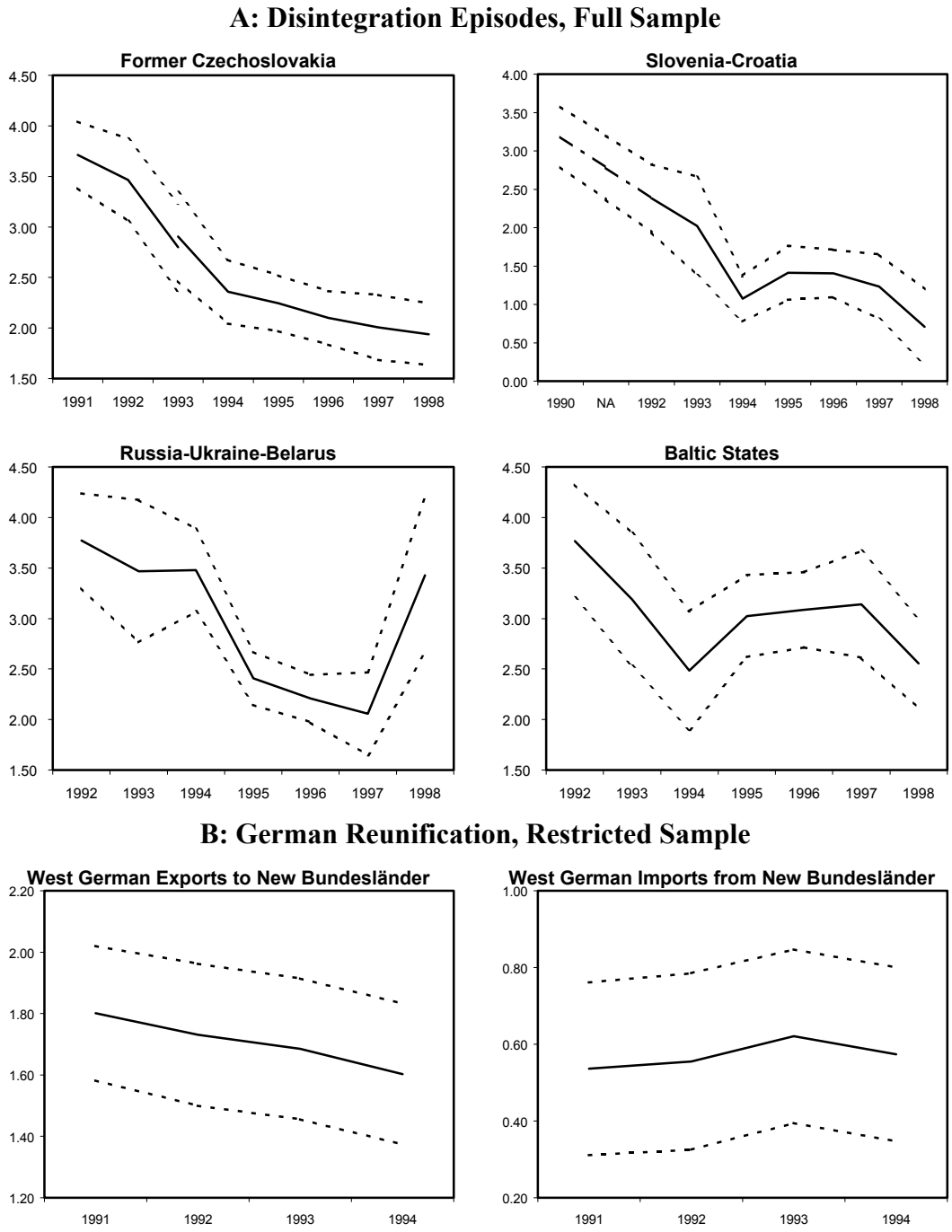
[12] A possible explanation for this is lower income per capita in the developing countries. Helliwell (1998) shows that the difference between the home bias in the developed and developing countries diminishes if he controls for income levels. Nevertheless, our estimates of home bias in the former federations are little affected by the inclusion of GDP per capita, as discussed in Section 7 below.

[13] Note that we do not have trade between Slovenia and Croatia in 1991. In Figure 1, this is indicated on the x-axis, as well as by a dotted line before 1992.

[14] After the fall of the Berlin Wall in November 1989, the two Germanies formed an economic and monetary union on July 1, 1990. The political unification formally took effect on October 3, 1990.

[15] The pre-unification data measure only goods exports whereas the later data also include services, see Haschke (1993).

[16] We also tried alternative measures of remoteness. For example Wolf (2000) uses the ratio of the bilateral distance to an average of R_X and R_M, $R_{IJ} = D_{IJ} / 0.5 (R_X + R_M)$. However, this remoteness measure was even less robust than that defined by (2). Furthermore, Helliwell and Verdier (2001) suggest a closely related measure of alternative trade opportunities, which follows earlier remoteness specifications developed by Helliwell (1997) and Nitsch (2000). However, this measure performs poorly in our sample (the results are available from authors on request). Similarly, Stein and Weinhold (1999) review the properties of various remoteness measures and select Wei's indicator of remoteness for their estimations.



Note: We use estimates for trade flows between the Czech Republic and Slovakia for trade flows during 1991-1993, which are not fully comparable to later custom statistics (1993-1997). This causes the discontinuity in 1993. Trade flows between Slovenia and Croatia in 1990 are according to Mencinger (1998) and WIIW (1999), while trade data for 1991 are not available.

Figure 1. Disintegration in Eastern Europe and German Reunification

	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. of observations	630	630	630	630	630	630	630	630	630
Adjusted R^2	0.8698	0.8853	0.8358	0.8029	0.8361	0.8479	0.8478	0.8407	0.8161
Constant	3.346	3.659	3.796	3.765	3.519	3.285	3.480	3.604	3.552
	(8.742)	(9.540)	(10.251)	(10.358)	(9.962)	(9.128)	(10.121)	(10.519)	(10.242)
GDP of importing country	0.875	0.839	0.838	0.838	0.850	0.868	0.861	0.857	0.845
	(36.485)	(35.237)	(36.879)	(36.946)	(36.663)	(37.394)	(39.104)	(37.823)	(35.882)
GDP of exporting country	0.913	0.894	0.909	0.925	0.911	0.922	0.921	0.909	0.902
	(40.054)	(44.008)	(43.995)	(45.415)	(45.092)	(42.083)	(44.140)	(44.257)	(40.754)
Distance	-0.866	-0.872	-0.884	-0.900	-0.881	-0.876	-0.888	-0.875	-0.868
	(-21.313)	(-21.950)	(-22.333)	(-22.616)	(-22.308)	(-21.557)	(-22.887)	(-22.214)	(-21.796)
Dummy: Common border	0.406	0.445	0.427	0.398	0.421	0.385	0.389	0.397	0.386
	(3.617)	(3.606)	(3.257)	(3.084)	(3.241)	(3.185)	(3.359)	(3.589)	(3.332)
Dummy: English speaking countries	1.136	1.109	1.105	1.174	1.180	1.251	1.154	1.130	1.276
	(6.178)	(5.953)	(5.469)	(6.122)	(6.262)	(6.946)	(6.397)	(6.065)	(7.001)
Dummy: EC12	0.417	0.370	0.391	0.389	0.357	0.388	0.361	0.375	0.355
	(5.459)	(4.892)	(5.134)	(5.134)	(4.779)	(4.961)	(4.669)	(4.836)	(4.517)
Dummy: CEFTA	0.418	0.451	0.164	0.217	0.378	0.557	0.554	0.641	0.626
	(1.249)	(2.960)	(1.353)	(1.825)	(3.257)	(3.213)	(3.159)	(3.094)	(2.997)
Dummy: Europe Agreements	-0.528	-0.201	-0.240	-0.052	0.025	0.124	0.140	0.132	0.259
	(-4.832)	(-1.626)	(-2.027)	(-0.484)	(0.237)	(1.220)	(1.466)	(1.310)	(2.632)
Dummy: EFTA	0.189	0.094	0.228	0.253	0.198	0.195	0.116	0.083	0.165
	(1.845)	(0.900)	(2.041)	(2.138)	(1.592)	(1.463)	(0.823)	(0.578)	(1.147)
Dummy: EC12- EFTA3	0.240	0.196	0.281	0.342	0.319	0.299	0.279	0.275	0.297
	(2.836)	(2.374)	(3.550)	(4.267)	(3.924)	(3.379)	(3.180)	(3.224)	(3.201)
Dummy: EFTA3-Associated	-0.400	0.034	0.091	0.137	0.271	0.112	0.090	0.092	0.219
countries	(-1.975)	(0.225)	(0.628)	(0.959)	(1.671)	(0.759)	(0.659)	(0.652)	(1.749)

Notes: t-statistics (heteroscedasticity robust) in parentheses. Estimated on bilateral trade flows among OECD countries (excl. Mexico and Korea), and Central and Eastern European countries. CEFTA includes the Czech Republic, Hungary, Poland, Slovakia and Slovenia. EC12 refers to the 12 countries, which were members of the European Community until 1995. EFTA includes EFTA3 (Austria, Finland, and Sweden) and Norway and Switzerland. Associated countries are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

Table 1. Gravity Model of Trade Flows, Restricted Sample

	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. of observations	670	643	836	1140	1219	1248	1247	1238	1247
Adjusted R^2	0.8698	0.8853	0.8358	0.8029	0.8361	0.8479	0.8478	0.8407	0.8161
Constant	3.372	3.663	4.426	4.691	4.786	4.206	4.136	4.311	4.776
	(8.400)	(9.613)	(10.137)	(13.123)	(15.977)	(14.610)	(14.887)	(15.281)	(15.036)
GDP of importing country	0.873	0.852	0.903	0.838	0.845	0.873	0.853	0.855	0.823
	(35.596)	(36.001)	(38.751)	(43.194)	(47.957)	(51.761)	(50.953)	(51.032)	(40.779)
GDP of exporting country	0.924	0.899	0.865	0.872	0.860	0.939	0.959	0.958	0.935
	(40.777)	(44.504)	(36.782)	(44.072)	(48.944)	(55.925)	(57.897)	(54.998)	(45.399)
Distance	-0.877	-0.886	-0.976	-0.988	-1.007	-1.024	-1.016	-1.025	-1.040
	(-21.689)	(-21.920)	(-20.744)	(-24.005)	(-26.899)	(-28.098)	(-28.010)	(-27.599)	(-23.753)
Dummy: Common border	0.317	0.454	0.608	0.537	0.760	0.664	0.631	0.595	0.670
	(2.552)	(3.706)	(3.575)	(2.251)	(5.691)	(5.567)	(5.712)	(5.364)	(5.009)
Dummy: English speaking	1.169	1.128	1.179	1.342	1.360	1.536	1.479	1.493	1.535
countries	(6.381)	(6.048)	(5.828)	(7.333)	(7.557)	(8.713)	(8.273)	(7.980)	(8.498)
Dummy: EC12	0.437	0.364	0.288	0.377	0.289	0.396	0.447	0.471	0.309
	(5.650)	(4.821)	(3.498)	(4.570)	(3.852)	(5.070)	(5.815)	(6.143)	(3.730)
Dummy: CEFTA	0.842	0.466	0.050	0.195	0.163	0.537	0.613	0.681	0.344
	(2.783)	(3.051)	(0.334)	(0.901)	(0.965)	(3.627)	(4.227)	(4.653)	(2.387)
Dummy: Europe Agreements	-0.580	-0.190	-0.303	-0.351	-0.337	0.015	0.141	0.193	0.014
	(-5.114)	(-1.564)	(-2.329)	(-3.573)	(-3.875)	(0.191)	(1.889)	(2.524)	(0.177)
Dummy: EFTA	0.230	0.089	0.070	0.158	-0.022	0.099	0.120	0.110	-0.011
	(2.100)	(0.876)	(0.637)	(1.104)	(-0.209)	(0.881)	(0.985)	(0.880)	(-0.087)
Dummy: EC12- EFTA3	0.245	0.190	0.233	0.344	0.294	0.375	0.409	0.411	0.306
	(2.896)	(2.310)	(2.771)	(4.448)	(3.684)	(4.230)	(4.714)	(4.803)	(3.174)
Dummy: EFTA3-Associated	-0.364	0.057	0.350	-0.207	-0.119	0.127	0.181	0.237	0.055
countries	(-1.982)	(0.392)	(1.879)	(-1.344)	(-0.828)	(0.966)	(1.393)	(1.766)	(0.415)
Dummy: Baltic States			3.766	3.188	2.485	3.024	3.088	3.142	2.556
			(13.130)	(9.454)	(8.241)	(14.533)	(16.165)	(11.585)	(11.202)
Dummy: Russia-Belarus-			3.771	3.467	3.480	2.407	2.207	2.057	3.427
Ukraine			(15.740)	(9.596)	(16.561)	(18.024)	(18.347)	(9.807)	(8.663)
Dummy: Slovenia-Croatia			2.382	2.021	1.075	1.413	1.404	1.231	0.708
			(10.535)	(6.124)	(7.004)	(7.823)	(8.872)	(5.695)	(2.810)
Dummy: Former Czechoslovakia				2.905	2.359	2.245	2.099	2.006	1.939
				(12.968)	(14.550)	(15.885)	(15.472)	(12.224)	(12.350)

Notes: See Table 1.

Table 2. Gravity Model of Trade Flows, Full Sample

	1990[SLO]	1991[CS]	1992[CS]	1993[CS]	1991[GE]	1992[GE]	1993[GE]	1994[GE]
No. of observations	672	645	838	1140	632	632	632	632
Adjusted R^2	0.8699	0.8855	0.8360	0.8028	0.8825	0.8805	0.8803	0.8786
Constant	3.372	3.663	4.426	4.691	3.659	3.796	3.765	3.519
	(8.400)	(9.613)	(10.137)	(13.123)	(9.540)	(10.251)	(10.358)	(9.962)
GDP of importing country	0.873	0.852	0.903	0.838	0.839	0.838	0.838	0.850
	(35.596)	(36.005)	(38.752)	(43.195)	(35.237)	(36.879)	(36.947)	(36.663)
GDP of exporting country	0.924	0.899	0.865	0.872	0.894	0.909	0.925	0.911
	(40.780)	(44.510)	(36.787)	(44.071)	(44.008)	(43.995)	(45.415)	(45.092)
Distance	-0.877	-0.886	-0.976	-0.988	-0.872	-0.884	-0.900	-0.881
	(-21.689)	(-21.920)	(-20.744)	(-24.005)	(-21.950)	(-22.333)	(-22.616)	(-22.308)
Dummy: Common border	0.317	0.454	0.608	0.537	0.445	0.427	0.398	0.421
	(2.552)	(3.706)	(3.575)	(2.251)	(3.606)	(3.257)	(3.084)	(3.241)
Dummy: English speaking	1.169	1.128	1.179	1.342	1.109	1.105	1.174	1.180
Countries	(6.381)	(6.048)	(5.828)	(7.333)	(5.953)	(5.469)	(6.122)	(6.262)
Dummy: EC12	0.437	0.364	0.288	0.377	0.370	0.391	0.389	0.357
	(5.650)	(4.821)	(3.498)	(4.570)	(4.892)	(5.134)	(5.134)	(4.779)
Dummy: CEFTA	0.842	0.466	0.050	0.195	0.451	0.164	0.217	0.378
	(2.783)	(3.051)	(0.334)	(0.901)	(2.960)	(1.353)	(1.825)	(3.257)
Dummy: Europe Agreements	-0.580	-0.190	-0.303	-0.351	-0.201	-0.240	-0.052	0.025
	(-5.114)	(-1.564)	(-2.329)	(-3.573)	(-1.626)	(-2.027)	(-0.484)	(0.237)
Dummy: EFTA	0.230	0.089	0.070	0.158	0.094	0.228	0.253	0.198
	(2.100)	(0.876)	(0.637)	(1.104)	(0.900)	(2.041)	(2.138)	(1.592)
Dummy: EC12- EFTA3	0.245	0.190	0.233	0.344	0.196	0.281	0.342	0.319
	(2.896)	(2.310)	(2.771)	(4.448)	(2.374)	(3.550)	(4.267)	(3.924)
Dummy: EFTA3-Associated	-0.364	0.057	0.350	-0.207	0.034	0.091	0.137	0.271
Countries	(-1.982)	(0.392)	(1.879)	(-1.344)	(0.225)	(0.628)	(0.959)	(1.671)
Dummy: Baltic States			3.767	3.188				
			(13.130)	(9.454)				
Dummy: Russia-Belarus-			3.771	3.467				
Ukraine			(15.741)	(9.596)				
Dummy: Slovenia-Croatia	3.184		2.382	2.021				
	(15.746)		(10.535)	(6.124)				
Dummy: Former Czechoslovakia		3.713	3.466	2.798				
		(22.106)	(16.628)	(12.568)				
Dummy: West German Exports to					1.801	1.731	1.685	1.603
former East Germany					(16.039)	(14.610)	(14.344)	(13.608)
Dummy: West German Imports from					0.536	0.555	0.621	0.574
former East Germany					(4.645)	(4.710)	(5.355)	(4.934)

Notes: See Table 1. [SLO] Estimates of trade flows between Slovenia and Croatia according to Mencinger (1998) and WIIW (1999). [CS] Estimates of trade flows based of data on firm deliveries between the Czech Republic and Slovakia for 1991-1993. [GE] Trade flows (including services) between West and East Germany according to the German Statistical Office.

Table 3. Gravity Model of Trade Flows, Using Alternative Estimates of Trade Flows between Selected Pairs of Countries

	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. of observations	619	643	641	1140	1219	1248	1247	1238	1247
Adjusted R^2	0.8791	0.8943	0.8922	0.8092	0.8424	0.8535	0.8545	0.8461	0.8317
Constant	-6.863	-7.734	-6.626	-7.543	-5.144	-2.876	-1.975	-2.281	-1.922
	(-2.501)	(-2.617)	(-2.210)	(-2.536)	(-1.698)	(-0.938)	(-0.722)	(-0.859)	(-0.687)
GDP of importing country	0.868	0.883	0.870	0.967	0.948	0.977	0.927	0.920	0.918
	(31.037)	(31.947)	(30.512)	(37.158)	(38.322)	(36.207)	(40.311)	(39.352)	(33.505)
GDP of exporting country	0.851	0.876	0.829	0.923	0.933	0.877	0.934	0.916	0.939
	(30.276)	(31.055)	(30.289)	(27.499)	(33.086)	(33.810)	(37.998)	(35.782)	(34.481)
Distance	-0.937	-1.015	-1.061	-1.091	-1.112	-1.123	-1.119	-1.113	-1.130
	(-16.666)	(-16.125)	(-18.245)	(-22.729)	(-25.011)	(-25.046)	(-26.393)	(-26.648)	(-24.575)
GDP per capita of importing country	0.169	0.032	0.064	-0.161	-0.135	-0.167	-0.107	-0.105	-0.116
	(3.262)	(0.630)	(1.370)	(-3.955)	(-3.095)	(-3.868)	(-2.836)	(-2.601)	(-2.507)
GDP per capita of exporting country	0.250	0.240	0.323	0.010	-0.061	0.153	0.134	0.180	0.132
	(4.312)	(5.054)	(6.662)	(0.201)	(-1.211)	(3.800)	(3.426)	(4.230)	(3.155)
Remoteness of importing country	0.687	0.665	0.728	0.732	0.614	0.635	0.434	0.433	0.220
	(3.396)	(2.916)	(3.161)	(3.032)	(2.491)	(2.593)	(2.022)	(2.043)	(0.946)
Remoteness of exporting country	0.397	0.592	0.524	0.623	0.553	0.261	0.378	0.376	0.558
	(2.040)	(2.784)	(2.465)	(3.014)	(2.695)	(1.224)	(1.994)	(2.021)	(2.766)
Volatility of bilateral exch. rate	-0.131	-0.054	0.067	-0.031	0.047	0.147	0.311	0.034	0.086
	(-1.724)	(-2.346)	(1.353)	(-0.668)	(0.858)	(3.733)	(3.311)	(1.216)	(1.979)
Average exchange rate volatility	0.141	0.057	-0.045	0.044	-0.032	-0.201	-0.306	-0.040	-0.064
of importing country	(1.801)	(2.333)	(-0.696)	(0.848)	(-0.541)	(-3.407)	(-3.124)	(-1.386)	(-1.300)
Average exchange rate volatility	0.138	0.069	0.022	0.056	-0.023	-0.032	-0.262	-0.017	-0.031
of exporting country	(1.690)	(2.851)	(0.386)	(1.114)	(-0.384)	(-0.517)	(-2.668)	(-0.580)	(-0.652)

Table 4. Augmented Gravity Model of Trade Flows, Full Sample

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Dummy: Common border	0.254	0.277	0.343	0.363	0.614	0.571	0.590	0.548	0.544
	(2.081)	(2.150)	(2.426)	(1.460)	(4.637)	(4.698)	(5.044)	(4.637)	(4.373)
Dummy: English speaking	0.807	0.844	0.961	1.233	1.364	1.537	1.485	1.395	1.553
countries	(5.497)	(5.376)	(5.494)	(7.509)	(8.054)	(9.375)	(8.746)	(8.356)	(8.591)
Dummy: EC12	0.330	0.285	0.294	0.444	0.417	0.412	0.459	0.434	0.438
	(4.231)	(3.809)	(3.827)	(5.027)	(5.296)	(5.230)	(5.700)	(5.423)	(5.028)
Dummy: CEFTA	1.438	0.845	0.553	0.435	0.337	0.559	0.662	0.719	0.562
	(4.655)	(3.872)	(3.243)	(1.960)	(1.973)	(3.692)	(4.535)	(4.985)	(4.183)
Dummy: Europe Agreements	-0.183	0.048	-0.121	-0.187	-0.206	0.084	0.159	0.204	0.222
	(-1.180)	(0.357)	(-0.944)	(-1.865)	(-2.393)	(1.076)	(2.212)	(2.738)	(2.742)
Dummy: EFTA	-0.138	-0.104	-0.154	0.411	0.287	0.186	0.093	0.031	0.154
	(-1.114)	(-0.870)	(-1.239)	(2.343)	(2.277)	(1.478)	(0.663)	(0.214)	(1.059)
Dummy: EC12- EFTA3	0.055	0.096	0.113	0.497	0.487	0.444	0.429	0.396	0.463
	(0.617)	(1.106)	(1.368)	(5.430)	(5.400)	(4.624)	(4.623)	(4.263)	(4.587)
Dummy: EFTA3-Associated	-0.089	0.175	0.082	-0.033	0.022	0.141	0.120	0.183	0.243
Countries	(-0.395)	(1.120)	(0.525)	(-0.212)	(0.157)	(1.117)	(0.955)	(1.379)	(1.864)
Dummy: Baltic States				3.527	2.762	3.008	3.180	3.184	2.956
				(10.124)	(9.648)	(17.323)	(18.227)	(11.999)	(13.831)
Dummy: Russia-Belarus-				2.402	2.928	2.462	2.226	2.086	3.248
Ukraine				(4.335)	(9.443)	(11.103)	(12.568)	(9.074)	(5.031)
Dummy: Slovenia-Croatia				2.262	1.375	1.554	1.547	1.121	1.038
				(6.083)	(9.535)	(11.249)	(11.177)	(5.953)	(5.365)
Dummy: Former Czechoslovakia				2.924	2.412	2.362	2.119	1.986	1.981
				(12.646)	(15.064)	(16.267)	(15.402)	(12.112)	(13.259)

Notes: See Table 1.

Table 4. Continued