THE TRADING POTENTIAL OF EASTERN EUROPE

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ABSTRACT

The Trading Potential of Eastern Europe*

This paper fits a gravity model to the trade of 76 market economies. It then applies the model to data on East European economies to estimate what their trading potential might have been, had behaved like market economies in the mid-1980s. At existing levels ot national income, the liberalization of Eastern Europe and the Soviet Union is unlikely to affect their mutual trade and trade with developing countries, but it will increase trade with industrial counties by factors ot three to thirty. West Germany and the USA are the principal beneficiaries of this new trade, increasing their exports and imports by over 20%. Trade must flow both ways, however: the West cannot increase its exports to the East without correspondingly increasing its imports.

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NON-TECHNICAL SUMMARY

As the economies of Eastern Europe emerge from 40 years of inward-looking and managed international trade, it is natural to ask by how much and in what directions their trade will expand. This is not only important for those economies themselves, but also for the economies of the West, which will face opportunities for increased trade and pressures for increased adjustment as a result of the change in the East. This paper explores these issues using an unsophisticated but apparently robust approach – the gravity model of international trade. It finds vast new trading opportunities for both the Eastern-bloc and the industrialized market economies.

The gravity model describes the size of a bilateral international trade flow as a function of the importer's demand, the exporter's supply and various stimulating or restraining factors relating to the specific flow. A country's potential export supply depends on its GNP and also on the ratio of its production for export to its total production. The latter bears a strong negative relation to population, as larger countries need to trade proportionately less to obtain a full range of goods. Import demand similarly depends on GNP and population.

Trade resistance covers both natural and artificial impediments. Geographic distance is the main proxy for the natural obstacles to trade, supplemented by an adjacency effect to reflect the economic links typically found between neighbouring countries. Difficulties in collecting data on tariffs and non-tariff barriers mean that we are unable to directly estimate the effects of artificial obstacles to trade. We do, however, make an explicit allowance for preferential trading arrangements – the main differences between impediments faced by different countries.

Our gravity model is based on averaged data over 1984–6 and estimated on 76 market economies. The estimates confirm that GNP has a strong positive effect on trade, with elasticities exceeding unity, and that population has mildly negative effects. The effects of distance (negative) and adjacency (positive) are well defined, as are those of several of the preferential arrangements.

Assuming the coefficients we obtain describe the main determinants of market economies' trade patterns, we apply them to East European data to predict those countries' trade potential in 1985. The predicted levels of trade are very sensitive to the estimates used for Eastern countries' GNP, which vary enormously. For the sake of simplicity, however, we conduct most of our analysis on the basis of Summers and Heston's (1988) estimates alone. These refer to 1985, the central year of our sample, are based on a sound methodology and adequate data, and are compiled only for academic purposes.

Our results show that reported trade within the Eastern bloc substantially exceeds the potential trade we predict. The excess is recorded entirely for Bulgaria, Czechoslovakia, East Germany and the Soviet Union, however, whose intra-Comecon trade is, we believe, severely exaggerated by the reported data. For Hungary, Poland and Romania – which meet IMF data standards – potential and actual trade roughly balance. Hence we infer that while Comecon caused a huge increase in the share of intra-Comecon trade in total trade, it is unlikely that it increased the absolute level of intra-bloc trade much above normal levels.

East European trade with market economies falls dramatically short of its potential. On average, actual trade between Eastern-bloc countries and market economies is just one-quarter of its potential, but there are differences between countries. Within the market economies, trade is currently least restricted relative to potential with developing countries, followed by EFTA, the EC, and other industrial countries in that order. In fact East European trade with developing countries broadly matches its potential, while the shortfalls with other industrial countries, of which Japan and the USA are the principal components, are by factors of 20 or 30.

The ratio of West German actual to potential exports to Eastern Europe (excluding the USSR) is relatively high for every partner. Consequently, liberalization will have a proportionately smaller beneficial effect on German trade than it will on the trade of other countries. As a large economy close to Eastern Europe, however, Germany's trade with the East is already substantial. In absolute terms, therefore, Germany gains the most from liberalization. We also find great scope for the USA to increase its trade with Eastern Europe and the Soviet Union.

Our data suggest that rather than accounting for a mere 7% of world merchandise trade, Eastern Europe and the Soviet Union would have accounted for 18%, even at their current levels of income. Moreover, if liberalization boosts Eastern incomes, their trade potential will increase correspondingly. Every 1% of GNP will boost imports by 1% and exports by 1.2%. Had these countries realized West European levels of income in the mid-1980s, therefore, their share of world trade would have been much higher.

The opening up of Eastern Europe offers great opportunities for industrial countries' producers to expand their sales; it offers those countries' consumers the corresponding opportunity to expand their purchases. These opportunities cannot be decoupled. Any attempt by industrial countries as a whole to sell in Eastern markets without accepting their output in return is destined either to fail or to degenerate into the provision of goods against credit. Direct foreign investment will of course support some such imbalance, but not on the scale of our results, and good arguments for financing an export boom on the basis of credit cannot be found. Hence Western economies must offer decent market

access to the East if either they themselves are to benefit from liberalization or the East is to progress to new market institutions and levels of affluence. Moreover, decent access entails not only freeing markets now – including sensitive sectors such as agriculture and steel – but also accepting large volumes of imports of goods whose export we cannot even envisage at the moment.

If it wishes to expand its exports, or to help Eastern Europe and the Soviet Union to develop, the West must accept imports from the East. To exclude them from Western markets in order to protect uncompetitive Western producers of simple goods will only prevent the producers of more sophisticated goods from gaining the market shares they deserve in the East.

The liberalisation of Eastern Europe - and potentially of the Soviet Union - has introduced a series of major new players into the world trading system. Naturally this has raised questions about what and how much they might trade - both their potential to compete with existing producers and exporters and their potential as new markets for existing traders. After so long a period of suppression and distortion, and with such poor data to describe the current situation, these are not trivial questions. They have spawned a considerable literature already but, as an early contribution (CEPR, 1990) observed, with such uncertainty surrounding them there is much to be said tackling them in a variety of ways. This paper explores the potential volume and direction of Eastern-bloc trade using an unsophisticated but apparently robust approach - the gravity model.

THE GRAVITY MODEL

The gravity model stems from Linnemann (1966), who proposed it as a pragmatic way of combining three sets of determinants of the size of a bilateral international trade flow: the importer's demand, the exporter's supply and the costs of doing business. Its theoretical foundations have never be made entirely secure - see below - and yet it has great intuitive appeal and has been used regularly since 1966 for a wide range of tasks - e.g. Aitken (1973), Bergstrand (1985), Slama (1983), and Brada and Mendez (1985). We use it here to characterise the trading patterns of a large sample of market economies and then assume that eventually Eastern Europe and the Soviet Union will slot into the

same pattern.

The gravity model refers to countries' total trade and may be estimated on cross section data referring to a single year or period. It is best thought of as providing a long-run equilibrium view of trading patterns and thus in the present context entirely avoids the issues of what Eastern Europe will trade and how (and how rapidly) it will progress from its present position to the estimated equilibrium.

The gravity model describes the trade flow from a particular origin (i) to a particular destination (j) in terms of supply factors in the origin, demand factors in the destination and various stimulating or restraining factors relating to the specific flow. The model is expressed as the following equation:

$$X_{ij} = B \ Y_i^{\beta_1} \ N_i^{\beta_2} \ Y_j^{\beta_3} \ N_j^{\beta_4} \ D_{ij}^{\beta_5} \ A_{ij}^{\beta_6} \ \prod_k P_{kij}^{\gamma_k} \qquad (1)$$

where X_{ij} is the value of the trade flow from country i to country j,

Y_m is the Gross National Product (GNP) of country m,

N_m the population of country m,

D_{ij} the distance between countries i and j,

A_{ij} a dummy reflecting the adjacency of i and j,

P_{kij} a dummy variable representing the kth preference relationship between countries i and j, and

B, β_m and γ_k are parameters.

Country i's potential supply of exports depends on its national product and on the ratio of its production for export to total production. The former is represented by GNP, while the latter - the openness ratio - shows a strong tendency to vary with population. The population variable proxies the physical size of the economy - the extent to which it might satisfy its own needs under autarky. Writers such as Chenery (1960), Deutsch et al (1960), Kuznets (1960), Chenery and Syrquin (1975) and Balassa (1986), all show that population has a strongly negative effect on the openness ratio, which is most plausibly justified in terms, first, of economies of scale and, second, of the positive correlations between population and geographical size and between the latter and natural resource endowments.

Very similar arguments pertain to the import side of the equation. Higher income suggests higher demand, while higher population suggests greater self-sufficiency. Overall, therefore, we would expect β_1, $\beta_3 \geq 0$ and β_2, β_4, ≤ 0.

The remaining variables reflect trade resistance - both natural obstacles and artificial impediments. The main natural obstacles to international trade are transaction costs and the cost of transportation. These comprise not only actual transportation costs, but also two other sets of factors: first those based on the time involved in transportation, and second, the 'economic

horizon' of a country. It is commonly held that people are better informed about conditions prevailing in near-by countries: propinquity leads to better business information, greater familiarity with laws, institutions, habits, and language of the partner country, and greater similarity in the way of life and in preference patterns. Thus transportation costs, transportation time and economic horizon might all be modelled by the distance between the two trade partners, so we use geographic distance as the main proxy for the natural obstacles to two countries' mutual trade. This is supplemented, however, by an adjacency dummy which is non-zero if i and j share a common land border. The latter reflects reductions in both cultural and transportation frictions between adjacent countries over and above the effect of distance.

The principal artificial obstacles to trade are trade policies; we cannot estimate directly the effects of tariff and/or non-tariff barriers to trade because of the difficulties involved in collecting the data, especially from developing countries. The critical issue, however, is the extent to which such barriers affect flows differentially and hence it probably suffices (a) to omit from the estimation any trade flows that are known to be distorted for political reasons (e.g. Iran-Iraq, China and Eastern Europe), and (b) to make allowance for explicitly preferential trading arrangements. The latter is done by including a series dummy variables.

The gravity model analyses imports or exports for many countries

at a single point in time, and being based on cross-section data excludes price variables. This exclusion stems from the general equilibrium nature of analysis, in which prices are endogenous and merely adjust to equate supply and demand. As Leamer and Stern (1974) observe, this does not imply that prices are not effective in allocating resources. On the contrary, prices are assumed to adjust quickly and demand and supply are assumed to be responsive enough to prices to bring about an equilibrium rapidly.

THE THEORY OF THE GRAVITY MODEL

Several commentators have argued that the gravity model suffers from the absence of a cogent derivation based on economic theory. As Deardorf (1984) notes, this tells us something important about what happens in international trade, but it does not tell us why. Several authors have tried to provide the model with such a theoretical underpinning, notably Anderson (1979), Bergstrand (1985) and Helpman and Krugman (1985), but none of them generates a model exactly as formulated in the equation above. For our purposes the important issue is the empirical application of the model to trade flows between countries, and hence we are more concerned with the model's empirical robustness than with its theoretical purity. Nonetheless, theoretical soundness is comforting, if not essential, and so we briefly review some of the theoretical structures that have been proposed to explain the gravity model.

Anderson (1979) uses a simple Cobb-Douglas expenditure system to underpin the gravity model. His approach requires three steps. In the first the Cobb-Douglas function's fixed expenditure shares make X_{ij} proportional to Y_i (the importer's GNP), and applying the balance of payments constraint also proportional to Y_i (the exporter's GNP)[1]. The second step observes that there are large interregional and international variations in the shares of total expenditure accounted for by traded goods, and that these variations are related to income and population (N), even across regions or countries where spending patterns are reasonably similar. Anderson assumes that the traded-goods shares are log-linear functions of their arguments, allowing him to have X_{ij} proportional to i's and j's expenditures on traded goods but to model these latter expenditures as constant (but non-unit) elasticity functions of Y and N. Thus he obtains

$$X_{ij} = B \ (\phi_i Y_i) \ (\phi_j Y_j) \tag{2}$$

where $\phi_m^{\cdot} = a_m^{\cdot} \ Y_m^{\sigma} \ N_m^{\varrho}$ - which is specific to country m - is the share of m's income devoted to traded goods[2].

Anderson's final step allows for trade frictions[3]. With consumers having fixed expenditure shares for goods from each supplier, cost-increasing trade frictions reduce the amount of

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[1] This is essentially the point reached by Helpman and Krugman (1985) in their model of trade with differentiated products: $X_{ij} = s_i \ Y_i$ where s_i is $y_i / \Sigma_k y_k$, i.e. i's share of world expenditure.

[2] We ignore here an adjustment Anderson makes for unbalanced trade.

[3] This representation is not Anderson's, although it is based on his.

trade observed: the greater the friction, the higher the
proportion of the given expenditure that goes on costs rather
than the good itself.   If trade frictions were log-linearly
related to distance, such that $(1 - \pi_{ij}) = D_{ij}^{-\beta 5}$, where π_{ij}

represents the proportional wastage between expenditure on flow
ij and observed trade X_{ij}, distance is easily introduced into (2).
Clearly trade preferences could be treated similarly.

While this argument takes us from first principles to the gravity
model it is not entirely satisfactory as a foundation for the
latter.   Anderson himself shows that once stochastic errors
and/or multiple commodities are introduced, the derivation is no
longer precise - the log-linear relationship between aggregates
is difficult to support.   In addition, Anderson does not
rationalise the relationship between openness and population, or,
more importantly, between openness and GNP or GNP per head.

A related derivation of a "generalised" gravity model is due to
Bergstrand (1985, 1989). Bergstrand derives a semi-reduced form
equation for bilateral trade flows from a general equilibrium
model based on non-homothetic Stone-Geary utility functions and
products differentiated by both place of production and place of
sale. His object is to integrate the Heckscher-Ohlin model with
a model of bilateral trade and he obtains (1989) a final equation
describing bilateral flows of a good from i to j as a
multiplicative function of: i's income measured in units of

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capital, j's income and income per head, trading cost variables, complex price terms, and various endowment and factor intensity variables. The importer's population enters via its income per head, which, in turn, appears because of the non-homotheticity of demands; the exporter's population enters only via its labour endowment variable.

Bergstrand's model is only loosely related to the gravity model as specified in equation (1); the exporter's income and population enter only via related variables (capital and labour endowments); the equation applies only to a subset of goods (trade in the numeraire implicitly varies according to different determinants and total trade will not reflect gravity factors alone); the importer's population enters Bergstrand's equation differently from in (1), and Bergstrand includes prices in his model.

The inclusion of prices raises two difficulties: first it undermines the model's long-run equilibrium nature, for it implies that a country's price level determines its trade in a way quite foreign to the tradition of barter models usually employed for the long run. Second, it raises almost insoluble measurement difficulties. As specified, Bergstrand's predictions depend on the relative prices charged by different suppliers at a single point of time, but he can measure, and uses in his estimation, only the changes in prices through time measured for each country independently. Hence in explaining trade in, say, 1966 he uses the wholesale price index for 1966 with 1960 base -

essentially each country's inflation since 1960. There is no way in which such data can say whether the absolute prices of different suppliers are converging or diverging or whether one exceeds another. Hence their role is spurious[4]

THE DATA

To ensure the widest possible country coverage, we use data from the years 1984-86.[5] They have been averaged over three years in order to reduce the effects of temporary disequilibria and other temporary shocks. For a variety of reasons we cannot include all the countries of the world in our estimation, but our sample contains 76 countries 19 industrial and 57 developing. Our country coverage, given in Appendix Table 1, potentially gives us 76 x 75 = 5,700 trade flows, which account for about 80 per cent of total world trade over 1984-86. Since the purpose of this exercise is to characterise market economies' trade, the East European countries and China are not included in the estimation sample.[6] Oil exporting countries are the other main exclusion. The trade flows are expressed in $US millions and were obtained from the IMF's Direction of International Trade.

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[4] Bergstrand argues that if their base year is relatively normal he can extract relative price information from price index numbers. Since he uses no other data referring to the base year anywhere in his equations this is incorrect. If, for example, he included base year trade he might then claim that differences in prices between 1960 and 1966 might explain changes in trade patterns between those two years. But he does not.

[5] There are considerable delays in reporting data for many developing countries.

[6] Yugoslavia is relatively well integrated into the west, and hence has been included in the sample.

Trade studies covering only merchandise trade have an obvious
shortcoming, but data on trade in services are just not good
enough for inclusion. Many developing countries do not record
services trade with any degree of accuracy and even where they
do, they do not report its origin or destination. In some
respects the gravity model appears more relevant to manufacturing
than to total merchandise trade - for example, the appeal in some
derivations to economies of scale - but we have not pursued this
route, first for lack of data and second because our interest is
in total trade. Besides there is no empirical support for
restricting attention to manufacturing alone[7].

Trade flows can be measured either at the point of export or at
the point of import. Apart from the well-known differences in
valuation and minor differences due to the time-lags between the
recording of exports and imports the two measures should be
identical. We have used import data on the grounds that the
import statistics are likely to be more reliable because
countries tend to pay more attention to their import records than
to their export records. Where necessary, however, export data
have been used to fill holes in the data.

Very small trade flows are recorded as zero in DIT. This creates
a problem in log-linear equations such as (1). One solution is

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[7] Work will shortly be conducted on manufactured trade alone, however.

to omit all flows recorded as zero – essentially estimating the size of a trade flow conditional on its being large enough to be recorded. An alternative response may be to substitute a small positive for zero. The smallest import data recorded in DIT differ across countries; for 10 countries it is $0.01 millions, for 32 countries it is $0.1 million and for the remaining 34 countries it is $1 million. As well as suppressing all zeros we experimented in our estimation with replacing each zero by a multiple of the appropriate minimum recorded value, using multiples of 0.5, 0.25 and 0.1. These reflect alternative views of the expected value of a flow too small to be recorded explicitly. In addition, for unreported reasons, some countries do not record any transactions with some of our 76 countries. We regarded these unreported data as missing observations and excluded them from the regression analysis[8].

The GDP data (measured in $US million) are taken from the World Bank's World Development Indicators and are averaged over 1984–86, while the population data (in millions) are taken from the same source and years. The distances in equation (1) are measured in nautical miles (1 nautical mile = 1.15 land mile) as the shortest navigable distance between countries main ports, plus the overland distance from the ports to the economic centres of the countries concerned. For countries in continental Europe, where overland communication is predominant, the direct rail or road distance is used. For continental Africa, road

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[8] This distinction between zero and missing is that when a partner country is never mentioned it is missing but where it is mentioned even if all flows are recorded as zero it is 'zero'.

communication is quite poor, so that although the road distance between the economic centres of respective countries is much shorter than the nautical distance, the cost of overland transportation is probably higher than the cost of sea transportation. Hence sea distance is used in the analysis for these African countries. As noted above, distance is supplemented by an adjacency dummy, which takes the value 2 when countries share a land border and 1 otherwise.

The preference variables, which take the value 2 where a preference applies and 1 otherwise, refer to ex-colonial and economic integration preferences, unilateral preferences from industrial countries to developing countries and EC preferences to certain developing countries. The economic integration schemes included are the EC, European Free Trade Association (EFTA), the Economic Community of West African States (ECOWAS), the South African Developing Co-Ordination (SADCC), the Central American Common Market (CACM), the Andean Group (AG), Latin American Integration Association (LAIA) and Association of South East Asian Nations (ASEAN). This is the subset of arrangements defined in Greenaway and Milner (1990) for which our country coverage permitted us to identify effects statistically. For the ex-colonial preferences, we consider only the British and French colonies: although nearly all colonies have become independent, the trade links developed under colonialism appeared to continue long after independence - see for example, Kleiman (1976) and Livingstone (1976). In addition, EC preferences for the African, Caribbean and Pacific developing countries under the Lomé

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Convention were included, as were all industrial countries'
Generalised System of Preferences.

The final equation, which was estimated by least squares is:
$$\ln X_{ij} = a + \beta_1 \ln Y_i + \beta_2 \ln N_i + \beta_3 \ln Y_j + \beta_4 \ln N_j + \beta_5 \ln D_{ij}$$

$$+ \beta_6 \ln A_{ij} + \sum_K \gamma_k \ln P_{kij} + u_{ij} \qquad (3)$$

THE ESTIMATES

We conducted two series of computations: one based on all trade
including zero trade flows with due substitutions, and the other
excluding all zero trade flows.   The results excluding zeros are
reported in Table 1.   Those with substitutions were similar,
except that all their slope co-efficients were absolutely larger
than in the table, and that, because these regressions had a mass
of "observed" trade at the assumed lower limit, their residuals
were non-randomly distributed[9].

The estimates confirm our hypotheses above. All the coefficients
except for two dummy variables - EFTA and ECOWAS - have the
expected signs, and most, including all those on the non-dummy
variables are statistically different from zero. The proportion

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[9] When substitutions for zero were made, the corresponding residuals
were invariably ·negative (i.e."actual" trade < predicted trade).   The
remaining residuals appeared random, however.

of the variance explained - 70% - is also very satisfactory.

Several of the dummy variables are not significantly different
from zero, but we retain them in the equation to ensure that
their absence does not bias the estimates of the main parameters.
We would not wish to make too much out of the precise sizes of
the dummy co-efficients, and neither shall we make use of them
below.   Nevertheless it is worth considering their general
implications for Eastern European trade.

The strongest and best-defined effect refers to a regional
grouping of relatively small countries (South East Asia) but the
co-efficients on the other regional groupings are disappointing
in their degree of definition or the size of their effects.
Hence while history and geography may encourage some thoughts of
Eastern European co-operation, it is not clear that such a group
would emulate ASEAN rather than ECOWAS.   Moreover, the gravity
model can not distinguish between trade creation and trade
diversion, so that one certainly can not generalise from the
increases in intra-bloc trade recorded in table 1 to increases
in welfare.

Outside the intra-developing country groupings, the British ex-
colonial links are very strong but the broader preferential
schemes relatively weak - especially the GSP.   We interpret this
as meaning that it is difficult and time-consuming to build up
effective trade preferences, especially between richer and poorer
countries.   Hence, short of full accession, Eastern Europe should

not expect to gain very much in trade volume terms from preferential access to EC or other markets[10]. Several commentators have argued that the ineffectiveness of the GSP stems from the quantitative limits imposed on the imports receiving preferences and the various escape clauses, and we assume that any EC-Eastern European arrangement would, at least informally, also be subject to such iniquities.

Turning to the main co-efficients, we find strong income effect on trade, with elasticities exceeding unity, and mild but well defined population effects. The signs accord well with Linnemann's original interpretation of the gravity model, which stresses inter-industry trade, but also with more modern ones, which stress intra-industry trade. Reparameterising the equation in terms of income per head and a size variable shows that each affects trade positively. The first components of table 1 may be equivalently written as either:

$$\ln X_{ij} = 1.17 \ln(Y_i/N_i) + 0.79 \ln N_i + 1.02 \ln(Y_j/N_j) + 0.80 \ln N_j$$
or
$$\ln X_{ij} = 0.38 \ln(Y_i/N_i) + 0.79 \ln Y_i + 0.22 \ln(Y_j/N_j) + 0.80 \ln Y_j.$$

Each suggests that richer economies can afford to trade more - see, for example, Barker's (1977) variety approach in which foreign goods are luxuries because higher incomes predispose consumers to pay the fixed costs of trade more readily. They

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[10] They may, however, gain terms of trade advantages as they receive revenues that would otherwise have accrued to EC coffers.

also suggest that, as they grow larger, economies produce more varieties and hence generate greater demand for their goods, i.e. trade more - see, for example, Krugman (1989).

EASTERN EUROPEAN TRADE

Assuming that the co-efficients in table 1 describe the main determinants of market economies' trade patterns, we may apply them to Eastern European data to predict those countries' trade potential in 1985. The fundamental determinants of trade patterns have not changed much since then, so the figures generated will give a strong indication of these countries' potential over the near future. We can not predict how long it will take to realise this potential, however, and so, rather than look to any particular future year, we ask what East European trade would have been if that potential had been realised in the mid-1980s. This has the additional attraction of obviating Bikker's (1987) concern that unless, fortuitously, $\beta_1 + \beta_3 = 1$ the gravity model exhibits money illusion, for it means that we are making predictions at the same prices as are used in estimation.[11]

Even for the mid-1980s, however, there is huge uncertainty about the true current-price level of GNP in Eastern Europe, as Appendix Table 2 shows. It is plain that our estimates can be

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[11]   If all national prices increased by 1% the current value of trade, X_{ij}, would be predicted to increase by $(\beta_1 + \beta_3)$% rather than the 1% which would seem natural for a equilibrium real relationship.

no more reliable than these data - although we are not unique in this limitation, see, for example, Collins and Rodrik (1991) who estimate an openness relationship using GDP and apply it to Eastern European incomes to predict their trade.

Tables 2 and 3 report actual and potential exports and imports for Eastern Europe and the Soviet Union using each of several different estimates of GNP. Each Eastern European country, including East Germany, is treated separately but we report here only the aggregate results. We take population and distance data from the same sources as for the market economies and assume that Eastern Europe benefits from no preferential trade arrangements.

Some of the data on actual trade shown in Tables 2 and 3 are subject to a severe reservation. For Hungary, Poland and Romania we take trade from the Direction of International Trade, as we do for market economies, and we presume that these countries' coverage and valuation conventions are much the same as those for market economies. For the remaining Eastern countries, however, while we use the DIT wherever a market economy, Hungary, Poland or Romania is involved, we are thrown back on to data from various issues of PlanEcon for mutual trade. The PlanEcon data for these countries' trade with market economies and for Hungary, Poland and Romania's total trade appear to match the DIT data reasonably well, and so this appears to be a reasonable procedure. It does, however, depend on two potentially very distorted exchange rates. Intra-CMEA trade is reported in terms

of transferable roubles and we are obliged to convert these first into local currency and then into dollars according to conversion factors provided by PlanEcon.

Two features make us suspicious of the exchange rate conversion factors reported to PlanEcon. First, the implied exchange rates between the transferable rouble and the dollar vary strongly by country. For Hungary and Poland, the countries most integrated with the west and able to meet IMF statistical standards, the rates for a dollar were R1.94 (Hungary) and R2.16 (Poland), but for the others they were R0.64, (Bulgaria), R1.38, (Czechoslovakia), R0.63, (East Germany) and R0.61, (USSR). Second, the value of dollar trade suggested by these conversion factors seems huge for these last four countries – see tables 4 and 5. Thus Bulgaria appears to have nearly twice the total trade of Hungary, an economy of roughly equal size, and Czechoslovakia more than twice the trade of the roughly equivalent Romania. For now, however, we are obliged to accept these data at face value, as do Collins and Rodrik (1991), whose data show a similar tendency to ours.

Turning to the predicted levels of trade it is obvious that the results are very sensitive to the income estimates used. CSFB's very depressed picture of Eastern living standards suggests that total trade volumes will fall as the CMEA is wound up and Eastern Europe integrates into the world economy, while the CIA's alarmist view of Eastern economic might, would have their trade increasing four or six-fold! This wide range of possibilities

is disconcerting, but quite unavoidable. For the sake of simplicity, however, we proceed now on the basis of Summers and Heston's (1988) estimates alone. These refer to 1985, the central year of our sample, are based on a sound methodology and adequate data, and are compiled only for academic purposes. We feel, therefore, that they are at least as likely as any other estimates to be reliable.

Tables 4 and 5 report our estimated potential trade flows for each Eastern country along with estimates of actual trade flows for 1985. Consider, first, trade within the Eastern bloc. Taken as a whole reported trade substantially exceeds our predicted potential trade. The excess is primarily for the Soviet Union, Bulgaria and East Germany, however, the countries with the most serious data problems. Indeed, Poland seems not to have achieved its potential, while Hungary and Romania appear to be roughly in trading equilibrium with their eastern partners. Overall, then, we infer that while Comecon caused a huge increase in the share of intra-CMEA trade in total trade, it probably did not increase the absolute level of intra-bloc trade much above "normal" levels. On the other hand, until the valuation of CMEA trade can be put on a sounder footing such a conclusion must remain very tentative.

Turning to trade with market economies it is plain that Eastern European trade falls dramatically short of its potential. We can record data only for our sample of countries but that is complete enough not to be misleading. On average the actual

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trade of Eastern-bloc countries with market economies is just below one-quarter of its potential, but there are differences between countries. Hungary – the most open relative to potential – manages about 30% of potential, while Romania achieves 25% for imports and 50% for exports. The latter discrepancy reflects the draconian import compression imposed by Ceaucesceu as he sought to pay off Romanian debt, but does not obscure the fact that Romania's trading ties with the West are generally stronger than are those of others in Eastern Europe on countries.

Within the market economies one sees the impact of politics on trade: trade is currently least restricted relative to potential with developing countries, followed by EFTA, (in which Finland is strongly represented) the EC and other industrial countries in that order. In fact, it is striking that Eastern European trade with developing countries broadly matches its potential, while the shortfalls with other industrial countries, of which the USA and Japan are the principal components, include factors of 20 and 30.

Table 6 and 7 extend the results to the major industrial countries individually while table 8 summarises the results from these countries' points of view. The relative success of West Germany in Eastern European (excluding the USSR) is evident in table 8, while comparing tables 5 and 7 reveals that the ratio of actual to potential exports for Germany exceeds the corresponding ratio for the EC as a whole for every partner. The corollary of this success is that German exports will benefit

proportionately less from liberalisation than will those from other countries. Not too much should be made of this observation, however, for as a large economy close to Eastern Europe, Germany's trade with the East is already large absolutely. Hence in absolute terms and relative to her total trade Germany records the largest gains in the West.

Turning to German-USSR trade we find Germany recording relatively large proportional gains because her actual trade is quite low. Hence here again West Germany looks set to make large absolute gains, larger indeed than France, Italy and the UK's put together, but this time not from any particularly favoured position.

Of course, some of West Germany's recorded increases will now count as internal trade - see below - but they are still real enough and even without them Germany can expect formidable increases in her trade. Indeed we show below that while German unification reduces potential trade with the rest of Eastern Europe and the Soviet Union below the sum of the potential trade of East and West Germany separately, it increases potential trade with the EC and EFTA.

Turning to the other countries in table 8 it is striking how large an interest the USA has in Eastern European liberalisation. This is perhaps not wholly commensurate with its willingness to play second fiddle to the EC politically. Equally striking is the relative paucity of Japan's gains. In part these stem from

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her distance from Eastern Europe, but they also stem from her relatively high existing trade with the Soviet Union. The latter may reflect atypically close existing trading links, but they might also reflect a specification problem with the gravity model: although the economic centre of the USSR is taken to be Moscow, which is very distant from Tokyo, there is scope for trading over much smaller distances between the east of the country and Japan.

It is notable that the model projects broadly balanced trade for the eastern bloc both in total and with individual partners. The income effects in table 1 ensure that, as the Eastern economies grow, exports will expand slightly faster than imports unless population growth is much faster in the East than elsewhere. Thus as the Eastern economies begin to recover from the ravages of socialism we should expect their small deficits to change into small surpluses. Note, however, that we are here referring to equilibrium relationships, not actual values which will respond to cyclical and other factors in addition to those identified by this exercise.

To put these figures in perspective, our data suggest that rather than accounting for a mere 7% of world merchandise trade, Eastern Europe and the Soviet Union could, even at their current levels of income have accounted for 18% (after correcting our data for missing countries - see below). Moreover, if, as one hopes and expects, liberalisation boosts Eastern incomes, their trade potential will increase correspondingly. Every 1% on GNP will

boost imports by 1% and exports by 1.2%, so that had these countries realised Western European levels of incomes in the mid-1980s their shares of world trade would have been much higher than our tables suggest.

ALTERNATIVE ESTIMATES

With predictions of the kind offered here no appeal to actual outcomes can be made to establish their credibility.   It is interesting, however, to compare them with similar predictions. CEPR (1990) did not forecast total Eastern European trade potential, although it did foresee major increases in the excess supply of tradables such as agriculture and energy.   Collins and Rodrik (1991), on the other hand, do conduct an exercise similar to our own.   In its first step, they fit an openness relationship across ninety-one countries, regressing the exports-to-GNP ratio on GNP, log(GNP), log(population) and a series of dummies, and then apply this to the estimates of GNP from PlanEcon.   Table 9 compares their and our predictions.   The data headed Wang & Winters adjusted are based on the results from table 4 adjusted to allow for our incomplete country coverage and the tendency of the gravity model to over-predict trade flows which are null.

The first factor entails scaling Eastern countries' actual trade with the excluded countries in 1985 by the growth factors between predicted and actual trade calculated above for similar included countries.   The second factor reduces our estimates of exports to developing countries to recognise that while we are estimating positive exports to all partners, experience suggests that at

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least some will actually be zero. Between 11% and 45% of the exports we predict going from each Eastern exporter to developing countries are to countries to which actual exports were zero in 1985. Now it is plain that there would be more null trade flows in the distorted actual trade than in our undistorted predicted trade, but some null flows are likely to remain. In our sample overall 32% of potential flows to developing countries were zero; hence we reduce our flows by 32 x/y% where x is the proportion of the predicted trade corresponding to actually null flows, and y is the proportion of flows (not trade) that were actually null. x and y are calculated separately for each Eastern exporter.

The predicted levels of exports are remarkably similar given their different methodologies. On the other hand it must be recalled that our estimates refer to 1984-6 prices and incomes and total world exports of around $1,850 billion, while theirs refer to 1988 when world trade in dollar terms had risen to around $2,700 billion. This dramatic increase arose substantially from the devaluation of the dollar and is quite undetectable in Eastern Europe's actual export data in real terms - see below. Nevertheless it causes Collins and Rodrik to put the East's share of world trade at 10% compared with our 18%. (One further percentage point difference arises from our different country coverage). Given the uncertainties over the GDP data, however, not much more can be said about the differences.

A more marked contrast between our results and those of Collins

and Rodrik lies in the geographical distribution of trade. The latter estimate Western partners' shares in each Eastern European country's total exports and imports by updating a 1928 trade matrix. They estimate a regression model on trade shares from six comparator countries - Austria, Finland, Germany, Italy, Spain and Portugal - regressing partners' shares in these countries' totals in 1989 (s_{ij}) on a constant, the corresponding shares in 1928 (s'_{ij}) and a series of dummies for each partner (d_i). Thus

$$s_{ij} = \alpha + \beta s'_{ij} + \sum_{k=1}^{n} \gamma_k \, d_k$$

where d_k=1 iff k=j, j are partners and i are comparator countries. They then apply this relationship to Eastern European trade shares in 1928 to predict their patterns in 1989. In terms of our own model, the 1928 share broadly captures the trade friction effects and the partner dummies the partners' growth of GNP and population since 1928; the effects of the country's own GNP and population are reflected in the estimates of its total trade as described above.

Collins and Rodrik predict relatively similar partner shares for each Eastern European country, because the co-efficients on the 1928 shares - the only variables that differ across these countries - have co-efficients (β) of 0.27 for import shares and 0.46 for export shares. Thus differences in trade patterns are necessarily compressed compared to 1928. The partner dummies

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also have to capture changes in institutions between 1928 and 1989, specifically the advent of the EC. Applying the same dummies and co-efficients to Eastern European trade implies that these countries too would have benefitted from such integration to the same extent as the 'average' comparator country did. As a result Collins and Rodrik predict a greater concentration of Eastern trade on the EC than we do. For example, Hungary, the least EC-dependent country for Collins and Rodrik trades 47% of its imports and sends 37% of its exports with the EC, compared with 35% for each flow in our exercise. For every other flow except one Collins and Rodrik have an EC share of one half or more, compared in our exercise with shares of 25%-35% except for the USSR and Czechoslovakia where they are about 43% and 46%. (These proportions have been adjusted for missing countries).

Concomitant with the differences in predicted EC trade shares are those with other countries - especially Japan and the USA. While our approach suggests great potential for these countries in Eastern Europe, Collins and Rodrik are more restrained. Our predictions begin to approach Collins and Rodrik's if we allow, for preferences with the EC, but in that case our total volumes of trade exceed theirs.

In another paper, only recently available, Havrylyshyn and Pritchett (1991) also estimate the gravity model of trade and use it to simulate post-transition patterns of trade of Eastern Europe. They use two different samples of countries for estimating the model: fourteen semi-industrialised countries and

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twenty-one non-oil exporting countries with per capita income in
1985 between $2,000 and $5,000. They use bilateral trade data
of each of their sample countries with each of 95 non-socialist
partners to estimate the gravity model. Like us they emphasize
the change of geographic direction of East European trade and
predict large shifts towards the West. However, like Collins and
Rodrik they find the increase much more concentrated on Western
Europe than we do, indeed suggesting a fall in the share of trade
with North America.   This result probably stems from their
inclusion of land area in their model - it affects trade
negatively - and also from their greater elasticity on distance
(around -1.5 compared with our -0.75).

Although our reasons for working with 1985 are sound enough - to
improve the statistical basis of our work - it is interesting,
to bring our results up to date in two ways. First, in table 10
we imagine that East and West Germany had already unified in
1985.   We sum their GNPs and population and take the union of
their adjacency dummies but otherwise use the West German data
for the unified Germany.   In particular, we see the industrial
centre as continuing in the Ruhr.   The differences in the
predicted trade with other countries are not surprising. In the
absence of integration and adjacency effects the trade of the
United Germany falls short of the sum of the trade of the two
Germanies separately - the anti-trade consequences of size. This
is evident in trade with "other industrial" countries.   In
Europe, however, unifying Germany extends the scope of the
integration and adjacency effects.   Thus, for example, East

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German producers suddenly benefit from adjacency with Austria and from EC effects with Portugal (in the developing country aggregate) and other EC countries, while West German producers suddenly get adjacency advantages with Poland and Hungary. The latter increases those trade flows, but in our table this is obscured by the size effects on trade with the USSR.

The second extension is to compare Eastern European countries' trade in 1985 and 1989, the latter converted to 1985 dollars by the unit value index of world exports from International Financial Statistics. This comparison suggests that, except in Romania, nothing fundamental had changed between the two years, and hence that the gaps between actual and potential trade refer as well to the present as to the mid-1980's. Romania cut her trade significantly between 1985 and 1989.

THE IMPLICATIONS FOR THE WEST

It is worth reflecting briefly on the consequences of these potential changes in Eastern trading patterns on western economies. First, and most obviously, the long-term increases in western trade are huge - exports rise by 24% for West Germany, 22% for the USA, and 15% for the UK and imports by similar amounts. Such increases offer scope for new specialisation and economies of scale on a scale approaching the opening up of the new world, only quicker. Second, our model suggests that given their current levels of income the Eastern countries should expect in equilibrium to have an excess of imports over exports - i.e. to run small trade deficits. As they grow relative to other

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countries, however, these will gradually correct themselves. Third, in view of their very small initial shares, Japan and the USA will increase their shares of East European trade at the expense of those of EFTA and the EC (especially Germany).

Fourth, a weakness of the gravity model is that the increased trade we predict between, say, the UK and Poland, has no implications in our model for the UK's other trade: it apparently neither diverts imports from other sources nor absorbs exports destined for elsewhere[12]. This implies that the new imports displace only domestic sales, while the new exports are met by curtailing domestic sales or increasing output. This is not necessarily a bad approximation - see, for example, Winters (1984) or Brenton and Winters (1990) where UK producers are seen to absorb nearly all foreign country-specific shocks - but it is rather extreme. Hence overall we should expect some spillover from the growth of Eastern European trade to declines in intra-industrial country flows. That is, market economies may find that they face extra competition in export as well as home markets.

An obvious implication of these deficits is that while the opening up of Eastern Europe offers great opportunities for industrial country producers to expand their sales, it offers those countries' consumers the corresponding opportunity to expand their purchases. Moreover these opportunities can not

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[12] This weakness is identified, but not adequately corrected by Bikker (1987).

be decoupled. Any attempt by industrial countries as a whole to sell in Eastern markets without accepting their output in return is destined either to fail or to degenerate into the provision of goods in return for financial assets. Direct foreign investment will, of course, support some such imbalance, but not on the scale of our results, and there are no good arguments for financing an export boom on the basis of credits. Hence Western economies must offer decent market access to the East if either they themselves are to benefit from liberalisation, or if the East is to progress to new market institutions and levels of affluence. Moreover, decent access entails not only freeing markets now - including sensitive sectors such as agriculture and steel - but also accepting large volumes of imports of goods whose export we can not now even envisage. The consequent changes in the sourcing of western production and consumption will require a high degree of flexibility and adjustment in both exportable and importable industries. They will, however, be spread over long periods of time for it seems unlikely that Eastern countries could realise their trading potential in less than two or three decades. Hence even for Germany and the USA we are looking at increasing the growth rate of exports and imports by only perhaps 1% per annum relative to what it would have been.

CONCLUSION

This paper has calculated the trading potential of Eastern Europe and the Soviet Union with the simple but robust gravity model. The potential is huge. Using estimates of Eastern national

incomes in the middle of the published range, and taking account of likely errors in reported trade data, we find that intra-CMEA probably broadly matched its potential level in 1985. Trade with the market economies, on the other hand, fell increasingly below potential as we moved from developing countries, through EFTA and the EC to other industrial countries - mainly the USA and Japan. We hypothesise that these short-falls reflect pre-liberalisation political biases and that they also measure the potential for increased trade over the next decade or so. The latter view suggests that the West European share of Eastern European trade with industrial economies will fall while those of the USA and Japan will rise for quite natural reasons. On the other hand, the principal gainer from Eastern liberalisation in absolute terms and relative to its existing trade is Germany, followed by the USA.

The potential increases in trade are huge - factors of four and five are common. But they refer to trade in both directions. If it wishes to expand its exports, or to help Eastern Europe and the Soviet Union to develop, the West must accept imports from the East. These will be cheap and at least, for a period, of low quality, but to exclude them from our markets in order to protect uncompetitive western producers of simple goods, will only prevent the producers of more sophisticated goods from gaining the market shares that they deserve in the East.

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Table 1   Coefficients of the Estimation (without zero trade flows)
(All Sample)

Constant	Yi	Yj	Ni	Nj	D
-12.49	1.02	1.17	-0.22	-0.38	-0.75
(32.42)	(42.75)	(58.19)	(8.19)	(15.67)	(22.28)

A	Peec	Pefta	Puk	Pfrance	Pacp	Pgsp	Pacp*
0.78	0.70	-0.02	1.91	0.73	0.89	0.35	1.05
(3.27)	(2.17)	(0.05)	(4.96)	(1.24)	(4.20)	(2.92)	(5.27)

Pecowas	Psadcc	Pcacm	Pag	Plaia	Pasean
0.31	1.25	2.10	0.38	0.96	2.25
(0.34)	(0.97)	(1.32)	(0.55)	(2.85)	(5.15)

No. of Observations: 4320

goodness-of-fit index: 0.70

Note: 1.The definitions of all terms in the table are the same as in the text
2.t-statistics are in brackets
3.Pacp* refers to EEC preference to ACP countries
4.Pacp refers to EEC aids to ACP countries, We believe that
   it encourages EEC exports to ACP countries

Table 2

Eastern European Potential Merchandise Exports, mid-1980s $ million

	EC	EFTA	Other Ind.	EE and USSR	Dev.	Total
Actual Trade(1985)	13086	2396	1805	61879	7919	87085
Income Estimate						
CSFB	24066	4195	8467	4654	3301	44683
Heston-Summers	65778	11696	23698	36673	9359	147240
PlanEcon	71097	12571	25594	39146	10052	158460
CIA	99571	17387	35874	80968	14080	247880

Soviet Union

	EC	EFTA	Other Ind.	EE and USSR	Dev.	Total
Actual Trade(1985)	14082	4578	1744	33359	4674	58437
Income Estimate						
CSFB	14872	3415	8381	1437	2837	30942
Heston-Summers	66873	15342	37653	16111	12746	148725
PlanEcon	57971	13312	32669	14933	11059	129944
CIA	105117	24139	59238	36322	20052	244871

Table 3

Eastern European Potential Merchandise Imports, mid-1980s $ million

	EC	EFTA	Other Ind.	EE and USSR	Dev.	Total
Actual Trade(1985)	11934	2972	2104	61618	5822	84440
Income Estimate						
CSFB	28464	5322	10729	4519	3052	52086
Heston-Summers	68952	13081	26629	36379	7661	152702
PlanEcon	73782	13975	28419	38510	8152	162838
CIA	98965	18748	38120	80417	10936	247186

Soviet Union

	EC	EFTA	Other Ind.	EE and USSR	Dev.	Total
Actual Trade(1985)	10287	4673	7755	40249	9507	72471
Income Estimate						
CSFB	19624	4764	11676	1571	2895	40530
Heston-Summers	72714	17651	43267	16434	10726	160792
PlanEcon	64250	15506	38230	15668	9478	143222
CIA	107944	26203	64229	36870	15923	251169

Table 4

East European Countries' Exports, 1985(1)
(Actual and Potential)

$ millions

	EC	EFTA	Other Ind.	Dev.	Sum(4)	EE
Bulgaria(2)	402	61	71	582	1117	9855
	2521	602	1741	742	5606	2652
Czechoslovakia	1532	596	201	1998	3327	12541
	15221	2198	4175	1707	23301	7411
E.Germany(3)	4726	698	149	1149	6722	25003
	23631	4061	6391	2196	36279	8992
Hungary	1326	749	262	892	3229	4464
	6505	923	2364	1204	10996	4103
Poland	2502	688	344	1356	4890	5998
	12653	2630	5922	2004	23209	9154
Romania	2595	302	778	1942	5617	4018
	5247	1282	3105	1506	11140	4361
Total Excl USSR	13086	2396	1805	7919	25206	61879
	65778	11696	23698	9359	110531	36673
U.S.S.R	14082	4578	1744	4674	25078	33359
	66873	15342	37653	12746	132614	16111
EE and USSR	27168	6974	3549	12593	50284	95238
	132601	27038	61351	22105	243145	52784

Note: 1. The GDP data come from Heston-Summers (1988)
2. The first line is actual trade, the second one is potential.
3. E.Germany data with W.Germany are collected from PlanEcon.
4. Sum of trade with 76 partner countries identified in gravity model

Source:
   Actual:IMF "Direction of International Trade" 1989
           PlanEcon 1987

   Predicted: Our calculations

Table 5

East European Countries' Imports,1985 (1)
(Actual and Potential)

$ millions

	EC	EFTA	Other Ind.	Dev.	Sum(4)	EE
Bulgaria(2)	1338	383	277	696	2694	10071
	2707	694	1989	618	6008	2661
Czechoslovakia	1642	522	194	567	2925	13360
	15678	2384	4591	1329	23982	7172
E.Germany(3)	4289	497	312	1140	6238	24075
	23895	4339	6794	1712	36740	8394
Hungary	1756	840	440	718	3754	4034
	6898	1061	2658	981	11598	4076
Poland	2074	562	448	1057	4141	6372
	13934	3074	6918	1714	25640	9512
Romania	835	168	433	1644	3080	3706
	5840	1529	3679	1307	12355	4564
Total Excl USSR	11934	2972	2104	5822	22832	61618
	68952	13081	26629	7661	116323	36379
U.S.S.R	10287	4673	7755	9507	32222	40249
	72714	17651	43267	10726	144358	16434
EE and USSR	22221	7645	9859	15329	55054	101867
	141666	30732	69896	18387	260681	52813

Note: 1. The GDP data come from Heston-Summers (1988).
       2. The first line is actual trade, the second one is potential.
       3. E.Germany data with W.Germany are collected from PlanEcon.
       4. Sum of trade with 76 partner countries identified in gravity model.

Source:
        Actual:IMF "Direction of International Trade" 1989
               PlanEcon 1987

        Predicted: Our calculations

Table 6

East European Countries' Exports to Selected Countries, 1985
(Actual and Potential)

$ millions

	France	Germany	Italy	U.K.	Japan	U.S.
Bulgaria	53	147	76	26	20	36
	518	654	455	393	344	1172
Czechoslovakia	145	781	199	139	49	78
	2614	4764	2173	1849	796	2884
E.Germany	266	3554	115	238	40	93
	3430	10896	2599	2612	897	4660
Hungary	115	681	251	124	29	197
	1123	1475	1164	797	443	1616
Poland	274	963	279	375	62	226
	1637	4637	1946	1827	853	4296
Romania	289	842	838	302	62	647
	1053	1346	974	795	603	2102
Total Excl USSR	1142	6968	1758	1204	262	1277
	10375	23772	9311	8273	3936	16730
U.S.S.R	2267	4264	2738	851	1307	403
	10050	25637	8110	7982	5493	27245
EE and USSR	3409	11232	4496	2055	1569	1680
	20425	49409	16726	16255	9429	43975

Note: 1.The first line is actual trade ,the second one is potential

2. E.Germany export data with W.Germany are collected from PlanEcon

Source: IMF "Direction of International Trade" 1989

Table 7

East European Countries' Imports from Selected Countries, 1985
(Actual and Potential)

$ millions

	France	Germany	Italy	U.K.	Japan	U.S.
Bulgaria	183	624	185	162	137	114
	566	726	474	412	384	1351
Czechoslovakia	146	902	197	145	63	69
	2716	5027	2154	1844	844	3160
E.Germany	230	3523	115	91	152	80
	3479	11227	2516	2544	989	4987
Hungary	152	944	230	158	139	245
	1207	1615	1194	822	485	1833
Poland	203	972	248	236	74	238
	1825	5251	2071	1956	970	5053
Romania	116	294	146	157	92	265
	1193	1549	1053	697	865	2513
EE Excl USSR	1030	7259	1121	949	·657	1011
	10986	25395	9462	8275	4537	18897
U.S.S.R	2070	3963	1697	756	3049	2665
	11024	28563	8492	8358	6144	31523
EE and USSR	3100	11222	2818	1705	3706	3676
	22010	53958	17956	16633	10681	50420

Note: 1. The first line is actual trade, the second one is potential

2. E.Germany import data with W.Germany are collected from PlanEcon

Source: IMF "Direction of International Trade" 1989

Table 8

Increase in Exports to and Imports from Eastern Europe and the USSR
(Potential-Actual)

	France	Germany	Italy	U.K.	Japan	U.S.

Exports

Difference (Potential-Actual $USmillions)

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	9956	18136	8341	7326	3880	17886
USSR	8954	24600	6795	7602	3095	28858

Difference as multiple of actual trade

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	9.7	2.5	7.4	7.7	5.9	17.6
USSR	2.8	6.2	4.0	10.1	1.0	10.8

Difference as percentage of exporter's total exports in 1985

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	9.8	9.9	10.6	7.0	2.2	8.4
USSR	8.9	13.4	8.6	7.5	1.7	13.5

Imports

Difference (Potential-Actual $USmillions)

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	9322	16804	7553	7069	3674	15454
USSR	7783	21373	5372	7131	4186	26842

Difference as multiple of actual trade

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	8.1	3.4	4.3	5.9	14.0	12.1
USSR	3.4	5.0	2.0	8.4	3.2	66.6

Difference as percentage of importer's total imports in 1985

	France	Germany	Italy	U.K.	Japan	U.S.
Eastern Europe	8.6	10.6	8.3	6.5	2.8	4.3
USSR	7.2	13.5	5.9	6.5	3.2	7.4

Table 9

The Comparison of the Results Between Wang-Winters and Collins-Rodrik

	Collins&Rodrik 1988 (1)			W-W Adjusted			Wang&Winters 1985 (2)		
	$USb.	%of world export	X/GNP Ratio	$USb.	%of world export	X/GNP Ratio	$USb.	% of world export	X/GDP Ratio
Bulgaria	11.7	0.42	0.23	9.5	0.52	0.21	8.3	0.46	0.18
CSFR	27.3	0.98	0.23	33.6	1.86	0.28	30.7	1.71	0.26
E.Germany				47.5	2.63	0.33	45.3	2.51	0.31
Hungary	15.8	0.57	0.23	18.8	1.05	0.31	15.1	0.84	0.25
Poland	39.3	1.42	0.19	36.2	2.00	0.19	32.4	1.79	0.17
Romania	18.0	0.65	0.19	22.7	1.26	0.23	15.5	0.86	0.16
Yugoslavia	23.1	0.83							
Sum	135.2	4.88		168.3	9.33		147.3	8.17	
USSR	143.1	5.16	0.09	157.5	8.72`	0.09	148.7	8.23	0.08
EESU	278.3	10.04		325.6	18.05		296	16.40	

Note: (1)Collins and Rodrik data are from Collins and Rodrik(1991)"Eastern
      Europe and the Soviet Union in the World Economy"
      (2) Our calculation

Table 10
Predicted Exports of a United Germany (national, 1985)

$millions

	EC	EFTA	Other Ind.	Dev.	Sum	EE	Total
W.Germany	130682	31833	20936	9118	192569	55797(1)	248366
	127200	33178	21577	9106	191069	50636	241765
E.Germany	22631(1)	4061	6391	2196	36279	8892	45171
	23895	4339	6794	1712	36740	8394	45134
Total	143417(2)	35894	27327	11314	217952	64789(2)	282741
	139868	37517	28371	10818	216574	59030	275604
Uniteed	148443	36164	23782	10357	218746	63382	282128
Germany	146042	37825	25046	10352	219265	58138	267403

Note: The first line refers to the predicted value of exports and
      second to imports

      (1) Including mutual trade between East ang West Germany

      (2) Excluding mutual trade between East ang West Germany

Appendix Table 1

Sample Countries

Industrial Countries (19)	Developing Countries (57)				
Industrial	Africa	Asia	Europe	Middle East	West Hemisphere
Canada	Algeria	Burma	Greece	Egypt	Argentina
U.S.A	Cameroon	HongKong	Portugal	Israel	Brazil
	Congo	India	Turkey	Kuwait	Chile
Austria	Ethiopia	Indonesia	Yugoslavia	Jordan	Colombia
Belgium-Luxmburg	Ghana	Korea		Libya	Costa Rica
Denmark	Guinea	Malaysia		Yemen,PDR	Dominican Rep
Finland	Kenya	Pakistan			Ecuador
France	Liberia	P.N.Guinea			Guatemala
Germany,Fed.Rep	Maturitius	Philippines			Haiti
Ireland	Morroco	Singapore			Jamaica
Italy	Mozambique	Sri Lanka			Mexico
Netherlands	Nigeria	Thailand			Nicaragua
Norway	Senegal				Peru
Spain	Somalia				Trinidad&Tobago
Sweden	S.Africa				Uruguay
Switzerland	Sudan				Venezuela
United Kingdom	Tanzania				
	Tunisia				
Australia	Zimbabwe				
New Zealand					
Japan					

East European Countries' GDP Per Capita and Population

	GDP $ millions				Population millions of Inhabitants
	PlanEcon (1988)	H-S (1985)	CSFB (1988)	CIA (1988)	Three-year-average
Bulgaria	5630	5113	1500	7510	9.1
Czechoslovakia	7600	7424	3500	10140	15.6
E.Germany	9360	8740	4000	12480	16.8
Hungary	6490	5765	3000	8660	10.7
Poland	5450	4913	2000	7270	37.8
Romania	4120	4273	1000	5490	23.2
Soviet Union	5550	6266	1735*	9230*	281.3

Note: H-S, Heston and Summers

CFSB, Credit Swiss First Boston

Source: CEPR (1990) and Collins and Rodrik (1991) for GDP Per Capita and
        UNCTAD "Handbook of International Trade and Development Statistics"
        for population