

Freedom and Trade

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Political changes in Eastern Europe and Soviet democratic movements are likely to bring about changes in trade among nations and increases in transportation requirements. The impact of these changes in freedom, market structure, and governmental status on world trade is estimated in this paper. The primary regional beneficiaries of change are identified. Using a data base consisting of 237 country pairs that report on trade flows, a gravity-type model is calibrated in which 1988 trade flows are related to freedom level, government type, socioeconomic variables, country GNP, shipment times, and extent of free market economy. The model is then used to forecast future (1993) trade under several political scenarios. Results show that baseline trade growth (i.e., trend increases in country GNP) will be about 31 percent during 1988 to 1993; reunification of Germany or freeing up of Communist bloc governments and economies will increase trade by an additional 3.5 to 11.5 percent over the base case. Most of the increases will be limited to trade with Eastern European and Communist bloc nations. On the other hand, a "world freedom" scenario would increase trade about 70 percent, most dramatically in African and Asian developing nations. This compares with a 57 percent increase from vastly improved shipping infrastructure, the benefits of which would flow primarily to currently industrialized nations. It is concluded that trade will increase more if market economies are introduced, rather than if transportation infrastructure is improved. In summary, nations now not free should be encouraged to become so, not be given more transportation infrastructure to increase trade. The shortest path to increased trade is increased freedom.

The 45 years following World War II have seen tremendous economic gains for democratic-capitalist countries and equally dramatic economic stagnation in communist-totalitarian countries. Recent changes in the political structure of nations, particularly in their forms of government, type of economy, and level of freedom raises many questions as to what effects these changes will have on the world economy. The recent collapse of communism in Eastern Europe and its decline worldwide may therefore signal the beginning not only of a "new world order" but a new economic order as well. Economically, this opening-up of Eastern Europe should necessitate greater or expanded trade market (or both) and business opportunities with the rest of the world. The political and social repercussions of these events are numerous and would take much research and study to address adequately. Indeed, events are moving so rapidly that analysis can hardly keep up.

One aspect of this change will be the focus of this paper: the international trade issues raised by these events. The key world trade relations are explored in view of the current political changes and compares them with trade patterns resulting from improved infrastructure.

Also addressed is the extent to which trade will increase and in what form, that is, whether trade will divert to freed nations in Eastern Europe from other countries (a "pie" model) or will increase globally (a "balloon" model) or some combination of these. Areas of the world that will most likely benefit or lose out will also be considered. The impact of transportation improvements on the distribution of goods and services between Eastern Europe and other nations is also examined. Distance, shipment time, and proximity between countries are the most significant transportation variables used in this model. The goal of this analysis is to determine how transportation infrastructure improvements are likely to increase trade.

Since this analysis was completed (summer 1990) events have continued to unfold at a rapid pace. The two Germans have reunited, combining their fast and slow economies in about the way suggested in this paper. But war in the Middle East has disrupted trade in the region and Iraq's and Kuwait's trade have ceased and their economies have been devastated. Soviet Union international tensions have caused that nation to look inward again, at least temporarily. Romania and Bulgaria's steps toward freedom have been difficult. Poland's search for a market economy is painful. It is hoped that the assessment presented in this paper will remain valid, if not in the specifics, then in the generalities.

BACKGROUND

Throughout history, countries have achieved great status by building strong economic foundations. The rise and fall of nations depends partially on their ability to participate in the world economic markets of their time. Historically, the United States has traded with nearly every other country in the world. U.S. interactions with the rest of the world take several forms: social, economic (goods and services), and political. The United States has generally maintained cordial, if not warm, relations with Eastern European nations in spite of political disparities. But trade with Eastern Europe has been nominal, primarily because of the closed political structure in these economies, coupled with Soviet influences. This closed pattern is now changing, and economic trade (goods and services) is likely to increase. Recent world events will therefore create new markets and new opportunities. By understanding what factors foster growth, which possible scenarios in world political structure promote growth, and which regions of the world may benefit or lose in the new economic structure, efforts can be taken to guide and shape events that lead to beneficial results.

The democratization of Eastern Europe, although sudden, has not occurred in a vacuum. For the last decade, the 12

nations of Western Europe have themselves been moving toward a more integrated economy. The unification of the European community into a single market creates an economic entity only slightly smaller than the United States, which is likely to stimulate trade by making the transport of goods to various industrialized western nations more efficient and less costly. Many presently closed national markets would be more open to outside businesses, creating competition and the innovation and improved quality that comes with it. In this scenario trade flows will be most influenced by the ease with which goods will pass between countries. Door-to-door transport time will be reduced as smoother border checks and standardized customs procedures are introduced and as the transportation networks within each country are improved. Most benefits will occur to the European community and to the handful of large multinational corporations that operate in the market. EC 92 is essentially the restructuring of an already existing and highly developed market. Worldwide repercussions of EC 92 are likely to be smaller.

On the other hand, the democratization of Eastern Europe will also change trade flows on a global scale. The collapse of communism has left behind a large market of well-educated and skilled workers, underserved and underutilized by their lagging economies. The business of supplying these countries and using their talents offers a tremendous amount of trading opportunity.

Obviously, the ultimate extent of the changes occurring in Eastern Europe (indeed, in the Soviet Union) cannot be fully determined at this time, as the process is ongoing. But one can safely assert that the common desire of these countries to acquire western tastes and to benefit from the vibrant economies of the industrialized countries, and the desire by western businesses to expand and explore these new markets for international trade, together will substantially increase trade in both goods and services. Particularly, effects on U.S. trade will relate to the following questions:

- Will the United States experience better trade advantages and economic opportunities with Eastern Europe as a result of the current political changes occurring in Europe?
- Will this result in a diversion of international trade from other countries, if indeed there are better trading relations with these new "turning west" countries?
- If trade is diverted from other countries to the new European markets, which countries are likely to lose from this shift and why?
- On the other hand, which countries will gain the most from trade if this new market is viewed as globally advantageous?
- What are the factors that will influence these trade patterns?
- How measurable are these factors that will influence international trade and transportation?
- What are the long- and short-term implications?
- Are the changes in Eastern Europe genuine and stable?
- To what extent can the United States expect increased trade with Eastern Europe?
- What is the role of other industrialized nations such as Japan, West Germany, Great Britain, and so on?
- What would be the economic impact as a result of the reunification of Germany?

- What are the likely impacts of EC 1992?
- What is the USSR role in this social, political, and economic transition?

APPROACH AND SCOPE

To answer the questions raised in this research, a gravity-type model was developed in which trade is related to measures of nation size, freedom, government structure, quality of life, economic activity, and spatial separation. The procedure uses microcomputer and mainframe systems [Excel and Statistical Analysis System (SAS)] to merge various economic indicators, including population, type of government, gross national/domestic product, literacy rate, inflation rate, percentage growth rate, infant mortality rate, population growth rate, degree of freedom, work effectiveness, imports and exports, external debt, and international and national trade transshipment times and distances.

The basic gravity form relates some measure of interaction (T_{ij}) to measures of size and separation:

$$T_{ij} = (K) \text{Size}_i^a \text{Size}_j^b \text{Activity}_i^c \text{Activity}_j^d / \text{distance}_{ij}^e \quad (1)$$

Here, T_{ij} is some measure of trade, "size" is a size measure, "activity" is some measure of economic performance or socioeconomic status, and "distance" is some measure of spatial separation, such as shipment time, distance or a combination. K is a scaling constant. In economic jargon, the size, activity, and distance terms can be thought of as "inputs" (factors of production), and trade is the "output" in produced units of interaction. The coefficients a, b, c, \dots , are constants, determined by calibration, which reflect the sensitivity of the interaction to changes in size, activity, or spatial separation. Models such as this are common in the economic and transportation literature, particularly in intercity travel applications.

It may easily be shown that the coefficients of the model (a, b, c, \dots) are the elasticities of T with respect to each variable; that is, they represent the percent change in T that would result from a 1 percent change in x . This is a convenient result, which allows the forecasting version of this model to be written directly in pivot-point form:

$$T_F = T_0 [1 + a(\text{percent change in } x_1) + b(\text{percent change in } x_2) + \dots] \quad (2)$$

In this form, forecasts of future trade (T_F) can be made by multiplying the present trade (T_0) by an expansion term [] representing the effects of changes in the independent variables. The basis for measuring or hypothesizing future trends in trade relations was calculated by comparing past trade performance (1985 and 1988) with future trade predicted from the model.

The assumption that countries engage in trade because each country is endowed with a comparative advantage in certain resources and a comparative disadvantage in another area is the basis of the model. As a result of specialization, each country is able to export goods reflecting its specialization, while purchasing needed imports. The total trade between

two countries will have a dollar value that depends largely on the country sizes, freedom, other factors, and spatial separation. We are modeling here the total goods-only trade; the scope of this paper does not include specific traded commodities between countries, nor does it cover trade in services.

To develop the model a sample of 43 countries was selected. These were chosen to represent the major trading nations in the world, with particular focus on nations in Europe. The specific nations chosen are listed in Table 1, along with selected variables.

DATA ITEMS

The source for the trade data was the *Direction of Trade Statistics, 1989 Annual Yearbook*, published by the International Monetary Fund (1). The variables used in this model

were selected on the basis of theoretical, practical, and economic considerations. These variables may be generally considered as factors influencing trade between countries. The variables shown in Table 2 were used. In total, trade in our data set represents about one-half of the world total. Explanations for selected variables follow.

- **Development Level**—Identified for all major geographic and economic areas of the world, as indexed by the seven categories listed in *Direction of Trade Statistics*. For convenience and applicability, these categories or groupings were classified as levels—regional classifications that do not necessarily measure the economic structure of country against any other country within the same level or another of classification. The levels are as follows.

- Industrialized—Australia, United States, Canada, Japan, Sweden, France, West Germany, Belgium, Denmark,

TABLE 1 COUNTRY STATISTICS, 1988

Country	Population (Millions)	Growth (%) Pctpop	GNP*/Bill GDP	Growth (%) GDP	Inflation	Unemplm	Billion Exports	Billion Imports	Govt type	Workeff	Dev Level
Industrial Countries											
Australia	16.45	1.2	202.2	1.7	7.7	6.9	29.8	32.1	1	5	1
Belgium	9.87	0.1	155	12.9	1.5	10.8	99	93	1	5	1
Canada	26.31	0.8	471.5	4.1	4.1	7.8	111.5	102.1	1	5	1
Denmark	5.12	0.1	101.3	1.1	4	8.9	25.6	25.5	1	5	1
France	56.01	0.3	939.2	2.3	2.7	10.5	153.6	162.4	1	5	1
W. Germany	60.97	0	908.3	2.2	0.3	0	243	191	1	5	1
Ireland	3.55	0.2	30.6	0.9	2.2	18.5	17.7	14.6	1	5	1
Italy	57.55	0.2	814	3.9	5	12	128.6	138.5	1	5	1
Japan	123.22	0.5	1843	4.8	0.7	2.5	231.2	150.8	1	5	1
Netherlands	14.79	0.5	223.3	4	1	11.1	92.4	91.3	1	5	1
Norway	4.2	0.3	82.6	1.3	8.7	2.1	21.5	22.6	1	5	1
Spain	39.2	0.53	282.2	3.1	5.6	0	27.2	35.1	2	4	1
Sweden	8.39	0.1	105.5	1.4	4.2	0	37.3	32.7	1	5	1
Switzerland	6.95	0.28	126.2	3.2	0.8	0	37.5	41	1	5	1
U. Kingdom	56.93	0.16	556.8	4.3	4.1	0	107	126	1	5	1
U.S.A.	246.04	0.89	4486.2	2.9	3.7	5	216.7	366.3	1	5	1
Sum	735.55		11327.9				1579.6	1625			
Developing Africa											
Algeria	24.94	3	59	2	11	19	8.1	6.1	2	2	2
Angola	8.53	3.5	4.7	1.5	0	1.5	1.5	1.1	3	1	2
Liberia	2.55	3.4	0.97	1.7	3.6	0	0.5	0.3	2	2	2
Nigeria	111.9	3	53.4	3.4	5.5	6.97	6.97	5.5	2	2	2
Africa	35.9	2.2	60	2.4	14	0	21	14	2	3	2
Sum	183.82		178.07				38.07	27			
Developing Asia											
Hong Kong	5.71	1	46.2	13.6	5.5	1.8	48.5	48.5	5	3	
India	83.34	2	231	1.2	8.8	10	11.4	16.7	1	2	3
Singapore	2.67	1.1	23.7	10.9	1.5	3	39	42.5	1	5	3
Korea	43.34	1.3	171	12	7	3	60.7	51.8	1	5	3
China	1112.29	1.6	350	11	18.5	2	57.1	52	3	2	3
Sum	1247.35		821.9				216.7	211.5			
Developing Europe											
Greece	10.04	0.3	46.6	0	16.4	7.4	5.6	12.5	1	4	4
Poland	37.95	0.56	259.8	3	22	0	21.7	21.2	4	2	4
Romania	23.04	0.49	138	3.8	0	0	12.5	10.6	4	2	4
Hungary	10.56	0.2	91.8	1.1	0	0	9.6	9.8	4	3	4
Yugoslavia	23.58	0.61	145	3	70.3	10.4	10.4	11.8	2	3	4
Sum	105.17		681.2				59.8	65.9			
Developing Middle East											
Iraq	18.01	3.8	34	0	27	5	12.4	13	2	3	5
Israel	4.37	1.7	36	1	16	8	9.4	12.9	1	5	5
Saudi Arabia	15.45	4.16	85	6	3	0	25	19	2	3	5
Sum	37.83		155				46.8	44.9			
Western Hemisphere											
Brazil	150.75	2	313	2.9	900	6	26.2	16.6	2	3	6
Mexico	86.36	2.2	135.9	1.4	5219	22.9	22.9	18.6	1	2	6
Argentina	31.91	1.2	74.31	2	188	65	6.3	5.8	1	3	6
Venezuela	19.26	2.5	47.3	4.2	35.5	7	10.4	10.9	2	3	6
Sum	288.28		570.51				65.8	51.9			
Soviet Bloc											
Germany	16.59	-0.06	187.5	2	0	0	27.9	27.6	4	3	7
Czechoslovakia	15.65	0.02	158.2	1.4	0.9	0.9	23.5	23.9	2	3	7
USSR	286.43	0.8	2356.7	2.5	0.7	0	0.97	0.88	2	2	7
Bulgaria	8.97	0.1	67.6	1.8	1.7	0	16.8	16.9	4	2	7
Sum	327.64		2770				69.17	69.28			
Total All	2925.64		16504.58				2075.94	2095.48			

TABLE 2 VARIABLES COMPILED FOR WORLD TRADE MODEL

Country Variables

- * Development level
- Population (millions)
- Annual percent population growth
- Gross domestic product
- Gross national product
- Annual percent GNP growth
- Infant mortality, deaths/1000 births
- Literacy rate, %
- Per-capita income
- Inflation rate
- Unemployment rate
- Total exports, billion U.S. \$ (goods only)
- Total imports, billion U.S. \$ (goods only)
- * Government type
- * Work effort

Separation Variables

- * Land distance
- * Water distance
- * Dock time
- * Shipment time
- * Contiguous

Trade Data

- 1985 exports - from country i to country j
- 1985 imports - to i from j
- 1988 exports - from i to j
- 1988 imports - to i to j

* See text

Ireland, Italy, Netherlands, Norway, Spain, and the United Kingdom;

—Developing, Africa—Algeria, Angola, Liberia, Nigeria and South Africa;

—Developing, Asia—India, South Korea, China, Hong Kong and Singapore;

—Developing, Europe—Greece, Hungary, Poland, Romania, and Yugoslavia;

—Developing, Middle East—Saudi Arabia, Iraq, and Israel;

—Developing, Western Hemisphere—Chile, Argentina, Mexico, Brazil, and Venezuela; and

—Developing, Soviet bloc—Bulgaria, Czechoslovakia, East Germany; and USSR.

• Government type—A constitutional status variable was used as a trade indicator, because the current political changes in Eastern Europe are viewed as facilitating greater trade potential in the region. The degree of political and constitutional freedom is hypothesized to influence trade. For all countries, government type was classified in three categories:

1. Constitutional. Government conducted with reference to recognized constitutional norms includes democracies, republics, constitutional monarchies, and so on.

2. Authoritarian. No effective constitution, or fairly regular recourse to extra constitutional power is confined largely to the political sector.

3. Totalitarian. No effective constitution. Broad exercise of power by the regime in both political and social spheres.

Rather than use dummy variables (e.g., -1, 0, 1) for this structure, a simple 1-2-3 code scale was used. This approach implies numerical properties that are, of course, only approximated by the data. The ratings of individual countries are based on our assessment of their status.

• Work effort—In this context, work effort is defined as the extent that individual's work allows him to participate in the economic environment present in his country, related to the same ability of other individuals in other countries. It may be thought of as a kind of economic quality-of-life. We used this variable to develop a standardized economic development level for comparison purposes, reflecting economic purchasing power for countries with various developmental, political, and social differences. The levels are

1. No structured economy and wages and money are essentially worthless. Revolution may be in progress. Necessary goods are procured through bartering.

2. Daily needs are hard to satisfy for majority of population. Wide disparity in incomes. Small elite group. Inflation is uncontrollable, unemployment high. Buying power is minimal, most purchases are for necessities. Political unrest and riots may result.

3. Consumer goods availability varies by location. Luxury items attainable by small percent of population. Wages do not keep up with inflation. Unemployment can be high for many sectors of the economy regardless of location.

4. Consumer goods available to most of population. Luxury goods take longer to acquire. Buying power is affected at times by inflation. Employment conditions vary widely from one area to another.

5. Consumer goods available to most of population, large supply of luxury goods available to majority. Wages maintain buying power over inflation, which is kept from wide fluctuations. Employment available.

Similarly, we also defined this variable as a code scale, that is, a series of codes approximately an interval scale. The use of dummy variables would be another option.

• Transportation Variables—We defined the following transportation variables:

—Land distance—the number of miles, on land, between two nations;

—Water distance—Number of miles, on water, between two nations;

—Dock Time—Customs, port, and other time delays in transshipment, assumed to average 5 days per dock; and

—Contiguity—Countries separated by all-water trade routes and countries sharing a land border were regarded as contiguous. Others are noncontiguous.

• Total shipment time—Defined as land distance/200 + water/600 + 5 days per dock - 1 (contiguity)

MODEL CALIBRATION

To forecast trade using this model, we must first calibrate it. That is, we must select those variables that are most important in explaining trade patterns and estimate the model's coefficients. To calibrate such a model it is a common practice to convert it linear form by taking logs:

$$\ln T = \ln K + a \ln \text{Size}_i + b \ln \text{Activity}_i + c \ln \text{dist} + (\dots \text{other terms}) \quad (3)$$

The data base of 237 data points consisting of country-country pairs of trade data (1985 and 1988) was merged with the country-specific data. Using the SAS Stepwise Regression procedures, a number of models were developed for different country groups using 1988 trade (imports + exports) as the dependent variable. Initially, all variables were tested, with the most powerful retained for further analysis. Tests were made of models using time and distance as separators, classified by government type and development level. Table 3 shows the models for one analysis, calculated for each group of developing countries, using total shipment time as the spatial separator. These models show some variation in coefficients and variables selected. Note that each of these models contains a GNP-product term and most contain terms for spatial separation (total shipment time), work effort, or government type. For some regions, there is not enough variation in the raw data to allow the calibration process to include all variables in the model. For instance, the Soviet bloc group is (generally) not free nor has wide availability of consumer goods, so these terms cannot enter the trade model. Note also that coefficients (elasticities) for the industrial nations are higher generally than for other nations, indicating greater sensitivity to these variables for this group. We do not believe it logical to assume such sensitivity for policy modeling, however. Therefore, we have chosen to use the aggregate coefficients in Table 3 (shown under the column titled All Observations) as our best estimate of policy impacts for all nations, although this will probably understate the impact of policy changes in less-developed nations.

Note also that the elasticities for GNP-product are in the range of 0.7, elasticities for total shipment time are in the range of -0.8 , whereas elasticities for work effort and government type are higher, 4 to 5 and -1 to -2 , respectively. This means that, in our data set, international trade is much more sensitive to overall levels of freedom—as reflected in free market economy and constitutional government—than to either country size or spatial separation.

In general, our model calibration showed that total shipment time, GNP, and level of freedom (government type and

work effort) were the key variables related to trade patterns. The final model selected accounted for about 65 percent of the variance in 1988 trade, with all terms significant at the 0.05 level. In its policy (forecasting) form, the model is written as:

$$\begin{aligned} \text{Future Trade} = & (1988 \text{ Trade}) \times [1 + .723 \\ & \text{(percent change in GNP} \\ & \text{product)} \\ & + 1.550 \text{ (percent change in} \\ & \text{"work effort")} \\ & - 1.313 \text{ (percent change in} \\ & \text{"government type")} \\ & - 0.791 \text{ (percent change in} \\ & \text{"total shipment time")}] \end{aligned} \quad (4)$$

For calibration and forecasting, work effort is the defined as the sum of the work effort code variables for the two countries, government type is defined as the sum of the government type codes for the two countries, and GNP product is the product of the two country's GNPs.

SCENARIOS

To understand the relationship between trade flows and world events, six basic scenarios were developed. They represent changes in world political and social behavior as well as transportation access improvements. The results were analyzed according to the seven defined country development levels to gauge the impact of the models on each region of the world. The scenarios are

1. *Trend*: A five-year GNP trend forecast, from 1988 to 1993. This analysis assumes that recent one-year GNP growth rates will continue for five more years. This model forms the baseline projection for trade volumes, to which each of the following five scenarios were added.

TABLE 3 COEFFICIENTS OF WORLD TRADE MODELS

Variable	Development Level							
	All Observations	1 Industrial	2 Africa	3 Asia	4 Europe	5 Mid-East	6 Western Hemisphere	7 Soviet Block
n	233	66	21	34	43	15	25	23
R ²	.65	.90	.80	.85	.42	.76	.83	.85
overall F	105.32	132.78	38.55	60.63	15.11	44.29	36.69	38.04
Ln intercept	-1.227	-7.39	-10.76	-2.42	.99	-7.33	-10.23	-4.11
Ln GNP product	.723	.77	.63	1.25	.59	1.31	.90	.56
Ln total shipment time	-.791	-.87	-	-	-.62	-	-1.66	-1.05
Ln work effort	1.55	4.47	5.55	-	-	-	5.72	-
Ln gov't type	-1.31	-2.32	-	-1.10	-	-	-	-
Ln infant mortality	-	-	-	-.93	-	-	-	1.67*

significant coefficients (.05) only
* incorrect sign

2. *Germanys United*: A forecast of change from the impact of a united Germany. To model this scenario, the GNPs of East and West Germany were combined, East Germany's government type was set to constitutional, and the work efforts of both countries were set to 4, to reflect lower West German but higher East German performance.

3. *Communist Bloc Work*: A communist bloc standard of living and production increase without a shift to democratic political ideals. The work effort variable was raised to 5 for each communist country.

4. *Communist Bloc Free*: A communist standard of living and production increase, and a shift to democratic political ideas. The government variable was changed to constitutional to reflect a change in government, and work effort was raised to 5.

5. *World Freedom*: A world shift to democratic and capitalist ideas. For all nations, government types were changed to constitutional and all work efforts were raised to level 5.

6. *Transportation Access*: A major improvement of freight transportation on a world-wide basis. This scenario assumes a 50 percent increase in average land transport speeds, a 33 percent increase in water transport speed, and a 40 percent reduction in dock time. In other words

Shipment time = land distance/300 + water distance/800 + 3 days/dock.

These scenarios were developed to gauge what kinds of events would significantly affect the volume of world trade; they are not forecasts of what events will occur within the next five years. Some are obviously more probable than others. For example, the rise of living and productivity standards and change in political ideology in Eastern Europe may be more likely than world-wide changes or transportation system changes, which depend heavily on technology and infrastructure investments.

FINDINGS

Results of our analysis are summarized in Figure 1 and Table 4 and discussed here.

Scenario 1: Trend

Recent historical trends in trade (1985 through 1988) have been at about 39.9 percent growth overall. Overall, world trade (our total trade) grew from 1069 B\$ in 1985 to 1495 B\$ in 1988. On a percentage basis, trade with developing Asian nations grew most rapidly, almost 60 percent, Africa and Mid-East trade most slowly. About 70 percent of all trade remained with industrialized nations (Figure 2).

The 1993 trend forecast projection, using recent GNP growth rates to project trade, indicates a slowing from the previous levels to 30.9 percent growth. The percent growth for industrial countries is projected to be 28 percent; the Middle East will register a 32 percent increase; Asia will show a 59 percent growth; Africa a 23 percent increase in trade; Europe, 20.5 percent; Western Hemisphere, 20 percent; and the Soviet bloc, 20 percent. On balance, the trend forecast shows that

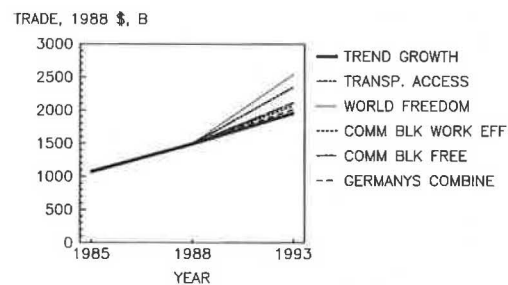


FIGURE 1 World trade, 1985 through 1993.

TABLE 4 FORECASTS OF WORLD TRADE (\$ BILLIONS, % CHANGE)

Scenario	Total		with Indust. Nations		with Africa		with Asia		with Europe		with Mid East		with West Hemisphere		with Soviet Block	
	Total*	Aver.*	Total	Aver.	Total	Aver.	Total	Aver.	Total	Aver.	Total	Aver.	Total	Aver.	Total	Aver.
1985 Trade	1069	4.53	741	11.07	22.6	1.03	116	3.13	54.2	1.23	32.7	2.05	70.8	2.72	31.8	1.32
1988 Trade	1495	6.33 (39.9)	1047	15.62 (41.3)	26.7	1.22 (18.1)	184	4.97 (58.6)	69.7	1.58 (28.6)	37.2	2.32 (13.8)	88.7	3.41 (25.3)	41.9	1.75 (31.2)
1. 1993 Trend	1958	8.37 (30.9)	1342	20.03 (28.2)	32.8	1.49 (22.8)	293	8.37 (59.2)	83.9	1.91 (20.5)	48.9	3.06 (31.8)	106.6	4.10 (20.2)	50.4	2.10 (20.2)
2. Germanys United	2011	8.59 (34.5)	1359	20.27 (29.7)	32.7	1.49 (22.5)	299	8.58 (62.5)	87.3	1.99 (25.3)	49.1	3.07 (32.0)	108.2	4.16 (21.9)	77.2	3.22 (84.2)
3. Communist Block Work	2069	8.84 (38.4)	1349	20.13 (28.8)	32.9	1.49 (23.2)	299	8.53 (62.5)	140.3	3.19 (101.0)	49.7	3.11 (33.7)	107.6	4.13 (21.3)	91.3	3.81 (117.8)
4. Communist Block Free	2113	9.03 (41.4)	1354	20.21 (29.3)	32.9	1.50 (23.2)	390	8.56 (111.9)	165.8	3.77 (137.9)	50.0	3.13 (34.4)	107.9	4.15 (21.6)	102.8	4.28 (145.3)
5. World Freedom	2539	10.85 (69.8)	1392	20.78 (33.0)	59.2	2.69 (121.7)	469	13.40 (154.9)	222.2	5.04 (219.8)	74.5	4.66 (100.3)	173.5	66.7 (95.6)	148.5	6.19 (254.4)
6. Transportation Access	2350	10.04 (57.2)	1619	24.17 (54.6)	39.2	1.78 (46.8)	339	9.69 (84.2)	102.4	2.33 (46.9)	57.8	3.61 (55.4)	130.5	5.02 (47.1)	61.5	2.56 (46.7)

*Billion U.S. \$ Note: Percent changes are calculated against 1988 except 1988-85 comparison.

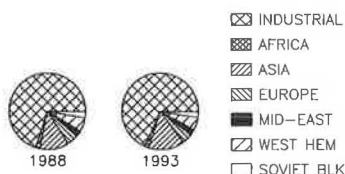


FIGURE 2 World trade by region, trend scenario.

trade by industrialized nations, developing Europe, the Soviet bloc, Western Hemisphere nations and Africa will be slower than the average growth, while trade with Asia and the Middle East will accelerate. Perhaps surprisingly, projected world trade will be 31 percent greater in just five years, even with no political or transportation changes. As GNP grows, so will trade.

Scenario 2: Germany United

The emergence of a united Germany raises many economic questions. The creation of a world economic superpower that will dominate the European continent will clearly affect trade volumes, but the initial short-term 5-year forecast is of interest because the merging process and its effects are not fully understood. According to our analysis, world trade volume would increase only about 3.6 percent above the trend forecast (34.5 percent versus 30.9 percent) if this occurs. But the gains will be highly regionalized, with developing Europe and the Soviet bloc countries reporting the largest gains, 25.3 percent and 84 percent, respectively. The tremendous rise in the trade with Soviet bloc nations shows how dramatically the spill-over effects of a single Germany will help to promote growth in the less developed areas of Europe. The further one moves from the region, the less the impact seems to be. The remaining regions' growth registered a 1 to 2 percent increase above their trend projections (Figure 3).

Scenario 3: Communist Bloc Work Ethic

If all Communist bloc nations adopt western-style markets, work ethics, and consumer goods availability (the general goal of present USSR economic structuring)—but do not adopt democratic freedoms—we would expect to see an additional 7.5 percent increase in overall world trade in five years (38.4 percent versus 30.9 percent) above the trend forecast. The increases will be most dramatic in the Soviet bloc and developing European nations: 118 percent and 101 percent growth, respectively. Asian trade will also see rapid growth (112 per-

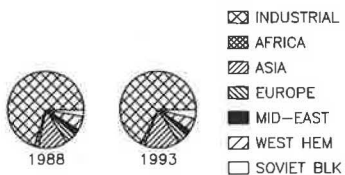


FIGURE 3 World trade by region, Germany united scenario.

cent). Trade with industrialized nations will grow 29 percent, with the western hemisphere and African trade showing lower growth rates, 21.3 percent and 23.2 percent, respectively. Thus, this scenario produces a modified pie future, in which certain wedges grow substantially more than others.

Scenario 4: Communist Bloc Free Government

In this scenario, we assume not only western-style markets in the Communist bloc, but also western-style constitutional governments. The effect is not only greater market freedom, but also greater personal freedom. This scenario indicates an approximate 145 percent (triple) increase in trade flow during the next five years for the Communist bloc countries, while trade flows for the world will increase 41.4 percent, or about 10.5 percent above the base forecast. The high Soviet bloc trade figures indicates that these country could unify their economies and/or trade better amongst themselves. This will indeed create a stronger competitive position between the Communist bloc countries and the rest of the world. Of course, our scenario assures no interim political disintegration, which seems to be increasing in probability.

Scenario 5: World Freedom

In assuming global freedom, the work effort variable for all countries was set to 5 and constitutional government type was assumed. This scenario projects a trade increase for the world by almost 70 percent in 5 years. Africa, Europe, Middle East, and the Western Hemisphere show the highest percentage increase (Figure 4). These regions of the world are areas experiencing the most unstable political problems, although the extent of the political unrest varies from country to country and region to region. It does not necessarily account for the capital endowments in these regions, which for the most part are primary resources or raw materials. The United States and other industrialized nations will experience a relatively slower but still substantial percent growth in trade. Those countries that had more political suppression and less freedom naturally experienced greater volume-of-trade increases. The results of this scenario is indicative of the real potential for economic interaction if freedom “breaks out” worldwide.

Scenario 6: Transportation Access

Generally, the greater the total shipment time between countries, the lower the level of trade. Conversely, with shorter shipment times between countries, the greater trade poten-

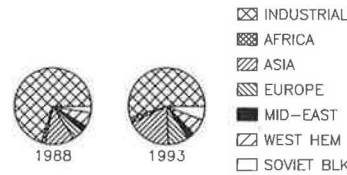


FIGURE 4 World trade by region, world freedom scenario.

tial exists. The effect of significantly improved transportation access on trade is clearly evident. With vastly improved and faster transportation, at rates of 50 percent faster for water, 33 percent faster for land, and 40 percent lower dock time, trade will increase about 57 percent over 5 years. However, the highest trade increases will be in the industrialized nations (i.e., trade flows between the United States and United Kingdom, Japan, South Korea, and Mexico), and trade with developing Asian nations. Other regions will register 46 to 55 percent increases (Figure 5).

This model suggests that if transportation barriers are removed or reduced, more goods will flow throughout the world, but that the effect will be greatest in industrial nations and Asia. As this happens, prices of commodities will become cheaper as the volume of trade increases on the world market. This pattern also suggests comparative advantage in trade as a result of economies of scale for industrialized countries.

POLICY IMPLICATIONS

Reunification of Germany

The ultimate effect of the merging of the two German economies is yet to be determined, because the process is ongoing. However, it would most likely have a greater impact on the East German economy, and a greater positive impact on East Germany than a negative impact on West Germany. German reunification will also stimulate world trade by about 3.5 percent, with very large increases in Soviet bloc neighbor nations.

Our model suggests that an effective way to accelerate the disintegration of communism is to encourage the solidification of market economy and democracy in Germany and the Communist bloc. Our logic is straightforward: East Germany will become another part of Germany, and both countries (and the rest of the Europe desirous of eventually becoming a part of the EC) will have then traded off some degree of economic, social, and political costs and benefits in their individual economies. However, the emergence of a unified German sovereignty will strengthen internal economies and create a better international trade bargaining position with the rest of the world. Another effect is to accelerate trade with Soviet bloc nations thereby hastening their westernization.

Adopting liberalized trade policies, carefully attending to the factors involved in these mixed economic markets (i.e., social and cultural), will put the United States in a more advantageous economic position. Although this approach may appear subtle or perhaps mundane, it is more important, as suggested in Hans Linnemann's (2) trade preferential theory and by other experts in international trade, to overcome the

political and cultural artificial barriers of these countries than to underestimate them or take them for granted.

The increase in intraregional trade between countries as a result of the political trade barrier reduction is another variation of what Linnemann referred to in his discussion on "equal-impact-of-trade barriers" assumption, wherein ". . . political and economic alliance may have led to a selective lowering of tariff barriers and qualitative restrictions, usually through the establishment of a preferential trading area. Member countries of such a preferential trading area meet less than usual trade resistance in their dealings with other members." In our model, prior spheres of economic influence are being realigned: the result is a substantial economic intraregional trade on the Eurasian subcontinent.

Communist Bloc

Our models show that a loosening of economic markets and political freedoms within the Communist bloc nations will essentially double their trade, with much of the gain going to developing Europe, less to industrialized nations. Perhaps surprisingly, trade with Africa will not substantially increase, while trade with Asia will increase only if the Communist bloc is politically free, not just an open market. In other words, only those regions of the world already free to benefit in trade from a freer Communist bloc will actually benefit.

World Freedom

Our world freedom scenario is a more simplistic explanation of Akira Onishi's optimistic scenario in his global model of alternative futures of the world economy to the year 2000 (3). He focuses on stable development in developing economies, global disarmament, and expansion of development assistance, where defense expenditure is frozen and increase in spending or research and development by both the industrialized nations and the Eastern bloc countries, coordination in macroeconomic policies and overall world trade expansion.

Since recent (1985 through 1988) trade growth has been strong, it is not surprising that our trend forecast produces a strong growth rate. More surprising is our world freedom forecast showing an overall 70 percent growth in trade, over twice the trend rate. Our transportation access scenario, posing almost Herculean improvements in shipment speeds and dock operations, in fact produced only one-third more trade growth worldwide than freeing up of the Communist bloc nations, and less trade growth than a world freedom model. In addition, the primary beneficiaries of that policy were not the developing nations, but those presently industrialized. In essence, our findings call for re-examination of trade-increasing strategies, away from those focusing on transportation access, capitalization, and technology and toward those focusing on the creative engines of free-market democratic economies. It appears that our investment policies are, at the least, cost-ineffective. While investments in infrastructure are needed and will improve trade, policies that encourage freedom and democracy are more effective. Nations now not free should be encouraged to become so, not given more infrastructure to raise trade. In sum, the shortest path to increased trade is increased freedom.

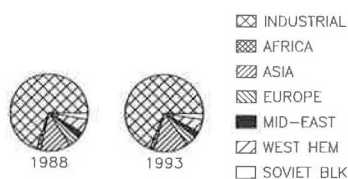


FIGURE 5 World trade by region, transport access scenario.

Need for Future Work

This analysis is not complete. Work is necessary to develop sharper forecasts that account for more considerations. Forecasts need to be disaggregated by commodity type, so that country matches can be better identified. Also, the analysis could be disaggregated by country or states, allowing for more targeted analysis of industry group or region. Models for total world trade, time series models, or difference models, and trade deficit models can also be constructed, and certain variables (e.g., transportation time) could be sharpened for each nation. Elasticities suitable for nation groups must be refined for individual nations. Models should also be developed for service and volume of freight, not just dollar value. On balance, we found this modeling structure to be adequate in the aggregate, but too blunt an instrument for analyzing specific countries. Separate models for service trade should be prepared. More detailed analysis of specific country-pair trade trends should also be reviewed. Changes in Eastern Europe, USSR and, of course, the Middle East all warrant that a more careful look at trade patterns should be made. These fruitful areas of further research will be explored in later papers.

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