
The Rise of U.S. Exports to East Asia And Latin America

By Timothy J. Schmidt

Exports have become an increasingly important source of revenue for both national and regional firms in the United States. U.S. exports are rising rapidly, especially from the Midwest.¹ As a result, national and district firms must be ever more attentive to changes in U.S. export markets. One such change is the rapid growth of U.S. export markets in the developing nations of East Asia and Latin America.

This article analyzes current trends in the geographic distribution of U.S. exports and identifies the primary growth markets for U.S. exports in the years ahead. The analysis suggests the developing nations in East Asia and Latin America will soon rival today's industrialized nations as the most important U.S. trading partners. This finding presents U.S. firms with a significant challenge. To take advantage of these growing markets, U.S. firms must establish new distribution networks, learn foreign regulations and customs, and train sales personnel in these developing geographic regions. Because such tasks require commitments of time and investment, firms must be able to forecast where the future demand for U.S. exports will be concentrated.

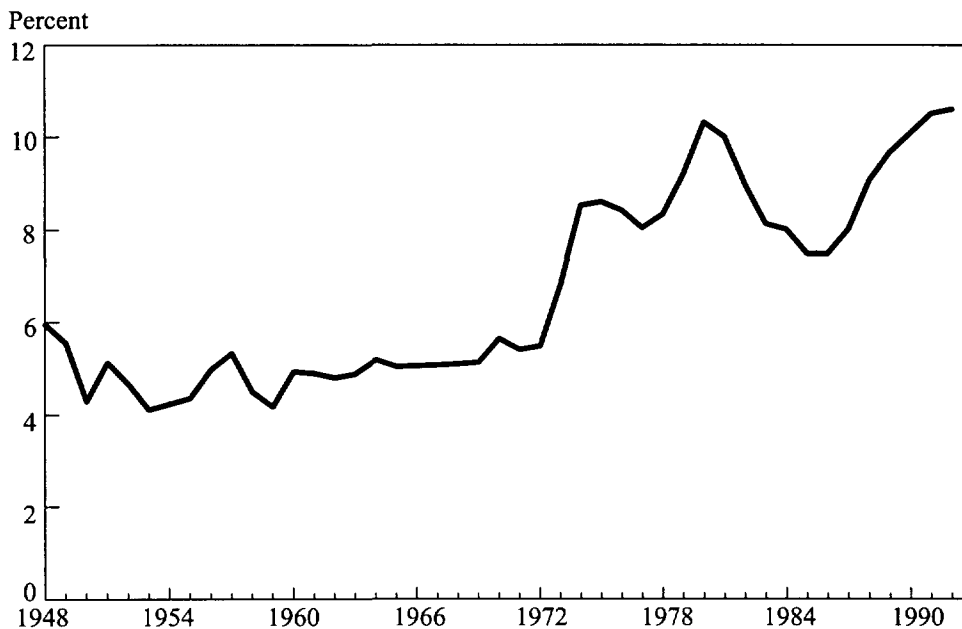
Timothy J. Schmidt is a research associate at the Federal Reserve Bank of Kansas City. This article was written under the supervision of Bryon Higgins, a vice president and economist at the bank, and Craig S. Hakkio, an assistant vice president and economist at the bank.

The first section of this article gives an overview of the rapid growth of U.S. exports and their geographic shift toward developing nations. To assess the prospects for U.S. export growth in developed and developing nations, the second section analyzes recent trends and uses a statistical model to predict future U.S. export patterns.

RECENT TRENDS IN U.S. EXPORTS

Two trends in recent U.S. export performance are particularly notable. First, U.S. exports have increased rapidly relative to total U.S. output—a development with important implications for the entire economy. Approximately 130,000 U.S. firms, employing over 10 million domestic workers, export their products (U.S. Bureau of the Census). Second, the geographic distribution of U.S. exports has been shifting dramatically. The industrialized nations of the Organization for Economic Cooperation and Development (OECD) account for about 57 percent of all U.S. exports. However, in recent years the share of U.S. exports to major trading partners in East Asia and Latin America has been rising and now accounts for 26 percent of the total.² Thus, economic policymakers can no longer make trade-related decisions without considering their effect on U.S. exports to East Asia and Latin America.³

Chart 1
U.S. Exports
Share of GDP



Source: Author's calculations. Data from International Monetary Fund.

The growth in U.S. exports

Exports have not always been vital to the U.S. economy. For more than 20 years after World War II, U.S. exports remained a relatively fixed share of total U.S. output (Chart 1). U.S. export growth was slow to develop after the war because many of the world's industrialized countries, our traditional trading partners, found their economic and trading relationships severely disrupted by the war. The upheaval disrupted income growth in these countries and restrained U.S. exports. However, U.S. export volume began a substantial upward trend in the early 1970s. This trend was interrupted from

1981 to 1987 when the dollar appreciated significantly and the international debt crisis suppressed foreign demand for U.S. goods. More recently, U.S. exports have resumed their rise and are now playing a larger role in the domestic economy.

1973-81. U.S. exports began to swell in 1973 after the breakdown of the Bretton Woods system of fixed exchange rates. Completed in 1944 as the basis for a postwar system of international finance, the Bretton Woods agreement required its signatory countries to fix their exchange rates around a par value. The U.S. dollar was pegged to gold at \$35 per ounce. However, during the 1960s and early 1970s, U.S. economic policy became inconsistent

Table 1

GATT Negotiating Rounds

<u>Round</u>	<u>Starting date of round</u>	<u>Number of countries</u>	<u>Value of trade covered (billions of U.S. dollars)</u>
Geneva	1947	23	10
Annecy	1949	33	NA
Torquay	1950	34	NA
Geneva	1956	22	2.5
Dillon	1961	45	4.9
Kennedy	1964	48	40
Tokyo	1973	99	155
Uruguay	1986	117	755

NA: not available.

Source: Bhagwati; General Agreement on Tariffs and Trade.

with the commitment to maintain a fixed exchange rate at the predetermined par value. As a result, the U.S. dollar became significantly overvalued relative to key foreign currencies.⁴ The United States and other nations were finally unable to sustain exchange market intervention to maintain the par values of their currencies and in 1973 allowed exchange rates to float. As the U.S. dollar depreciated, the foreign price of U.S. exports fell and the demand for U.S. goods abroad began to accelerate.

Another significant stimulus to U.S. export growth since the early 1970s has been trade liberalization.⁵ Trade protection has generally diminished since the 1930s when high tariffs, epitomized by the infamous Smoot-Hawley Act, stifled world trade and output.⁶ The movement toward trade liberalization finally gained strong momentum in 1973 with the Tokyo Round of the General Agreement on Tariffs and Trade, or GATT. Although six GATT negotiating rounds preceded it, the Tokyo

Round encompassed more than twice the number of countries and almost four times as much trade as the largest prior round (Table 1). More recently, many developing nations have joined the GATT and lowered their barriers against U.S. exports. GATT membership has grown from an original 23 signatory countries in 1947 to more than 100, over two-thirds of which are developing countries (General Agreement on Tariffs and Trade).

1981-87. Two factors temporarily stemmed the rising tide of U.S. exports during the early to mid-1980s. First, the U.S. dollar began to appreciate significantly in 1981 as the United States enacted a restrictive monetary policy and an expansionary fiscal policy.⁷ From 1981 to 1985, the dollar rose almost 50 percent, thus making U.S. exports more expensive relative to foreign goods (Hakkio and Whittaker). Second, the international debt crisis culminated in 1982 when Mexico announced a moratorium on its debt payments to commercial

creditors. The debt crisis dramatically reduced income in many developing countries, especially Latin America, thereby paring the demand for U.S. exports.

1987-92. U.S. exports resumed their upward trend in the late 1980s and early 1990s. The dollar depreciated substantially after the major industrialized nations agreed to coordinate their economic policies in the Plaza Agreement of 1985 and the Louvre Accord of 1987. In the Latin American debtor countries, policy reforms stabilized financial conditions and per capita income growth began to recover in 1987 (Edwards 1994). As a result, U.S. exports to Latin America more than doubled from 1987 to 1992.

The geographic shift in U.S. exports

As total U.S. exports have been growing, the geographic distribution of U.S. exports has been shifting dramatically toward certain regions of developing nations. At the vanguard of this shift was East Asia. Rapid income growth and increased trade liberalization have transformed the developing nations of East Asia into a dynamic market for U.S. exports. The successful development of East Asia has influenced other developing countries, most notably in Latin America, to adopt similar policies for economic growth (Schadler). As a result, the developing nations of Latin America have also become important markets for U.S. exports.

The traditional U.S. trading partners are the industrialized countries of the OECD, but the developing countries of East Asia and Latin America are closing the gap. From 1973 to 1992, real U.S. exports to the OECD slightly more than doubled, increasing 4.5 percent annually (Chart 2). During the same period, U.S. exports to East Asia increased four and a half fold, or 8.4 percent annually. Meanwhile, U.S. exports to Latin America rose threefold, or 6.0 percent annually.

As a result, the share of U.S. exports to East Asia and Latin America has increased relative to the OECD share. In 1992, U.S. exports to East Asia and

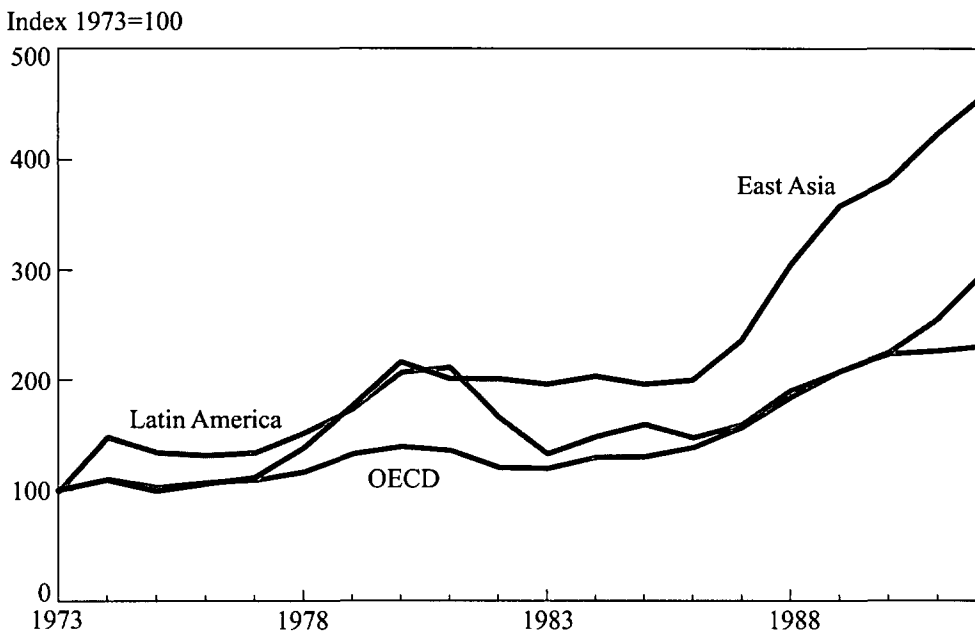
Latin America accounted for 26.1 percent of total U.S. exports, about half of the OECD's 57.2 percent share. However, the share of U.S. exports to East Asia and Latin America has increased substantially in recent years, while the share to the OECD has actually fallen. From 1973 to 1992, the share of U.S. exports to the OECD shrank 4.6 percentage points, while the share of U.S. exports to East Asia and Latin America swelled 8.1 percentage points. The developing country share would have risen even more if U.S. exports to Latin America and East Asia had not been temporarily depressed by the debt crisis.

In the absence of such external shocks, the demand for U.S. exports is determined by fundamental economic factors. Three factors have been instrumental in expanding the share of U.S. goods exported to developing countries in East Asia and Latin America. First, rapid per capita income growth in these developing nations has made U.S. exports more affordable. Second, strong population growth in East Asia and Latin America has expanded market size by increasing the number of consumers. Third, trade liberalization has enlarged U.S. export markets in East Asia and Latin America by creating or increasing access to previously restricted market segments.

Per capita income growth. A nation can increase its aggregate income in two ways—either by increasing the amount of output per person (productivity growth) or by increasing the number of people (population growth). Both sources of growth are important factors in determining overall market size for U.S. exports. However, real per capita income growth is the basis for long-term improvement in a nation's standard of living. In this context, real per capita income is defined to be real GDP per person.

Real per capita income growth in East Asia has been unprecedented by historical standards. For example, during the industrial revolution of the 19th century, Great Britain and the United States paced the world with annual per capita income growth rates of 1.3 and 1.7 percent, respectively, from 1820 to 1913 (Maddison). At that rate of growth, the

Chart 2
Growth of U.S. Exports to Selected Trading Partners
 Constant 1987 dollars



Source: Author's calculations. Data from International Monetary Fund 1994.

United States and Great Britain doubled their levels of GDP per capita in an average of 50 years. In contrast, today's leading developing economies in East Asia commonly register annual real income growth rates of 6 to 7 percent. Such rates allowed South Korea to double its GDP per capita in only 11 years, from 1966 to 1977.

Growth in per capita income has consistently been the most important source of aggregate real income growth in East Asia (Table 2). From 1973 to 1981, real per capita income grew 5.5 percent annually in East Asia, almost three times the comparable rate in the OECD. In recent years, East Asia's real per capita income growth has slowed

only marginally and remains more than double the OECD rate. As a result, several developing nations in East Asia have already surpassed some members of the OECD in their level of real per capita GDP.⁸ For example, real per capita GDP is now higher in Hong Kong than in 14 OECD countries.

One of the most important elements in promoting long-term per capita income growth is a high rate of domestic investment.⁹ A high rate of investment permits an economy to accumulate additional capital and increase its capital-to-labor ratio.¹⁰ The more productive capital that each worker employs, the more output that worker can produce in a given amount of time. Over the last two decades, domestic

Table 2

Real Income, Population, and U.S. Exports, 1973-92*Average annual percent growth*

	1973-81			1981-87			1987-92		
	GDP per capita	Population	U.S. exports	GDP per capita	Population	U.S. exports	GDP per capita	Population	U.S. exports
OECD	1.86	.78	3.79	2.26	.59	2.43	2.04	.84	8.04
East Asia	5.45	1.95	9.11	5.01	1.72	2.71	5.19	1.58	14.28
Latin America	3.04	2.61	9.85	-2.11	2.15	-4.67	1.47	1.90	13.56

Note: Growth in GDP per capita for 1991 and 1992 was calculated using growth rates of aggregate real GDP for each country.

Source: Author's calculations. Data from Penn World Tables 5.5 (Summers and Heston); World Bank 1994a; International Monetary Fund 1994.

investment has grown significantly faster in the developing nations of East Asia than in the industrialized nations of the OECD (Table 3). From 1973 to 1981, real gross domestic investment increased 8.9 percent annually in East Asia, seven times the comparable rate in the OECD. Although it slowed to 4.4 percent annually from 1981 to 1987, the growth rate of real domestic investment in East Asia rose again to 10.1 percent annually from 1987 to 1992. This growth was almost four times the annual investment rate in the OECD from 1987 to 1992, and a major factor why East Asia has sustained rapid real per capita income growth.¹¹

In Latin America, however, strong real per capita income growth in the 1970s yielded to strains from the debt crisis of the 1980s. From 1973 to 1981, real per capita income grew 3.0 percent annually in Latin America, significantly faster than in the OECD. However, from 1981 to 1987 real per capita income in Latin America actually declined. Real per capita income has only recently begun to

recover in Latin America, rising 1.5 percent annually from 1987 to 1992.

Numerous developing countries, including many in East Asia, incurred substantial debt problems in the early 1980s. Latin America was hit particularly hard by the crisis. Its effects lingered in Latin America primarily because appropriate adjustment policies were implemented much later than in East Asia (Sachs). For example, both Korea and Mexico borrowed heavily during the 1970s, primarily to finance public sector spending. However, Korea enacted a tight fiscal policy in 1979 as part of a comprehensive stabilization program. In contrast, Mexico actually increased its public sector expenditures by 14 percent of GDP from 1979 to 1981. As a result, the level of debt exploded and Latin America could not follow East Asia in sustaining its prior growth performance.

The debt crisis reduced U.S. exports to Latin America in two ways. First, the large fiscal deficits led to a crowding-out of private investment and to

Table 3

Real Gross Domestic Investment, 1973-92*Average annual percent growth*

	<u>1973-81</u>	<u>1981-87</u>	<u>1987-92</u>
United States	.90	2.84	.02
OECD	1.25	3.08	2.59
East Asia	8.86	4.37	10.13
Latin America	7.31	-4.92	6.13

Source: Author's calculations. Data from World Bank 1994a.

eventual cuts in government investment spending (International Monetary Fund 1987).¹² For example, from 1981 to 1987 real domestic investment in Latin America fell 4.9 percent annually (Table 3). The decline in investment spending was exacerbated by severe capital flight from the debtor countries and a sharp curtailment in lending from foreign creditors.¹³ Among major debtor countries, the share of investment financed by external borrowing fell from 23 percent in 1981 to 1 percent in 1984 (International Monetary Fund 1985). As investment declined in these countries, so too did per capita income growth and the demand for U.S. exports. For example, U.S. exports to Latin America fell 4.7 percent annually from 1981 to 1987 (Table 2).

The second way the debt crisis curtailed U.S. exports to Latin America was through the process of current account adjustment. After external lending was sharply reduced by foreign creditors, debtor countries were compelled to increase their foreign exchange earnings to repay their external debts. In other words, exports had to exceed imports in debtor countries. In Latin America, 100 percent of the net trade balance increase between 1980 and 1986 was achieved by reducing imports (Edwards 1989).

In effect, Latin America dramatically reduced its consumption of U.S. (and other) exports.

Population growth. The second factor promoting the shift in U.S. exports to East Asia and Latin America has been population growth. Along with increasing per capita income, population growth is an important consideration for U.S. firms seeking to identify regions with expanding markets.

Population growth has been a strong and consistent contributor to economic growth in the developing nations of East Asia and Latin America. From 1973 to 1992, annual population growth was two to three times higher in East Asia than in the OECD. Population growth has been even more important to Latin America's expansion. From 1973 to 1981, population growth accounted for almost half of Latin America's aggregate real income growth (Table 2). In addition, when real per capita income growth turned negative in Latin America during the early 1980s, population growth remained strong and ameliorated the decline in U.S. exports to the region.

Trade liberalization. Access to foreign markets is the third crucial factor in the growth of U.S. exports. Strong foreign income and population growth offer no opportunities for domestic firms

that export unless their goods can be sold in foreign markets at competitive prices. Thus, it is important that developing nations in both Latin America and East Asia have made significant strides toward trade liberalization.

East Asia was at the forefront of developing countries in implementing trade liberalization measures. For example, given their status as entrepôt city-states and lack of natural resources, both Hong Kong and Singapore have depended on free trade for their economic expansion. As a result, Hong Kong and Singapore have long been among the most open countries in the world. After a brief experiment with import-substituting industrialization, Singapore began to liberalize its trade in the late 1960s (Noland).¹⁴ Hong Kong liberalized even earlier, adopting free trade in 1949 along with other laissez-faire policies of its British colonial government (*The Economist* 1989).

Latin American economies, once among the most protected in the world, have more recently emulated the East Asian countries in liberalizing trade. Mexico, already the third-largest market for U.S. exports, offers a vivid illustration of the benefits of lowering trade barriers. As recently as 1985, import licenses protected more than 90 percent of Mexico's domestic production from competing imports (Lustig, Bosworth, and Lawrence). Mexico embarked upon large-scale trade reform in mid-1985 and methodically reduced import licensing to only 19 percent of domestic production by 1990 (Lustig).

Many developing countries in Latin America have also initiated moves to liberalize trade through the GATT. Since 1980, almost half of all new accessions to the GATT have been Latin American nations.¹⁵ In the process, these Latin American nations have agreed to substantial tariff reductions. At the time of their accessions, Mexico, Venezuela, Bolivia, and Costa Rica all committed to tariff ceilings, the highest of which was 55 percent (OECD 1992). These trade liberalization measures contrast starkly with developments in the OECD. Over the last decade, 20 out of 24 OECD member nations have increased their trade barriers (Bergsten and Noland).

In summary, exports have become increasingly important to the U.S. economy. The growth in U.S. exports has been accompanied by a geographic shift toward the developing nations of East Asia and Latin America. Although briefly interrupted by external shocks in the 1980s, three primary factors have precipitated the geographic shift in U.S. exports. Per capita income growth, population growth, and increased trade liberalization have all contributed to faster market expansion in East Asia and Latin America than in the OECD. In fact, these same three factors point toward bright prospects for future U.S. export growth in East Asia and Latin America.

PROSPECTS FOR U.S. EXPORTS TO EAST ASIA AND LATIN AMERICA

The developing nations of East Asia and Latin America will continue to become more important markets for U.S. exports in the years ahead. Spurred by recent investment growth, strong real income growth in these developing nations is likely to continue. Rapid income growth in East Asia and Latin America has important implications for U.S. exports because fast-growing countries tend to import a higher proportion of goods than slow-growing countries (Plosser). In addition, current trends toward increased trade liberalization will allow U.S. exports greater access, while per capita income growth and population growth expand market size in these developing nations.

Per capita income growth

Rapid per capita income growth will remain an important factor in making East Asia and Latin America key U.S. export markets. East Asia's rapid income growth has already made U.S. officials take notice. Commerce Secretary Ronald Brown has said, "These [East Asian] nations are the fastest growing markets for U.S. goods, and if we are to expand the share of world markets claimed by

Table 4

Output and Population Forecasts, 1994-2030*Annual percent change*

	Real GDP	Nominal GDP (U.S. dollar terms)	Population	
			1994-2000	2000-30
United States	2.7	6.0	.95	.79
OECD	2.7	5.9	.51	.23
East Asia	7.6	11.5	1.32	.84
Latin America	3.4	9.6	1.94	1.18

Sources: World Bank 1993, 1994b; World Bank, International Economics Department; Day.

American companies and workers, it will occur in these countries" (*Daily Report for Executives*). In addition, recent policy reforms in Latin America have already begun to restore real income growth and have greatly improved the prospects for future gains.

Current forecasts indicate that East Asia will continue to set the pace for real income growth in the decade ahead (Table 4). During the next ten years, real GDP in the developing nations of East Asia is expected to grow 7.6 percent annually, over two and a half times as fast as in the United States or the OECD.¹⁶ Income growth at these rates makes for a large potential market for U.S. exports. For instance, when converted at purchasing power parity exchange rates, China already has the third largest GDP in the world (International Monetary Fund 1993). This has led some to suggest that China will be an emerging economic superpower in the 21st century (Burt).

Recent policy reforms have also restored the potential for rapid income growth in Latin America.¹⁷ The developing economies in Latin America have made significant progress in restoring macroeconomic stability through deficit and inflation re-

duction. Chile, Mexico, and Colombia all recorded fiscal surpluses by the late 1980s, while Argentina reduced its deficit from 8 percent of GDP in 1980-82 to 3 percent in 1985-88 (Williamson). With the onset of Economic Solidarity Pact reforms, Mexico's monthly inflation rate was reduced from 10 percent to 1 percent during 1988 (Lustig).

Latin America initiated a second set of policy reforms in privatizing state-owned firms. For example, after nationalizing all but two of Mexico's commercial banks in 1982, the government has completely privatized the banking system (Welch and Gruben). From 1982 to 1992, the number of public firms in Mexico fell from 1,155 to 217 (Banco de Mexico). The process of privatization has reallocated a large amount of capital from inefficient state enterprises to more promising private ventures. As a result, Latin American investment is now better able to spur rapid per capita income growth.

While these reforms have been relatively recent, experience has shown that U.S. exports to a nation can grow rapidly after reforms have been adopted. Reforms were implemented in some of East Asia's

developing nations before U.S. exports took off. For example, prior to its economic reforms begun in 1978, China was a relatively small market for U.S. exports, consuming less than a billion dollars per year. By 1992, however, just 14 years after the first economic reforms, U.S. exports to China increased ninefold to almost \$7.5 billion.¹⁸ In an additional parallel to China, foreign capital has been flowing into Latin America in large amounts recently, a sign of investor confidence in the progress of policy reform and the region's growth prospects.¹⁹

Population growth

Over the next three decades, population growth worldwide is expected to moderate. However, population growth in East Asia and Latin America will continue to outpace the OECD by a wide margin.

Current forecasts suggest that the population in East Asia will expand 1.3 percent annually through the year 2000. This growth is more than two and a half times as fast as in the OECD (Table 4). Although projected to slow thereafter, East Asia's population growth is expected to be more than three and a half times the OECD rate by 2030.

Population growth is also expected to remain robust in Latin America well into the 21st century, thus expanding the potential market for U.S. exports. Current projections indicate that Latin American population will grow about 1.9 percent annually during the 1990s, among the most rapid in the world. At that rate, by the year 2000 about 8.6 percent of the world's population is likely to live directly south of the U.S. border. Although its growth rate is forecast to moderate somewhat after that, Latin America's population is projected to swell from the current 453 million to 765 million by 2030.

Trade liberalization

Trade liberalization improves the prospects for U.S. exports in two ways. First, lower foreign trade

barriers directly increase U.S. access to growing markets. Second, trade liberalization indirectly benefits U.S. exports by increasing foreign economic growth and, hence, the potential demand for U.S. exports.

Although several East Asian nations are already among the most open of all developing nations, further progress in trade liberalization is spreading throughout the region. Given their small size and prominent role as trading centers, Hong Kong and Singapore have traditionally been two of the most open markets in the world. In Korea, the average tariff for all industries was cut in half from 36 percent in 1978 to 18 percent in 1988 (Yoo). Korea plans further tariff reductions to 7.9 percent in 1994 (Noland). The relatively high level of remaining trade barriers in East Asia suggests that additional liberalization would provide a substantial boost to U.S. exports. The level of protection in manufacturing industries in several East Asian countries is approximately equivalent to 40 percent tariffs (*The Economist* 1994). Thus, there is substantial room for U.S. exports to expand in the wake of further trade liberalization.

The movement toward free trade is also gaining momentum in Latin America. The North American Free Trade Agreement (NAFTA) just took effect on January 1, 1993. The ensuing gradual phaseout of trade barriers will provide increasingly open markets for U.S. goods. Independent studies have estimated the NAFTA's trade barrier reductions, in conjunction with continued policy reforms in Mexico, will increase U.S. exports by \$16.7 billion per year starting in 1995 (Hufbauer and Schott 1992).

The movement to reduce barriers to U.S. exports is spreading throughout other Latin American countries as well. President Clinton recently asked the U.S. Congress for the authority to begin fast-track negotiations to include Chile in the NAFTA. In addition, a recent report by the Institute for International Economics found that Chile and Trinidad and Tobago are in prime position to enter into a free trade agreement with the United States (Hufbauer and Schott 1994). Moreover, U.S. trade negotia-

tions in Latin America are unlikely to end there. The President has said, "We ought to move next on this free trade agreement with Chile and that could be a model for all of South America" (*Telerate* 1994a). It is estimated that a free trade pact encompassing the western hemisphere would raise U.S. exports by an additional \$36 billion in 2002 (Dunne). On the basis of these and other factors, U.S. Trade Representative Mickey Kantor has predicted that by the year 2000 the United States will conduct more trade with Latin America than with Europe (*Telerate* 1994b).

In addition, several other developing nations in Latin America are currently applying for GATT membership. These new applications give strong reason to expect additional progress in trade liberalization in the near future. Moreover, Latin American nations have strong incentives to reduce trade barriers, since trade liberalization is likely to add several percentage points to the region's economic growth rate in the 1990s (Malpass). U.S. firms are particularly well positioned to benefit from Latin American trade liberalization because of their geographic proximity to those markets.

Trade liberalization has the added benefit of increasing economic growth and thereby expanding the potential market for U.S. exports. There is increasing evidence, for example, of a direct positive link between East Asia's openness and its rate of economic growth (Trehan). In general, open Asian economies have grown faster than those that were more closed (Helliwell). Specifically, trade liberalization encouraged economic growth in Korea and Thailand by increasing economies of scale and capacity utilization (OECD 1992). In addition, by exposing domestic industries to greater foreign competition, trade liberalization in East Asia may also stimulate productivity and, hence, income growth (*The Economist* 1993). Recent projections suggest that trade liberalization will indeed increase economic growth in East Asia. East Asia stands to gain the most from the liberalization measures in the recent GATT agreement, which will add an estimated \$300 billion per year to world income

(World Bank 1994b). Other estimates suggest that if current tariff levels were reduced by half, East Asia's income would rise by \$100 billion per year (*The Economist* 1994).

In short, the prospects for future U.S. export growth in the developing nations of East Asia and Latin America are very good. A rising tide of trade liberalization is improving the access of U.S. exports to these developing markets at the same time that strong income growth and population growth are expanding the size of those markets. In addition, continued policy reforms in Latin America will free domestic resources from debt service and inefficient state enterprises and create new demand for U.S. capital and consumer goods.

Predicted U.S. export flows

Empirical estimates support the view that the developing nations of East Asia and Latin America will remain the foremost growth markets for U.S. exports in the years ahead. Using income and population growth forecasts, it is possible to predict the flow of U.S. exports to East Asia, Latin America, and the OECD by estimating what international trade theorists call *gravity equations*. Such equations have been used successfully for over 30 years in empirically estimating international trade flows (Aitken; Bergstrand).

The gravity equations estimated for this article use five independent variables: nominal output for the United States and its trading partners, the population of the trading partners, the distance between the United States and its trading partners, and the residuals from the prior year's estimated regression. The U.S. GDP variable represents the potential export supply. Foreign country GDP is included to measure the potential demand for U.S. exports. Foreign population is a proxy to capture the effects of market size.²⁰ The distance variable represents natural trade resistance factors such as transportation costs.²¹ Finally, the residual term from the prior year is included to explain the fact that the United States

Table 5

Gravity Regression Equations

Dependent variable: U.S. exports to region

Sample period: 1981-91

Independent variables					Summary statistics	
<u>U.S. GDP</u>	<u>Foreign GDP</u>	<u>Foreign population</u>	<u>Distance</u>	<u>Lagged residuals</u>	<u>\bar{R}^2</u>	<u>Standard error of estimate</u>
<i>OECD</i>						
1.58 (.08)	.55 (.07)	.22 (.09)	-1.01 (.07)	.23 (.03)	.82	.58
<i>East Asia and Latin America</i>						
.69 (.03)	1.30 (.03)	-.54 (.02)	-.13 (.03)	.12 (.02)	.84	.39

Note: Standard error in parentheses.

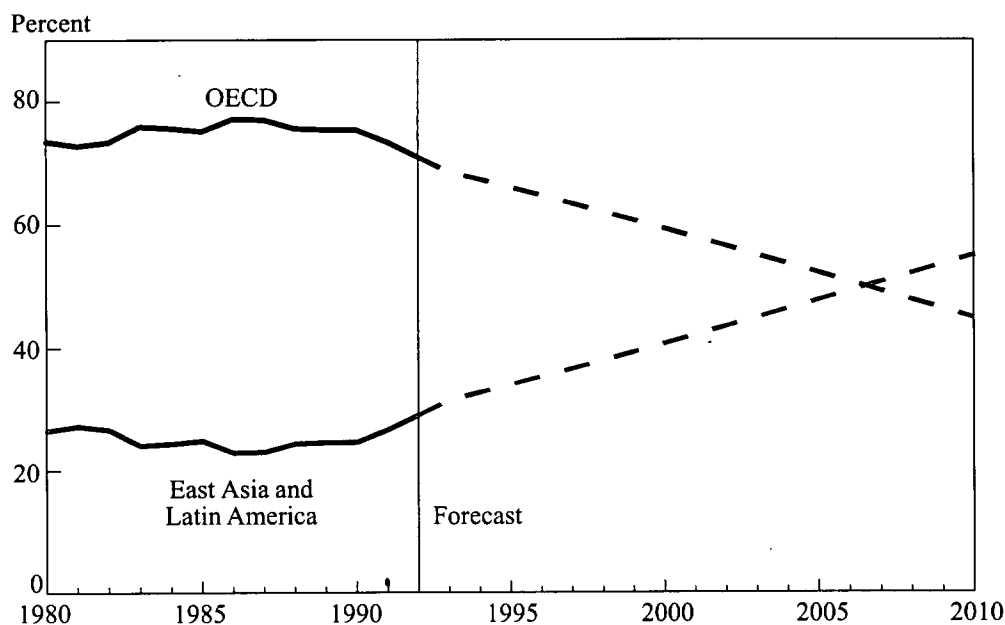
consistently conducts more trade with these countries than would be predicted by obvious trade factors.²² For example, the residual term may capture the unquantifiable effects of favorable trade relationships, political orientation, or gradual trade liberalization.

The objective is to predict export flows from the United States to two separate groups of countries: the developing nations of East Asia and Latin America, and the developed nations of the OECD. Therefore, two separate gravity equations are estimated, one for each of the two groups of trading partners. The details of the estimation procedure are described in the appendix.

The estimated regression equations are presented in Table 5. As expected, the coefficients on U.S. GDP are positive because the more output the United States produces, the more exports it can

supply. The foreign income coefficients are positive for the developed and developing nations, indicating that higher foreign income raises the demand for U.S. exports. The coefficients on the distance variables are negative because countries located farther from the United States have higher transportation costs imbedded in the price of U.S. exports. Foreign population growth creates a larger market for U.S. exports, making the expected sign of the population coefficient positive.²³ In fact, the reported population coefficient is positive for the OECD. The reported population coefficient is negative, however, for the developing countries. This may reflect the lingering impact of stringent trade barriers that were part of import substitution policies in Latin American countries.²⁴ Many other empirical studies using gravity equations have also reported negative foreign population coefficients

Chart 3

Actual and Predicted U.S. Exports*Share of total U.S. exports to selected trading partners*

Source: Actual data from International Monetary Fund 1994. Predicted data are fitted values from gravity regressions (see text).

(Leamer; Summary).

These gravity equations are used to forecast the future shares of U.S. exports to the developing and developed nations considered in this article. The future or out-of-sample values of the independent variables are computed using nominal output and population growth forecasts (Table 4). Given these values, the predicted levels of U.S. exports are generated in two steps. First, the estimated equations (Table 5) are used to compute separate time series of predicted values for each country in the two groups of trading partners. Second, predicted aggregate time series of U.S. exports to each country group are computed by summing the predicted time series of all nations in each group.

The gravity regressions estimated here clearly

support the view that the share of U.S. exports to East Asia and Latin America will continue to grow faster than the share of U.S. exports to the OECD (Chart 3). The forecasts indicate that the share of U.S. exports to East Asia and Latin America will exceed the share of U.S. exports to the OECD by the year 2007. Given that only a portion of all Latin American and East Asian developing countries are included in this study, it is possible that this succession could happen sooner. Therefore, the results presented are consistent with similar forecasts made by the Office of the U.S. Trade Representative. The important point is not the specific year in which the succession will occur, but that East Asia and Latin America will be the primary growth markets for U.S. exports in the coming years.

CONCLUSIONS

Two important trends have emerged in recent U.S. export performance. First, U.S. exports have been increasing rapidly relative to total U.S. output. Second, a geographic shift in the direction of U.S. exports is occurring as the developing nations of East Asia and Latin America are consuming an increasing share of U.S. exports. These developing nations have accounted for most of the recent growth in U.S. exports.

Several factors have contributed to this geographic shift in U.S. exports. Aggregate real income growth has been faster in East Asia and Latin America than in the industrialized nations of the OECD. Thus, spurred by strong domestic investment and per capita income growth in East Asia and Latin America, the market for U.S. exports in these developing nations has expanded rapidly. These fundamental economic trends have been augmented by increased trade liberalization in East Asia and Latin America, which has allowed U.S. exports greater access to developing markets.

The shift in U.S. exports to East Asia and Latin America is likely to continue in the future. The economic fundamentals underlying rapid income growth in East Asia remain in place, while continued trade liberalization promises greater access to U.S. exports in these burgeoning markets. Through measures like the NAFTA and the GATT, trade liberalization is also opening markets to U.S. exports in Latin America. In addition, continued policy reforms and strong population growth will keep Latin American markets expanding rapidly.

Forecasts presented in this article confirm that U.S. exports to these developing nations will continue to grow faster than U.S. exports to the OECD in coming years. The share of U.S. exports to East Asia and Latin America is likely to surpass the share of U.S. exports to the OECD during the first decade of the 21st century. These forecasts are contingent on current trade liberalization and policy reform trends. The emergence of protectionism or reversal of current policy reforms, while unlikely at present, would damage world growth and impair the prospects for U.S. exports.

APPENDIX

This appendix outlines the procedures used to generate the forecasted shares of U.S. exports to developed and developing countries.

Estimation of gravity equations

Gravity equations were estimated using annual data from a sample of countries in each of two groups: the developed countries of the OECD, and the developing countries of East Asia and Latin America.²⁵ The estimation procedure comprised two steps.

First, annual gravity equations were estimated for each of the two groups. For each year, t , in the 1980-91 sample period, the gravity equations took the form:

$$(1) \quad x_t^i = \beta_1 + \beta_2 y_t^j + \beta_3 n_t^i + \beta_4 d_i + e_t^i, \\ i = 1, \dots, N_j; j = 1, 2,$$

where the subscript i indexes the N_1 countries in the developed group and the N_2 countries in the developing group. The dependent variable x_t^i represents U.S. exports to country i in year t . Similarly, y_t^j represents nominal GDP in country i expressed in U.S. dollars, n_t^i represents the population of country i , and d_i represents the distance in miles from country i to the United States.²⁶ All variables were expressed in logarithms.

The second step in the estimation procedure incorporated the estimated residual term \hat{e}_t^i from the annual regressions in step one. The estimated residual from the prior year was used to capture unquantifiable factors, like political

orientation, that affect trade. The estimated residual was included as an independent variable in a set of annual gravity equations used to compose a system of seemingly unrelated regressions (SUR). To be specific, the following set of equations was simultaneously estimated:

$$(2) \quad \begin{aligned} x_i^{1981} &= \beta_1 y_{US}^{1981} + \beta_2 y_i^{1981} + \beta_3 n_i^{1981} \\ &\quad + \beta_4 d_i + \beta_5 \hat{e}_i^{1980} + \varepsilon_i^{1981} \\ &\quad \cdot \\ &\quad \cdot \\ &\quad \cdot \\ x_i^{1991} &= \beta_1 y_{US}^{1991} + \beta_2 y_i^{1991} + \beta_3 n_i^{1991} \\ &\quad + \beta_4 d_i + \beta_5 \hat{e}_i^{1990} + \varepsilon_i^{1991}, \end{aligned}$$

where y_{US} is U.S. nominal GDP and \hat{e}_t^i is the once-lagged residual from equation (1). The coefficients in system (2) were restricted to be equal for each year in the sample. Thus, the SUR technique reduced the system of annual regressions to a single estimated equation over the 1981-91 sample period. The SUR technique also accounts for any contemporaneous correlation in the error terms (Kmenta). Such correlation occurs if a factor affecting one country's demand for U.S. exports affects other countries' demand for U.S. exports.

Computation of export shares

Using the estimated coefficients from equation (2), predicted export shares were computed for both developing and developed countries.

First, for each country in the two groups (developed countries and developing countries), the estimated coefficients were used to compute predicted (fitted) values. The predicted values, U.S. exports to each nation, were then aggregated by country group for the 1993-2010 forecast period:

$$(3) \quad \hat{X}_j^i = \sum_{i \in j} \hat{x}_i^i,$$

where \hat{x}_i^i represents the fitted values for country i in country group j . The aggregate predicted values \hat{X}_j^i were then used to compute the shares in Chart 3.

ENDNOTES

¹ Melcher and Kelly report that from the first quarter of 1993 to the first quarter of 1994, exports from the Midwest rose at twice the national rate.

² The industrialized economies are generally considered to be the member nations of the Organization for Economic Cooperation and Development (OECD). The OECD nations are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Although it became a member of the OECD on May 18, 1994, Mexico would still be more accurately considered a developing nation by virtually all observers. In addition, for the sample period examined, Mexico was not a member of the OECD. Therefore, in this article Mexico is classified as a developing country in Latin America. Iceland is excluded from the analysis. Since the article is written from the perspective of U.S. trade, the term OECD is understood to exclude the United States.

The developing countries in East Asia considered in this article include China, Hong Kong, Indonesia, the Republic of Korea (South Korea), Malaysia, the Philippines, Singapore, and Thailand. Latin America's developing countries considered here include Argentina, the Bahamas, Brazil, Chile, Colombia, Ecuador, Mexico, Panama, Peru, Trinidad and Tobago, and Venezuela. Although they exclude some countries, these regional definitions are economically comprehensive in that they include all nations that have a significant trading relationship with the United States, as indicated by the

data in the *Direction of Trade Statistics* (International Monetary Fund 1994).

³ Recent reform efforts have also focused attention on economic development in the economies of Eastern Europe and the former Soviet Union (Barkema). However, these studies have generally concluded that the progress of reform in those countries will be slow and uneven. In addition, many organizations do not strictly classify Eastern Europe and the former Soviet Union as developing economies, categorizing them separately as "formerly socialist economies" or "economies in transition" (World Bank 1993). For these reasons, Eastern Europe and the former Soviet Union are excluded from the analysis of this article.

Another nation often mentioned as a potential economic power is India. However, India is not included in this article for two reasons. First, India is not located in the geographic regions that are the focus of this article. Second, despite its formidable potential for economic growth, India has actually consumed a steadily declining share of U.S. exports since 1964.

⁴ Given the prevailing fixed exchange rate system, the dollar was overvalued in the sense that the supply of dollars greatly exceeded the private demand for dollars (*Economic Report of the President*).

⁵ The link between lower trade barriers and higher trade volumes has been well established (Harris).

⁶ Although the discussion here is focused on tariff protection,

there are other non-tariff barriers (NTBs) that nations often employ to restrict imports. Some of the more common NTBs are quotas, "voluntary" export restraints, and local content requirements. The GATT has also been instrumental in working to reduce NTBs through the principle of transparency. This principle calls for countries to convert NTBs into tariffs that are transparent or easily identified. The idea behind transparency is that trade barriers must be clearly identified before they can be lowered or eliminated.

⁷ A restrictive monetary policy and an expansionary fiscal policy combined to drive up real interest rates in the United States relative to the rest of the world. Thus, aided also by increased investment risk in Latin American debtor countries, foreign demand for U.S. assets rose. The tight U.S. monetary policy also reduced expectations of U.S. inflation. All of these factors combined to increase the demand for the U.S. dollar and raise its value relative to other currencies (*Economic Report of the President*).

⁸ In comparing levels of per capita GDP between countries, an exchange rate is needed to state all measures of income in terms of a common currency. Accurate comparisons require that this exchange rate reflect the differences in purchasing power of the respective currencies. This is especially important for comparisons between developing and developed countries. Converting data at conventional exchange rates tends to understate the income of developing countries (Summers and Heston). Therefore, all per capita GDP figures used in this article are calculated from data that were converted using purchasing power parity exchange rates. For an explanation of purchasing power parity, see Hakkio.

⁹ Chirinko and Morris note that there is a direct positive relationship between investment and economic growth across a large sample of countries.

¹⁰ In terms of the Solow or neoclassical growth model, an increase in an economy's investment will increase the equilibrium capital-to-labor ratio. The economy will move to a higher point along the production function, thus increasing the equilibrium output-to-labor ratio, that is, productivity. For an illustration of this model, see Branson.

¹¹ Young identifies high investment to GDP ratios, increased educational attainment, and a transfer of labor from low to high value-added sectors as the primary factors underlying the strong productivity growth in East Asia.

¹² Private investment can be "crowded out" if it is inversely related to interest rates. Increased government spending will raise interest rates if the government borrows to finance its spending or if financial market participants believe that the

government will have to borrow more in the future. Higher interest rates generally depress investment because most investment spending is financed by borrowed funds. For a more detailed discussion of crowding out, see Gordon.

¹³ Capital flight occurred primarily because governments attempted to fix the value of their currencies at overvalued exchange rates. Once again, Latin America was much more severely affected than East Asia. In Argentina and Mexico, for example, about two-thirds of the increase in gross external debt went to finance private capital flight (Sachs). The corresponding figure for Korea and Indonesia was an average of 15 percent.

¹⁴ Import-substituting industrialization is the policy of restricting imports of manufactured goods in order to encourage the development of domestic manufacturing industries. This policy was widely practiced in many developing countries, especially in Latin America, after World War II. Import substitution was implemented in response to an anticipated slackening of demand for the primary goods which predominated among developing country exports (Balassa and others). Most economists, however, now consider import-substituting industrialization to be a flawed development policy because it is based on the infant industry argument. Proponents of the infant industry argument contend that nascent manufacturing industries in developing countries cannot initially compete with established industries in developed countries. Therefore, proponents advocate the use of trade barriers to restrict imports and "protect" infant industries until they can develop a comparative advantage. For a discussion of the problems with the infant industry argument and import substitution, see Krugman and Obstfeld.

¹⁵ Seven Latin American nations have acceded to the GATT since 1980. These nations are Colombia, Belize, Mexico, Antigua and Barbuda, Venezuela, Bolivia, and Costa Rica (OECD 1992).

¹⁶ These growth forecasts, like any other, are based upon a number of different assumptions regarding future economic conditions. Most importantly, the forecasts reflect continued moderate growth and low inflation in the industrialized nations, conditions which are expected to keep world interest rates at relatively low levels. These forecasts come from the World Bank (1994b), which also computed forecasts under the assumption of rising world interest rates and protectionist trade pressures. Even under these pessimistic assumptions, East Asia's annual real GDP growth is forecast to be 7.1 percent over the next ten years. Due to its larger debt exposure and greater dependence on foreign capital, Latin America's real output growth is more severely affected under the pessimistic scenario, growing at an annual rate of 0.8 percent.

17 Edwards 1994 identifies 1988 as the beginning of a widespread reform era in Latin America.

18 Lardy points out that total U.S. exports to China are probably even somewhat higher than reported by official data, since some U.S. goods exported to Hong Kong actually end up as reexports to China.

19 Private capital flows to Latin America reached a low point of \$6.3 billion in 1986. Since that time, private capital flows to Latin America have steadily increased, reaching an estimated \$37.6 billion in 1992, an increase of almost 600 percent over six years (OECD 1993).

20 As discussed earlier in the article, population is an important determinant of aggregate income. Therefore, countries with large populations are likely to consume more U.S. exports than countries with small populations.

21 In this article, distance is measured as the number of miles from Kansas City, Missouri, to one of the major industrial cities in each relevant country. Kansas City was chosen as the reference point because it is a large city that is closest to the geographic center of the United States. The cities chosen as reference points in the other countries are: Sydney, Australia; Vienna, Austria; Brussels, Belgium; Winnipeg, Canada; Santiago, Chile; Beijing, China; Bogota, Colombia; Copenhagen, Denmark; Quito, Ecuador; Helsinki, Finland; Paris, France; Frankfurt, Germany; Athens, Greece; Hong Kong; Jakarta, Indonesia; Dublin, Ireland; Rome, Italy; Tokyo, Japan; Luxembourg-Ville, Luxembourg; Kuala Lumpur, Malaysia; Mexico City, Mexico; Amsterdam, the Netherlands; Wellington, New Zealand; Oslo, Norway; Panama City, Panama; Manila, the Philippines; Lisbon,

Portugal; Singapore; Seoul, South Korea; Madrid, Spain; Stockholm, Sweden; Bern, Switzerland; Bangkok, Thailand; Port-of-Spain, Trinidad and Tobago; Ankara, Turkey; London, United Kingdom; Caracas, Venezuela. The distance measures are from Fitzpatrick and Modlin.

22 The inclusion of the lagged residual variable improves the fit (increases the R^2), but does not significantly alter the parameter estimates. The objective here is to use the estimated regression equation to accurately predict trade flows. Therefore, the inclusion of the lagged residual term is justified for the sake of improved fit.

23 Brada and Méndez also suggest that a large export market better compensates exporters for the cost of acquiring information and establishing a sales and distribution network.

24 For countries that adopt import substitution policies, as many in Latin America have done since World War II, the population coefficient in a gravity equation should be negative. That is, foreign countries with import substitution policies and large populations may have sufficient economies of scale to support import substituting industries, thus reducing the demand for U.S. exports. This conclusion was supported by exploratory regression analysis. When separate gravity equations were estimated for East Asia and Latin America, the population coefficient was positive for East Asia and negative for Latin America.

25 For a list of the countries in each group, see note 2.

26 For more details on the distance measurements, see note 21.

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