

Transportation and Communication Infrastructure in Latin America: Lessons from Asia

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Abstract

In Latin America, inadequate transportation infrastructure has been identified as an increasingly important impediment to the region's further integration in global trade and a significant factor preventing countries from properly taking advantage of the multitude of regional, plurilateral, and bilateral trade agreements signed in the past decade and a half. This paper examines transport and communications infrastructure initiatives in Latin American and Asian regional trade arrangements and finds several lessons Asia can teach Latin America.

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Keywords: trade, infrastructure, regional trade agreements (RTAs), transport costs, transport infrastructure, cooperation, East Asia, Latin America

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INTRODUCTION

Latin American and Asian countries have undertaken concerted unilateral, regional, and multilateral trade liberalization efforts over the past few decades. Figure 1 shows the significant decline in average most favored nation (MFN) tariffs—the un-trade weighted average of the tariffs applied to goods imported from other countries—beginning in the 1980s and early 1990s. Average Latin American tariffs were brought down from levels of 35 percent in the late 1980s to a current regional average of about 8 percent. In Asia, the East Asia/Pacific region saw tariffs fall from 25 percent in 1985 to under 5 percent in 2009. Even South Asia, whose current average level of 13.5 percent seems nearly illiberal, has made significant strides, falling from over 85 percent at the end of the 1980s.

Trade liberalization was carried out through unilateral tariff reductions, multilateral negotiations, and participation in regional trade agreements (RTAs). Latin American RTAs proliferated in the 1990s and 2000s, with the creation of the MERCOSUR customs union in 1995, the modernization of the Andean Community (CAN, for its Spanish name, the Comunidad Andina de Naciones) and the Central American Common Market, and an explosion of bilateral and plurilateral free trade agreements (FTAs), particularly by Chile and Mexico, each of whom signed agreements with more than 45 trading partners. A decade later, Asian countries also increased their participation in RTAs. In the 2000s, FTAs have also “exploded” in Asia, in the words of Kawai and Wignaraja (2010), with East Asian economies “using FTAs to aggressively pursue their individual and collective trade strategies, leading to the expansion of advanced production networks across the region with hubs in Japan and the PRC [People’s Republic of China]” as well as Korea. While only three FTAs were in force in 2000, by 2010 45 were in effect and 84 were in negotiations (Kawai and Wignaraja 2010).

Trade has expanded apace. As shown in figure 2, Latin American exports have grown by nearly 10 percent per year over the depicted time period, expanding from \$147 billion in 1990 to a high of \$895 billion in 2008. Association of Southeast Asian Nations (ASEAN) exports grew from \$144 billion in 1990 to over a trillion in 2010.

As border barriers to trade have fallen, other non-trade policy-related impediments have been unmasked, and revealed to be more stubborn barriers to trade. In Latin America, inadequate transportation infrastructure has been identified as an increasingly important impediment to the region’s further integration in global trade and a significant factor preventing countries from properly taking advantage of the multitude of regional, plurilateral, and bilateral trade agreements signed in the past decade and a half.

Sufficient evidence has been collected to identify weak transport infrastructure as a major impediment to realizing Latin America’s potential for increased trade. However, infrastructure has received little tangible attention in the regional trade agreements whose objective has been to spur integration

and increase trade. In contrast Asian regional trade arrangements have devoted much attention to infrastructure, as Asian countries have striven to become even more competitive and integrated into the world trading system. This article explores whether the Asian experience addressing transport infrastructure integration at the regional level holds any lessons for Latin America.

THE IMPORTANCE OF INFRASTRUCTURE TO TRADE

A growing body of literature examines the impact of the state of infrastructure on trade and development. Several recent studies show that, under the right conditions, improvements in infrastructure can have a significant positive impact on trade, growth, and development. Improved infrastructure increases the ability to move goods, services, and ideas within countries and to pass goods and services from one country to another. It decreases transportation costs, and reduces inventory and logistical costs, thereby expanding markets. Improved infrastructure will benefit producers and consumers and will increase the attractiveness of the location for foreign direct investment (FDI). Improved infrastructure also allows for a more equitable distribution of benefits by enhancing the population's ability to take advantage of important health and education services essential for development. Infrastructure has an important role to play in reducing rural poverty; by connecting farmers and/or small business owners in isolated geographic pockets to mainstream markets, infrastructure helps combat their social and economic exclusion.

Economists tend to agree that there is a positive link between improved infrastructure and growth. In an early review of the empirical and theoretical literature, Briceño, Estache, and Shafik (2004) and Romp and de Haan (2005) find that a large percentage of studies of Organization for Economic Cooperation and Development (OECD) country cases find a positive impact of infrastructure improvement on output, efficiency, productivity, investment, and on employment. The impact of improved infrastructure tends to be higher for lower income countries.

There are three major factors suggesting that infrastructure development be high on the priority list of those organizations whose objective is to stimulate trade and integration:

Infrastructure has a significant impact on trade. Global supply chains have become more integrated over the past decades, and production is increasingly segmented across countries and continents. Poor quality infrastructure may effectively exclude some countries from supply chains of time-sensitive, highly complex manufactures, which tend to have a higher added value. David Hummels (2007) writes that “trading across borders... takes longer in developing countries than in developed ones for a number of reasons, including the quality of infrastructure, procedural coordination, and corruption.” Hummels calculates the tariff equivalents of trade delays—the delays related to customs and inland transport, the time goods spend waiting in ports—and finds that they exceed tariffs in every region of the world. These delays are attributed to the “hard” as well as “soft” aspects of infrastructure: In addition to physical

transport infrastructure, Hummels mentions other factors that may contribute to these delays, including land size and distance of ports from economic activity, customs delays due to poor coordination, communication and information management, low skill level of customs and inspection staff, and corruption. For Latin America, the tariff equivalent of time is 8.9 percent, versus the applied tariff of 7.0 percent; for East Asia and the Pacific it is 6.9 percent over an applied tariff of 5.6 percent. South Asia's 29.1 percent tariff equivalent also exceeds its 25.5 percent applied tariff.

The Inter-American Development Bank, or IDB (Pagés 2010), has found that Latin American countries have higher freight costs to the United States than do other countries—even countries much more geographically distant, such as China. They estimate that transport costs are more than four times more significant than tariff costs in Latin America.

Infrastructure impacts competitiveness. Various studies have pointed to the quality and quantity of infrastructure as an important factor in explaining the growth differential between East Asia and other developing countries (see Estache and Fray 2009). As early as 1996, Hulten found that effectiveness in the use of infrastructure could explain about a quarter of the growth differential between Latin America and East Asia and more than 40 percent of the differential between low- and high-growth countries (Hulten 1996). Calderón and Servén (2004) demonstrate that Latin America's lackluster infrastructure investment performance is a significant determinant of the region's trade and growth underperformance relative to East Asia in the 1980s and 1990s. High transport costs serve to limit the potential for efficient producers to expand and export, while protecting inefficient domestic producers. Hummels explains that the cost of delays is not only in the barriers to trade in existing products, but in the opportunity cost of products that are not exported as a result of the costs of transporting the goods. The IDB (Pagés 2010) estimates that a 10 percent cut in freight costs could boost plant productivity in Brazil and Chile by 0.5 and 0.7 percent, respectively.

Infrastructure impacts development. Infrastructure supports growth and poverty reduction both directly, by serving as a production factor, and indirectly, by facilitating technological progress. As pointed out by Straub and Terada-Hagiwara (2011), an increase in the stock of infrastructure capital is seen to have a direct impact on the increase in the productivity of other factors. For example, improved transportation and communication technologies will tend to increase labor productivity, allow for greater economies of scale, and improve access to health and education services.¹ Calderón and Servén (2004) find that the quality and quantity of infrastructure has a positive impact on a country's economic growth. They also find that improving infrastructure can improve a country's income distribution by improving the welfare of the poor over and above the growth impact. The authors demonstrate that better access to

1. Straub and Terada-Hagiwara find that the growth impact is mainly through the direct effect of factor accumulation rather than through enhanced productivity.

roads and sanitation, which, according to Rioja (2003) is only 74 percent as effective in Latin America as in the industrialized mean, lowers a country's Gini coefficient. The Gini coefficient is an indicator of the equality of a country's distribution of income. It ranges from the extreme equality value of zero, where all members of the system have the exact same income, to extreme inequality at 1.00 (where only one person has all the income). Improving transport infrastructure increases access to economic activity, thereby mitigating income inequality—not an insignificant offering in a region marked by highly unequal income distribution. Using a variety of econometric techniques, they estimate that if all Latin America countries were to catch up to the regional infrastructure leader, they could reduce their growth gains by between 1.1 and 4.8 percent per annum and reduce their Gini coefficients by between 0.02 and 1.0. Reaching the standards of a median East Asian country would provide even greater gains—growth boosts of between 3.2 and 6.3 percent per year and Gini reductions of 0.05 to .13.

HOW DO ASIA AND LATIN AMERICA COMPARE

A growing body of literature suggests that inadequate infrastructure remains a key barrier to trade, growth, and development for Latin America. A subset of that literature underlines an unfavorable comparison with Asia, particularly East Asia, suggesting that there may be important lessons Latin American countries can learn from their East Asian counterparts. This section of the paper will compare the two regions on the basis of a number of infrastructure indicators.

When comparing regions in terms of physical or “hard” infrastructure or “hardware”—the roads, ports, and air transport infrastructure necessary to physically get goods from one location to another—Latin America as a region consistently scores below Asia (see table 1).

Column 1 of table 1 shows the World Economic Forum's *Global Competitiveness Indicator's* (GCI) overall transport infrastructure index score. Subsequent columns show scores for road, rail, sea, and air infrastructure. The GCI index ranges from 0 to 7, with higher scores reflecting better infrastructure. In table 1, we define “Developing East Asia” as the ASEAN countries, minus Brunei and Singapore, which are categorized by the World Bank as “high-income economies” and add China, an “upper-middle-income economy.”

Latin America's greatest disadvantage, by far, is in railroads, an area in which the region has invested very little. An IDB study (Mesquita Moreira, Volpe, and Blyde 2008, 16) quotes Batista da Silva, the author of a 1996 study on the region's infrastructure, as explaining that “in emphasizing roads over rail, river and coastal logistics systems, these countries have selected the most expensive as well as the least environmentally friendly option for their infrastructure system.” Latin America falls a full point short of Asia in roads and slightly more than half a point in ports. Latin America exceeds the Asian average in only one area: The Mesoamerica region bests all others in Air Transport infrastructure.

Table 2 reveals the development results of infrastructure: the access a country's population has to electricity, sanitation services, safe water sources, and communications infrastructure as well as the stock of infrastructure in terms of roads and rail lines. This table underscores the differences across countries in both regions. Asia, Malaysia, and Thailand, which have built up internationally competitive infrastructure networks, and Vietnam, which is rapidly integrating into Asia and whose 2007 entry into the World Trade Organization (WTO) has increased its integration into the international trading system, score high in terms of the infrastructure stock indicators, while poorer countries and less integrated Cambodia, Laos, and Myanmar score lower. These countries also bring down the regional averages of the access indicators.

The regional differences seen in table 1 hold, however, at all income categories: When ranked according to per capita GDP, Asian countries perform better than Latin American countries in the top, middle, and lower thirds. Looking at the lower third of the income distribution, for example, which includes countries with per capita GDP below \$3,000, all of the Asian countries but the Philippines (Indonesia, Vietnam, Laos, and Cambodia) perform higher than the Latin American average on at least one indicator. Of the Latin American countries, of which there are five in this income category, only Paraguay outperforms the Latin average and approximates the ASEAN average on one indicator: percent of roads paved.

While the physical component of infrastructure is of course important, the effectiveness of physical infrastructure is conditioned in part by what is called soft infrastructure or "software"—defined as procedures and institutions related to moving goods and services. Improving soft infrastructure is a main objective of the trade facilitation agenda, which aims to increase the bureaucratic and administrative efficiency of customs, ports, and investment gateways and generally speed the movement of goods, services, and investments. Latin America performs better on soft infrastructure than hard, as shown in table 3, reaching and exceeding East Asia levels in terms of administrative procedures and time delays of processing documents.

Latin American countries, on average, perform well in terms of the number of documents needed to trade and the time cost of trading. South American countries, on average, require just one document more than their South East Asian counterparts; Mesoamerican countries require one fewer to export and the same number to import. There are of course some outliers, notably Uruguay and Guatemala, both of which require ten documents to export and import. Time to export is the same in South America as in ASEAN; it is much less in Mexico and several of the Central American countries. The notable difference with East Asia is in the cost: It is almost twice as expensive to both export and import a container of goods from South America as it is from East Asia; one and a half times as expensive for Mesoamerica. There are, of course, variations among countries: Panama is about on par with the ASEAN average, while the costs of Brazil and Colombia are more than three times that of China.

As shown in figure 3, in both regions the average number of days to import and export has fallen over the past half-decade—the number of years for which the World Bank has consistent data on this indicator—with Latin America closing the gap in terms of the number of days to import as well as eroding its lead in number of days to export.

Another aspect of infrastructure that is increasingly important to the transport of goods and services and to effective management of trade relations is the information and communication technology infrastructure. Here, Latin America has an edge over developing Asia, as shown in table 4.

While falling short of the OECD average in all indicators but mobile telephones per 100 people, Latin America outperforms Asia in terms of per capita computer and telephony standards. Latin America's relatively robust information and communications technology (ICT) structure should form a basis of its infrastructure strategy.

TRANSPORT INFRASTRUCTURE IN REGIONAL TRADE AGREEMENTS IN ASIA AND IN LATIN AMERICA

What does this have to do with regional integration arrangements? Infrastructure services are largely provided through networks, webs of relationships in which the impact of new investments will vary with the overall quality and scope of the network. A larger network will increase the reach and return of the investment and allow for a more efficient allocation of resources. Cooperating with neighboring countries—already partners in regional integration efforts—should benefit countries through sharing costs and expanding network possibilities.

Latin America should be a good candidate for coordinated transborder infrastructure projects. Regionalism has been an essential operating principle in Latin America during the post-WWII period. The Andean Community and the Central American Common Market date back to the 1960s. The MERCOSUR customs union began operations in 1991. These customs unions are highly institutionalized and aim (at least in terms of their stated objectives) towards deeper integration. They are administered by a political hierarchy, supported by Secretariats, and have the objectives of liberalization, cooperation, and harmonization. Regional integration in Latin America has tended to proceed on a relatively formalized path, negotiated by diplomats and technocrats, supported by dedicated institutions often modeled on the European Union. This should provide a strong basis for undertaking joint transborder infrastructure projects and addressing the main political economy question that plagues these types of large-scale projects: how to distribute the costs and benefits of such significant investments.

In Asia, preferential trading arrangements have historically played a smaller role than in Latin America. ASEAN has existed since 1967, however this has not been seen as a pulse for regional integration, with intraregional trade—the percentage of members' total trade that is traded among

members—hovering around the 18 percent mark from the 1970s through to the early 1990s. In the 1990s, however, governments moved towards more formal preferential arrangements and in 1992 the ASEAN Free Trade Area (AFTA) was formed.

Asia's approach to integration has tended to be driven by business and economic ties more than politics. Physical infrastructure and increasing trade flows have preceded more formal economic ties. East Asian regionalism has been shaped by the "flying geese" model, which describes the pattern of production in East Asia with a leader country first developing a particular industry, which is subsequently relocated from advanced to developing countries. A prominent example of this is the electronics industry, in which later industrializing countries or "East Asian tigers" (Korea, Singapore, and Taiwan) "learned" the technology from leader Japan. This flying geese model of production diffusion helped establish and consolidate production networks throughout the region, with large-scale investments in infrastructure made by the leading country.

In Asia, infrastructure investments have often been made to facilitate the development and consolidation of production supply chains. As Canuto and Sharma (2011) point out in a recent policy note, "in Asia, physical infrastructure investments and intraregional trade facilitation created an environment conducive to business-driven economic integration." Recent economic or development corridors, such as the Greater Mekong Subregion (GMS) which includes Cambodia, China (specifically Yunnan Province and Guangxi Zhuang Autonomous Region), Laos, Myanmar, Thailand, and Vietnam, and the East West Economic Corridor, which will link Burma, Thailand, Laos, and Vietnam are being developed, many with a view to facilitating trade with China. Economic corridors are cooperative initiatives to stimulate certain types of economic activity in a particular geographic location, usually linking several urban areas or production facilities. Corridor programs generally involve the development or improvement of transportation infrastructure, coordinating trade facilitation activities, harmonization of logistics, and the development of related urban areas. A famous example is the Walvis Bay Corridor which links South Africa's Walvis Bay port to Angola, Botswana, and Namibia, giving those three countries access to South Africa's geography and infrastructure, developing regional infrastructure and enabling economies of scale, with the goal of becoming the premier trade route in Southern Africa.

Table 5 shows a number of regional trade arrangements (RTAs) in Asia and in Latin America, their associated share of world trade (the proportion of that country's exports plus imports in world exports plus imports) and intraregional trade (the amount that the member countries trade with one another) as a percentage of the RTA's total trade with the world.

In Asia, intra-regional trade is becoming increasingly important, largely geared towards the growing Chinese market. Intraregional trade's importance in total trade has grown from 18 to 26 percent for the ASEAN grouping; 40 percent for the ASEAN Plus Three, a free trade agreement that adds the economies

of China, Japan, and South Korea to ASEAN. The SAFTA, which represents a relatively smaller share of world trade than ASEAN—2 percent compared to ASEAN’s 6 percent in 2010—has seen regional trade nearly double in importance from 2.6 percent to 4.6 percent of total trade.

In Latin America both MERCOSUR and the Andean Community have seen their share of intraregional trade grow, although 2010 figures are lower than they were in 2000. Only Mesoamerica has seen a decline in intraregional trade, from 3.2 percent in 1990 to 2.4 percent in 2010. The IDB estimates that in Latin America, intra-regional trade has only reached 50 percent of its full potential. This shortfall is attributable at least in part to deficiencies in infrastructure investment—which the Bank terms the hardware for integration—as well as trade policy issues, the software for regional integration. The IDB in *Unclogging the Arteries*, a seminal report on transportation costs in the region, states that Latin American countries spend, on average, twice as much as the United States to import goods (Mesquita Moreira, Volpe, and Blyde 2008, 13). If Latin America wants to compete with Asia in an increasingly integrated world market it needs to address the infrastructure needs that are limiting its potential.

Table 6 shows some of the similarities and some of the differences between RTAs in Latin America and East Asia. The most remarkable difference is, of course, in countries’ economic growth rates. Most Asian countries have demonstrated strong growth performance in the last decade, with the average annual GDP growth rate for ASEAN for the past decade at a remarkable 6 percent, with SAFTA countries growing, on average 6.4 percent. In contrast, South America’s nearly 4 percent growth and Mesoamerica’s 3.5 percent high for the region look anemic. Asian countries generally also have high public investment levels, with ASEAN governments devoting on average 24 percent of GDP to investment and 29 percent for South Asia. Several East Asian countries invest more than 7 percent of GDP in infrastructure, according to the Asian Development Bank (ADB), leading to a growth in infrastructure stocks in the region. Latin American governments, on the other hand, have traditionally underinvested in infrastructure. IDB and IMF studies place Latin American countries’ infrastructure investment at closer to 1 to 3 percent of GDP. As pointed out in a recent World Bank publication, the region on average spends less than 2 percent of GDP on infrastructure—but 4 to 6 percent per annum is needed if it is to catch up or keep up with countries that once trailed it, such as Korea or China. A notable trend in Latin America is that the private sector undertakes a relatively large share of infrastructure investment.

A similar challenge in both regions is the diversity among member countries. In ASEAN, Singapore’s per capita GDP is more than 40 times that of Laos, Cambodia, and Myanmar. Brazil is more than thirty times the size of tiny Paraguay, which is constrained not just by size but also by its landlocked position.

These differences manifest themselves in terms of the state of countries’ infrastructure, as was seen in table 1. Asia, Malaysia, and Thailand have built up internationally competitive infrastructure networks,

as has Panama, with its canal, in Latin America. Other countries' infrastructure is less developed, but East Asian integration is helping to move forward the infrastructure underpinnings for economic growth better than in other regions (ADB 2009). Landlocked and isolated countries and regions such as Mongolia, most rural areas, the outlying islands in Indonesia and the Philippines, and most Pacific Island States remain relatively unconnected to the major growth centers of East Asia.

A look at what is going on in East Asia reveals a wide network of robust cooperation in infrastructure initiatives. For reasons of space, only transport initiatives are detailed here. Most of the listed initiatives also have projects on connectivity and other transborder infrastructure initiatives. One key constant in these initiatives is the role of the ADB and the richer economies, which help fund many infrastructure projects.

The ADB, in a major study on regional infrastructure entitled *Infrastructure for a Seamless Asia*, recognizes Asia's important role in the international economy: "it is the world's factory, its biggest saver, and an emerging giant in outsourced services" (ADB 2009, 15). Key to this role is infrastructure: "physical connectivity is crucial to support complementarities in the production processes across the entire region." Asia now faces a second-order challenge: to shift from the concentration of infrastructure along the thriving maritime corridor to pull more remote regions from economic isolation into Asia's buzz of economic activity. Doing so is necessary to further bolster the regional market—particularly necessary as Europe and the United States fall deeper into economic crisis. As stated by Kuroda, Kawai, and Nangia (2008), infrastructure investment is "at the heart of Asia's development strategy of promoting integration with the regional and global economy." Table 7 shows a sample of regional transport initiatives underway in Asia.

Table 8 sets out the main Latin American regional transport infrastructure initiatives. The two major projects are the Initiative for Integration of Regional Infrastructure (IIRSA) in South America, and the Corredor Pacífico del Proyecto Mesoamerica (MP) in Mesoamerica. IIRSA, launched in 2000, covers the twelve South American countries. Three major regional development banks are cooperating in financial and analytical assistance.

The Corredor Pacífico del Proyecto Mesoamerica (MP) replaced Plan Puebla Panama. This Project, largely supported by the IDB, has galvanized cooperation among Central American countries and Mexico in building roads, coordinating the electrical grid, and cooperating on soft infrastructure of trade facilitation. This project has been given a boost by the strong demand from East Asia. Central America's Pacific infrastructure is relatively more developed than its Atlantic side. In the past this has been a disadvantage; the new realities of Asian demand are pushing for greater development of this Pacific corridor.

POLICY RECOMMENDATIONS

Asia and Latin America are both currently working to bolster the infrastructure that undergirds international trade. Asia's initiatives seem geared towards bolstering the internal market and even further increasing intra-regional trade. Latin American initiatives also seem geared towards Asia: in Mesoamerica, by competing with Asian countries by lowering the costs of exporting, and in South America by enhancing the infrastructure that will allow countries to more efficiently send their goods to East Asia.

What can Latin America learn from Asia's success in infrastructure investment? One lesson is to follow the money. Investors, both public and private, are more likely to invest in large-scale projects such as infrastructure when this will benefit already present or emerging production patterns. In East Asia, infrastructure development was spurred by the need to develop or maintain production chains in sectors such as electronics, for example. One driver of investment in infrastructure in both Asia and Latin America is the growth of demand from China and the rest of East Asia. Central America, particularly, is taking advantage of this to develop its Pacific corridor.

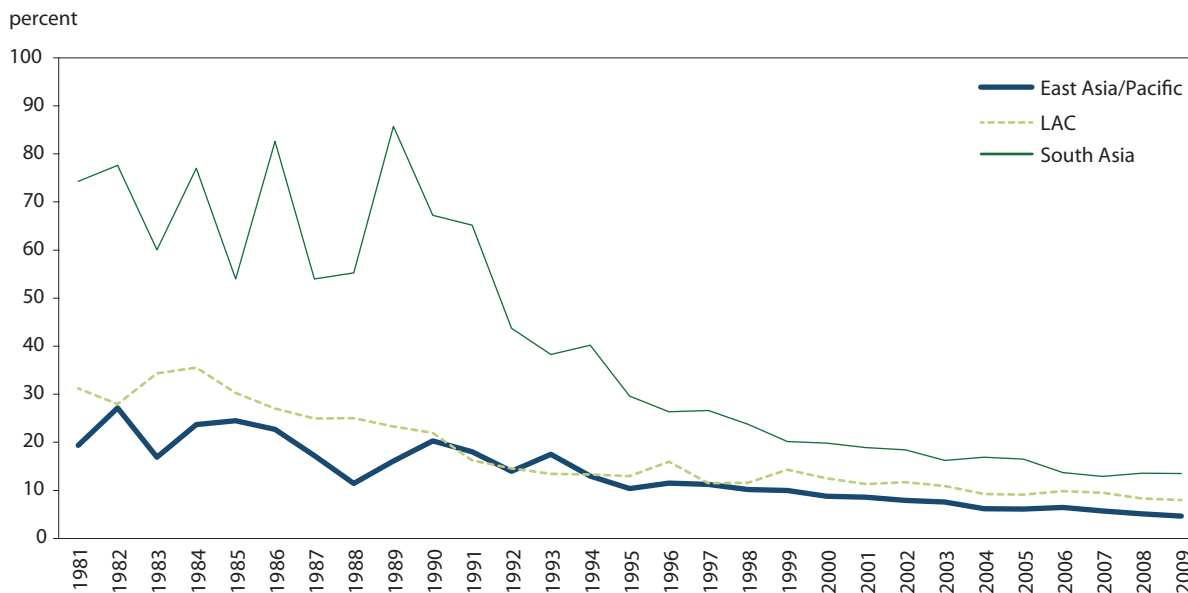
Second is the important role of government. While private participation is important, there is still a great need for public involvement. Many have pointed to the low level of public investment in infrastructure in Latin American countries. National commitment is essential to the success of regional cross-border initiatives. Estache (2005) points out that the significant public sector injection of funds—to the tune of \$361 billion—in private infrastructure over the past decade only covered up to a third of the region's annual investment needs. Scandizzo (2007) points out the important role the government should play in investing in (and investing in the maintenance of) projects with a high social impact while encouraging the private sector to take on projects with high financial rates of return.

Third is the need to provide a platform for private investment. One factor that needs to be taken into account is the political difficulties of cooperation and provision of regional public goods. As Estache and Fray (2009) point out in their paper for the Growth Commission, the two main sticking points in regional infrastructure provision are: (1) who should be in charge? and (2) who should pay? A sound outside guarantor—this role can be played by the IDB or the Andean Development Corporation—is necessary for attracting private investment. As noted by the Asian Development Bank, “Without effective policies and institutions, cooperation is likely to be haphazard, limited, sporadic, and ultimately ineffective” (ADB 2009).

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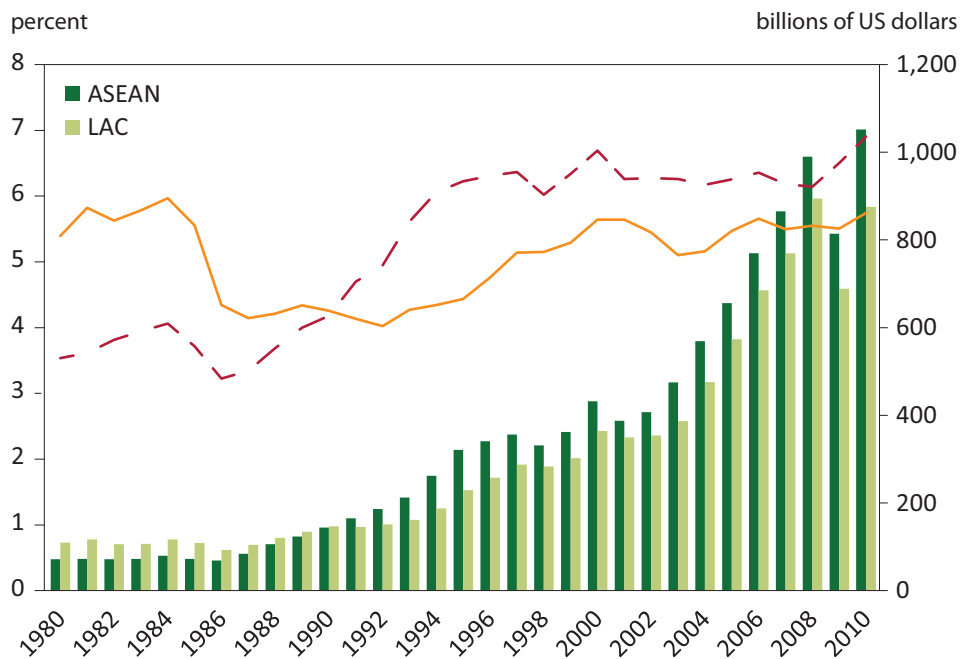
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Figure 1 Average MFN tariffs 1981–2010



Source: World Bank

Figure 2 ASEAN and LAC: exports and share of world trade



ASEAN = Association of Southeast Nations
 LAC = Latin America and the Caribbean

Table 1 Hard infrastructure: quality of transport infrastructure indicators for Asian and Latin American countries

	Transport infrastructure	Roads	Railroads	Port	Air
Cambodia	3.22	3.99	1.84	4.02	4.29
Indonesia	3.98	3.53	3.11	3.60	4.35
Malaysia	5.51	5.73	4.98	5.73	6.04
Philippines	3.02	3.11	1.65	3.03	3.63
Thailand	4.93	4.99	2.65	4.74	5.71
Vietnam	3.03	2.56	2.52	3.37	4.05
China	4.88	4.41	4.62	4.47	4.57
Developing East Asia	4.08	4.05	3.05	4.14	4.66
Bangladesh	2.78	2.92	2.50	3.36	3.55
India	4.55	3.43	4.44	3.90	4.73
Nepal	2.25	2.46	1.15	2.61	3.38
Pakistan	3.38	3.71	2.76	4.09	4.27
Sri Lanka	4.06	4.54	3.78	4.89	4.89
South Asia	3.40	3.41	2.93	3.77	4.16
Developing Asia	3.80	3.78	3.00	3.98	4.46
Costa Rica	2.70	2.51	1.72	2.34	4.72
El Salvador	3.53	4.76	1.36	3.83	5.46
Guatemala	3.43	3.88	1.22	4.32	5.37
Honduras	3.19	3.43	1.29	5.12	4.51
Mexico	4.14	4.28	2.56	4.03	4.77
Nicaragua	2.70	3.35	1.60	2.74	4.32
Panama	4.40	4.19	3.41	6.43	6.18
Mesoamerica	3.44	3.77	1.88	4.12	5.05
Argentina	3.14	3.18	1.99	3.71	3.46
Bolivia	2.84	2.99	2.53	3.13	3.76
Brazil	3.57	2.79	1.95	2.74	3.35
Chile	4.42	5.67	2.29	5.17	5.59
Colombia	3.00	2.94	1.73	3.39	4.10
Ecuador	3.21	4.16	1.96	3.78	4.30
Paraguay	2.16	2.44	1.04	3.44	2.49
Peru	3.13	3.18	1.87	3.49	4.60
Uruguay	3.53	4.02	1.43	5.06	5.19
Venezuela	2.48	2.87	1.34	2.53	3.62
South America	3.15	3.42	1.81	3.64	4.05
LAC	3.27	3.57	1.84	3.84	4.46

LAC = Latin America and the Caribbean

Note: No data was available for Afghanistan, Bhutan, Laos, Maldives, and Myanmar.

Source: World Economic Forum, *Global Competitiveness Indicators*, available at <http://www.weforum.org/issues/global-competitiveness>.

Table 2

	Infrastructure: Access to water, sanitation, electricity, and telecommunications					Infrastructure: Transportation networks by country and region		
	Electricity	Improved		Telephone	Internet	Paved roads (percent)	Rail lines km per 100 sq km	Roads
		Sanitation facilities	water source					
		percent of population with access						
Cambodia	24	29	61	3	1	6	0.4	22
Indonesia	65	52	80	16	9	59	0.2	24
Lao PDR	55	53	57	2	6	14	n.a.	15
Malaysia	99	96	100	16	56	83	0.5	30
Myanmar	13	81	71	1	0	12	n.a.	4
Philippines	90	76	91	7	9	10	0.2	67
Thailand	99	96	98	10	20	99	0.9	35
Vietnam	98	75	94	19	27	75	0.8	52
China	99	55	89	24	29	54	0.7	40
Developing East Asia	71	68	82	11	17	46	0	32
Afghanistan	16	37	48	0	4	29	n.a.	6
Bangladesh	41	53	80	1	4	10	2.2	184
Bhutan		65	92	4	14	62	n.a.	21
India	66	31	88	3	8	49	2.1	142
Maldives		98	91	15	28	100	n.a.	29
Nepal	44	31	88	3	7	56	n.a.	12
Pakistan	62	45	90	2	17	65	1.0	34
Sri Lanka	77	91	90	17	12	81	2.3	155
South Asia	51	56	83	6	12	57	3.2	103
Developing Asia	63	63	83	8	15	51	1.0	51
Costa Rica	99	95	97	32	37	25	n.a.	75
El Salvador	86	87	87	16	15	20	n.a.	48
Guatemala	81	81	94	10	11	35	n.a.	13
Honduras	70	71	86	9	11	20	n.a.	12
Mexico		85	94	18	31	35	1.4	19
Nicaragua	72	52	85	4	10	12	n.a.	17
Panama	88	69	93	16	43	38	n.a.	18
Mesoamerica	83	77	91	15	22	26	n.a.	20
Argentina	97	90	97	25	36	30	0.9	8
Bolivia	78	25	86	9	20	7	0.3	6
Brazil	98	80	97	22	41	6	0.4	21
Chile	99	96	96	20	45	20	0.7	11
Colombia	94	74	92	15	37		0.2	15
Ecuador	92	92	94	14	24	15	n.a.	18
Paraguay	97	70	86	6	24	51	n.a.	7
Peru	86	68	82	11	34	14	0.2	8
Uruguay	98	100	100	29	44		1.7	44
Venezuela, RB	99	91	93	25	36	34	0	11
South America	94	79	92	17	34	22	0.5	15
Latin America	90	78	92	16	29	24	1.0	21

Note: Electricity data are for 2009; access to water and sanitation data are for 2008; telecom data are 2010 or latest available. Data for transport networks are latest available in the WDI database.

Source: World Bank, *World Development Indicators* Database, December 2011, accessed at <http://databank.worldbank.org>.

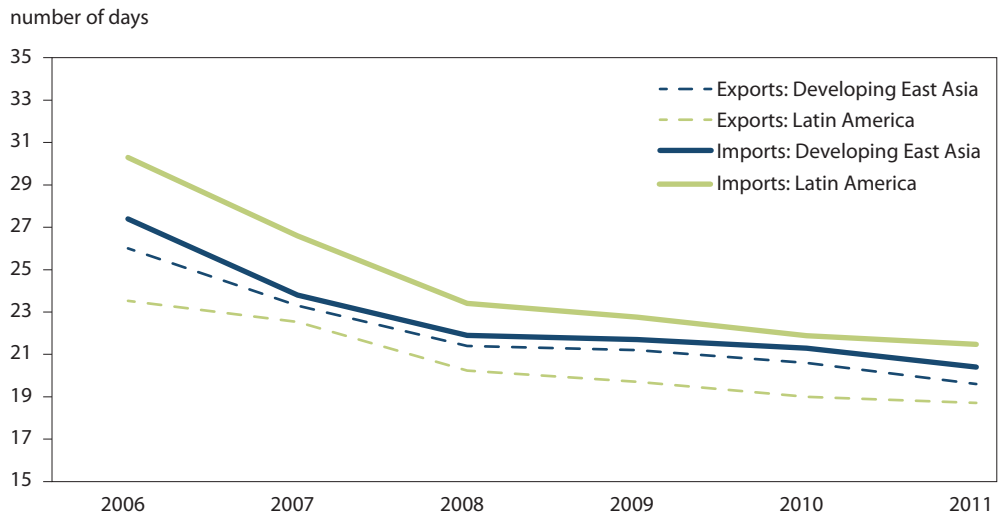
Table 3 Infrastructure software indicators in Asian and Latin American countries

	Cost to export	Cost to import	Documents to export	Documents to import	Time to export	Time to import
	(US dollars per container)		(number)		(days)	
Cambodia	732	872	10	10	22	26
Indonesia	704	660	5	6	20	27
Lao PDR	1,860	2,040	9	10	48	50
Malaysia	450	450	7	7	18	14
Philippines	675	730	8	8	15	14
Thailand	625	795	4	3	14	13
Vietnam	555	645	6	8	22	21
China	500	545	7	5	21	24
<i>Developing East Asia</i>	<i>763</i>	<i>842</i>	<i>7</i>	<i>7</i>	<i>23</i>	<i>24</i>
Afghanistan	3,865	3,830	12	11	74	77
Bangladesh	3,865	3,830	12	11	74	77
Bhutan	1,352	2,665	8	11	38	38
India	1,055	1,025	8	9	17	20
Maldives	1,550	1,526	8	9	21	22
Nepal	1,960	2,095	9	10	41	35
Pakistan	611	680	9	8	21	18
Sri Lanka	715	745	8	6	21	19
<i>South Asia</i>	<i>1,872</i>	<i>2,050</i>	<i>9</i>	<i>9</i>	<i>38</i>	<i>38</i>
<i>Developing Asia</i>	<i>1,317</i>	<i>1,446</i>	<i>8</i>	<i>8</i>	<i>30</i>	<i>31</i>
Costa Rica	1,190	1,190	6	7	13	15
El Salvador	845	845	8	8	14	10
Guatemala	1,182	1,302	10	10	17	17
Honduras	1,193	1,205	6	10	19	23
Mexico	1,420	1,880	5	4	12	12
Nicaragua	1,140	1,220	5	5	26	26
Panama	765	915	3	4	9	9
<i>MESOAMERICA</i>	<i>1,105</i>	<i>1,222</i>	<i>6</i>	<i>7</i>	<i>16</i>	<i>16</i>
Argentina	1,480	1,810	9	7	13	16
Bolivia	1,425	1,747	8	7	19	23
Brazil	1,790	1,730	8	7	13	17
Chile	745	795	6	7	21	21
Colombia	1,770	1,700	6	8	14	13
Ecuador	1,345	1,332	9	7	20	29
Paraguay	1,440	1,750	8	10	33	33
Peru	860	880	6	8	12	17
Uruguay	1,100	1,330	10	10	19	22
Venezuela, RB	2,590	2,868	8	9	49	71
<i>SOUTH AMERICA</i>	<i>1,455</i>	<i>1,594</i>	<i>8</i>	<i>8</i>	<i>21</i>	<i>26</i>
<i>Latin America</i>	<i>1,311</i>	<i>1,441</i>	<i>7</i>	<i>8</i>	<i>19</i>	<i>22</i>

Note: All data are for 2010. No data was available for Myanmar.

Source: World Bank, *World Development Indicators* Database, accessed at <http://databank.worldbank.org>.

Figure 3 Time to trade: Latin America vs. Developing East Asia 2005–11



Source: World Bank, *World Development Indicators* Database, accessed at <http://databank.worldbank.org>.

Table 4 Information and communications technology infrastructure, 2010

	Telephone lines (per 100 people)	Mobile cellular subscriptions (per 100 people)	Internet users (per 100 people)	Fixed broadband internet subscribers (per 100 people)	Secure internet servers (per 1 million people)
Cambodia	2.5	57.7	1.3	0.3	1.7
Indonesia	15.8	91.7	9.1	0.8	2.0
Malaysia	16.1	121.3	55.3	7.3	41.5
Philippines	7.3	85.7		1.8	6.7
Thailand	10.1	100.8	21.2	3.9	13.2
Vietnam	18.9	177.1	27.8	4.2	3.1
China	22.0	64.2	34.4	9.4	1.9
Developing East Asia	13.2	99.8	24.8	4.0	10.0
Bangladesh	0.6	46.2	3.7	0.0	0.3
India	3.0	64.2	7.8	0.9	2.2
Nepal	2.8	30.7	6.8	0.4	1.5
Pakistan	2.0	59.2	16.8	0.3	1.0
Sri Lanka	17.2	83.2	12.0	1.0	4.4
South Asia	5.1	56.7	9.4	0.5	1.9
Developing Asia	9.9	81.8	17.8	2.5	6.6
Costa Rica	31.8	65.1	36.5	6.2	107.8
El Salvador	16.2	124.3	15.0	2.8	13.4
Guatemala	10.4	125.6	10.5	n.a.	9.9
Honduras	8.8	125.1	11.1	n.a.	8.3
Mexico	17.5	80.6	31.0	10.0	20.6
Nicaragua	4.5	65.1	10.0	0.8	7.8
Panama	15.7	184.7	42.8	7.8	126.8
Mesoamerica	15.0	110.1	22.4	5.5	42.1
Argentina	24.7	141.8	36.0	9.6	26.1
Bolivia	8.5	72.3	20.0	1.0	8.0
Brazil	21.6	104.1	40.7	7.2	40.7
Chile	20.2	116.0	45.0	10.5	52.8
Colombia	14.7	93.8	36.5	5.7	14.3
Ecuador	14.4	102.2	24.0	1.4	14.6
Paraguay	6.3	91.6	23.6	0.6	6.7
Peru	10.9	100.1	34.3	3.1	14.2
Uruguay	28.7	132.2	43.5	11.4	45.0
Venezuela, RB	24.6	96.7	35.8	5.4	7.4
South America	17.5	105.1	33.9	5.6	23.0
Latin America	16.4	107.1	29.2	5.6	30.8
OECD average	45.1	105.8	76.6	27.2	968.6

OECD = Organization for Economic Cooperation and Development

Note: Asia figures are for 2009; Latin America figures are for 2010.

Source: World Bank, *World Development Indicators* Database, accessed at <http://databank.worldbank.org>.

Table 5 Regional trade agreements in Asia and Latin America

Acronym	Name	Type	Membership	In force since	Share of world trade (percent)			Intraregional trade as percent of total trade		
					1990	2000	2010	1990	2000	2010
ASEAN/AFTA	Association of South East Asian Nations/ASEAN Free Trade Area	FTA	Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam	1992	9.9	6.3	6.4	18.2	23.8	26
ASEAN Plus Three		FTA	ASEAN plus China, Japan, and Korea		33.6	19.6	24.8	30.9	39.6	40.4
SAFTA	South Asian Free Trade Area	FTA	Afghanistan (2005), Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka.	2004	1.9	0.9	2.1	2.6	3.6	4.6
MERCOSUR	Common Market of the South	CU	Argentina, Brazil, Paraguay, and Uruguay	1995	2.1	1.4	1.9	8.2	20.9	15.9
Andean Community	Andean Community	CU	Bolivia, Colombia, Ecuador, and Peru	1997	0.4	0.4	0.7	4.6	8.5	8.8
South America	MERCOSUR and Andean Community FTA countries	FTA			2.6	2.5	3.4	13.7	24.5	21
Mesoamerica	CACM plus Mexico	Network of FTAs			1.4	2.9	2.2	3.2	2.6	2.4

FTA = free trade area; CU = customs union; CACM = Central American Common Market

Note: Our units of analysis are the main regional trade arrangements (RTAs) in the two regions. In Asia this is the Association of Southeast Asian Nations (ASEAN) grouping, ten developing Asian economies (although member country Singapore, a high income economy, qualifies as developed for many purposes), and the South Asian Free Trade Agreement (SAFTA). In Latin America, we look at the Common Market of the Southern Cone, the MERCOSUR, which binds the economies of Argentina, regional powerhouse Brazil, Paraguay, and Uruguay, and the Central American Common Market (CACM). In the case of South America, MERCOSUR and Andean Community countries will at times be analyzed together; the two have a free trade agreement that covers all countries, and former Andean Community member Venezuela formally left the grouping in 2006 and has applied for full membership in MERCOSUR. Chile, geographically in both the southern cone and Andean regions, and with free trade agreements with all of the aforementioned countries, is included as well. The Central American countries are analyzed together with Mexico as Mesoamerica. Mexico and all Central American Common Market members have free trade agreements and all have signed on to modern trade disciplines through their respective FTAs with the United States.

Source: World Integrated Trade Solution (WITS) database, SICE, Asian Development Bank (ADB) database.

Table 6 Development indicators

	Population (millions)	Land area (kmsq)	GDP, current prices (billions of US dollars)	Per capita GDP, current prices (US dollars)	GDP growth average, 2000–10	Investment/ GDP average 2000–10	Growth of exports of goods and services 2000–10	Growth of imports of goods and services 2000–10
ASEAN								
Cambodia	14	176,520	12	814	8	16	15	9
Indonesia	238	1,811,570	707	2,974	5	31	3	8
Laos	6	230,800	7	1,004	7		6	14
Malaysia	28	328,550	238	8,423	5	29	7	7
Myanmar	61	653,520	45	742	11	13	10	14
Philippines	94	298,170	200	2,123	5	22	3	0
Thailand	64	510,890	319	4,992	4	31	7	8
Vietnam	88	310,070	104	1,174	7	29	8	9
China	1,341	9,327,480	5,878	4,382	10	42	15	18
<i>Developing East Asia</i>	<i>215</i>	<i>1,516,397</i>	<i>834</i>	<i>2,959</i>	<i>7</i>	<i>27</i>	<i>8</i>	<i>10</i>
Afghanistan	30	652,230	16	515	9	39	13	20
Bangladesh	164	130,170	106	642	6	22	10	6
Bhutan	1	38,390	2	2,069	8	46	13	13
India	1,191	2,973,190	1,632	1,371	7	28	14	11
Maldives	0	300	2	6,773	7	29	12	8
Nepal	28	143,350	16	557	4	24	-1	7
Pakistan	172	770,880	177	1,030	5	19	4	10
Sri Lanka	20	62,710	50	2,428	5	26	4	5
<i>South Asia</i>	<i>201</i>	<i>596,403</i>	<i>250</i>	<i>1,923</i>	<i>6</i>	<i>29</i>	<i>9</i>	<i>10</i>
<i>Developing Asia</i>	<i>208</i>	<i>1,083,458</i>	<i>559</i>	<i>2,471</i>	<i>7</i>	<i>28</i>	<i>8</i>	<i>10</i>
Latin America								
Costa Rica	5	51,060	36	7,701	4	22	3	5
El Salvador	6	20,720	21	3,618	2	16	4	3
Guatemala	14	107,160	41	2,867	3	19	3	4
Honduras	8	111,890	15	1,908	4	27	6	0
Mexico	109	1,943,950	1,034	9,522	2	25	3	5
Nicaragua	6	120,340	7	1,127	3	29	9	4
Panama	4	74,340	27	7,601	6	22	4	7
<i>Mesoamerica</i>	<i>22</i>	<i>347,066</i>	<i>169</i>	<i>4,906</i>	<i>4</i>	<i>23</i>	<i>5</i>	<i>4</i>
Argentina	41	2,736,690	370	9,131	4	20	5	11
Bolivia	10	1,083,300	20	1,900	4	15	7	5
Brazil	193	8,459,420	2,090	10,816	4	18	7	9
Chile	17	743,530	203	11,827	4	23	5	10
Colombia	46	1,109,500	289	6,360	4	20	4	8
Ecuador	15	248,360	58	3,921	4	24	4	10
Paraguay	6	397,300	18	2,878	3	19	4	9
Peru	30	1,280,000	154	5,205	6	21	6	8
Uruguay	3	175,020	40	11,998	3	17	7	5
Venezuela	29	882,050	293	10,049	4	24	-2	10
<i>South America</i>	<i>39</i>	<i>1,711,517</i>	<i>354</i>	<i>7,409</i>	<i>4</i>	<i>20</i>	<i>5</i>	<i>9</i>
<i>Latin America</i>	<i>32</i>	<i>1,149,684</i>	<i>278</i>	<i>6,378</i>	<i>4</i>	<i>21</i>	<i>5</i>	<i>7</i>

ASEAN = Association of Southeast Asian Nations

Sources: International Monetary Fund; World Bank, *World Development Indicators* Database, September 2011 and December 2011, accessed at <http://databank.worldbank.org>.

Table 7 Regional transport initiatives in Asia

Name of Initiative	Membership	Objectives	Cross-border infrastructure projects	Support
Asian Highway	29 signatories		planned to extend 140,479 km; \$26 million executed; \$18 million needed	UNESCAP, funding from more advanced countries and ADB
Brunei-Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA)	Brunei Darussalam, Indonesia, Malaysia, Philippines (a subregional grouping within ASEAN)	To expand trade and investment through infrastructure development, mainly upgrading airport and seaport facilities	Transport and border infrastructure projects, as of August 2011 totaling \$1.12 million	ADB
Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT)	Indonesia, Malaysia, Thailand	A subregional cooperation framework with the objective to accelerate integration in the less developed provinces	Working Group on Infrastructure and Transport (WGIT) has identified five economic connectivity corridors	ADB
Greater Mekong Subregion (GMS)	Cambodia, Laos, Myanmar, Thailand, and Vietnam and two Chinese provinces	Increased integration	73 transport projects, including the development of a road network and the establishment of economic corridors, many of which were completed in the mid-2000s; development of the Cross-Border Transport Agreement (CBTA), expected to be implemented in 2012.	ADB
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)	Bangladesh, India, Myanmar, Sri Lanka, Thailand, Bhutan, and Nepal.	Framework agreement	Study to promote and improve transport and logistics infrastructure among member countries. A main objective is to build a BIMSTEC Trilateral Highway, 1360 km of road linking India, Myanmar, and Thailand.	ADB
South Asian Association for Regional Cooperation (SAARC)	Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka	SAFTA initiative	Regional Multimodal Transport Study by ADB; Inter-Governmental Group on Transport has identified five rail corridors, ten inland or maritime gateways, and seven aviation gateways for further development	ADB
South Asia Subregional Economic Cooperation (SASEC)	Bangladesh, Bhutan, India, and Nepal		Information highway project approved in 2007; start date has been delayed to 2012	\$3.1 million financing from the Asian Development Fund, Republic of Korea e-Asia and Knowledge Partnership Fund (\$500,000)

UNESCAP = United Nations Economic and Social Commission for Asia and the Pacific; ADB = Asian Development Bank; SAFTA = South Asian Free Trade Area; ASEAN = Association of Southeast Asian Nations

Sources: Regional secretariat websites and ADB projects database

Table 8 Regional transport initiatives in Latin America

Name of initiative	Membership
MERCOSUR—Fondo para la Convergencia Estructural del MERCOSUR	Argentina, Brazil, Paraguay, Uruguay
Andean Community Border Integration Zones (ZIF) initiative	Bolivia, Colombia, Ecuador, Peru
Iniciativa para la Integración de la Infraestructura Regional Suramericana (IIRSA)	12 South American countries
Mesoamerican Integration and Development Project (MP) also known as the Corredor Pacífico del Proyecto Mesoamérica.	Belize, Colombia, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, México, Nicaragua, and Panama

Sources: Regional secretariat websites.