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Foreign Direct Investment in Cross-Border Infrastructure Projects

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Abstract

In this paper we critically review the relevant information and literature that can enhance the feasibility and the successful implementation of cross-border infrastructure projects. We provide detailed information concerning foreign direct investment in the major emerging regions: East Asia and the Pacific, Latin America, and Eastern Europe. We also discuss the theoretical and empirical literature which sheds light on the characteristics of transnational infrastructure projects, who should conduct them, and what determines their existence. The literature points to the importance of government involvement in transnational infrastructure projects as there are clear external benefits which will otherwise not be reaped. It also points to the importance of coordination for the success of the project. The Asian Development Bank is well placed to perform that role. Lastly, we provide six cases of cross-border infrastructure projects, two each from East Asia, Latin America, and Eastern Europe. These cases illustrate the critical need for smooth coordination of the diverse groups of team players, top-level backing of the projects, as well as a thorough understanding of all the political and financial factors involved that can influence the success of these projects.

JEL Classification: O19, F15, F36, R58

Contents

1. INTRODUCTION

There is a growing need to invest in infrastructure projects in East Asia and the Pacific. An estimated US$750 billion is needed to finance infrastructure sectors (including energy, telecommunications, transportation, water supply, and sanitation) in 2010–2020.[1] However, there is a big gap in the ability to finance all the infrastructure needs of the region. Consequently, it has long been suggested that the private sector has to be brought in as a financial partner. A large part of private sector investment in infrastructure in the developing world consists of foreign investment. For example, in 2003, one estimate showed that international investment in infrastructure in East Asia and the Pacific formed 3.4% of the gross domestic capital.

At the same time, due partly to the increasing integration of the Asian economies via the widening of the regional and global production network, there is an increasing need to invest in cross-border infrastructure projects (also called "infrastructure beyond borders"). These transnational infrastructure (or multinational) projects are expected to be more complex in many dimensions.[2] At the same time, they are often larger in scale. The need to have foreign investment in cross-border infrastructure projects may be even more acute. In addition, foreign direct investment (FDI) in infrastructure can bring in not only capital, but also technology and management skills.

There is a scarcity of literature on the economic issues related to infrastructure development in emerging countries. There are even fewer *comparative* studies of foreign direct investment in cross-border infrastructure in various regions. In the next section, we will provide up-to-date information on this set of issues in developing countries, focusing on Latin America, Eastern and Central Europe, as well as Asia.[3] In section 3, we examine the relevant theoretical and empirical literature related to the issue of foreign direct investment (FDI) in cross-border infrastructure projects. In section 4, we provide six case studies of investment in infrastructure projects in East Asia and the Pacific, Latin America, and Eastern Europe. Our conclusions are presented in the last section.

2. A BRIEF OVERVIEW OF FDI AND INFRASTRUCTURE PROJECTS IN EMERGING COUNTRIES

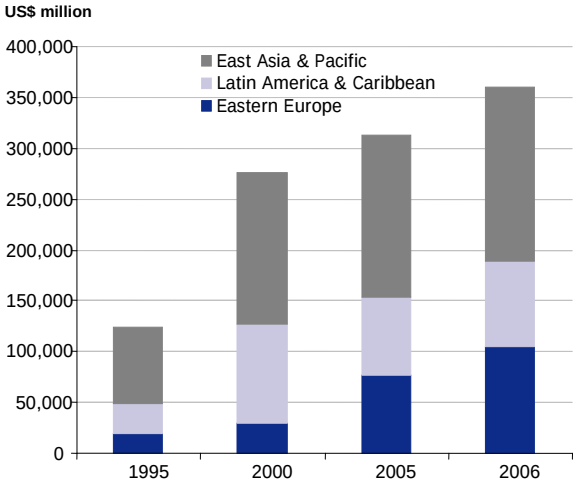
In this section, we report on recent trends on FDI in infrastructure projects across the main emerging regions: East Asia and the Pacific, Latin America, and Eastern Europe. However, as can be seen in Figure 1, FDI inflow into Eastern Europe and Latin America has been dwarved by that flowing into East Asia and the Pacific Region. In fact, in every year for which data are available, FDI inflow into East Asia and the Pacific was nearly double that of the other two regions combined.

[1] See Asian Development Bank Institute (2009), and Bhattacharyay (2008).

[2] We use the term cross-border or transnational infrastructure projects interchangeably. Both refer to a case where the projects involve more than one country or economy.

[3] In our analysis, we have tried to integrate relevant material from the literature on both FDI and cross-border infrastructure, as there is very limited work linking the two.

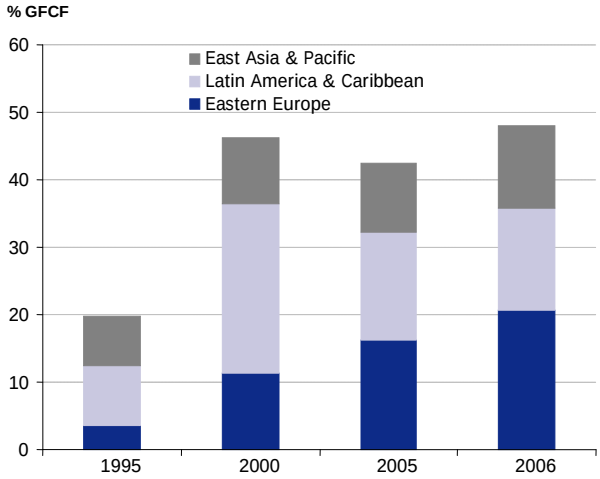
Figure 1: FDI Inflow by Region



Source: United Nations Conference on Trade and Development (UNCTAD) World Investment Report web data.

However, FDI inflow into Asia is much more concentrated. The People's Republic of China (PRC), Hong Kong, China; and Singapore receive over 80% of FDI inflow, leaving less than 20% for the 29 counties classified as East Asia and the Pacific. This is not the situation for Eastern Europe or Latin America, where FDI inflow is more evenly shared. Furthermore, despite East Asia and the Pacific receiving the highest volume of FDI inflow, this region represents only a small proportion of the total gross fixed capital formation (GFCF), as shown in Figure 2. This is in contrast to Latin America and Eastern Europe. Indeed, in the latter case, the proportion of GFCF has been growing rapidly.

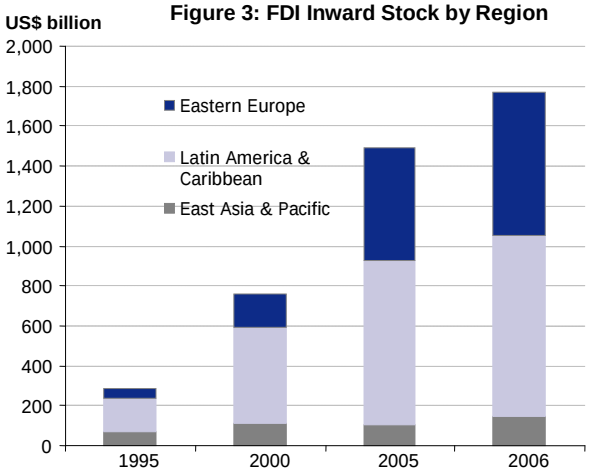
Figure 2: FDI Inflow as % of Gross Fixed Capital Formation



Source: UNCTAD World Investment Report web data.

In the same vein, Figure 3 shows that the stock of inward FDI has grown at a much slower rate in East Asia and the Pacific than in Eastern Europe and Latin America. From 1995 to 2006, inward FDI stock increased 16-fold in Eastern Europe and more than 5-fold in Latin America. In East Asia and the Pacific, for the same period, the stock of inward FDI barely doubled.

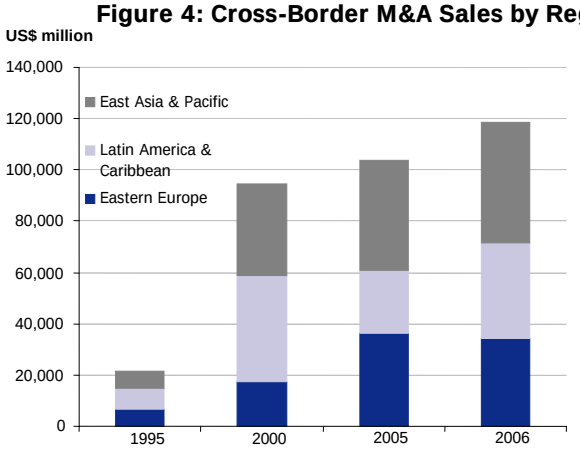
Figure 3: FDI Inward Stock by Region



Source: UNCTAD World Investment Report web data.

In Figure 4 we compare the value of cross-border mergers and acquisitions (M&A) sales from 1995 to 2006.[4] M&A sales in these economies may be correlated with privatizations in these countries, including privatizations in the infrastructure sectors.

Figure 4: Cross-Border M&A Sales by Region



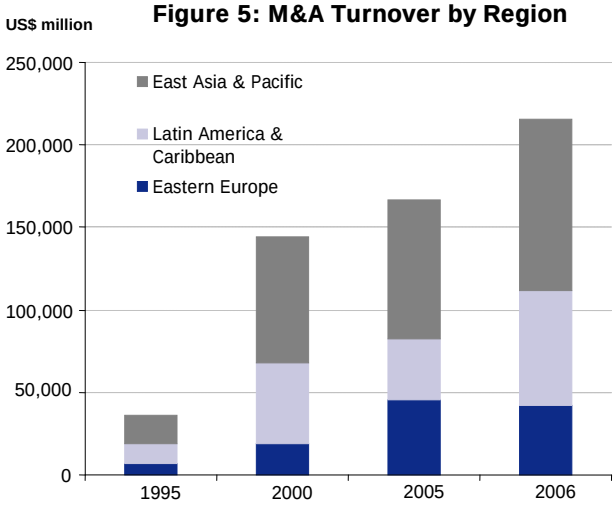
Source: UNCTAD World Investment Report web data.

Since 1995, the value of M&A operations has increased in all three regions. M&A sales in the Russian Federation, Romania, Brazil, and Columbia were particularly high in 2006. In that year, M&A sales accounted for more than 25% of all sales in the Russian Federation and Romania, and more than 15% of all Eastern European sales. In Latin America, Brazil accounted for more than 26% and Colombia for more than 10% of all M&A sales. In East Asia and the Pacific, the number of M&A sales in 2006 was the highest of the three areas and this region is also where the most deals have been struck: 872, for a combined value of US$48.9 billion, as opposed to 564 deals in Eastern Europe worth US$34.1 billion, and 384 cross-border M&A deals in Latin America worth US$37.6 billion. From this we can extrapolate that, on average, the value of cross-border M&A sales in Eastern Europe and Latin America has been much higher than those that have taken place in East Asia and the Pacific. One of the reasons for this is that more privatization has taken place in Eastern

[4] FDI includes both M&A and greenfield investment. M&A refers to the purchase of existing firms and production facilities in one country by another entity in another country.

Europe and Latin America, resulting in larger cross-border M&A operations. Figure 5 shows that the overall M&A turnover follows a parallel trend to M&A sales.

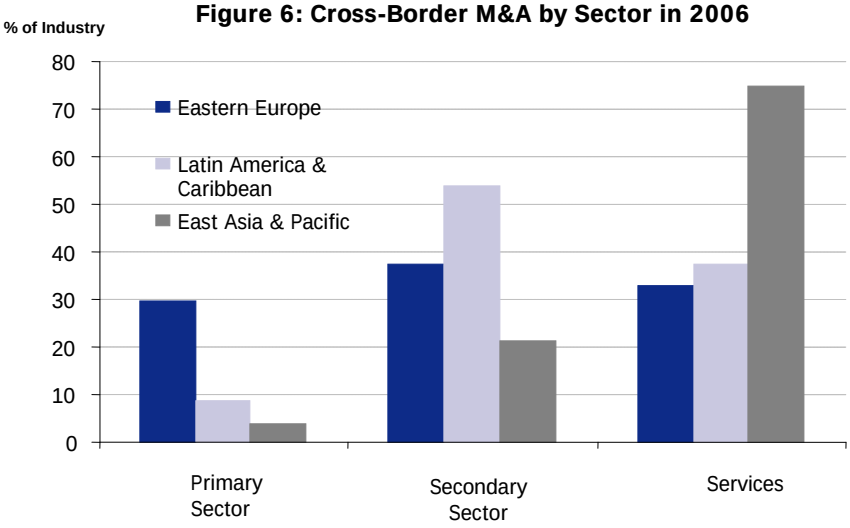
Figure 5: M&A Turnover by Region



Source: UNCTAD World Investment Report web data.

Figure 6 highlights cross-border M&A sales and purchases by broad sectors in these economies.

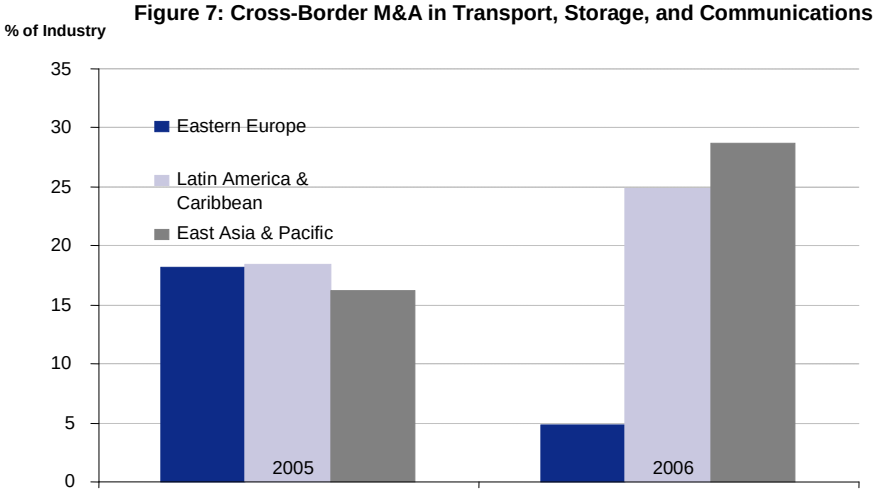
Figure 6: Cross-Border M&A by Sector in 2006



Source: UNCTAD World Investment Report web data.

It is clear from Figure 6 that most cross-border M&A operations that took place in East Asia and the Pacific were in the service sector, covering over 70% of all industries, whereas in Latin America and Eastern Europe, cross-border M&A affected mostly the secondary sector. Figure 7 shows that M&A sales in the transport, storage, and communications sector were relatively high (e.g., in 2005, the share of cross-border M&A sales in the industry in Latin America was 18.5%, and it rose to 24.9% in 2006).

Figure 7: Cross-Border M&A in Transport, Storage, and Communications

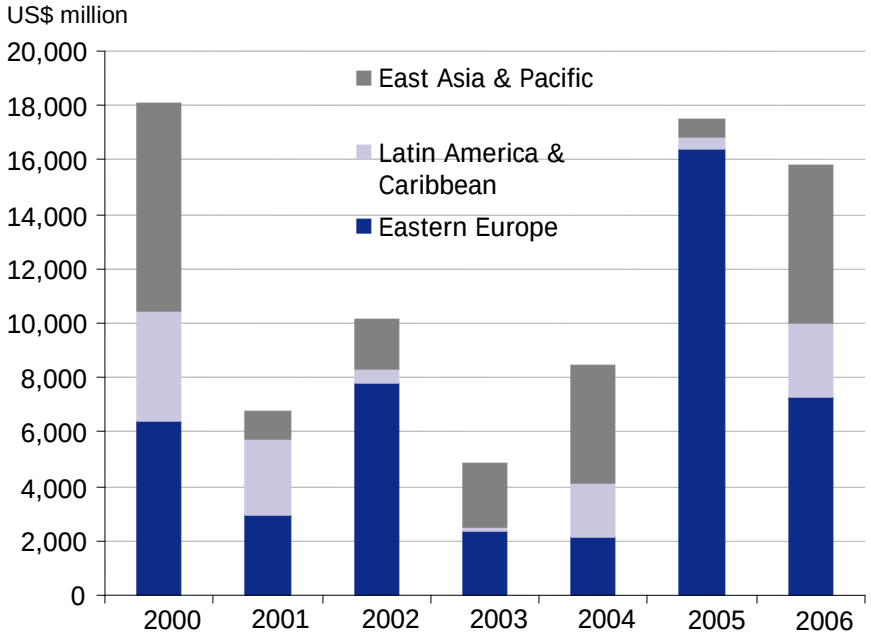


Source: UNCTAD World Investment Report web data.

Given the potential importance of the transport and communications sector, we will focus on the share of FDI inflow into such sectors in these economies. The results are given in Appendix Table 1. They show that in 2002, Peru had the highest share of its FDI going into these sectors, namely, 59% of total FDI. In East Asia, Cambodia received the most FDI in the transport and communications sector (41% of the total).

Figure 8 highlights the magnitude of the proceeds from privatization in the infrastructure sector of these countries. In Eastern Europe, the proceeds reached US$7.2 billion in 2006, as opposed to US$2.7 billion in Latin America, with East Asia and the Pacific lying in between with US$5.8 billion. By country, 86% of privatizations that were completed in East Asia and the Pacific in 2006 took place in the PRC, while Mexico accounted for 51% of privatizations in Latin America.

Figure 8: Proceeds from Privatization Transactions



Source: World Bank Privatization database.

Overall, investment commitments to infrastructure projects with private participation in Latin America and the Caribbean reached US$27.9 billion in 2006. The figure was somewhat lower in Europe and Central Asia (US$23.4 billion) and much lower in East Asia and the Pacific (US$18.5 billion).

In Appendix Table 2 we highlight the top 10 sponsors according to their investment in infrastructure in various regions from 1990 to 2006. Most of the multinationals originated from developed countries, including France, Spain, Portugal, Germany, and the United States. Not surprisingly, Telefónica SA had a substantial investment in the telecommunications sector in Latin America and Singapore Telecom was the biggest investor in East Asia.

Finally, in Figures 9–12, it can be seen that during the 1995–2007 time period, most investments in infrastructure were directed to the telecommunications sector in Latin America, and Europe and Central Asia. This pattern, however, was not followed in East Asia, where investments were geared towards transportation and, to a lesser extent, water and sewage.

Figure 9: Investment in Transport Infrastructure

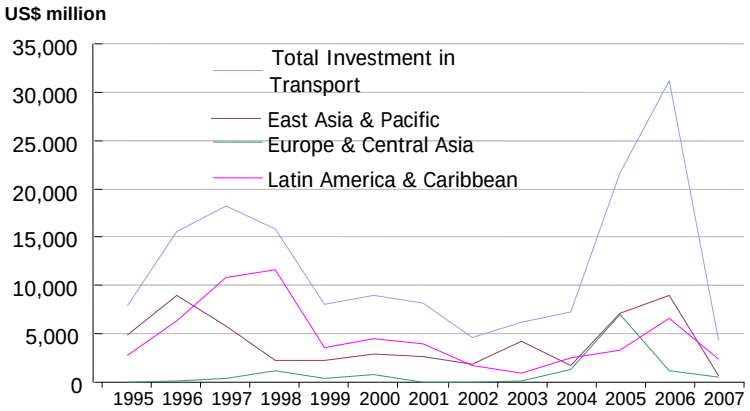
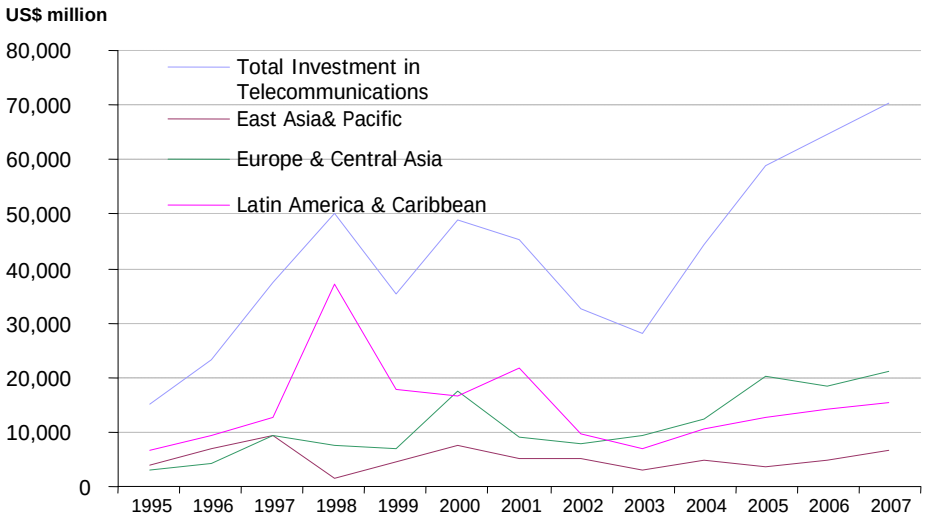


Figure 10: Investment in Telecommunications Infrastructure



Source: World Bank Infrastructure database.

Figure 11: Investment in Telecommunications Infrastructure

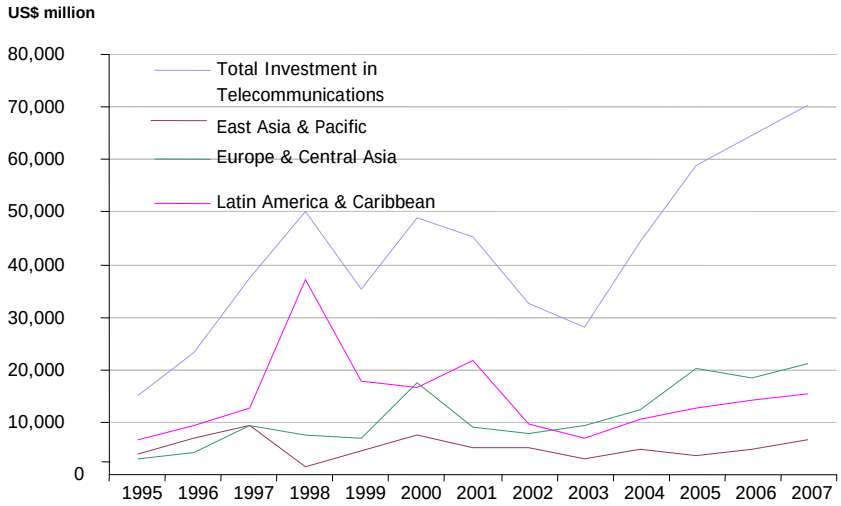
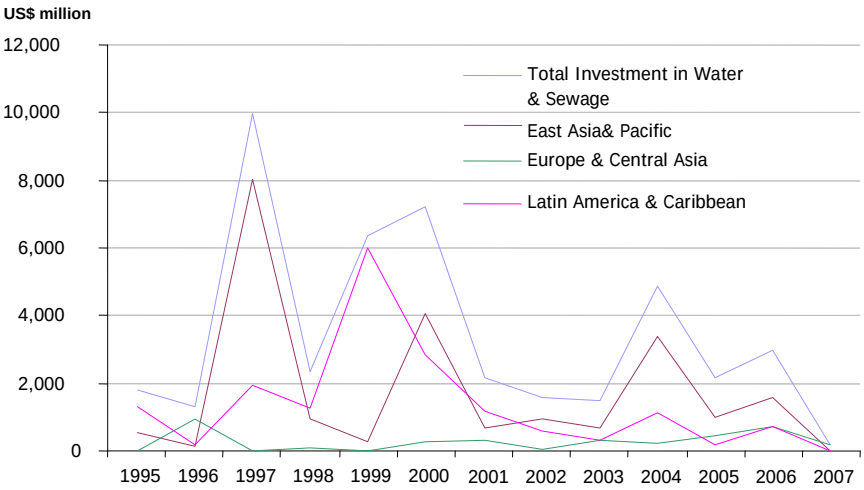


Figure 12: Investment in Water and Sewage



Source: World Bank Infrastructure database.

3. ANALYTICAL AND CONCEPTUAL FRAMEWORKS OF FDI IN CROSS-BORDER INFRASTRUCTURE PROJECTS

3.1 Theoretical Approaches

There is a very limited theoretical literature on FDI in cross-border infrastructure projects. Analytically, one can discern *three* interrelated approaches to studying cross-border infrastructure investment: theory of public good, game theory, and incomplete contract theory. An example of the first approach is provided by Beato (2008), who uses a *regional public good* perspective and highlights the multidirectional external benefits of transnational infrastructure projects. Given the potential free-rider problems, as well as the positive spill-over, over time and space, Beato (2008) reminds us yet again that there will be under-investment in cross-border infrastructure projects if this investment is left to the market. It is also clear that even if a country does receive a substantial amount of FDI, the cross-border infrastructure may still be deficient from a *social* standpoint. Thus, while it is essential to

invite FDI in infrastructures, national governments as well as international organizations should also be important contributors to the financing of such an investment.

The second approach, game theory, with interdependent actions by the participants, leads to a very similar conclusion. Carcamo-Diaz and Gabriel Goddard (2008) provide simple but useful illustrations showing that transport infrastructure often shares the characteristics of a network, with the extra benefits only being realized if the two governments involved in a transnational project invest in the project (and not only one of them). However, if either party believes that investment by the other government may not materialize, the policy of "not invest, not invest" (i.e. both governments choose not to invest in the project) will become the risk-dominant strategy. This also occurs if we adopt a dynamic game, where the game is played over time or a model with strategic governmental interactions with private companies or individuals. Coordination by a regional initiative or by international organizations such as ADB would clearly help solve this problem.

Finally, from an incomplete contract perspective, Navajas (2008) argues that energy infrastructure investment which facilitates long-term exchanges of energy will have to be supported by long-term contracting. But such contracting is necessarily incomplete. This is due partly to unforeseen domestic energy imbalances, which affect the incentive for the supplier to deliver the energy or the consuming country to accept it. Policy shocks and regulatory risks that occur beyond the contractual period will also lead to unforeseen circumstances that cannot be covered in the original contract. Such contract-incompleteness implies the need for better energy planning as well as coordination of intergovernmental bodies.

3.2 Empirical Literature

There is a wealth of empirical literature on *FDI determinants* but not on the specific issue of cross-border infrastructure. We therefore analyzed cross-border infrastructure on the basis of the existing literature that highlights the use of these various determinants.

From the FDI literature, we structured existing determinants into four sets of variables. The first is internal and relates to *multinational firm-specific* factors such as scale economies, and research and development intensity. The second set of factors is external and can be classified as *institutional* or *financial*. The institutional factors are well known: the level of corruption in the countries, government stability, rule of law, etc. The financial factors include exchange rate changes (or expectation of exchange rate changes), tax policies, trade protection, and trade volumes. The third set of factors relates to what *type of host economies* we are examining—whether the countries are members of the Organisation for Economic Co-operation and Development (OECD) or developing countries. The data strongly suggest that FDI going to these different countries can be quite different. Parallel with the classification of countries is the *classification of industries*, as there is strong evidence that vertical FDI is strongest in machinery and in electronics. The last set of factors relate to the *neighbors* of the host economies. For example, US multinationals have been investing in Ireland partly because they can then access Irish neighboring economies, including the United Kingdom, France, and Germany.

With these determinants in mind, we can then think of factors that influence FDI in infrastructure. First, instead of internal, firm-specific factors, we need to adapt the determinants to be *project-specific*. For infrastructure, these factors include the scale of the investment, the degree of technological difficulty (e.g., whether the railroads to be built have to go over environmentally sensitive mountains or rivers), the duration of the project, and the expected time needed to recoup the investment.

The external factors are the legal, institutional, political, and social dimensions of the infrastructure project. For example, there may be ambiguous or even conflicting centers of authority within the government. This may be related to the division between state and

provincial versus federal or central authority. Alternatively, this may be related to the different power structure within different ministries in the government. Another common example is that a new government in the country reneges on a promise made by the previous administration. Other impediments within the "soft" infrastructure include the reliability of the court system, political opposition by existing state-owned service providers, corruption, unclear bidding and award procedures, corruption, and uneven enforcement of the laws and regulations.[5] Infrastructure projects are inherently large scale and have long horizons, and international investors face substantial risks.

Next we turn to the economic or financial determinants of FDI in transnational infrastructures. These relate to the macroeconomic conditions of the countries, such as current and future inflation rates, expected gross domestic product (GDP) growth rates, the degrees of foreign indebtedness, as well as exchange rate risks.

Unlike purely national infrastructure projects, the external political and the financial determinants involved in transnational infrastructure projects have to be taken from *all* the host countries, not just from a single country. Obviously, this will compound the inherent difficulty of attracting more FDI to such cross-border projects.

The Asia and Pacific region has a deep and wide network of production sharing.[6] It is natural then to think of certain transnational regions, rather than a single country, as an economic platform for the production of components and parts. Furthermore, some regions, due to their strategic locations straddling several markets, are also good candidates for linking several countries. Some examples of these cross-border projects include the Greater Mekong Subregion (GMS) Northern Economic Corridor, the Nam Theun 2 hydropower project, and Indonesian-Singapore gas transmission (see Kuroda, Kawai, and Nangia 2007).

The risks facing private investors in financing cross-border infrastructure projects are immense and more complex than the risks for projects located in a single country. Institutional or political risks now include potential failures and coordination involving several governments (both local and central), compatibility of legal and social customs, as well as opposition from existing entities such as existing state-owned providers or ministries, as well as different civil society groups located in different countries. In some cases, these factors primarily involve the financial and political situations within the provinces or states of each country. The relevant income growth rates which act as proxies for the potential demands of future users may be the expected growth rates of the sub-national territories.

As for the third set of factors (the classification by country and by industry), we focused on emerging countries, as they are more comparable to the situation in Asia than in developed countries, particularly with respect to infrastructure. For the fourth set of determinants, the neighborhood, or spatial, approach to FDI is very relevant here. Linking up several countries via a transport network, for example, can mean that a landlocked country can gain access to ports and harbors, which in turn may mean that the country will be able to be a part of the "just-in-time" production-sharing network. The potential benefits and income growth is then not limited to the GDP growth of the parties, but also to the GDP growths of all contiguous neighbors, as well as links to efficient shipping. In this approach, GDP or GDP growth weighted by distances from the host economy can act as a potential determinant.

Another unique factor needed to attract FDI to cross-border infrastructure projects is the ability to coordinate a project. Here, much like the standard use of a corruption index or rule-of-law index, we may need to create a *coordination* or *compatibility index*. This may be related to the compatibility of different countries' standards and ways of doing business. The more compatible the countries are, the smaller the coordination costs.

[5] For a study comparing the importance of "soft" and "hard" infrastructure in attracting FDI, see Fung et al. (2005).

[6] For a recent comparative study of production sharing in East Asia and Latin America, see Fung et al. (2009).

One additional set of risk factors involves the need for institutional or regime harmonization and the coordination of various governmental bodies, which may involve different local civic societies. Balancing the fairness of returns to various parties and countries will also be a challenge. There is a greater need for multilateral agencies to help coordinate the financing of these projects, given that there are multiple jurisdictions.

The existing literature does not provide us with exact guidelines as to how to improve and enhance FDI in cross-border infrastructure projects. However, we can extend the current ideas in the literature and mold them into a relevant approach. Using the above insights from theories and from the empirical FDI literature, Box 1 presents a schematic summary of the factors that will influence FDI in cross-border infrastructure projects.

Box 1: Determinants of FDI in Cross-Border Infrastructure

Determinants or Factors	**FDI in Cross-Border Infrastructure Projects**
Internal, multinational project-specific factors	The scale of the project, the degree of technological difficulty, research and development intensity, duration of the project, expected time needed to recoup the investment, etc.
External political or institutional factors	Conflicting centers of authority within the government, turf battles between different ministries within the government, unclear bidding and award procedures, uneven enforcement of laws and regulations, potential repudiations of promises made by the previous administration, opposition from existing state-owned infrastructure operators, corruption index, government stability, rule-of-law index, etc. These factors apply to all countries involved in the cross-border projects.
External economic or financial factors	Relevant growth rates of income, exchange rate changes, tax policies, trade protection, trade volume, current and expected inflation rates, degrees of foreign indebtedness, etc. These factors apply to all countries involved in the cross-border projects.
Coordination factors	Compatibility of legal and social customs, different civil society groups across countries, coordination problems with different governments at different levels, balancing the perceived fairness of returns to various parties and countries.

4. CASE STUDIES OF TRANSNATIONAL INFRASTRUCTURE PROJECTS IN EMERGING REGIONS

4.1 Latin America

4.1.1 Initiative for the Integration of Regional Infrastructure in South America (IIRSA)

South America has a low ranking in the transport and communications infrastructure pillar of the global competitiveness index (CGI) compiled by the World Economic Forum (WEF). For example, in 2009–2010, Argentina was ranked 67, Brazil 68, and Mexico 74 of all the sampled countries. The lack of an integrated and effective infrastructure network has resulted in a disadvantage compared to other developing regions. The difficult public finances of some Latin American countries have limited the number and magnitude of infrastructure projects, although nowadays private investment has somewhat alleviated this situation.

Probably the first sizable cross-border infrastructure project in the region was the IIRSA. It was launched during the first South American Summit in 2000 as an instrument to promote interregional integration for as many as 12 countries in the region (details can be found in Appendix Table 3). The target sectors were transport, energy, and telecommunications networks.

The IIRSA members are trying to fund the integration projects by partnering with other countries, thereby reducing the impact on their own public finances. In view of the difficult economic context at the beginning of this initiative, the countries involved worked out three alternative sources of financing: public-private partnership, a fiscal margin for public investment (strict criteria for public investment and account records of public financing), and tailor-made financial instruments.

One of the most important proposals for an innovative financing scheme is the South American Infrastructure Authority (ASI), a multilateral entity with capital contributed by member states. The assets would comprise the projects receiving grants from the partners, reducing damage to their fiscal balances. This institution could attract funds and be entrusted with the development and management of the concessions. Another instrument examined by the IIRSA is the creation of guarantee funds, styled after the MIGA or World Bank, with capital supplied by other countries. Some initial financial support, as well as technical assistance, came from the Inter-American Bank of Development (BID), the Andean Corporation for Development, and the Fund for the River Plate Basin (FONPLATA). The total project portfolio investment accounts for US$38 billion, of which 43% are projects linking two countries.

Through medium-term territorial planning methodology and consensus agreement, 426 projects have been identified and classified into project groups according to their impact on sustainable development and technical, institutional, social, environmental, financial, and political feasibility.

The Action Plan is structured in 10 “Hubs” (plurinational territories with shared natural, human, and economic flows), with investment in transport, energy, and telecommunications. They are complemented by the sectorial integration process (PSI), transversally structured actions aimed at improving sustainable development and competitiveness, focusing on harmonization of the regulatory framework. In the absence of a common institutional scheme and regulatory framework, the PSI activities facilitate the correct development of the infrastructure projects by targeting the main operational and institutional obstacles to regional integration.

The improvements in transport, energy, and telecommunications networks will need to be accompanied by economic, social, and regulatory progress to make them fully effective and

equitable. Multi-target action plans are being developed to prevent possible social, cultural, and environmental damage.

4.1.2 Plan Puebla Panama (PPP)

The PPP is a planned set of development programs intended to promote regional integration and development within the Mesoamerican Region. It was first announced in March 2001 by Mexican President Fox and officially launched three months later. The PPP was originally seen as a method to establish infrastructure after Hurricane Mitch devastated the area in 1998, killing more that 14,500 people, leaving two to three million homeless, and costing over US$5 billion in damages.

The initiative later evolved towards the economic development of five economic axes (the Pacific Axis, the Gulf of Honduras Axis, the Peten Axis, the Mexico Trans-systemic Axis and the Guatamala/Yucatan Axis) or corridors that follow the trade flows across borders. The intent is to develop infrastructure networks within these five economic axes through large infrastructure projects, such as highways, air- and seaports, and electric and telecommunications grids, and thereby meet the needs of investment and trade.

Therefore, PPP mainly envisages coordinated improvements to trade, highway integration, energy interconnection, and the integration of telecommunication services for the movement of people and freight throughout Central America (details can be found in Appendix Table 4).

The investment required to complete the network of designated projects in the involved countries amounts to some US$8.07 billion. Of this amount, over $4.5 billion in loans and grants has been disbursed. Funding was raised from national governments in the region (35%), the Inter-American Development Bank (IDB) (24%), the private sector (15%), the Central American Bank for Economic Integration (BCIE) (7.5%), and the World Bank (5%), with 13.5% from other sources.

At present, the PPP consists of over 28 projects affecting seven countries (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), and nine states within Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Quintana Roo, Veracruz, and Yucatan). However, it has been noted that governments and institutions involved in the PPP have often not specified which projects are part of the PPP initiative. There have been projects that have been removed from the plan and continued via other means, or even cancelled. For instance, the Anillo Periférico highway in El Salvador and La Parota dam in Mexico are no longer included in the plan but are still being promoted by local governments.

On top of this, the initiative has drawn the criticism of civil society for its supposed lack of transparency and unequal distribution of costs and benefits, as most of the costs often have to be borne by the local communities or indigenous communities that live throughout the Mesoamerican Plateau. In addition, most of the projects have a big impact on the environment and its ecosystems. Because of these criticisms, and pressure from many environmental groups, some projects have had to be postponed or even abandoned.

To re-launch the PPP initiative, member countries announced the creation of a Funding and Promotion Committee (CPF) formed by IDB, the Andean Development Corporation (CAF), and the Central American Bank for Economic Integration (CABEI) during the annual 2008 IDB meeting. CPF aims to attract investors and funding to the PPP through promoting and supporting concession initiatives and public-private partnerships.

4.2 Eastern Europe

4.2.1 Trade and transport facilitation in the Southeast Europe Program (TTFSE)

The TTFSE started in 1999 under the umbrella of the Stability Pact for South-Eastern Europe and currently involves eight countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Romania, and Serbia and Montenegro. These countries share

35 border-crossing points and eight inland terminals (details can be found in Appendix Table 5).

Due to the disintegration of the Balkan territory into smaller countries, a shared planning of regional transport framework was needed for the common borders and long-distance routes in South-Eastern Europe.

Initially, the program's main concern was the improvement of cooperation to meet the requirements for accession to the EU. This involved a reduction in non-tariff and transport costs, and preventing smuggling and corruption at border crossings.

To achieve these objectives, four main activities were targeted: provision of border-crossing infrastructure and equipment, modernization of the customs information system; improvement of custom procedures; program implementation, and other trade facilitation measures, such as increasing participants' knowledge of trade, logistics, and international freight transport.

The Regional Steering Committee (RSC) is the principal governor of the program, which is composed of the customs administration heads of the eight countries, meeting annually and semi-annually. The RSC promotes the exchange of information, sharing of experiences, and the airing of different views. SECI-PRO (Southeast Europe Cooperative Initiative-PROcedures: public-private partnership committees) seek to eliminate obstacles to trade, increasing business and investment. The European Union (EU) has provided parallel assistance in the customs field in such areas as revenue collection, risk analysis, and enforcement.

The World Bank supports this program through funding and management by the Infrastructure and Energy Services Department (ECSIE). Each country has its own project appraisal document (PAD) and respective loan or credit agreement. The World Bank provided around US$76 million, national governments US$32 million, and the United States Agency for International Development (USAID) US$12 million.

The second phase of TTFSE expects to go beyond the original program, focusing on EU transport corridors via the Trans-European Network for Transport (TEN-T), inter-modal transport, and inter-agency coordination. This new program is currently being prepared and may include two more countries (Kosovo and Turkey). The final objective of this initiative is to boost trade competitiveness, providing the region with adequate logistic services that connect the countries in the region with their neighbors and with the global market.

Evaluations of the TTFSE program have mainly been positive, showing a decrease in non-tariff costs in the region and the creation of new infrastructure. The impact on corruption and smuggling is harder to measure, but some countries reported a decline.

4.2.2 The Black Sea Basin European Neighborhood & Partnership Instrument (ENPI) Cross-border Cooperation (CBC) program

The Black Sea Basin CBC program, an EU operational program under the framework of the ENPI, will be implemented from 2007 to 2013. With a budget of US$19.8 million, The Black Sea Basin program involves 10 countries, some of them including the whole of their national territory (Armenia, Azerbaijan, Moldova, and Georgia), and others, only those regions closest to the Basin (Bulgaria, Greece, Romania, Russia, Turkey, and Ukraine).

The main purpose is to develop stronger and more stable economies in the Black Sea Basin regions. In 2007, enlargement of the EU provided one more reason to be interested in its security and sustainable growth. The EU has set out a strategy for the CBC target regions: to equalize living standards on both sides of the external EU borders through integrated regional partnership and cooperation (details can be found in Appendix Table 6).

According to the ENPI CBC strategy paper there are three principal objectives: promoting economic and social development in the border areas; working together to address common

challenges; and promoting local, person-to-person cooperation. Such objectives would be pursued through different means: cross-border support for partnerships for economic development based on combined resources, networking resources and capabilities for environmental protection and conservation, and cultural and educational initiatives for the establishment of a common cultural environment in the basin.

The program is 90% financed by the European Neighborhood & Partnership Instrument. The participation of Turkey is financed by the IPA (Instrument for Pre-accession Assistance) and the participating countries co-finance projects with a minimum of 10% of the EU contribution. Potential beneficiaries of this project will be regional and local authorities, non-governmental organizations (NGOs), representative associations and organizations, universities, research institutes, cultural institutes, and public agencies.

The final project details are yet to be set out. The approval of the programming document by the EC took place in late 2008. In 2009 there was a launch of the call for proposals. These proposals had to be consistent with the program requirements and take into account certain criteria. The projects will then be evaluated before the final process of operational and financial monitoring of projects.

While the characteristics of the concrete projects are yet to be determined, we can foresee that they will be consistent with the main activities of the program: strengthening access and connection on interregional transport links, creation of tourism networks, environmental common regional actions, and promotion of cultural and educational exchange.

4.3 South-East Asia

4.3.1 The Greater Mekong Subregion Program

In 1992, the Greater Mekong Subregion (GMS) Program was launched by the six member countries with the assistance of ADB. Since its creation, it has contributed significantly to facilitating cross-border flow of goods and people within the GMS and linking the subregion to other markets through the development of infrastructure and the required agreements for its efficient use (details can be found in Appendix Table 7).

More broadly, the program aims to facilitate sustainable economic growth by strengthening the economic ties among the member countries. At the same time, efforts are being made to reduce poverty and improve the quality of life of the more than 300 million people who live in the territory. The strategy of the GMS 2009–2010 Business Plan is consistent with the 3-fold GMS objective of an integrated, harmonious, and prosperous subregion. To attain this, the program aspires to improve communication and transport through sustainable development of infrastructure and transnational economic corridors.

Since its foundation, the GMS Program has been involved in the planning and execution of several projects in nine main areas: transport, telecommunications, tourism, environment, human resources development, agriculture, trade facilitation, and private investment. In all these areas, the development of infrastructure has played a decisive role in establishing a base for a sustainable and equally distributed growth within the regions. The GMS Program has been the multilateral platform that has allowed cross-border infrastructure projects that have benefited all the regions involved.

The GMS Program involves key stakeholders including governments, civil society organizations, the private sector through the GMS Business Forum, and major external aid and funding agencies. ADB serves as coordinator for the GMS Program, as requested by the member countries. The program has also received the political support of the regional leaders at the GMS Summits of 2003 in Phnom Penh (Cambodia), 2005 in Kunming (Yunnan Province, PRC), and 2008 in Vientiane (Lao People's Democratic Republic, PDR).

In the current portfolio, from the US$26.5 billion budget, the projects that imply coordination of two or more member countries are those related to the development of the North-South,

East-West and Southern Economic Corridors. To support the integration of these regions, the current Business Plan projects spent US$1 billion on transport and communications in the East-West Corridor during 2009, and it is planned to spend another US$1.14 billion in the Southern Corridor during 2010.

Although these steps towards economic development have raised high expectations in foreign investors, cross-border infrastructure projects and programs often have to face the criticism or even the opposition of civil society. Among the main concerns are the environmental and social costs associated with large, high-impact infrastructure projects. On top of that, the involvement of different administrations does not ensure an equal distribution of cost-benefit, and compensations for loss of land and property are not necessarily fair to all the stakeholders. Nevertheless, the role of civil society is significant in ensuring a rigorous system of monitoring the transparency of the project process.

4.3.2 The Nam Theun 2 Hydropower Project

The Nam Theun 2 Hydropower Project has been under preparation since the mid-1980s, when a feasibility study was undertaken by the World Bank. However, development of the necessary infrastructure to utilize the region's full potential had to be postponed due to the 1997 Asian Crisis.

The hydropower potential of the region, as well as that of the whole of the country, is increased by the mountainous terrain and the heavy rainfalls that end up in the multiple Mekong tributaries that flow from North to South of the territory. This potential has been well exploited by the Lao PDR government, which is now coping with the steadily growing demand for electric energy of its neighboring countries, especially Thailand with its practically non-existent energy resources. By supplying energy to its neighbors, Lao PDR enhances economic integration and helps create a regional power market that provides energy security and regional stability. Moreover, it achieves environmental benefits by substituting hydropower for coal and other fossil fuels. These cross-border infrastructures also allow countries such as Lao PDR to export energy to provide revenues to meet the government's development objectives, with particular emphasis on the eradication of poverty.

This US$1.2 billion project is a private-sector undertaking with multilateral and bilateral financial and technical support. To the government's pride, the Nam Theun 2 Hydropower Project is not only the largest private power project in Lao PDR, but also the largest private sector hydroelectric cross-border project in the world (details can be found in Appendix Table 8).

As 30% of the project funds come from equity, the Nam Theun 2 Power Company Limited (NTPC) was established under Lao PDR law as the owner of the project. Shareholders in the NTPC are the Lao Holding State Enterprise (25%), Electricity Generating Public Company Limited of Thailand (25%), Electricité de France International (35%), and the Italian-Thai Development Public Company Limited of Thailand (15%). Twenty-seven international banks including international financial institutions such as the World Bank, ADB, the European Investment Bank, and Agence Française de Développement are involved in the financing of the project as well, and have provided about half of the 70% of total funding. The other half of the 70% of the funding comes from seven commercial Thai banks. The first half of the debt is denominated in US dollars and the second half in Thai baht.

The project is near completion, and it is expected to start commercial use at the end of 2010. However, not all of the process has been easy; in addition to its strong supporters, several groups have opposed it. Given the size of the infrastructures, the social and environmental challenges were a major issue in the project. Although the government will receive US$1.9 billion in revenue over the 25-year operating period from dividend income, royalties, and taxes, which will be dedicated to promoting sustainable growth and eradication of poverty, the main costs are borne by local communities and the environment around the project area.

To reduce the impact to the more than 70,000 local inhabitants (some of them from ethnic minorities), US$90 million has been designated for capital and operating expenditures for environmental and social mitigation, and compensation.

5. CONCLUSION

In this paper we survey and critically review the relevant information, literature, and tools that can enhance the feasibility and the successful implementation of cross-border infrastructure projects. We provide detailed background information concerning FDI in the major emerging regions: East Asia and the Pacific, Latin America, and Eastern Europe. We then review the theoretical and empirical literature which can shed light on the characteristics of transnational infrastructure projects, who should conduct them, and what determines their existence. The literature points to the importance of government involvement in transnational infrastructure projects as there are clear external benefits which will otherwise not be reaped. It also points to the importance of coordination for the project to be successful. ADB seems to be well placed for the role of coordinator.

Lastly, we provide six cases of cross-border infrastructure projects, two each from East Asia, Latin America, and Eastern Europe. These cases illustrate the critical need for smooth coordination of the diverse groups of players, top-level backing of the projects, as well as a thorough understanding of all the political and financial factors involved that can influence the success of these projects.

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APPENDIX

Table 1: Share of Transport and Communications in Total FDI Inflow for Selected East Asia, Eastern Europe, and Latin America Countries

Country	Infrastructure Sector	1995	2000	2001	2002
Eastern Europe					
Armenia (1998)	Total FDI (US$ million)	221	104	70	111
	Transport & communications (US$ million)	78	38	14	9
	As % of total FDI inflow	35.3	36.5	20.0	8.1
Russian Federation (1998)	Total FDI (US$ million)	2,761	2,714	2,748	3,461
	Transport & communications (US$ million)	250	1,326	..	..
	As % of total FDI inflow	9.1	48.9	..	..
Latin America					
Argentina	Total FDI (US$ million)	5,609	10,418	2,166	2,149
	Transport & communications (US$ mill)	634	3,870	167	–715
	As % of total FDI inflow	11.3	37.1	7.7	–33.3
Brazil (1996)	Total FDI (US$ million)	10,792	32,779	22,457	16,590
	Transport & communications (US$ million)	819	10,979	4,276	4,337
	As % of total FDI inflow	7.6	33.5	19.0	26.1
Chile	Total FDI (US$ million)	3,041	4,860	4,200	2,550
	Transport & communications (US$ million)	412	870	1,281	336
	As % of total FDI inflow	13.5	17.9	30.5	13.2
Colombia	Total FDI (US$ million)	968	2,395	2,525	2,139
	Transport & communications (US$ million)	42	876	416	345
	As % of total FDI inflow	4.3	36.6	16.5	16.1
Ecuador	Total FDI (US$ million)	452	720	1,330	1,275
	Transport & communications (US$ million)	25	0.2	11	22
	As % of total FDI inflow	5.5	0.0	0.8	1.7

Country	Infrastructure Sector	1995	2000	2001	2002
El Salvador (1998)	Total FDI (US$ million)	1,104	173	279	470
	Transport & communications (US$ million)	251	2	62	49
	As % of total FDI inflow	22.7	1.2	22.2	10.4
Honduras	Total FDI (US$ million)	69	282	193	175
	Transport & communications (US$ million)	..	6	49	64
	As % of total FDI inflow	..	2.1	25.4	36.6
Mexico	Total FDI (US$ million)	9,526	17,789	27,449	19,363
	Transport & communications (US$ million)	876	–2,372	2,913	750
	As % of total FDI inflow	9.2	–13.3	10.6	3.9
Paraguay	Total FDI (US$ million)	103	104	84	10
	Transport & communications (US$ million)	7	29	–28	..
	As % of total FDI inflow	6.8	27.9	–33.3	..
Peru	Total FDI (US$ million)	609	1,433	696	669
	Transport & communications (US$ million)	3	1,036	27	395
	As % of total FDI inflow	0.5	72.3	3.9	59.0
East Asia					
Cambodia	Total FDI (US$ million)	2,032	181	146	155
	Transport & communications (US$ million)	10	..	..	64
	As % of total FDI inflow	0.5	..	..	41.5
Japan	Total FDI (US$ million)	3,930	28,998	17,921	17,436
	Transport & communications (US$ million)	70	7,020	6,837	1,394
	As % of total FDI inflow	1.8	24.2	38.1	8.0
Mongolia	Total FDI (US$ million)	37	91	126	173
	Transport & communications (US$ million)	13	7	1	2
	As % of total FDI inflow	34.4	7.2	0.7	1.1

Country	Infrastructure Sector	1995	2000	2001	2002
Myanmar	Total FDI (US$ million)	668	218	19	87
	Transport & communications (US$ million)	119	8	..	..
	As % of total FDI inflow	17.8	3.7	..	..

Note: for the countries that are not listed, either no data were available, or they were small island countries.

Source: UNCTAD FDI Country Profile web data.

Table 2: Top Ten Sponsors by Investment and Region, 1990–2006 (US$ million)

Sponsor	Total Investment	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Telefónica SA	70,856	0	11,554	57,557	1,745	0	0
Telecom Italia	35,030	0	320	34,710	0	0	0
Carso Group	32,560	0	0	32,560	0	0	0
America Movil	29,231	0	0	29,231	0	0	0
SUEZ	28,095	8,206	1,902	13,670	4,154	0	164
France Telecom	27,459	1,009	18,946	1,285	3,893	0	2,327
AES Corporation	21,046	2,169	2,165	14,556	415	6	772
Deutsche Telekom	20,442	1,185	19,175	0	0	0	82
Portugal Telecom	19,988	0	0	17,694	1,745	0	549
Singapore Telecom	18,684	10,774	0	0	0	59	0

Source: World Bank Infrastructure Projects Database. http://ppi.worldbank.org/explore/ppi_exploreDetail.aspx?mode=detail&panel=region&results=0

Table 3: The Initiative for the Integration of Regional Infrastructure in South America (IIRSA)

Number of Projects	426 (priority portfolio: 31 high-impact projects carried out during 2005–2010)
Project Sector (Priority Portfolio)	Transport (84.19% of funds) Energy (15.78 of funds) Communications (0.03% of funds)
Project Type (Priority Portfolio)	Roads (76.25% of funds) Railway (10.33% of funds) Seaport (6.64% of funds) River transport (4.54% of funds) Bridge (1.86% of funds) Border crossing (0.2% of funds) Logistic center (0.19% of funds)

Budget	US$40 billion (priority portfolio US$6.4 billion)
Countries	Bolivia, Colombia, Ecuador, Peru, Argentina, Brazil, Paraguay, Uruguay, Venezuela, Guyana, Suriname, and Chile
Financial Sources (established)	Public sector (IDB, CAF, and FONPLATA and national governments)—30% of investment Private sector—15% of investment Public-private partnership- 53%

Table 4: Plan Puebla Panama (PPP)

Number of Projects	Current portfolio: 100 (eight executed, 50 in progress, and 42 in preparation)
Project Sector (Current Portfolio)	Transport (76.15% of budget) Tourism (0.04% of budget) Human development (7.43% of budget) Disasters, 0.7%, Trade (0.29% of budget) Sustainable development (2.48% of budget) Energy (11.5 of budget) Communications (0.27% of budget)
Budget	Current portfolio: US$8.076 billion (US$50 billion expected)
Countries	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, and recently Colombia
Financial Sources (established)	Public sector (IDB, CABEI, CAF, World Bank, and national governments)—71.5% of investment Private sector—15% of investment Other—13.5%

Table 5: Trade and Transport Facilitation in Southeast Europe Program (TTFSE)

Number of Projects	Eight (one for each country)
Project Sector	Transport
Project Type	Border-crossing infrastructure and equipment (62% total) Customs information system modernization (21% total)

	Customs procedures improvement (9% total) Program implementation (4% total) Other trade facilitation measures: increasing participants' knowledge of trade, logistics, and international freight transport (3% total)
Budget	US$120 million
Countries	Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia (all closed in 2005), Moldova (closed in 2007), Romania (closed in 2004), and Serbia and Montenegro (closed in 2006).
Financial Sources (established)	Public sector: World Bank: International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) (63%) USAID (10%) National governments (27%)

Table 6: Black Sea Basin ENPI CBC

Number of Projects	To be determined
Project Sector	Multisectorial (democracy, human rights, governance, managing movement and improving security, the "frozen conflicts", energy, Transport, environment, maritime policy, fisheries, trade, research and education networks, science and technology, employment and social affairs, regional development)
Project Type	To be determined
Budget	US$19.8 million (without Turkey[7])
Countries	Bulgaria, Greece, Romania, Russia, Turkey, Ukraine, Armenia, Azerbaijan, Moldova, and Georgia
Financial Sources (established)	Public sector: —EU (90%) —National governments (10%)

[7]IPA funds for the participation of Turkey were €1 million per year from 2007 to 2009. This amount will be revised for 2009–2013.

Table 7: GMS 2009–2011 (Greater Mekong Subregion 2009–2011)

Number of Projects	Current portfolio for 2009–2011: 58 projects
Project Sector (Current Portfolio)	Multisector (30.02% of budget) Agricultural and natural resources (20.06% of budget) Energy (16.96% of budget) Transport and communications (13.96% of budget) Water supply and sanitation (7.43% of budget) Education (5.66% of budget) Industry and trade (3.77% of budget) Health, nutrition, and social protection (2.14% of budget)
Budget	US$26.5 billion
Countries	Cambodia, PRC (Yunnan Province, Guangxi Zhuang Autonomous Region), Lao PDR, Myanmar, Thailand, and Viet Nam.
Financial Sources	Public sector (ADB and national governments)—72% of investment Public-private partnership—3% of investment Other—25% (possible PPP cofinancing resources included)

Table 8: Nam Theun 2 Hydropower Project

Number of Projects	One project
Project Sector	Energy Poverty reduction Environmental protection
Project Type	Construction of power plant and reservoir in Lao PDR Exports of 5,354 GWh (95%) of electricity to Thailand Supply of 200–300 GWh (5%) of electricity to consumers in Lao PDR US$1.9 billion revenue for the Lao Government over the 25-year operating period Development program for resettled villages and downstream areas Protection of a 4,000 km^2 biodiversity area—US$1 million per year for 31 years

Budget	US$1.25 billion (+ additional contingent financing of US$200 million)
Countries	Lao PDR and Thailand
Financial Sources	Equity (shareholders) (30%) International loans (70%): —International development and commercial financiers, debt in US dollars (50% of the debt) —Seven Thai commercial banks, debt in Thai baht (50% of the debt)