

EAP Infrastructure at a Glance

Benchmarks and Comparisons

East Asia and Pacific Infrastructure Department

World Bank



transport



urban



water &
sanitation



telecom



power

July 2005

Introduction

The provision of infrastructure plays a critical role in economic development. Infrastructure performs many functions, from providing basic services necessary for a minimum standard of living to improving a region's global competitiveness and overall investment climate. Given infrastructure's important role and impact on a number of levels, it is important that its development be tracked and monitored over time. This brief is intended to provide an at-a-glance overview of the state of economic infrastructure in the main developing countries of East Asia. It contains sample graphs and tables presenting measures and indicators across countries on stock, access, affordability, efficiency, the state of reform, and financial performance of the Energy, Water Supply and Sanitation, Telecom, and Transport sectors. It also presents figures on Urban issues and rough estimates of infrastructure investment.

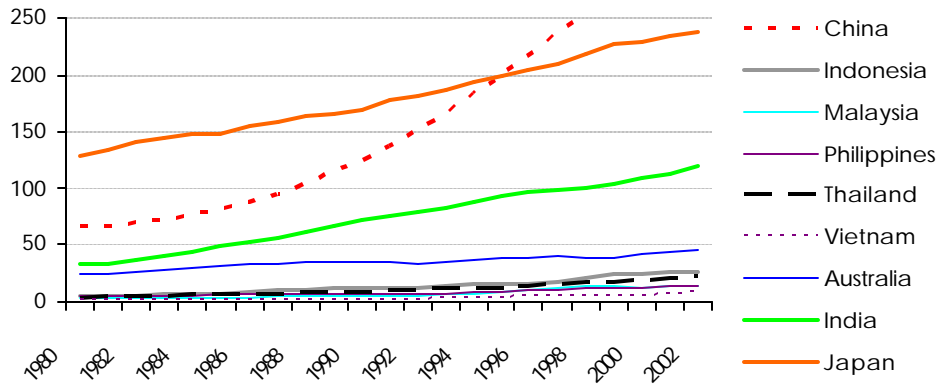
Database. All the data presented in this brief is from the East Asia Infrastructure Department's Infrastructure Database and can be found at <http://eapinfradata> on the World Bank intranet. The Database contains a much larger collection of indicators than those presented here. In addition to the indicators, written infrastructure sector briefs are also available on the website.

Data Sources. We have focused here on a narrow set of core indicators identified by the World Bank Infrastructure Sector Boards, as the most important indicators generally available. The definitions, original sources, and interpretive comments are included in the notes that accompany each table or graph. Throughout the brief, italics refer to data that is from a year other than that specified in the key. Furthermore, "country-specific sources" referenced in the notes refer to in-country data sources collected from the WB field offices. Virtually all of the data was collected using publicly available sources, including publications and internet websites from development institutions, sector-specific international agencies, and national statistical offices. In some cases, data was also collected through conversations with national government agencies or World Bank sector specialists, and from reports.

Caveats. Data collected from publicly available, country-specific sources are always subject to reliability and comparability issues. These inconsistencies arise from a number of factors, including differences in classifications, definitions, and coverage across countries. All efforts were made to verify the data and specify the definitions used, but care must be taken when analyzing these indicators. It is impossible to completely guarantee the validity of the data, though the figures are current best estimates of the indicators presented.

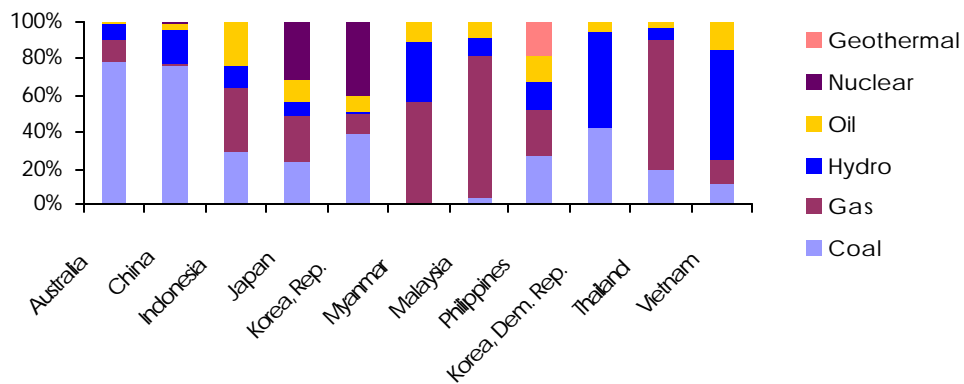
I. Power

Electricity Installed Capacity (MW)



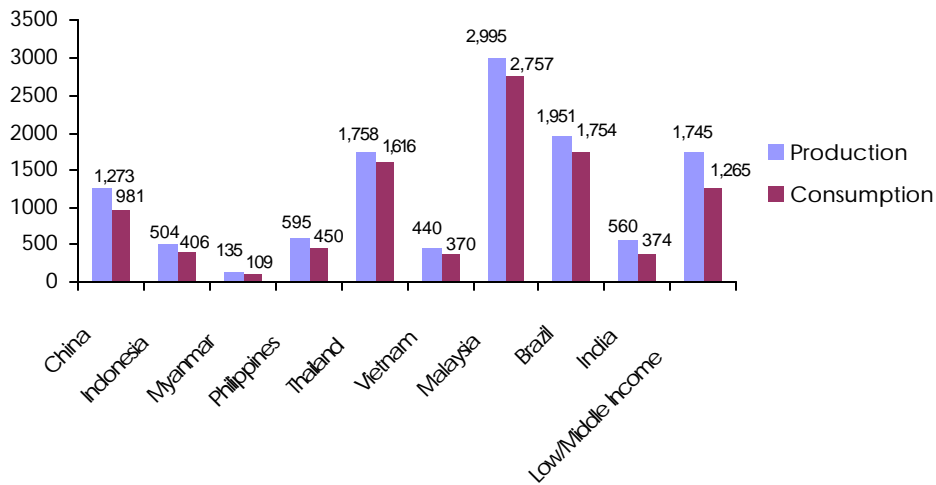
The figure above displays total electricity installed capacity, and includes both utility and non-utility sources. Data is taken from the US DOE Electricity Information Administration.

Electricity Production Sources



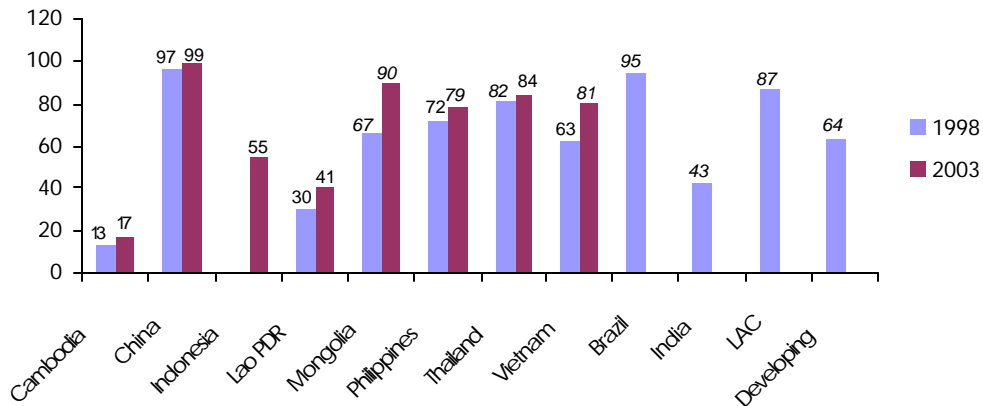
Sources of electricity refer to the inputs used to generate electricity. This indicator refers to the percentage of electricity generated from geothermal, nuclear, oil, hydro, natural gas, and coal sources. Figures are for the latest year available and are taken from WB World Development Indicators and country-specific sources.

Electricity Production and Consumption per Capita (kWh)



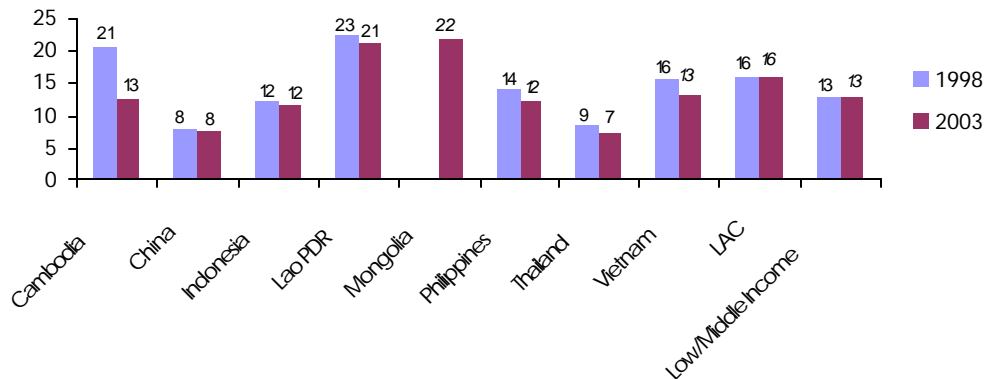
Electric power production refers to total public and autoproducers production, including production from pumped storage. Electric power consumption measures the production of power plants and combined heat and power plants, less distribution losses and own use by heat and power plants. Figures are taken from IEA *Electricity Information 2004* and are as of 2002 for all countries.

Households with an Electricity Connection (%)



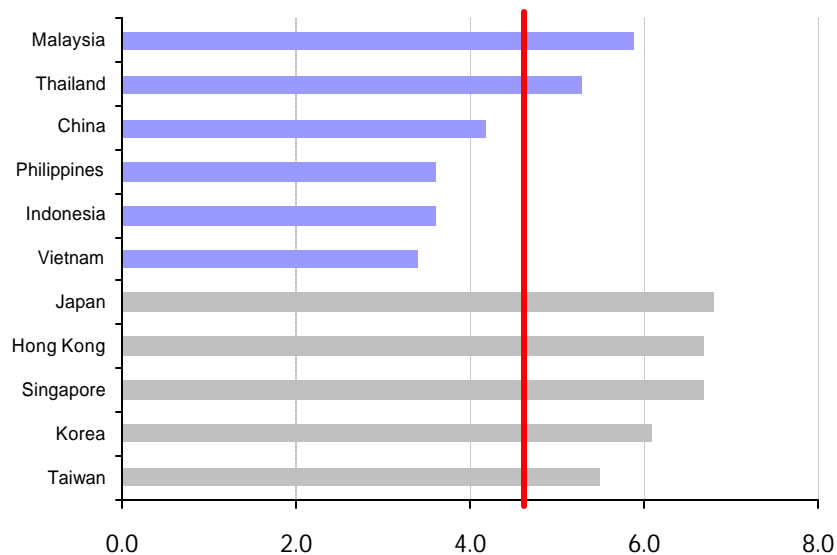
Electricity access in this context is at the household level. It comprises commercially sold electricity, both on-grid and off-grid. It also includes self-generated electricity, for those countries where access to electricity has been assessed through surveys by government or non-government agencies. The data do not capture unauthorized connections. Data is taken from numerous country-specific sources and the IEA *World Energy Outlook 2002*.

Transmission and Distribution Losses (%)



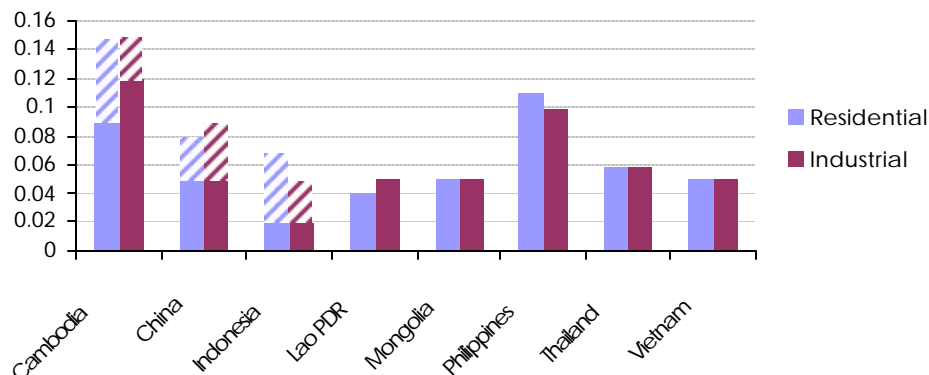
Electric power transmission and distribution losses include technical and non-technical losses due to operation of the system and the delivery of electricity as well as those caused by unmetered supply. This comprises all losses due to transport and distribution of electrical energy and heat. Data is taken from the WB World Development Indicators and country-specific sources. *Note that differences in definitions and classifications are particularly common across countries and over time, making comparisons unreliable.*

Quality of Electricity Supply (Scale of 1-7)



Business leaders survey response to the question, "The quality of electricity supply in your country in terms of lack of interruptions and lack of voltage fluctuations is 1-worse than most other countries, 7-equal to the highest in the world." The red line indicates the average of all 102 respondent countries (developed and developing). Data is from the 2003-2004 Global Competitiveness Report.

Electricity Tariffs (US\$/kWh)



The figure above displays the average residential and industrial electricity tariffs. Where the average tariff was not available, the tariff range is displayed and is denoted by the diagonally-lined regions. Data is for 2003 and is taken from country-specific sources.

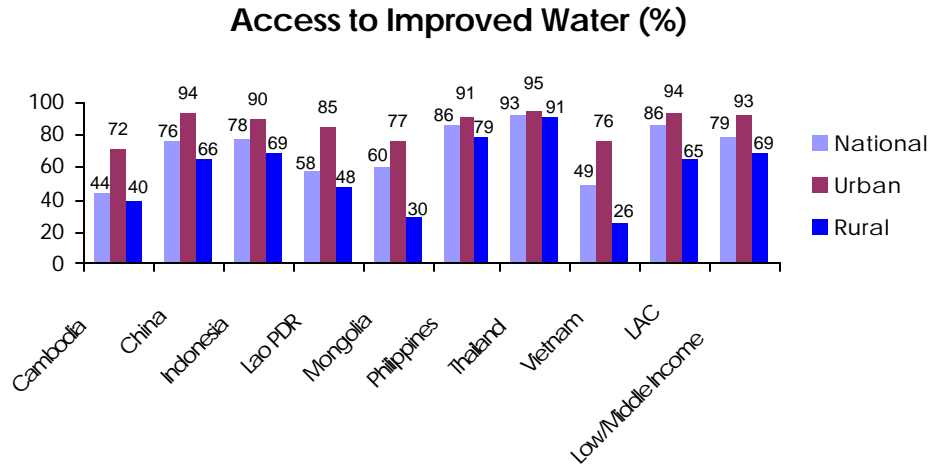
Status of Energy Reform

	Cambodia	China	Indonesia	Lao PDR	Mongolia	Philippines	Thailand	Vietnam
Has the utility (state owned enterprise) been commercialized and corporatized?	Y	Y	Y	Y	Y	Y	N	N
Has an 'Energy Law' that permits the creation of a sector that could be unbundled and/or privatized in part or whole been completely passed by Parliament?	N	N*	Y*	Y	Y	Y*	N	N
Has a regulatory body that is separate from the utility and ministry started work?	Y	Y	Y*	N	Y	Y	N	N
Is there any private sector investment on greenfield sites in operation or under construction?	Y	Y	Y	Y	N	Y	Y	Y
Has the core state owned utility been restructured/separated?	N	Y	Y	Y	Y	Y	N	N
Has any of the existing state owned enterprises been privatized (including outright sale, voucher privatization, or joint ventures)?	Y	Y	..	N	Y	Y	Y	N

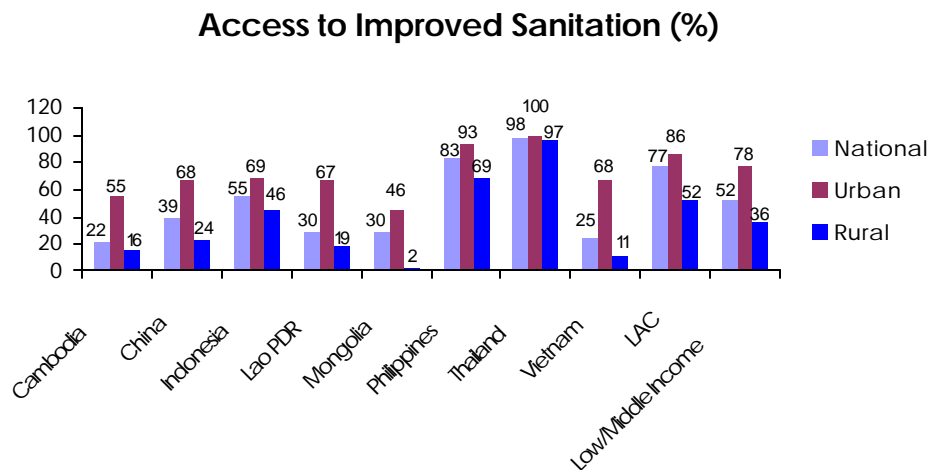
This table presents a scorecard of energy sector reforms as developed by WB report *Global Energy Sector Reform in Developing Countries: A Scorecard*. The first question and step of reform involves (1) the removal of the utility from the direct control that results from being a part of a ministry and (2) the creation of an independent legal corporation with the goal of behaving like a commercial company (e.g. maximizing profits). This second step is crucial to allowing the sale of a state utility to the private sector. It should be noted that the second question specifically asks whether the law is completely passed, since many countries have started the process of drafting and validating a new law but have not enacted it, despite the passage of a considerable period of time. In Indonesia, a law was passed (that created an independent regulatory body) but was later annulled by the Constitution court. Independent regulation is also seen as a step forward in the reform process as it limits government interference. In the fourth question, a greenfield site refers to the construction of an entirely new plant, rather than the change in ownership of an existing plant or extension of capacity at an

existing plant. Restructuring/separation referred to in question 5 results in separate generation, transmission, and distribution entities. The last question asks whether there is *some* privatization, not whether the sector has been completely privatized. To this extent it treats as equal those cases where the state has sold a minority of shares in a company to private shareholders, and cases where the whole of a generating plant or regional distribution network have been sold outright to a single owner. Hence the answer must be seen as measuring whether the country has proved itself willing to permit private ownership of previously state-owned assets, rather than measuring the extent of private ownership.

II. Water Supply and Sanitation

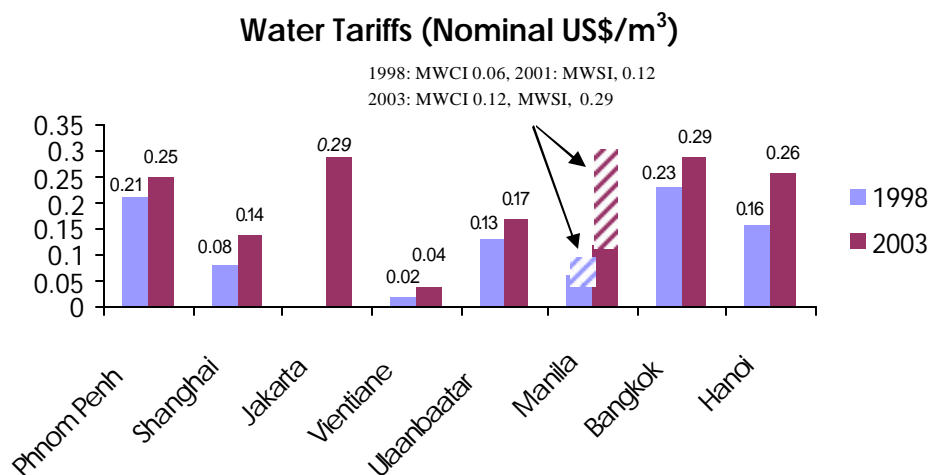


"Improved" water supply technologies are: household connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection. Availability includes at least 20 liters per person per day from a source within one kilometer of the user's dwelling. "Not improved" are: unprotected well, unprotected spring, vendor-provided water, bottled water (based on concerns about the quantity of supplied water, not concerns over the water quality), tanker truck-provided water. Figures are taken from WB World Development Indicators and country-specific sources and are for the latest year available. *Note that differences in definitions and classifications are particularly common across countries and over time, making comparisons unreliable.*

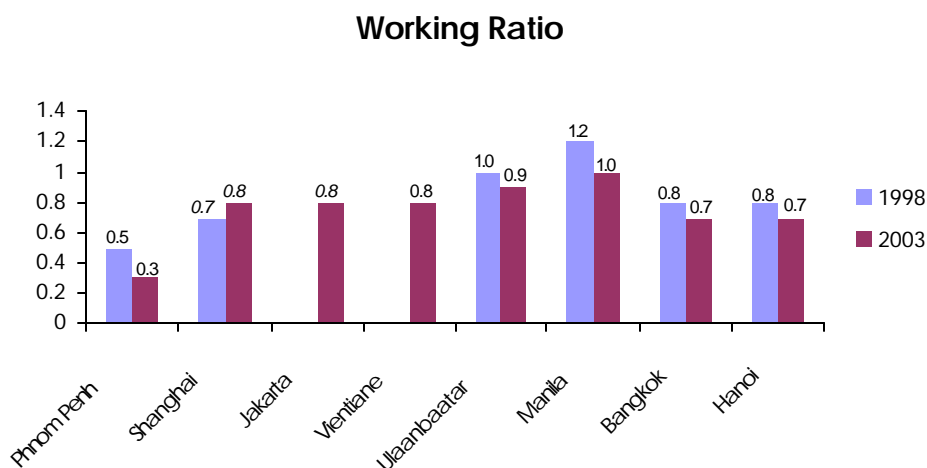


"Improved" sanitation technologies are: connection to a public sewer, connection to septic system, pour-flush latrine, simple pit latrine, ventilated improved pit latrine. The

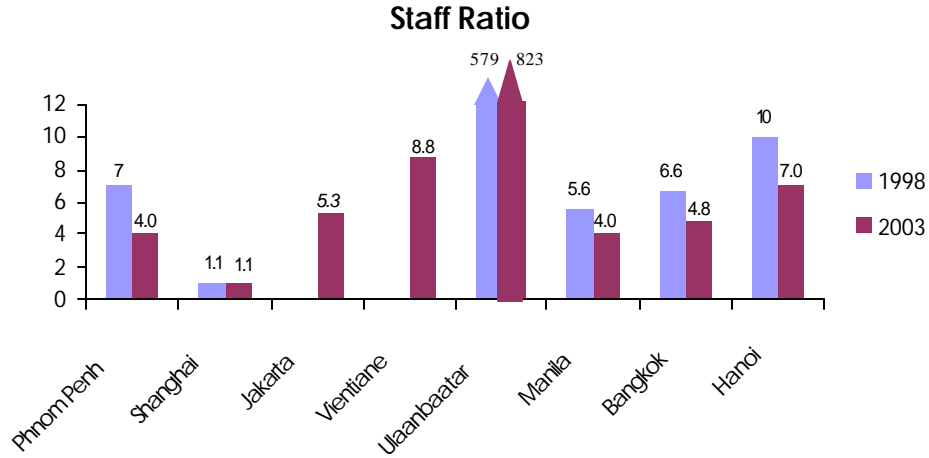
excreta disposal system is considered adequate if it is private or shared (but not public) and if it hygienically separates human excreta from human contact. "Not improved" are: service or bucket latrines (where excreta are manually removed), public latrines, latrines with an open pit. Figures are taken from WB World Development Indicators and country-specific sources and are for the latest year available. *Note that differences in definitions and classifications are particularly common across countries and over time, making comparisons unreliable.*



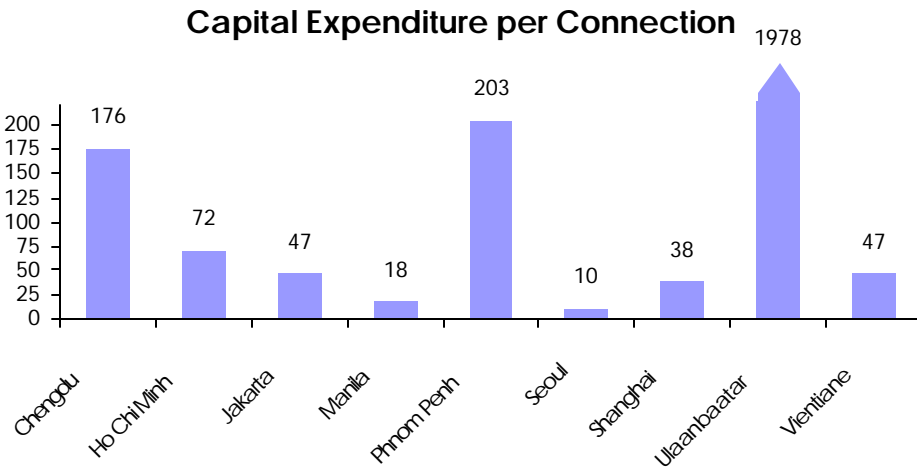
This indicator is the average water tariff from the main utility provider. It is generally calculated as the total revenue from water supply tariffs divided by the amount of water consumed. In Manila, two providers exist (MWSI and MWCI) which have significantly different average tariff levels (the diagonally-lined regions are not a range; rather, they mark the two average tariff levels). Figures are taken from country-specific sources.



The working ratio of the main utility provider is defined as the operating cost as a share of the operating revenue. Figures are taken from country-specific sources and the ADB. For Manila, figures are for MWSS, a government corporation comprised of two service providers (MWCI and MWSI). For Shanghai, working ratio was calculated for two water companies (Shinan and Minhang) and one wastewater company (SMSC).



The staff ratio of the main utility provider is defined as the number of staff per 1000 connections. Figures are taken from country-specific sources and the ADB. Ulaanbaatar's main utility, USAG, maintains bulk connections. Each bulk connection serves approximately 230 people, partially explaining its large ratio.



The figures above are the capital expenditure per connection for the year 2001. Mongolia's main utility, USAG, maintains bulk connections. Each bulk connection serves approximately 230 people, partially explaining its large ratio. Figures are from the ADB's *Water in Asian Cities*.

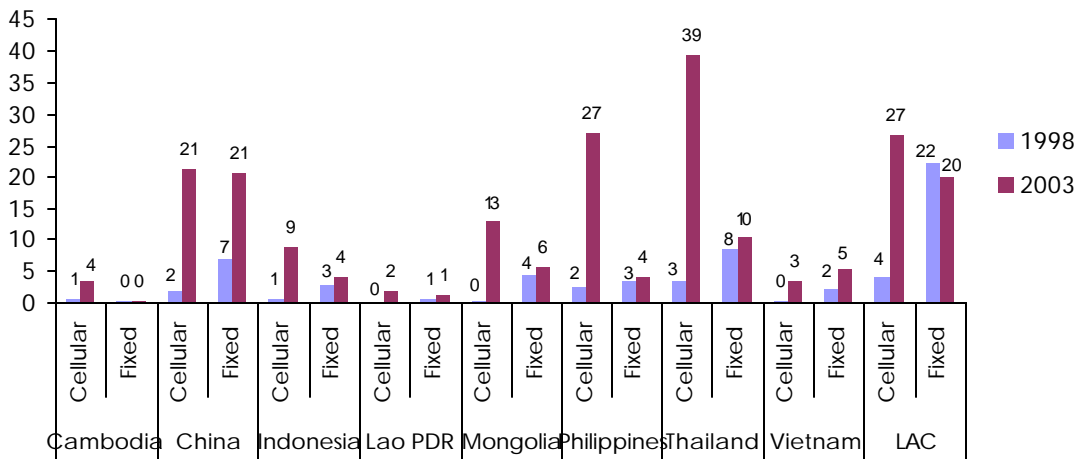
Status of WSS Reform

	Jakarta	Beijing	Bangkok	Manila	Vientiane	Hanoi	Phnom Penh	Ulaanbaatar
Is the water utility predominantly public or private?	Public-w/ 2 concession aires	Public-w/ concession aires	Public	Public, with 2 concession aires	Public	Public	Public	Public
Is the water utility corporatized/commercialized?	Y	Y	N, but public utility is autonomous	Y	N	Y	N, but public utility is autonomous	Y
Regulatory body	Y	N	N	Y	N	N	N	N

Anything more than 50 percent publicly owned is considered “predominantly public.” Further, a “corporatized, commercial entity” involves (1) the removal of the utility from the direct control that results from being a part of a ministry and (2) the creation of an independent legal corporation with the goal of behaving like a commercial company (e.g. maximizing profits). Regulatory body means an entity, distinct from a ministerial department, set up to exercise regulatory functions in the WSS sector. Data is taken from country-specific sources.

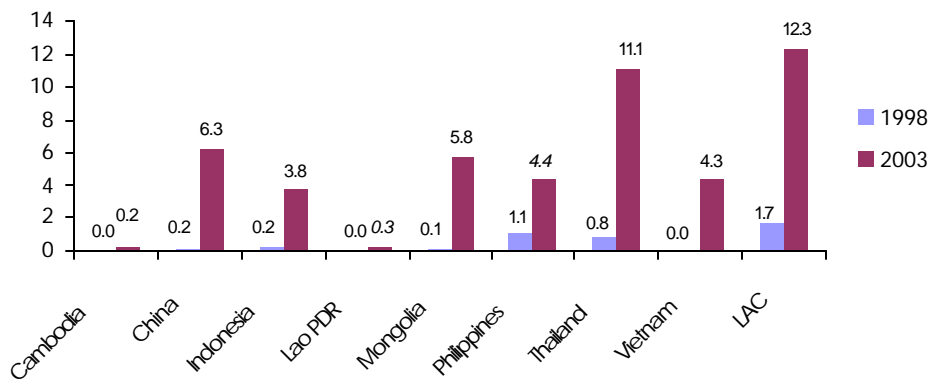
III. Telecommunications

Cellular Subscribers and Fixed Lines per 100 People



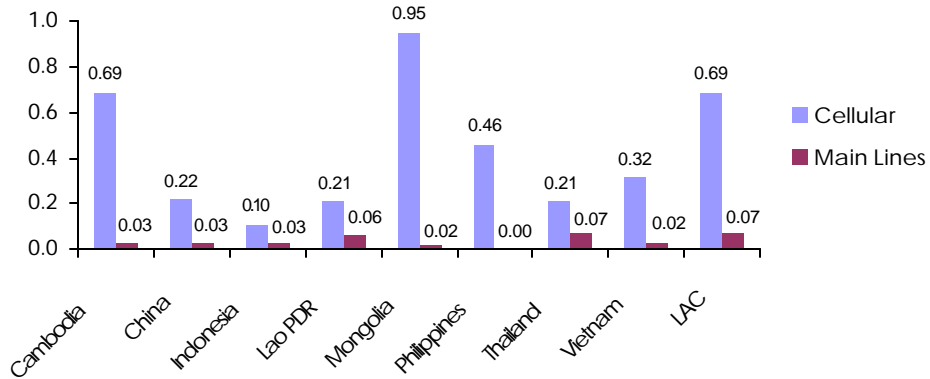
These figures are calculated by dividing the number of cellular subscribers and fixed lines by the number of inhabitants and multiplying by 100. It is clear from the figure that cellular subscribers outpaced fixed line growth, particularly for Thailand, Mongolia, and the Philippines. Figures are from the International Telecommunications Union (ITU).

Internet Users per 100 people



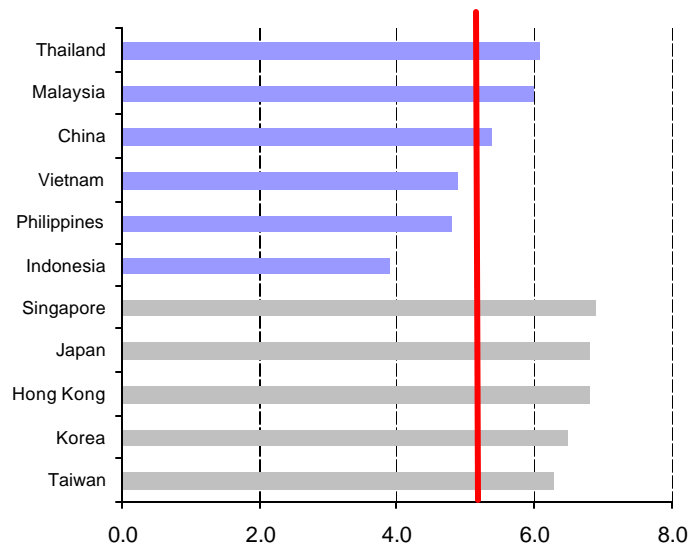
No definition from ITU available. Growth of internet use across Asian countries has been explosive, especially for Thailand and China. Figures are from the ITU.

Price of 3 Minute Local Phone Calls (Nominal US\$)



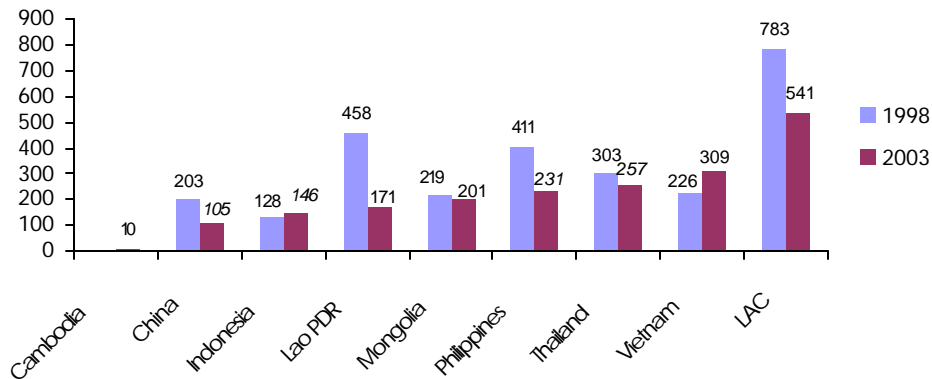
Figures are the price of a 3-minute local call during peak hours for cellular and fixed lines. A local call is within the same exchange area using the subscriber's own terminal (i.e., not from a public telephone). Cellular prices are significantly higher than fixed line prices. Figures are for the latest year available and are taken from the ITU.

Quality of Telephone Infrastructure (Scale of 1-low to 7-high)



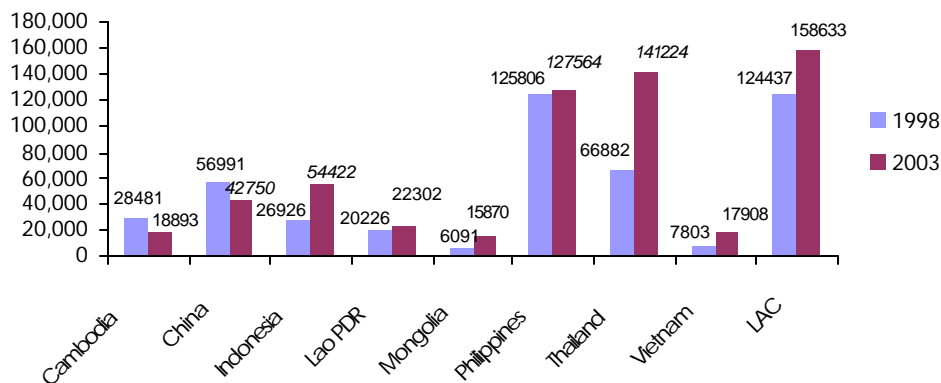
Business leaders survey response to the question, "New telephone lines for your business are 1-scarce and difficult to obtain, 7-widely available and highly reliable." The red line indicates the average of all 102 respondent countries (developed and developing). Data is from the 2003-2004 Global Competitiveness Report.

Income per Fixed Line (Nominal US\$)



Figures are calculated by dividing total fixed line revenue by the number of main lines in operation. Interestingly, the ratio decreased for many Asian countries. The revenue includes non-refundable connection charges, line rentals and local, national long distance and international call usage charges. It typically also includes revenue from public payphones. The treatment of interconnection and settlement payments varies across countries. Most countries include receipts as revenue; some include only billed revenues (not counting any interconnection or settlement payments) while others include net revenues (receipts-payments). Data is from the ITU.

Telecom Revenue per Staff (Nominal US\$)



Figures are calculated by dividing total telecom revenue by the total number of full-time telecom staff. The revenue refers to earnings from the direct provision of facilities for providing telecommunication services to the public (i.e., not including revenues of resellers). This includes revenues from fixed telephone, mobile communications, text (telex, telegraph and facsimile), leased circuits and data communications services. Some countries include telecommunication-related revenue such as directory advertising and equipment rental or sales. Others include value-added telecommunication services such as the provision of electronic mail or on-line services.

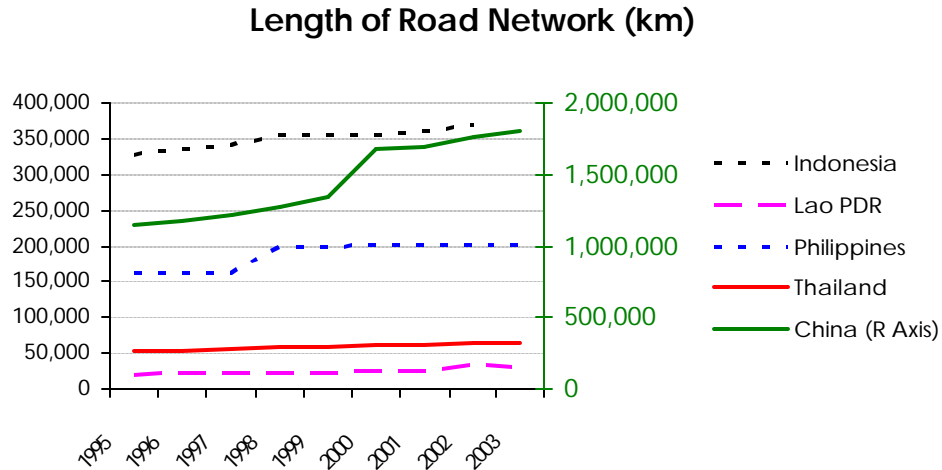
The denominator includes full-time staff employed by telecommunication network operators in the country for the provision of public telecommunication services. Part-time staff are generally expressed in terms of full-time staff equivalents. Some countries do not distinguish between staff working for the provision of telecommunications services and those working in postal services.

Status of Telecom Reform

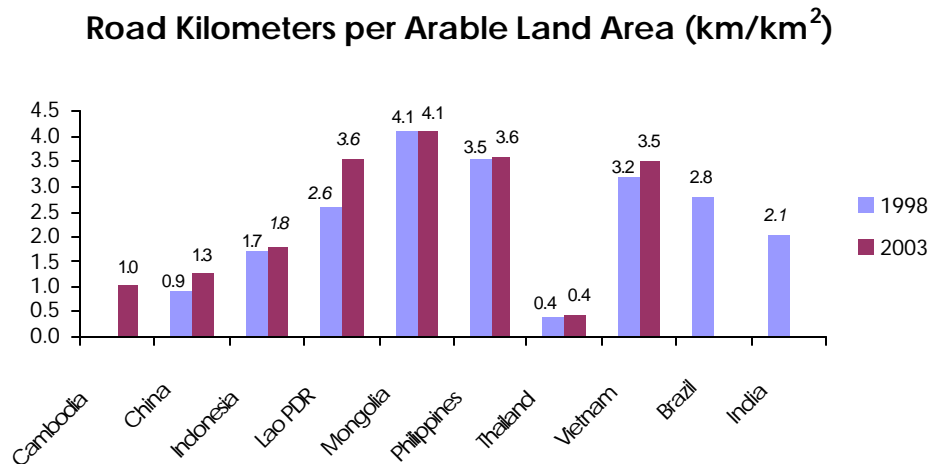
Does competition exist?					
	Fixed Local Loop	Domestic Long Distance	International	Cellular	Internet Service Provider
Cambodia	N	Y	Y	Y	Y
China	Y	Y	Y	Y	Y
Indonesia	N	N	Y	Y	Y
Lao PDR	Y	Y	Y	Y	Y
Mongolia	Y	Y	Y	Y	Y
Philippines	Y	Y	Y	Y	Y
Thailand	Y	Y	Y	Y	Y
Vietnam	N	Y	Y	Y	Y

Yes denotes the existence of more than one service provider, whereas No means there is either zero or one service provider. Data is taken from ITU Asia-Pacific Telecommunication Indicators, 2004 and information provided by Bank staff.

IV. Road Transport

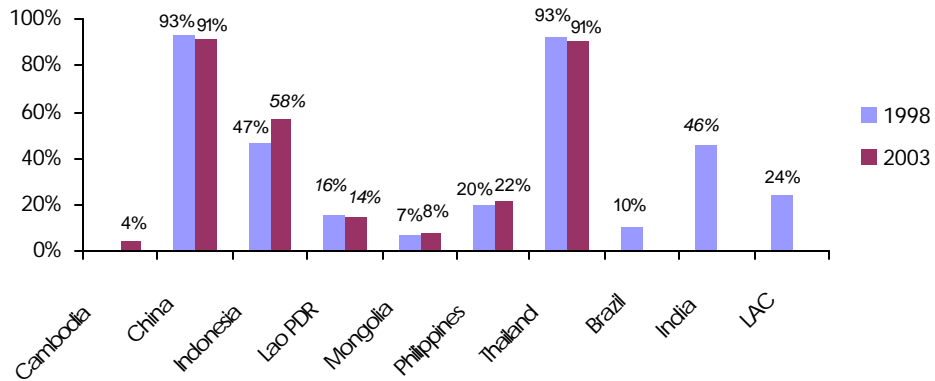


The graph above shows the growth of the total length of the road network since 1995. Given China's large scale, a separate axis for China's trend line is located on the right. Further, data was interpolated for two instances where no figures were available. Road network figures are from country-specific sources.



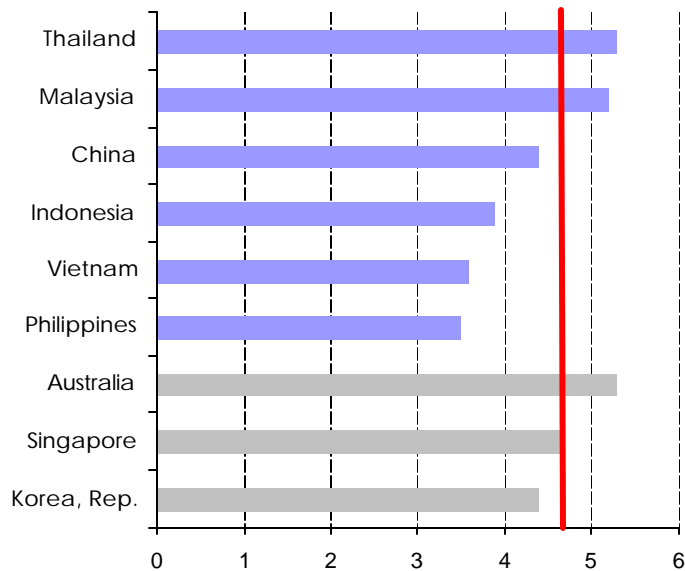
The figures above are the ratio of the total length of the road network to the total area of arable land, giving a sense of the density of roads in a country. Road network figures are from country-specific sources, while arable land area is taken from the WB World Development Indicators.

Percentage of Roads That Are Paved



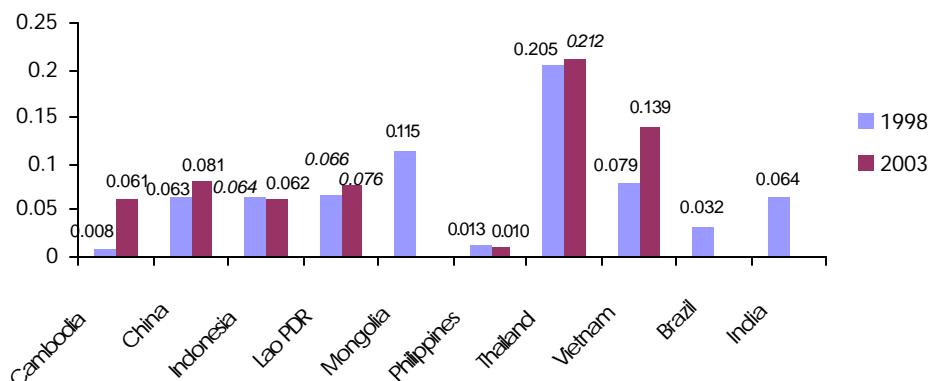
Length of all roads that are surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete or with cobblestones as a share of the total road network. Data is taken from the WB World Development Indicators and country-specific sources for the years shown.

Road Infrastructure Quality (1-low, 7-high)



Business leaders survey response to the question, "Accounting for road quality outside major cities, what is the typical driving speed between cities? 1 (10 km/hr) and 7 (150 km/hr)" The red line indicates the average of all 75 respondent countries (developed and developing). Data is from the 2001 Global Competitiveness Report.

Road Fatalities per 1000 People



Number of people who were involved in any injury accident with at least one motor road vehicle in motion on a public road or private road to which the public has right of access, resulting in at least one person killed as a result of the accident and within 30 days of its occurrence. Included are: collisions between road vehicles; between road vehicles and pedestrians; between road vehicles and animals or fixed obstacles between road and rail vehicles and accidents involving one road vehicle alone. Multi-vehicle collisions are counted as only one accident provided that any successive collisions happen at very short intervals. Data is taken from country-specific sources and the International Road Federation.

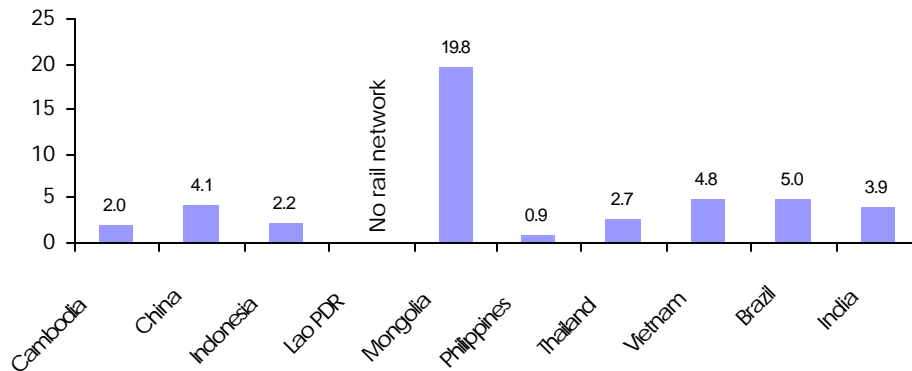
Existence of Roads Board

	1998	2003
Cambodia	N	N
China	N	N
Indonesia	Y	Y
Lao PDR	N	N
Mongolia	N	Y
Philippines	N	Y
Thailand	N	Y
Vietnam	Y	Y

The table displays the answer to the question, "Does an institution that advises the Minister on various matters pertaining to management [and financing] of roads, namely a National Roads Board (NRB) (or Road Council, Highways Agency Board) exist?" Road boards are generally made up of public and private sector citizens, allowing road users to participate and advise in the management, planning, and financing of roads. Data is taken from country-specific sources.

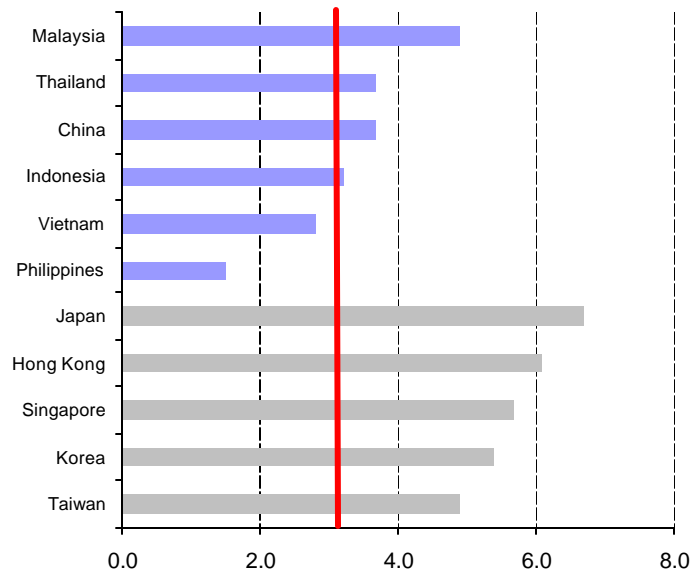
V. Rail Transport

Rail Network per 100 km² of Arable Land



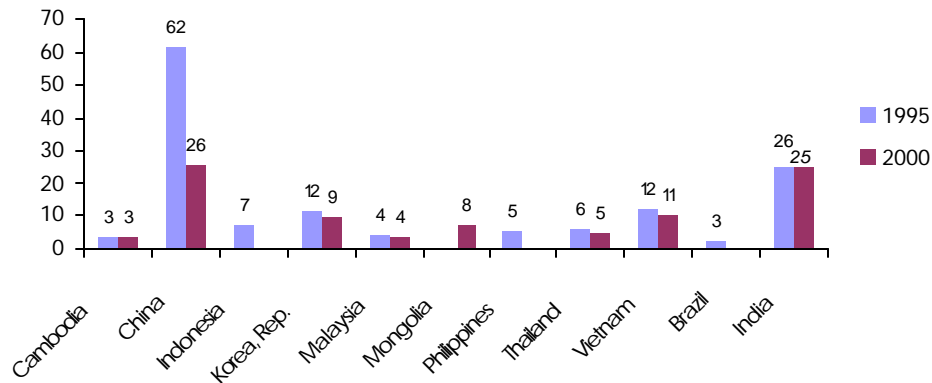
The figure above displays the length of the total rail network per 100 km² of arable land area, giving a sense of the density of the rail network in a country. Railway data is for 2003 and is taken from country-specific sources and the CIA World Factbook. Arable land area is taken from the WB World Development Indicators.

Rail Infrastructure Quality (1-Low, 7-High)



Business leaders survey response to the question, "Railways in your country are 1-underdeveloped, 7-as extensive and efficient as the world's best." Data is from the 2003-2004 Global Competitiveness Report. The red line indicates the average of all 102 respondent countries (developed and developing).

Employee per Rail Kilometer



The figures above represent measures of efficiency and are calculated by dividing the number of employees by kilometers of rail for 1995 and 2000. Data is taken from the country-specific sources and the WB Railways Database.

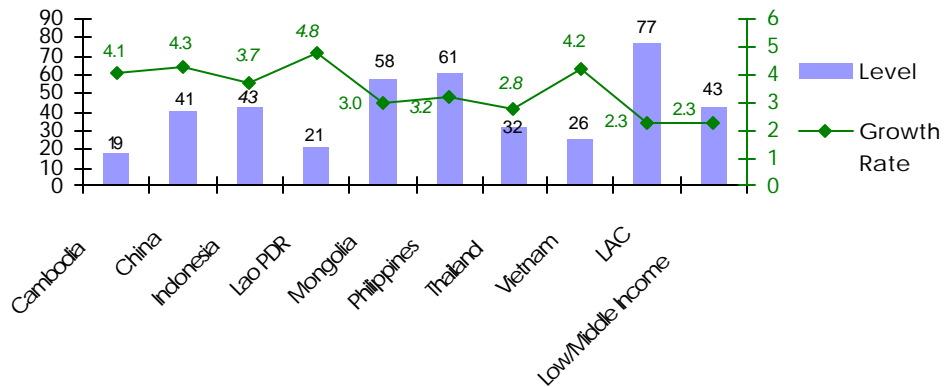
Status of Rail Reform

	Is the main national railway company predominantly public rather than private?	If public, is the national railway company a corporatized commercial entity rather than a government department authority?
Cambodia	Y	Y
China	Y	N
Indonesia	N	Not applicable
Lao PDR	No rail network	No rail network
Mongolia	Y	N
Philippines	Y	Y
Thailand	Y	N
Vietnam	Y	Y

Anything more than 50 percent publicly owned is considered “predominantly public.” Further, a “corporatized, commercial entity” involves (1) the removal of the utility from the direct control that results from being a part of a ministry and (2) the creation of an independent legal corporation with the goal of behaving like a commercial company (e.g. maximizing profits). Data is taken from country-specific sources.

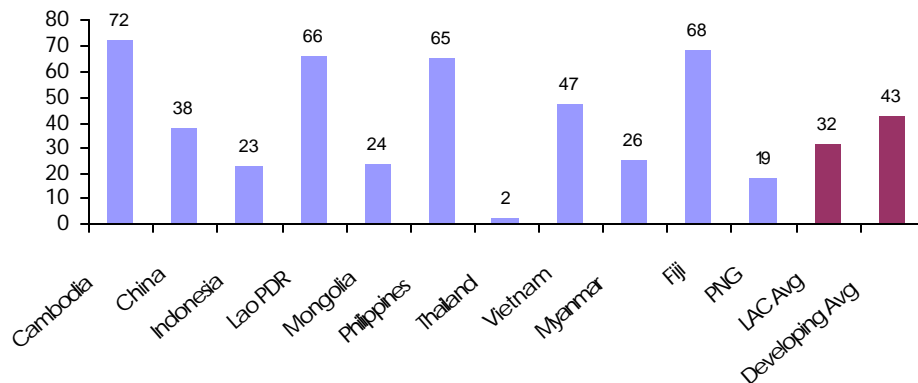
VI. Urbanization Trends

Level and Rate of Urbanization



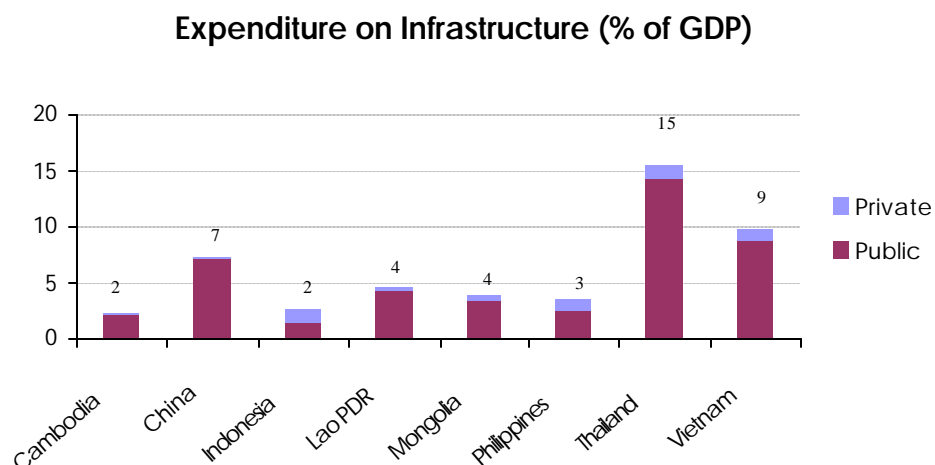
The figure above shows the urbanization level, which is defined by the urban population as a share of the total population. It also shows the urbanization population growth rate. Figures are for 2003 unless italicized, in which cases they are from the latest year available. They are taken from country-specific sources, WB World Development Indicators, UN, and ITU.

Slum Population (% of Urban Population)



Figures above are taken from UN Habitat publication *Slums of the World*, which defines a slum household as a group of individuals living in a dwelling that presents one or more of the following characteristics: insecure residential status, inadequate access to safe water, inadequate access to sanitation, poor structural quality of housing and overcrowding. Figures are from 2001.

VII. Infrastructure Finance



The figure above displays the results of an exercise to determine expenditure on infrastructure. It includes *available* data on capital and current expenditure on transportation, telecommunications, water supply and sanitation, power, and other urban (solid waste, housing, etc) from national government, local government, SOEs, and private sources. Data was not available for many sources and sectors. The following table is helpful to interpret the data as it displays what the figures include.

		National	Local	SOEs	Private
Cambodia	Transport	Current expenditures by MPT	Current expenditures by Provincial Dept.	No	Yes
	Telecom	Yes	Current expenditures by Provincial Dept.	No	Yes
	WSS	Capital expenditures only	No	No	Yes
	Other Urban	No	No	No	No
	Power	Current expenditures by MIME	Current expenditures by Provincial Dept.	Yes	Yes
China	Transport	Yes	Yes	Yes	Yes
	Telecom	No, but most is from SOEs	No, but most is from SOEs	Capital construction only	Yes
	WSS	No, but most is from SOEs	No, but most is from SOEs	Capital construction only	Yes
	Other Urban	No	No	No	No
	Power	Yes	Yes	Yes	Yes

		National	Local	SOEs	Private
Indonesia	Transport	Yes, plus Meteorology/ Geophysical Sector	Yes, plus Meteorology/ Geophysical Sector	No	Yes
	Telecom	Yes, plus Tourism/ Post	Yes, plus Tourism/ Post	No	Yes
	WSS	Yes, plus Irrigation	Yes, plus Irrigation	No	Yes
	Other Urban	No	No	No	No
	Power	No	No	No	Yes
Lao PDR	Transport	Roads only	No	No	Yes
	Telecom	No	No	No	Yes
	WSS	No	No	Yes	Yes
	Other Urban	No	No	No	No
	Power	Yes	No	Yes (EdL only)	Yes
Mongolia	Transport	Yes	Yes	No	Yes
	Telecom	Yes	No	No	Yes
	WSS	No	No	No	Yes
	Other Urban	Yes	Yes	No	No
	Power	Yes	Yes	No	Yes
Philippines	Transport	Capital expenditures only	Capital expenditures only	Capital expenditures only	Yes
	Telecom	Capital expenditures only	Capital expenditures only	Capital expenditures only	Yes
	WSS	Capital expenditures only	Capital expenditures only	Capital expenditures only	Yes
	Other Urban	Capital expenditures only	Capital expenditures only	Capital expenditures only	No
	Power	Capital expenditures only, plus other energy	Capital expenditures only, plus other energy	Capital expenditures only	Yes
Thailand	Transport	Yes	No	Yes	Yes
	Telecom	Yes	No	Yes	Yes
	WSS	Yes	No	Yes	Yes
	Other Urban	Yes	No	Yes	No
	Power	Yes	No	Yes	Yes
Vietnam	Transport	Yes, plus Storage	Yes, plus Storage	Yes, plus Storage	Yes, plus Storage
	Telecom	Yes	Yes	Yes	Yes
	WSS	Yes	Yes	Yes	Yes
	Other Urban	No	No	No	No
	Power	Yes, plus gas	Yes, plus gas	Yes, plus gas	Yes, plus gas