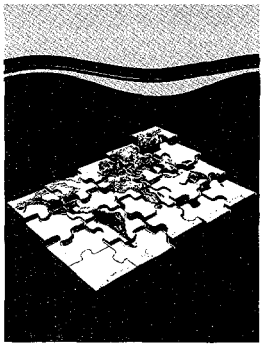

Technical note

Chapter 1

Data and definitions. The historical section of this chapter uses data on GDP and GDP per capita for the period 1700–1988 (for Table 1.1 and Figures 1.1 and 1.3) which are based on a 41-economy sample (with a combined population of 3.99 billion people in 1988) along with aggregate figures on Eastern Europe from Maddison, background paper (covering 310 million people). The sample, along with Maddison's data on Eastern Europe, thus covers roughly 86 percent of the world's population. Economies are classified as OECD, Eastern Europe, and developing. The developing economies are further grouped by geographical region: Latin America; South Asia; East Asia; Africa; and Europe, Middle East, and North Africa (non-OECD, non-Eastern Europe). The economies included in each group are as follows. OECD: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States. Eastern Europe (Maddison): Czechoslovakia, Hungary, USSR. Latin America: Argentina, Brazil, Chile, Colombia, Mexico, Peru. South Asia: Bangladesh, India, Pakistan. East Asia: China; Indonesia; Philippines; Republic of Korea; Thailand; Taiwan, China. Africa: Ethiopia, French Africa (aggregate for Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Gabon, Madagascar, Mali, Mauritania, Niger, Senegal, Togo), Kenya, Nigeria, Tanzania. Europe, Middle East, and North Africa: Algeria, Arab Republic of Egypt, Islamic Republic of Iran, Morocco, Syria, Turkey, Yugoslavia. The term "four newly industrializing economies of East Asia" refers to Hong Kong; the Republic of Korea; Singapore; and Taiwan, China.

Statistical methods. Data are based on a benchmark of 1980 dollars as determined by the International Comparison Project (ICP), if available, or on a benchmark of Maddison estimates of 1980 ICP dollars for others. For countries not in the ICP-Maddison sample (Algeria, Ethiopia, Islamic Republic of Iran, Morocco, Syria, and other African countries), estimates are from a computer data base (copyright 1987 and 1988 by Prospect Research Corporation) developed by Robert Summers and Alan Heston. GDP volume estimates for 1830–1965 are taken from Maddison (1981, 1989), and Maddison and Associates, (forthcoming) for the ICP-Maddison sample countries. The volume series is spliced to a World Bank data base GDP volume series at 1965. GDP volume indexes for 1950-65 are taken from OECD 1968 for the non-ICP-Maddison sample countries. These indexes are also spliced to World Bank data starting in 1965.

World Development Report forecasts. Box 1.4 uses projections for average real GDP growth over the decade of the 1980s as reported in the *World Development Reports* of 1979, 1980, 1981, and 1982. The projections for the developing regions are based on the country classifications used in those Reports at the time of their publication. Because the World Bank's regional country classifications have changed during the past ten years, an attempt has been made to plot the "outcomes" (actual growth performance in the 1980s) on the basis of the original classifications. Therefore, the growth rate averages, as plotted in the box figure, may differ from the regional averages that are presented elsewhere in this report. The plotted growth rates for both the projections and outcomes are based on GDP in constant price and dollar exchange rates that were used in the Reports cited above. Because the World Bank's country classification for the Europe, Middle East, and North Africa region has changed significantly, an analytical group, "oil exporters," is plotted in its place.

Figures. Figure 1.1 is based on data taken from the sample described above, with the exception of the United Kingdom. Estimates for the United Kingdom

for the years before 1830 are extrapolated backward from the sample data using growth rates from Crafts 1981. The starting date for the United Kingdom coincides with estimates of the beginning of the industrial revolution. Some economic historians view the time around 1840 as the beginning of a period of acceleration in U.S. per capita income growth. The conclusion of Japan's deflationary period in 1885–86 is seen by some as the beginning of modern economic growth in that country. For other countries shown in the figure, periods of continuous growth based on 5-year, center-weighted, moving averages of GDP per capita were used to identify the shortest doubling periods that excluded cyclical macroeconomic effects.

Figure 1.2 uses life expectancy estimates from Gwatkin 1978 for years before 1978 and from WHO 1989 for 1978 onward. Limited data availability prevented the identification of a sample with the same life expectancies at the beginning of each noted period. Instead, starting point life expectancies are provided and sample countries are presented in the order of starting life expectancy and chronology (which coincide). Breaking points between periods were determined by the availability of intermediate-year survey data. Figure 1.3 presents timeline data that are 5-year, center-weighted moving averages for a 41-country sample. Data are weighted by GDP. Averages for OECD- and developing-country groups are derived by dividing the total GDP for the group (aggregated at 1980 international dollars) by the total population of the group. Figure 1.5 uses statistics from a World Bank data base based on a 130-country sample. Group averages are GDP weighted.

Chapter 2

Data selection. This chapter uses data from a sample of 68 economies in 5 regions: 27 in Sub-Saharan Africa, 10 in East Asia, 15 in Latin America, 12 in Europe, Middle East, and North Africa (from which Pakistan is excluded), and 4 in South Asia (with which Pakistan is included). The selection of this sample was determined solely by the availability of the required data. The following developing countries with populations of more than 10 million in 1988 did not meet the data criteria: Ecuador, Iran, Iraq, Myanmar, Nepal, Saudi Arabia, South Africa, and Viet Nam.

Statistical methods. Most variables are from a World Bank data base and are self-explanatory. Physical and human capital series, however, do not exist as such. Lau, Jamison, and Louat 1991 suggested a method to overcome this difficulty by computing these stocks from annual capital investment and educational enrollment data. The chapter expands their method and applies it to a larger set of countries.

A growth accounting approach is used. Variables are defined as follows. Variables related to output and inputs: change of GDP in 1980 dollars, *zy*; change in utilized capital (through the use of instrumental variables), *zk*; change in agricultural land, *zh*; change in labor force, *zl*; average level of education (in years of primary and secondary schooling) for the population 15–64 years of age in 1960, e_{60}; change in education if education level ranges from 0 to 3, de_{03}; change in education if education level ranges from 3 to 9, de_{39}. Variables related to openness: price of tradables relative to the U.S. level, zp_{tr}; change in price of tradables if price level is below U.S. level, zp_{tr1}; change in price of tradables if price level is above U.S. level, zp_{tr2}; change of price level of tradables in direction of U.S. price level (under an assumption of symmetrical response; that is, zp_{tr1} minus zp_{tr2}), zp_{tr}; product of change of price of tradables in direction of U.S. price level and level of education (that is, zp_{tr} times *e*), zp_{tre}; and a dummy for missing data on zp_{tr}, *mvpt*. The growth of total factor productivity (the component of *zy* not explained by *zk*, *zl*, or *zh*) was calculated as the residual between the actual *zy* and predicted *zy* using the estimated coefficients on *zk*, *zl*, and *zh* obtained by regression 1 in Note table 2.1 for the sample of 68 countries.

In Table 2.4, the use of the foreign exchange premium as a proxy for policy distortions allows for the

Note table 2.1 Regressions of selected factors in GDP growth, 1960–87

Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*
zk	0.38	0.38	0.38	0.38	0.38
	(17.7)	(17.6)	(17.6)	(17.6)	(17.6)
zl	0.44	0.46	0.046	0.45	0.45
	(3.6)	(3.8)	(3.8)	(3.7)	(3.8)
zh	0.04	0.04	0.04	0.04	0.04
	(1.3)	(1.4)	(1.4)	(1.4)	(1.4)
de_{03}	0.09	0.09	0.09	0.09	0.09
	(2.5)	(2.6)	(2.6)	(2.6)	(2.6)
de_{39}	0.04	0.04	0.04	0.04	0.04
	(1.9)	(2.0)	(2.0)	(2.0)	(2.0)
e_{60} (*100)	0.13	0.16	0.16	0.17	0.17
	(1.5)	(1.8)	(1.8)	(1.9)	(1.9)
zp_{tr1}		0.04			
		(2.0)			
zp_{tr2}		−0.03			
		(−1.2)			
zp_{tr}			0.04	−0.02	
			(2.3)	(−0.6)	
zp_{tre}				0.01	0.01
				(1.6)	(2.7)
mvpt		0.004	0.004	0.004	0.004
		(1.3)	(1.3)	(1.3)	(1.3)
R^2	0.2256				
n	1,826	1,826	1,826	1,826	1,826

Note: Numbers in parentheses are *t*-statistics.
All regressions include dummies for regions (Africa; East Asia; Europe, Middle East, and North Africa; Latin America and the Caribbean; South Asia) and for time (1960–73 and 1974–87).
All data are annual. All changes are differences of log levels except for education levels (which are differences of levels).

Note table 2.2 Dependent variable: change in infant mortality

Independent variable	(1)	(2)	(3)
Growth in private income	−0.024	−0.029	−0.032
	(−2.3)	(−3.6)	(−3.4)
Growth in health expenditure			
General government	−0.002	−0.002	−0.004
	(−0.1)	(−0.1)	(−0.3)
Consolidated central government	0.001	0.001	0.001
	(0.1)	(0.1)	(0.1)
Budgetary central government	0.003	0.002	0.001
	(0.4)	(0.3)	(0.2)
Gastil's index		0.002	0.001
		(4.6)	(2.0)
Female education			−0.004
			(−5.7)

Note: *t*-statistics in parentheses. Continent dummies are included. All changes are first differences in logs.

largest number of observations. The use of two indexes of trade liberalization (Papageorgiou, Michaely, and Choksi 1990; Thomas, Halevi, and Stanton, background paper) and of yearly changes in education yielded results consistent with those shown in Table 2.4.

The effect of "liberty" on infant mortality decline. For regressions on 247 annual country observations for which Gastil's liberty index (political and civil liberties), education data, and reliable infant mortality data are available (1973–84), see Note table 2.2. Because Gastil's index goes from 2 (best) to 14 (worst) (his two indexes of political and civil liberties, which each run from 1 [best] to 7 [worst], have been added together), the positive coefficient on this index implies that political and civil liberties have a negative and significant effect on infant mortality.

Income differences. The analysis in the maps and the text section on regional differences in income within countries is based on the following definitions of regions. Brazil: the southeastern region includes the states of Minas Gerais, Espírito Santo, Rio de Janeiro, and São Paulo; the northeastern region includes Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, and Bahia. China: the eastern region comprises of the provinces of Anhui, Fujian, Jiangsu, Jiangxi, Shandong, Shanghai, and Zhejiang; the south and southwest region here includes Henan, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Guizhou, and Yunnan. India: the eastern region consists of the states of Bihar, Orissa, and West Bengal; the western region includes Daman, Diu, Goa, Gujrat, and Maharashtra. Nigeria: the eastern region includes the provinces of Anambra, Benue, Cross River, Imo, and Rivers; the northern region includes Bauchi, Borno, Gongola, Kaduna, Kano, Plateau, Sokoto, and Niger. United States: the Middle Atlantic region includes the states of New Jersey, New York, and Pennsylvania; the South Atlantic region includes Georgia, North Carolina, South Carolina, Virginia, and West Virginia.

In Box figure 2.5, years of education is computed separately for males and females from primary and secondary school enrollment. Enrollment series are generally available from 1960 onward; in some countries, however, it was also possible to find data from 1950 to 1960. These series are projected backward in order to get series from 1902 onward. Finally, the total number of person-school-years in the working-age population is computed by the perpetual inventory method, and mean years of schooling are obtained by dividing this total number by the size of the working-age population for each period.

Chapter 3

Data for the two cross-sectional analyses. The analyses of the economic burden of adult illness (Table 3.1) and of the education of entrepreneurs (Figure 3.3) are based on several household surveys, including Living Standards Measurement Surveys in six countries conducted in the late 1980s, the 1975/76 Malaysia Family Life Survey, the 1978 Bicol (Philippines) Multipurpose Survey, and the 1978 Indonesian Socioeconomic Survey. These surveys are nationally representative random samples, with the exception of the Philippine and Bolivia (urban only) surveys. For details, see the two background papers by King, Rosenzweig, and Wang.

The economic burden of adult illness. The analysis examined the incidence of illness among adults between ages 20 and 59 years (in the month before the survey), and the duration of illness and absence from work of those who were ill. Self-reported illness may be affected by several factors other than health status, including wages, the possibility of work-sharing arrangements among family members, and the availability of paid sick leave. Sensitivity analyses, however, do not show statistically significant association of self-reported illness or absence from work to daily earnings or whether the worker was entitled to paid sick leave or social security. The number of days lost due to illness was then evaluated at the reported daily earnings of workers. Results show that potential income loss could be substantial comparing with workers' normal income.

Education of entrepreneurs. Figure 3.3 is supported by statistically robust results from multivariate analyses. One background analysis consisted of multinomial logit regressions on occupational choice of adults. Given the choice of being an entrepreneur and undertaking appropriate statistical corrections

for possible sample selection bias, the size of the enterprise was found to be positively associated with the education of the entrepreneur. These results took account of the entrepreneurs' age, sex, and place of residence; for Malaysia, ethnicity and inherited wealth were also controlled for.

AIDS in developing countries. Box figure 3.5 is based on studies of urban samples from three countries. In Rwanda, the sample consisted of 1,255 urban adults from a national sample; in Zambia, 1,078 patients, blood donors, and staff of an urban hospital; and in Zaire, 5,951 employees of an urban textile factory. Low, middle, and high socioeconomic status are defined, respectively, as: for Rwanda, primary education or less, more than primary education, and no definition; for Zambia, 0–4 years of education, 5–9 years, and 10 or more years; and for Zaire, workers, foremen, and executives.

Public spending and social indicators. The analyses of the relative effect of income growth and changes in public spending in the social sectors on changes in infant mortality rates and school enrollment rates were based on two studies which used different econometric models and measures of income: (a) a fixed-effect model with GDP and time dummies, estimated using quinquennial time-series data for 124 countries (see Note table 3.1) (King and Rosenzweig, background paper); (b) a first-difference model with a variable reflecting private income growth (GDP minus total government expenditure) and using an annual time-series data for 68 economies (see Note table 3.2) (Bhalla and Gill, background paper). Using model a, the elasticity of IMR with respect to public spending is −0.08, and income elasticity is −0.11. Using model b, the elasticity of IMR with respect to private income is −0.05.

Note table 3.1 The effect of income and social expenditures on infant mortality; a fixed-effect model

Independent variable[a]	*Coefficient*	*t*
GDP	−0.0000367	−2.954
Health1	−0.0011655	−1.069
Health2	0.0035853	0.836
Educ1	−0.0007568	−0.702
Educ2	−0.0039422	−1.287
Interactions with variable for developing economies		
GDP	0.0000008	0.057
Health1	−0.0148330	−5.826
Health2	−0.0701540	−1.748
Educ1	0.0010280	0.504
Educ2	0.0209830	2.401

Note: Number of observations = 409; adjusted R^2 = 0.9990. Health1 and Educ1 are expenditure data for the consolidated central government accounts; Health2 and Educ2 are derived from budgetary central government accounts. These data are expressed as per capita spending. The infant mortality rates (IMR) were first transformed as log (IMR/1 − IMR). All variables are then defined as the differences from the country means.
a. Time dummy variables and dummies for missing variables are omitted from the table.
Sources: Government expenditures are IMF data and Unesco data; GDP data are from Summers and Heston's (1988) estimates of internationally comparable real product; infant mortality rates are from a World Bank data base, checked against the data survey by Hill and Pebley 1989. See King and Rosenzweig, background paper.

Note table 3.2 The effect of income and social expenditures on infant mortality; a first-difference model

Independent variable	*Coefficient*	*t*
Intercept	−0.024752	−20.63
Private income	−0.049862	−4.04
Government health expenditure		
General government	−0.026073	−1.33
Consolidated central	−0.003557	−0.45
Budgetary central	−0.004220	−0.50

Note: All variables, including the dependent, infant mortality rate (IMR), are defined as the log-differences between t and $t-1$. Private income is measured by GDP, minus total government expenditure.
Sources: World Bank data; IMF data. See Bhalla and Gill, background paper.

Chapter 4

Data and definitions. The last sections of the chapter analyze the productivity of projects utilizing the data on reappraised economic rate of return (ERR) for 1,200 projects in the public and private sectors. The analysis is based on a background paper by Kaufmann. The ERR data originate in the Operations Evaluation Department of the World Bank and the Evaluation Unit of the IFC. Reappraisal of a project takes place within one year of project completion, and the ERR evaluation is then performed according to the standard Squire–van der Tak methodology. The ERR on an investment project is a commonly used productivity indicator measuring the economic contribution of the investment project to the overall economy. It is calculated by measuring a project's benefits and costs, which are adjusted utilizing border and shadow prices to capture opportunity costs. The ERR is the discount rate at which the project's net present value of the stream of benefits and costs is set to zero. An ERR for the project of less than 10 percent implies that each dollar invested in plant and machinery yields annual economic benefits of less than 10 cents per dollar invested—a return that is lower than alternative investment opportunities and does not compare favorably with that on investments in less risky financial instruments. When the net economic benefits are significant, the ERR will exceed the 10–15 percent range.

The average ERR on all evaluated projects has been about 15 percent, but the variation has been large,

ranging from negative values to ERRs of more than 50 percent. Similarly, policy performance has varied enormously across countries and over time. Various country- and year-specific policy variables measuring policy distortions were gathered independently and incorporated into the statistical analysis to determine whether policy-related factors explained differences in the performance of projects. The results are summarized in Table 4.2.

The projects reviewed began as early as the mid-1960s; evaluation took place 1973–89. These projects were implemented in 58 developing economies. For these economies, independent information was available on at least one macro-financial variable (real interest rate, fiscal deficit) or a variable measuring trade restrictions. In addition, data on foreign exchange rate premiums were gathered for each country and year. Thus, each project ERR was correlated with at least two policy indexes.

Table 4.2 presents average ERRs for various values of the four policy indexes: (a) real interest rates, from a World Bank data base; (b) IMF data on central government fiscal deficits; (c) the Halevi-Thomas (Thomas, Halevi, and Stanton, background paper) index of trade restrictiveness/openness, ranging from one (most restrictive) to five (most open), for 32 countries for which comparable published information on tariff and nontariff barriers was available from Bank documents; and (d) the parallel exchange rate premiums (sources were International Currency Analysis, Inc., various years, for the parallel rate and IMF data for the official exchange rate. In addition, as background, other policy indexes were collected and correlated with ERRs, including a measure of distortion in the relative price of tradables (from Dollar, forthcoming) and a second trade liberalization index (from Papageorgiou, Michaely, and Choksi 1990).

Statistical methods. For the overall sample, the simple correlations between each policy index and the project ERRs are of the right sign and statistically significant. For most sectoral and public-private breakdowns, the significance of the correlations between the different policy indexes and sectoral ERRs is maintained, although for selected subsamples (such as between the fiscal deficit and the ERR of nontradables) the simple correlations are not statistically significant.

To explore causality, a variety of controlling variables were obtained for most countries, which made multivariate analysis possible. A tobit procedure was utilized (instead of ordinary least-squares) to address the censoring in the data at an ERR of -5 percent. The ERR of each project is the unit of observation for the dependent variable in the multivariate analysis. Country- and year-specific policy and structural variables were used as independent variables. In addition to the policy indexes, controlling variables in the analysis included, among others, the economywide capital-labor ratio; years of education; degree of institutional complexity of the project; GDP growth rate; and external terms of trade changes. Alternative specifications, including dummy variables to control for country-specific and year-specific effects, were also estimated.

Results. Estimates of the various specifications indicate an economic and statistically significant effect of policy indexes on ERRs, controlling for other factors. The parallel exchange rate premiums and trade restrictiveness variables remain significant across specifications even when combined with each other in the same specification. And the magnitudes of the coefficients are large, which suggests increases in ERRs of 8–10 percentage points (or more) when large improvements in the parallel premiums and trade regime take place. In contrast, when included along the parallel premiums and trade restrictiveness variables, the real interest rate variable loses all economic and statistical significance. The fiscal deficit variable is significant in the single-policy specification and in some combined-policy specifications. Further, a number of additional sensitivity tests were performed by segmenting the sample by time periods and country sizes; the results were not altered.

To test the effect of public sector investments on the productivity of projects in agriculture and industry, two variables were related to ERRs: public investment as a share of GDP, and public investment as a share of total investment in the economy (drawn from a World Bank data base). Figure 4.3 shows the simple ERR averages for each range of the public investment over total investment variable, after the sample is segmented for low and high parallel premiums, respectively. Multivariate tobit analysis was also carried out to control for other structural and policy-related variables. The public investment variables were specified as kink-linear, to allow for a breaking point and separate slopes for the lower and higher ranges of the variable. This permitted testing the hypothesis that the effect of complementary public investments is different when an increase takes place at relatively low levels of public investments than at high levels.

The results of both types of specifications (public investment as a share of GDP, and public investment as a share of total investment) supported the hypothesis that increases in the share of overall public investments improve the ERR of tradable projects, up to a point. For the public investment in total investment specification, the effect of an increase in the share is positive up to a share of 40–45 percent, and negative thereafter, the coefficients being large and statistically significant.

Data and definitions. Figure 5.2 is based on a background paper by Harrison, which draws on a cross-country, time-series data set assembled by the core team for *World Development Report 1991.* Seven proxies for trade and exchange rate policies were used to test the statistical relationship between openness and growth. The first, index of trade liberalization, 1960–84, measures the degree of trade liberalization using data on exchange rate and commercial policies (source: Papageorgiou, Michaely, and Choksi 1990). Although this measure is not comparable across countries, country dummies included in the regressions should control for differences in measurement. The second, index of trade liberalization, 1978–88, measures the movement toward liberalization for 30 countries for the period 1978-88. The index was calculated using country sources on tariffs and nontariff barriers (source: Thomas, Halevi, and Stanton, background paper). The third, foreign exchange premium, measures the deviation of the black market rate from the official exchange rate (source: International Currency Analysis, Inc., various years). The fourth, change in trade shares, measures the ratio of exports and imports to GDP (source: World Bank data). The fifth, movement toward international prices, was derived from the relative price of a country's tradables, which was computed using current and constant national accounts price indexes. The variable is based on a benchmark of the relative price of consumption goods for 1980 from Summers and Heston 1988. It is then transformed to measure the movement toward unity. The sixth, index of price distortion, is a modified version of the index used in Dollar (forthcoming). The relative price of consumption goods from Summers and Heston is "purged" of its nontraded component by taking the residual from a regression of this index on urbanization, land, and population. The seventh, bias against agriculture, measures the indirect bias against agriculture from industrial sector protection and overvaluation of the exchange rate. (source: Schiff and Valdés, forthcoming).

Statistical methods. The effects of these seven variables on GDP growth were separately tested, controlling for other effects such as input growth (capital, labor, education, land) and country differences. Annual observations were available for time periods which ranged from 1960–87 for trade shares to 1978–88 for the Halevi-Thomas trade liberalization index (Thomas, Halevi, and Stanton, background paper). The number of countries available for each index varies, ranging from 60 (for trade shares) to 19.

Results. Note table 5.1 shows the results for different period averages. Although the annual data were used for the estimates presented in columns 1 and 2, cyclical fluctuations could in theory lead to spurious correlations between the policy variables and GDP growth. Consequently, six- or seven-year averages were also used. Period averages were computed for 1960–66, 1967–73, 1974–81, and 1982–88. These results are given in columns 3 and 4. Finally, averages for the entire period were also computed, reported in columns 5 and 6. With the exception of the foreign exchange premium and changes in trade shares—which do suggest that greater openness positively affects growth—the other variables are not significant

Note table 5.1 Effects of openness on growth: synthesis of findings

	Annual data		*Six-year averages*		*Entire period averages*	
Openness variable	*Levels (1)*	*Changes (2)*	*Levels (3)*	*Changes (4)*	*Levels (5)*	*Changes (6)*
Trade liberalization index						
1960–84	>0*	>0	>0**	>0	<0	>0
1978–88	>0**	>0	..	..	<0	>0
Foreign exchange premium[a]	>0**	>0**	>0**	>0	>0**	>0
Trade shares	>0	>0*	<0	>0**	>0	>0**
Price distortion measure[a]	>0**	<0	>0**	>0**	<0	>0
Movement toward world prices	..	>0**	..	>0	..	>0
Bias against agriculture[a]	>0*	>0	>0*	>0**	>0	>0

** Significant at the 5 percent level.
* Significant at the 10 percent level.
Note: All regressions except entire period average include country dummies.
a. For purposes of comparison, a value of ">0" indicates that more openness (less distortion) positively affects growth. Consequently, for the foreign exchange premium, price distortion measures, and bias against agriculture, the table shows ">0" when a higher level of distortion negatively affects growth.

when long-term averages are used. Trade policies in developing countries have varied too much during the 1960–87 period to make long-term averages very meaningful. This analysis draws more from variations in trade policy over time *for the same country* rather than exploiting differences across countries.

The annual data and six-year averages do indicate a robust relation between openness and growth. All variables which are statistically significant show a positive relation between openness and growth—in levels or differences, annually, or over several years.

Although the partial correlations presented in Figure 5.2 are all statistically significant, the amount of variation explained by the openness variable varies. The R^2 on the partial correlations ranged from 0.03 to 0.30, indicating that although trade policy is important, much variation in growth rates is still unexplained, even after accounting for education, labor, land, and capital stock.

Direct foreign investment. The chapter's discussion of direct foreign investment in manufacturing uses data for Côte d'Ivoire, Morocco, and Venezuela to compare the relative performance of domestic and foreign firms in the manufacturing sector. Relative levels of labor productivity as well as export orientation were compared for domestic firms, joint ventures (minority foreign ownership), and majority-owned foreign firms. Means were computed, weighted by the share of each firm in total sectoral output. Because labor productivity or export orientation could be higher simply because of capital intensity or the size of the firm, means were also computed controlling for the capital-labor ratio and firm size, but the results remained unchanged.

The possibility that domestic firms benefit from a significant foreign presence, generating so-called technological spillover effects, was also analyzed. The possibility of "spillover" was tested by deriving a production function for domestic firms and measuring the effect of foreign firms on the growth in productivity of domestic firms. Foreign presence was measured by the share of foreign investment in the sector. The evidence suggests few spillovers.

Chapter 7

Types of government. Figure 7.1 is based on Vanhanen 1979, 1990. The data base created from these sources contains time series for 145 countries from 1850 to 1987 (although many countries in the sample did not gain independent governments until after World War II). The classification of one-party states differs from Vanhanen's in that it includes countries in which a single party receives more than 95 percent of the vote, as well as countries that have one party by law. This correlates, in general, with Vanhanen's ranking of "index of democratization" (a combination of vote received by the largest party and the percentage of population participating in the vote) using a cutoff of 10 percent in the index of democratization.

Income distribution. The data on income distribution in Figure 7.2 are from Sachs 1989, with additions of United Nations and World Bank data. Income inequality is defined as the ratio of the income shares of the highest and lowest quintiles. Per capita GDP growth statistics are World Bank data calculated using the ordinary least-squares method for 1965–89. Other variables are also from a World Bank data base. The statistical work was conducted using both levels and growth of education stock and per capita GDP. Continental dummy variables were included.

One set of regressions tested the hypothesis that income inequality matters for the rate of growth a country can achieve. In this regression it appears that high inequality is associated with lower growth. With continental dummies, however, the result does not hold up. The second set of regressions tested the hypothesis that the level of income inequality is influenced by education and per capita GDP. The level of both education and per capita GDP are associated with lower income inequality. Without continental dummies, the growth of per capita GDP appears to be associated with lower income inequality. This result, however, disappears with the inclusion of continental dummies. In sum, the relation between growth and income inequality is weak, and the direction is ambiguous.

Chapter 8

The estimates in Table 8.1 are based on model simulations by the World Bank's country economists for a sample of 40 countries, taking into account domestic policies and external economic conditions. The estimates in the table are based on an unweighted average of deviations (in percent per year) under the specified scenario from the growth rate projected in the "central case." For each country, the central case is based on good domestic policies and external economic conditions as depicted by the baseline scenarios described in Chapter 1.

The results should be regarded as very rough estimates and are to be interpreted only as illustrative. The number of countries considered for calculating the averages varies from cell to cell because not all country-specific exercises considered all combinations of domestic policy stance and external economic conditions. In addition, the external conditions assumed under the "poor" and "very good" case scenarios are country-specific; for example, higher international oil prices may have been considered as part of a "very good" case scenario for an oil-exporting country but as part of a "poor" case scenario for an oil-importing country. Conversely, the key assumptions for the baseline scenario for the external economic conditions are uniform across countries.