ACLP Political andEconomic Database Codebook

Mike Alvarez, De Paul University
José Antonio Cheibub, University of Pennsylvania
Fernando Limongi, University of Sao Paulo
Adam Przeworski, University of Chicago

December 1999

This document describes all the variables created for and used in the project *Democracy and Development: Political Institutions and Material Well-Being in the World, 1950-1990.* The data set covers 135 countries observed between 1950 or the year of independence or the first year for which data on economic growth are available ("entry year"), and 1990 or the last year for which data on economic growth are available ("exit year"). The unit of analysis is a particular country during a particular year, for a total of 4,126 observations.

The core of the data set is constituted by the regime variables. A detailed discussion of the way in which these variables were conceptualized and operationalized can be found in Alvarez, Cheibub, Limongi and Przeworski (1996).

All variables used in the project are listed below. The regime variables are listed first, followed by all the other variables in alphabetical order, including the ones derived or related to the regime variables. Missing data in all variables are coded as -9. Information about sources is given in brackets. Variables with no reference to source are either coded by the authors, derived from existing variables, or common knowledge. All variable names are in capital letters.

REGIME VARIABLES

See Alvarez, Cheibub, Limongi and Przeworski (1996).

REG: Dummy variable coded 1 for dictatorships and 0 for democracies. Transition years are coded as the regime that emerges in that year. For instance, there was a transition from democracy to dictatorship in Argentina in 1955. In that year, REG=1.

INST: Classification of political regimes in which democracies are distinguished by the type of executive. Coded 0 if dictatorship; 1 if parliamentary democracy; 2 if mixed democracy; 3 if presidential democracies. Transition years are coded as the regime that emerges in that year.

INST2: Identical to INST, except for the cases that resulted in a transition from above (by the incumbent). In these cases the incumbent rule (INCUMB) for classification of democracies and dictatorships was not applied and the regime was classified as parliamentary, mixed or presidential.

DIVIDED: Classification of political regimes in which dictatorships are distinguished by the number of formal powers. Coded 0 if democracy; 1 if dictatorship with a legislature or at least one political party; 2 if dictatorship with executive only. Transition years are coded as the regime that emerges in that year.

MOBILIZE: Classification of political regimes in which dictatorships are distinguished by the presence of political parties. Coded 0 if democracy; 1 if mobilizing dictatorship (with parties); 2 if exclusionary dictatorship (without parties). Transition years are coded as the regime that emerges in that year.

AUT: Classification of political regimes in which dictatorships are distinguished by the existence of a legislature (elected or appointed). Coded 0 if democracy; 1 if bureaucracy (dictatorships with a legislature); 2 if autocracy (dictatorships without a legislature). Identical to LAWS, except that coding was adjusted for transitional regimes. See appendix 3 for a summary of these adjustments. Transition years are coded as the regime that emerges in that year.

LAWS: Classification of political regimes in which dictatorships are distinguished by the existence of a legislature (elected or appointed). Coded 0 if democracy; 1 if bureaucracy (dictatorships with a legislature); 2 if autocracy (dictatorships without a legislature). Transition years are coded as the regime that emerges in that year.

ALL OTHER VARIABLES

ACCHEAD: Number of changes of chief executives (HEADS) accumulated during the life of a particular political regime as defined by REG.

AGDEMONS: Any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature. [Banks 1996]

AGEA: Age in years of the current regime as classified by AUT.

AGEH: Number of years chief executive has been in power. The year the chief executive comes to power is coded 1. In cases in which chief executive changed more than once during one year (HEADS>1) AGEH=1. Also, AGEH=1 for the first year of countries that became independent after 1950 (even in cases where the chief executive served as a prime-minister or governor general of the colony). AGEH is missing for Switzerland, Uruguay (1951-1966) and Yugoslavia after 1980 due to their collective executive. [Banks 1997, Da Gra a 1985, Bienen and Van De Walle 1991]

AGEI: Age in years of the current regime as classified by INST.

AGER: Age in years of the current regime as classified by REG. The year in which the regime comes into existence is coded as 1. When applicable, ages were extended back as far as 1870. See appendix 2 for the value of AGER in 1950 for those regimes that existed before then.

AGETOGO: Number of years before a regime transition (as classified by REG). Transition year is coded as 0. Countries that never experienced a transition during the 1950-90 period, and

the last regime in each country, are coded as missing.

ASPELL: Number of successive spells of political regimes as classified by AUT. A spell is defined as years of continuous rule under the same regime.

BIRTHS: Crude birth rate per 1000 people [WB94, series 374].

BRITCOL: Dummy variable coded 1 for every year in countries that were British colonies any time after 1918, 0 otherwise.

CATH: Percentage of Catholics in the population. [LPS 1993/94].

CIVLIB: Civil liberty. This variable can take values from 1 (least free) to 7 (most free). [Freedom House 1992].

CIVMIL: Civil-military relations coded 1 if a government was controlled by a nonmilitary component of the nation's population; 2 if outwardly civilian government effectively controlled by a military elite; 3 if direct rule by the military, usually (but not necessarily) following a military coup d'etat; 4 if other (all regimes not falling into one or another of the foregoing categories, including instances in which a country, save for reasons of exogenous influence, lacks an effective national government). [Banks 1996].

COMEX: Dummy variable coded 1 for countries that are primary commodity exporters, as defined by the IMF, 0 otherwise. [IMF 1994b].

CTRCEPT: Percentage of female population using contraception [WB94, series 369].

COUNTRY: The number assigned to each country in ACLP, from 1 to 135 (See appendix 1 for country codes).

CPI: Rate of inflation: annual rate of growth of the consumer price index. [IMF (1994, CD-ROM)].

DEATHS: Crude death rate per 1000 people [WB94, series 375].

DEMADIC: Dummy variable coded 1 for all the years of a democracy that follows a dictatorship (as defined by REG), 0 otherwise.

DEMBDIC: Dummy variable coded 1 for all the years of a democracy that precedes a dictatorship (as defined by REG), 0 otherwise.

DICADEM: Dummy variable coded 1 for all the years of a dictatorships that follows a democracy (as defined by REG), 0 otherwise.

DICBDEM: Dummy variable coded 1 for all the years of a dictatorship that precedes a democracy (as defined by REG), 0 otherwise.

EDT: Cumulative years of education of the average member of the labor force. (Bhalla-Lau-Louat series). [Bhalla 1994].

EDTG: Percent annual rate of growth of EDT.

EFFPARTY: Number of effective parties, defined as 1/(1-F), where F=Party Fractionalization Index. [Banks 1996].

ELF60: Index of ethnolinguistic fractionalization, 1960. [Easterly and Levine 1997]

ETHNIC: Percentage of population of the largest ETHNIC group, measured in the year for which data were available (roughly 1976-1985). [*The Economist* 1988 and Vanhanen 1992].

EXSELEC: Mode of effective executive selection:1 if direct election (election of the effective executive by popular vote or the election of committed delegates for the purpose of executive selection); 2 if indirect election (selection of the effective executive by an elected assembly or by an elected but uncommitted electoral college); 3 if nonelective (any means of executive selection not involving a direct or indirect mandate from an electorate). [Banks 1996, but modified and completed where appropriate].

FEMSEC: Gross enrollment ratio, secondary, female [WB94, series 301].

FERTIL: Total fertility rate (births per woman). [WB94, series 373].

FLAGC: Dummy variable coded 1 for the first year each country is observed, 0 otherwise.

FLAGE: Dummy variable coded 1 for the last year each country is observed, 0 otherwise.

FLAGR: Dummy variable coded 1 in the first year of each regime spell (as classified by REG), 0 otherwise.

G: Annual rate of growth of per capita income (LEVEL).

GDPW: Real GDP per worker, 1985 international prices [PWT56].

GINI: Gini index of income distribution. [Deininger and Squire 1996]

GLAG: G lagged one year.

GXPDEDUC: Central government expenditure on education as as share of GDP (both at factor cost, current national currency). [WB1994, series 450/series 9].

GXPDHLTH: Central government expenditure on health as a share of GDP (both at factor cost, current national currency). [WB 1994, series 451/series 9].

GXPDSSEC: Central government expenditure on social security and welfare as a share of GDP (both at factor cost, current national currency) [WB 1994, series 452/series9].

GXPKTOTL: Central government total capital expenditure as a share of GDP (both at factor cost, current national currency) [WB 1994, series462/ series S9].

HEADS: Number of changes of the chief executive in each year. Chief executives are presidents in presidential democracies, prime ministers in parliamentary and mixed democracies, and whoever is the effective ruler in dictatorships (designated explicitly as "dictators," or as "heads of military juntas," "presidents," "leaders of the ruling party," "executers of the state of emergency," or "kings"). Contrary to Bienen and Van del Walle (1991), we did

not exclude acting or provisional governments, on the assumption that one cannot distinguish between cases in which heads attempted to consolidate power and failed from cases in which heads did not try to do so. HEADS is coded as missing for Switzerland, Uruguay from 1951 to 1966, and Yugoslavia after 1980, cases of a collective executive with specific rules for rotation of the chief executive. For Portugal the president was considered to be the chief executive between 1976-1982 and the prime minister between 1983-90. [da Gra a 1985, Bienen and Van de Walle 1991, and Banks 1996].

INCUMB: Consolidation of incument advantage. Dummy variable coded 1 if: (1) the regime year qualifies as a democratic regime *and* (2) sometime during its current tenure in office the incumbents (person, party, military hierarchy) unconstitutionally closed the lower house of the national legislature and rewrote the rules in their favor.

INEQ: Ratio of income shares of the top to the bottom quintiles of income recipients. [Deininger and Squire 1996].

INFMORT: Infant mortality rate per 1000 live births [WB 1994, series 379].

INV: Real gross domestic investment (private and public) as a percentage of GDP (both in 1985 international prices). [PWT56].

KS: Capital stock per capita. Capital stock data come from PWT5.6 for 1578 observations in 62 countries. The remaining cases are generated according to the following procedure: (1) Regress (in logs) output on capital stock and labor force for the observations for which data are available, using a fixed-effects model. (2) Regress the country-specific fixed effects on initial LEVEL and regional dummy variables and fill for the remaining 73 countries. (3) Use the estimated coefficients from (1) and the predicted fixed effects from (2) to fill both for the missing years in countries for which some data are available and all years for countries for which they are not. Retain the original observations whenever available and fill with the estimates when they are not. See appendix 4 for the detailed procedure adopted to construct this variable.

KSG: Growth of KS.

LAGREG: Lagged REG. In this case, transition years are coded as the regime that dies. For instance, there was a transition from democracy to dictatorship in Argentina in 1955. In that year, LAGREG=0.

LEGELEC: Number of elections held for the national lower chamber in a given year. [Mostly taken from Banks 1996; complemented by Keesing=s Contemporary Archives.]

LEGSELEC: Legislative selection. Coded 0 if no legislature exists (includes cases in which there is a constituent assembly without ordinary legislative powers); 1 non-elective legislature (examples include the selection of legislators by the effective executive, or on the basis of heredity or ascription); 2 if elective (legislators, or members of the lower house in a bicameral system, are selected by means of either direct or indirect popular election). [Banks 1996, but modified and completed where appropriate].

LEVEL: Real GDP per capita, 1985 international prices, Chain index. [PWT56].

LEVLAG: LEVEL lagged one year.

LF: Labor force, derived from PWT5.6.

LFAGRIC: Labor in agriculture (% of total labor force). [WB 1994, series 309].

LFG: Labor force growth. Annual rate of growth of LF.

LFGLAG: LFG lagged one year.

LFPW: Labor force, female (% of total). [WB 1994, series 308].

LIVES: Life expectancy at birth, total (in years). [WB 1994, series 387].

LS: Labor share of value added in manufacturing. [WB 1995, series UM VAD WAGE ZS].

MOSLEM: Percentage of Moslems in the population. [LPS 1993/94].

NEWC: Dummy variable coded 1 for every year in countries that became independent after 1945, 0 otherwise.

ODRP: Other democracies in the regions, percentage. Percentage of democratic regimes (as defined by REG) in the current year (other than the regime under consideration) in the REGION to which the country belongs. For example, in 1980 Kenya had an authoritarian regime. The number of democracies in the region equalled 4 and the total number of regimes in the region equalled 44. ODRP for Kenya 1980 then equals 4/44. In turn, Austria had a democratic regime in 1980. The number of other democracies in the region was 24 and the total number of regimes in the region was 25. ODRP for Austria 1980 then equals 24/25.

ODWP: Other democracies in the world, percentage. Percentage of democratic regimes (as defined by REG) in the current year (other than the regime under consideration) in the world. Constructed in the same way as ODRP.

OIL: Dummy variable coded 1 if the average ratio of fuel exports to total exports in 1984-86 exceeded 50%, 0 otherwise. [International Monetary Fund (1994b)].

OPENC: Exports and imports as a share of GDP (both in 1985 international dollars). [PWT56].

PARTY: Number of political parties in a given year. Coded 0 if no parties (political parties were banned, or elections were held on a non-partisan basis, or incumbents used their electoral victory to establish a non-party rule by banning all parties, or the current term in office ended up in a later year in the establishment of a non-party rule; 1 if one party (the share of seats in the lower house of the national legislature held by the largest party was 100%, or there was only one party list presented to voters, or incumbents used the electoral victory to establish a one-party rule by banning all opposition parties or forcing them to merge with the ruling party, or the current term in office ended up in a later year in the establishment of a one-party rule); 2 if more than one party. [Banks 1996, but modified and completed where appropriate].

PINV: Price level of investment. [PWT56].

POLLIB: Political liberty. This variable can take values from 1 (least free) to 7 (most free). [Freedom House 1992].

POP: Population, in thousands. [PWT56].

POPG: Annual rate of growth of population. [PWT56].

PPPQUAL: Data quality (ranging from 0 = worst to 10 = best) of Penn World Tables, version 5.5, by country. [Appendix A:2 in Summers and Heston 1991].

PRESELEC: Number of presidential elections held in a given year. [Mostly taken from Banks 1996; complemented by Keesing=s Contemporary Archives].

PRIME: US prime rate. [IMF 1994a, CD-ROM)].

PROT: Percentage of Protestants in the populaton [LPS 1993/94].

RECOVERY: Dummy variable coded 1 for the first five years after the end of a war (WAR).

REGION: Region of the world, coded 1 if Latin America and Caribbean; 2 if Middle East; 3 if Eastern Europe; 4 if Africa; 5 if Southern Asia; 6 if Eastern Asia; 7 if OECD. [World Bank 1990].

REGION2: Region of the world, coded 1 if Sub-Saharan Africa; 2 if South Asia; 3 if East Asia; 4 if South East Asia; 5 if Pacific Islands/Oceania; 6 if Middle East/North Africa; 7 if Latin America; 8 if Caribbean and non-Iberic America; 9 if Eastern Europe/Soviet Union; 10 if Industrial Countries.

RELIGION: Percentage of population of the largest religious group, measured in the year for which data were available (roughly 1976-1985). [*The Economist* 1988 and Vanhanen 1992]

RIOTS: Number of violent demonstrations or clashes of more than 100 citizens involving the use of physical force. [Banks 1996].

RSPELL: Number of successive spells of political regimes as classified by REG. A spell is defined as years of continuous rule under the same regime.

SEATS: Percentage of seats in the lower house of the national legislature which are held by the largest political party or party list. [Based on Banks 1996, but modified and completed where appropriate].

STRA: The sum of past transitions to authoritarianism (as defined by REG) in a country. If a country experienced one or more transitions to authoritarianism before 1950, STRA was coded 1 in 1950.

STRD: The sum of past transitions to democracy (as defined by REG) in a country. If a country experienced one or more transitions to democracy before 1950, STRD was coded 1 in 1950.

STRIKES: Number of strikes of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority. [Banks 1996].

TINC: Regime transitions (including transitions by incumbents), as coded by INST2. Coded 0 for years in which there was no transition, 1 for years in which TTI = 1, and 2 for years in which there was a regime transition led by the current incumbent. TINC includes all the transitions in TTI (except transitions from one type of democracy to another, two of them in Brazil and one in France), although five cases in which TTI=1 were recoded as TTI=2.

TTR: Dummy variable coded 1 if a regime transition (as classified by REG) occurred at any time during the current year, and the regime at the end of the year was different from the regime at the beginning of the year, 0 otherwise.

TTRLAG: TTR lagged one year.

TTRLEAD: TTR led one year.

TURNOVER: Rate of turnover of chief executives per year of life of a regime. Defined as

ACCHEAD/T, where T is the cummulative year of life of the regime from the first observation.

TYPEII: Dummy variable coded 1 if the "Alternation" rule for classifying regimes as democracies or dictatorships applies, 0 otherwise.

UNDER15: Proportion of people under 15 years of age. [WB94, series 356-58, 364-69].

UNSTABLE: Dummy variable coded 1 for all the years in a country that experienced at least one regime transition (as defined by REG) between 1950 and 1990.

WAR: Dummy variable coded 1 when there is a war of any type (international or civil) on the territory of a country, 0 otherwise. [Singer and Small 1994].

WORLD: Average annual rate of growth of LEVEL for all the countries in the WORLD, weighted by SIZE = POP*LEVEL of each country.

XR: Exchange rate (national currency relative to the US dollar). [PWT56].

YEAR: Calendar year.

Appendix I: Country Codes

	COUNTRY
1.	Algeria
2.	Angola
3.	Benin
4.	Botswana
5.	Burkina Faso
6.	Burundi
7.	Cameroon
8.	Cape Verde Is.
9.	C.African Rep.
10.	Chad
11.	Comoro Island
12.	Congo
13.	Djibouti
14.	Egypt
15.	Ethiopia
16.	Gabon
17.	Gambia
18.	Ghana
19.	Guinea
20.	Guinea-Bisau
21.	Ivory Coast
22.	Kenya
23.	Lesotho
24.	Liberia
25.	Madagasgar
26.	Malawi
27.	Mali
28.	Mauritania
29.	Mauritius
30.	Morocco
31.	Mozambique
32.	Niger
33.	Nigeria
34.	Rwanda
35.	Senegal
36.	Seychelle
37.	Sierra Leone
38.	Somalia
39.	South Africa
40.	Sudan
41.	Swaziland
42.	Tanzania
43.	Togo
44.	Tunisia
45.	Uganda
46.	Zaire
47.	Zambia

	COUNTRY
48.	Zimbabwe
49.	Bahamas
50.	Barbados
51.	Belize
52.	Canada
53.	Costa Rica
54.	Dominican Rep.
55.	El Salvador
56.	Grenada
57.	Guatemala
58.	Haiti
59.	Honduras
60.	Jamaica
61.	Mexico
62.	Nicaragua
63.	Panama
64.	Trin. & Tobago
65.	U S A
66.	Argentina
67.	Bolivia
68.	Brazil
69.	Chile
70.	Colombia
71.	Ecuador
72.	Guyana
73.	Paraguay
74.	Peru
75.	Suriname
76.	Uruguay
77.	Venezuela
78.	Bangladesh
79.	China-PR
80.	India
81.	Indonesia
82.	Iran
83.	Iraq
84.	Israel
85.	Japan
86.	Jordan
87.	Korea, South
88.	Laos
89.	Malaysia
90.	Mongolia
91.	Myanmar
92.	Nepal

93. Pakistan
94. Philippines

COUNTRY

95. Singapore
96. Sri Lanka
97. Syria
98. Taiwan
99. Thailand
100. Yemen Arab Rep.
101. Austria
102. Belgium
103. Bulgaria
104. Czechoslovakia
105. Denmark
106. Finland
107. France
108. West Germany
109. East Germany
110. Greece
111. Hungary
112. Iceland
113. Ireland
114. Italy
115. Luxembourg
116. Malta
117. Netherlands
118. Norway
119. Poland
120. Portugal
121. Romania
122. Spain
123. Sweden
124. Switzerland
125. Turkey
126. U K
127. U S S R
128. Yugoslavia
129. Australia
130. Fiji
131. New Zealand
132. Papua New Guinea
133. Solomon Islands
134. Vanuatu
135. Western Samoa

Appendix II: Value of AGER in 1950

Country Name	Code	REG	AGER	Ethiopia	15	1	81
Egypt	14	1	29	Liberia	24	1	81

Country Name	Code	REG	AGER
South Africa	39	1	17
Canada	52	0	31
Costa Rica	53	0	2
Dom. Rep.	54	1	81
El Salvador	55	1	81
Guatemala	57	0	6
Haiti	58	1	81
Honduras	59	1	81
Mexico	61	1	81
Nicaragua	62	1	81
Panama	63	0	2
U.S.A.	65	0	81
Argentina	66	0	5
Bolivia	67	1	81
Brazil.	68	0	5
Chile.	69	0	19
Colombia	70	1	2
Ecuador	71	0	3
Paraguay	73	1	81
Peru	74	1	3
Uruguay	76	0	9
Venezuela	77	1	3
China-PR	79	1	81
India	80	0	4
Indonesia	81	1	4
Iran	82	1	81
Iraq	83	1	19
Israel	84	0	3
Jordan	86	1	5
S. Korea	87	1	3
Mongolia	90	1	30
Myanmar	91	0	3
Nepal	92	1	81
Pakistan	93	0	4
Philippines	94	0	5
Sri Lanka	96	0	3
Syria	97	1	5
Taiwan	98	1	2
Thailand	99	1	81

Country Name	Code	REG	AGER
Austria	101	0	6
Belgium	102	0	32
Bulgaria	103	1	17
Czechoslovakia	104	1	3
Denmark	105	0	50
Finland	106	0	7
France .	107	0	76
Germany	108	0	2
Greece	110	0	2
Hungary.	111	1	33
Iceland	112	0	7
Ireland	113	0	30
Italy	114	0	5
Luxembourg	115	0	81
Netherlands	117	0	81
Norway	118	0	66
Poland	119	1	25
Portugal	120	1	26
Romania.	121	1	81
Spain .	122	1	14
Sweden	123	0	33
Switzerland	124	0	81
Turkey	125	1	81
U.K.	126	0	40
U.S.S.R.	127	1	81
Yugoslavia	128	1	22
Australia	129	0	50
New Zealand	131	0	44

Appendix III: Adjustments for Transitional Dictatorships in AUT

There are four potentially problematic sequences (B = bureaucracy, A = autocracy and D = democracy) when we code the variable LAWS:

(1) B/AB or D/AB, where / stands for the occurrence of a coup (or a change in administration). This may indicate a transitional autocracy, that is, a regime that is reorganizing after the breakdown. The closure of congress does not really indicate a trait of the regime. These cases of autocracies should be, in fact, considered as bureaucracies.

(2) A/BD or B/AD. These sequences pose a problem because they may indicate a liberalizing bureaucracy or autocracy, that is, a regime that is in the process of becoming democratic. These transitional regimes, however, cannot be classified as a democracy yet. Nor can they be classified as the pre-coup regime since the very fact of the coup indicates that they are not the same regime.

In view of these considerations, some regimes classified by LAWS as Aautocracies@ were in fact bureaucracies, while others classified as Abureaucracies@ were in fact autocracies. The table below summarizes the changes that were made from LAWS to AUT. The facts of each case can be obtained by request to the authors.

Summary of Cases Recoded in AUT:

COUNTRY	YEARS	FROM	TO	# OF YEARS
3. Benin	1963	A	B	1
12. Congo	1968-72	A	B	5
14. Egypt	1952-56	A	B	5
	1958-59	A	B	2
	1961	A	B	1
20. Guinea-Bissau	1980-83	A	B	4
31. Mozambique	1975-76	A	B	2
36. Seychelles	1977-78	A	B	2
40. Sudan	1969-73	A	B	5
48. Zimbabwe	1979	A	B	1
55. El Salvador	1979-81	A	B	3
57. Guatemala	1957	A	B	1
	1982-83	A	B	2
82. Iran	1979	A	B	1
87. Korea	1961-62	A	B	2
90. Mongolia	1950	A	B	1
93. Pakistan	1969	A	B	1
97. Syria	1951	A	B	2
	1958-59	A	B	2
	1970-72	A	B	3
99. Thailand	1977-78	A	B	2
110. Greece	1973	A	B	1
120. Portugal	1974	A	B	1
125. Turkey	1960	A	B	1
18. Ghana	1969	B	A	1

A = Autocracy; B = Bureaucracy

Appendix IV: The Capital Stock Data

PWT has capital stock data for 62 countries, following 1965, altogether 1578 observations. Our problem is to generate the data for the entire sample of 135 countries between entry and exit years, or 4126 observations.

One way to do it is to follow Benhabib and Spiegel (1994), who in turn appear to be following Kyriacou (1991). They use two years (1980 and 1985), regress output on capital stock, labor force, and human capital, and then fill for the remaining countries. Using these base-year estimates, they then depreciate and add the observed investment.

When we apply this method, we get negative estimates of capital stock for the early years, whatever depreciation rate is used. This is one reason not to follow them. There are others: (1) Since PWT has 1578 observations, one loses what are presumably better estimates by basing the series just on two years and (2) Summers and Heston use a weighted depreciation rate which is much higher than the one applied by Benhabib and Spiegel.

The alternative is to proceed as follows: (1) Regress (in logs) output on capital stock and labor force for the observations for which data are available, using LSDV. (2) Regress the country-specific fixed effects on some variables and fill for the remaining 73 countries. (3) Use the estimated coefficients from (1) and the predicted fixed effects from (2) to fill both for the missing years in countries for which some data are available and all years for countries for which they are not. Retain the original observations whenever available and fill with the estimates when they are not.

A detailed explanation follows.

(1) *Estimating with the available data.* The coefficients are constrained to $\alpha+\beta=1$. Fixed effects are very strong: they alone explain 98 per cent of variance of logY. Haussman test indicates fixed effects. Moreover, fixed effects, as opposed to random, generate almost exactly the same coefficients at different bands of per capita income. Hence, there are good reasons to use fixed.

Note: The errors are highly autocorrelated. But since we want to reproduce the data

structure, we did not remove the autocorrelation.

When the predicted values of capital stock are calculated on the basis of this estimate, the predicted and the observed values are very close.

The file that performs these operations is KSTOCK.LIM.

(2) *Estimating fixed effects for other countries.* Fixed effects can be estimated for the 62 countries for which capital stock data are available. In the second step, therefore, we regress these fixed effects on other variables. We used various regions and the initial per capita income. Once the regions are introduced, colonial legacy no longer matters. These variables explain together 49 per cent of variance of the country-specific effects.

Using these estimates, we then fill for the countries for which data were not available.

The estimation file is ALPHA.LIM. It produces an output that has 135 rows (called FALPHA.DAT), which needs to be rewritten by repeating the values for each year of each country, to get N=4221 (which is the size of the original matrix when missing observations of LEVEL and LF and the oil countries are rejected). The latter operation is done by FALPHA.BAS, which generates FALPHA.FIL.

(3) Once fixed effects are available for all countries, the coefficients α and β obtained by doing LSDV and the estimated fixed effects are used to calculate predicted values of capital stock. Then the original and the constructed observations are merged by retaining the original whenever available and filling the rest with constructed. This is done by FKSTOCK.LIM and the output is KSTOCK.DAT, with COUNTRY, YEAR, KSFILL (predicted values), and KSMERGE (original whenever available, otherwise predicted).

The results can be evaluated in four ways: (1) By checking whether there are any negative estimates of capital stock: there are none. (2) By comparing predicted and observed values, whenever the latter are available. (3) By examining whether there are sharp breaks between the original and the constructed data for the countries for which some original data exist and (4) By seeing whether countries for which no data were available look like otherwise similar countries for which they were. To show the second and third, we enclose the results for the US (country =

65). Until 1965, the "Merged" data are constructed; beginning from 1965 they are original.

COUNTRY	YEAR	KSFILL	KSMERGE
65.00000	1950.000	0.6744426E+09	0.6744426E+09
65.00000	1951.000	0.7573322E+09	0.7573322E+09
65.00000	1952.000	0.7769572E+09	0.7769572E+09
65.00000	1953.000	0.8363387E+09	0.8363387E+09
65.00000	1954.000	0.8120309E+09	0.8120309E+09
65.00000	1955.000	0.9466806E+09	0.9466806E+09
65.00000	1956.000	0.9671177E+09	0.9671177E+09
65.00000	1957.000	0.9778685E+09	0.9778685E+09
65.00000	1958.000	0.9449523E+09	0.9449523E+09
65.00000	1959.000	0.1064459E+10	0.1064459E+10
65.00000	1960.000	0.1101628E+10	0.1101628E+10
65.00000	1961.000	0.1127370E+10	0.1127370E+10
65.00000	1962.000	0.1236474E+10	0.1236474E+10
65.00000	1963.000	0.1317772E+10	0.1317772E+10
65.00000	1964.000	0.1440311E+10	0.1440311E+10
65.00000	1965.000	0.1607697E+10	0.1411350E+10
65.00000	1966.000	0.1769061E+10	0.1536030E+10
65.00000	1967.000	0.1826227E+10	0.1673167E+10
65.00000	1968.000	0.1960646E+10	0.1792351E+10
65.00000	1969.000	0.2049893E+10	0.1910183E+10
65.00000	1970.000	0.2061184E+10	0.2031148E+10
65.00000	1971.000	0.2144339E+10	0.2122478E+10
65.00000	1972.000	0.2310302E+10	0.2211898E+10
65.00000	1973.000	0.2521537E+10	0.2314585E+10
65.00000	1974.000	0.2406241E+10	0.2448548E+10
65.00000	1975.000	0.2269051E+10	0.2565864E+10
65.00000	1976.000	0.2461641E+10	0.2621177E+10
65.00000	1977.000	0.2652404E+10	0.2688546E+10
65.00000	1978.000	0.2870965E+10	0.2780432E+10
65.00000	1979.000	0.2943199E+10	0.2901940E+10
65.00000	1980.000	0.2816983E+10	0.3030964E+10
65.00000	1981.000	0.2913208E+10	0.3129392E+10
65.00000	1982.000	0.2710989E+10	0.3243614E+10
65.00000	1983.000	0.2875053E+10	0.3306650E+10
65.00000	1984.000	0.3268954E+10	0.3371726E+10
65.00000	1985.000	0.3423352E+10	0.3512069E+10
65.00000	1986.000	0.3575714E+10	0.3667862E+10
65.00000	1987.000	0.3759874E+10	0.3814035E+10
65.00000	1988.000	0.4036773E+10	0.3955738E+10
65.00000	1989.000	0.4248064E+10	0.4090568E+10
65.00000	1990.000	0.4268825E+10	0.4270735E+10

Files necessary for creating KSFILL and KSMERGE:

FILE NAME: KSTOCK.LIM

```
READ; FILE=REGPPP6.WK1; FORMAT=WKS; NAMES $

CREATE; KAPT=KAPW*LF $
REJECT;LEVEL=-9|LF=-9 $
CREATE; LOGY=LOG(SIZE); LOGLF=LOG(LF) $

SAMPLE; ALL $
REJECT;LEVEL=-9|LF=-9|KAPT<0 $
CREATE; LOGK=LOG(KAPT) $
DSTAT; RHS=KAPT $

CREATE;GROUP=NDX(COUNTRY,0) $
MATRIX;NGA=GSIZ(GROUP) $

REGRESS; LHS=LOGY; RHS=LOGK,LOGLF
        ; PANEL; fixed; STR=GROUP; rls:b(1)+b(2)=1 $

?????? Make predicted values without constant $
MATRIX;KAL=PART(B,1,1); BETA=PART(B,2,2) $ CONST=PART(B,3,3);
CALC; B1=1/KAL; B2=-BETA/KAL; B3=-1/KAL $
MATRIX; LIST; BB=[B1/B2] $
NAME; XG=LOGY,LOGLF $
CREATE; PLOGK1=DOT(XG,BB) $
DSTAT; RHS=PLOGK1 $

????? Calculate part due to constants $
MATRIX; CI=INIT(1578,1,0) $ R=1578, C=1
CALC; K=0 $
MATRIX; ALPHA1=B3*ALPHA $

PROCEDURE
MATRIX; GN=PART(NGA,J,J); AL=PART(ALPHA1,J,J) $
CALC; I=0 $
LABEL; 100 $
CALC; I=I+1 $
CALC; K=K+1 $
MATRIX; CI(K,*)=AL $
GOTO; 100; I<GN $
ENDPROC
EXECUTE; J=1,62 $

CREATE; PCONS=CI $
CREATE; PLOGK=PLOGK1+PCONS $
CREATE; PK=EXP(PLOGK) $
DSTAT; RHS=PLOGK, LOGK, PK, KAPT $
```

```
??????? Create FILL $

SAMPLE; ALL $
REJECT; LEVEL=-9|LF=-9 $
CREATE;IF(KAPT>0)PKMERGE=KAPT;(ELSE)PKMERGE=PK $
WRITE; COUNTRY,YEAR,KAPT,PKMERGE; FILE=KSTOCK.DAT $
STOP
```

FILE NAME: ALPHA.LIM

```
READ; NVAR=2; FILE=ALPHA.DAT; NAMES=X1,ALPHA $
READ; NVAR=7; FILE=ALPHA.ADD
        ; NAMES=COUNTRY,LEVEL,REGION,NEWC,BRITCOL,COMEX,PPPQUAL $

CREATE;IF(REGION=1)AFRICA=1
        ;IF(REGION=2)SASIA=1
        ;IF(REGION=3)EASIA=1
        ;IF(REGION=4)SEASIA=1
        ;IF(REGION=5)OCEANIA=1
        ;IF(REGION=6)MEAST=1
        ;IF(REGION=7)LA=1
        ;IF(REGION=8)CARRIB=1
        ;IF(REGION=9)EE=1
        ;IF(REGION=10)OECD=1 $ OCEANIA HAS NO VARIATION
NAME; REGIONS=SASIA,MEAST,LA,OECD $

REJECT; ALPHA=-999 $
REGRESS; LHS=ALPHA; RHS=ONE,REGIONS,LEVEL
        ; KEEP=PALPHA; FILL $
SAMPLE; ALL $
CREATE;IF(ALPHA=-999)AMERGE=PALPHA;(ELSE)AMERGE=ALPHA $

WRITE; COUNTRY,AMERGE; FILE=AMERGE.DAT $
STOP
```

FILE NAME: FALPHA.BAS

```
OPEN "FALPHA.DAT" FOR INPUT AS #1
OPEN "FALPHA.FIL" FOR OUTPUT AS #2

FOR I = 1 TO 135
INPUT #1, COUNTRY, ALPHA, N
         FOR J = 1 TO N
         WRITE #2, COUNTRY, ALPHA, N
         K = K + 1
         NEXT J
NEXT I
PRINT K
```

FILE NAME: FKSTOCK.LIM

```
READ; FILE=REG4221.WK1; FORMAT=WKS; NAMES $
READ; NVAR=3; NAMES= X1,AMERGE,X2; FILE=FALPHA.FIL $
DSTAT; RHS=AMERGE $

CREATE;GROUP=NDX(COUNTRY,0) $
CREATE; LOGLF=LOG(LF); LOGY=LOG(SIZE) $
NAME; XG=LOGY,LOGLF $
CREATE;KAPT=KAPW*LF $

REJECT; KAPT<0 $
CREATE; LOGK=LOG(KAPT) $

REGRESS; LHS=LOGY; RHS=LOGK,LOGLF
        ; PANEL; fixed; STR=GROUP; rls:b(1)+b(2)=1 $

MATRIX;KAL=PART(B,1,1); BETA=PART(B,2,2) $
CALC; B1=1/KAL; B2=-BETA/KAL; B3=-1/KAL $
MATRIX; LIST; BB=[B1/B2] $

SAMPLE; ALL $

CREATE; PLOGK1=DOT(XG,BB) $
CREATE; PCONS=B3*AMERGE $
CREATE; PLOGK=PLOGK1+PCONS $
DSTAT; RHS=PLOGK1,PCONS,PLOGK $
CREATE; PK=EXP(PLOGK) $
DSTAT; RHS=PLOGK, LOGK, PK, KAPT $

CREATE;IF(KAPT>0)PKMERGE=KAPT;(ELSE)PKMERGE=PK $
WRITE; COUNTRY,YEAR,PK,PKMERGE; FILE=KSTOCK.DAT $
STOP
```

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Key:
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LPS 93/94 = Leksykon Pa 'stw S'wiata 1993/94
PWT56 = Penn World Tables, mark5.6
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