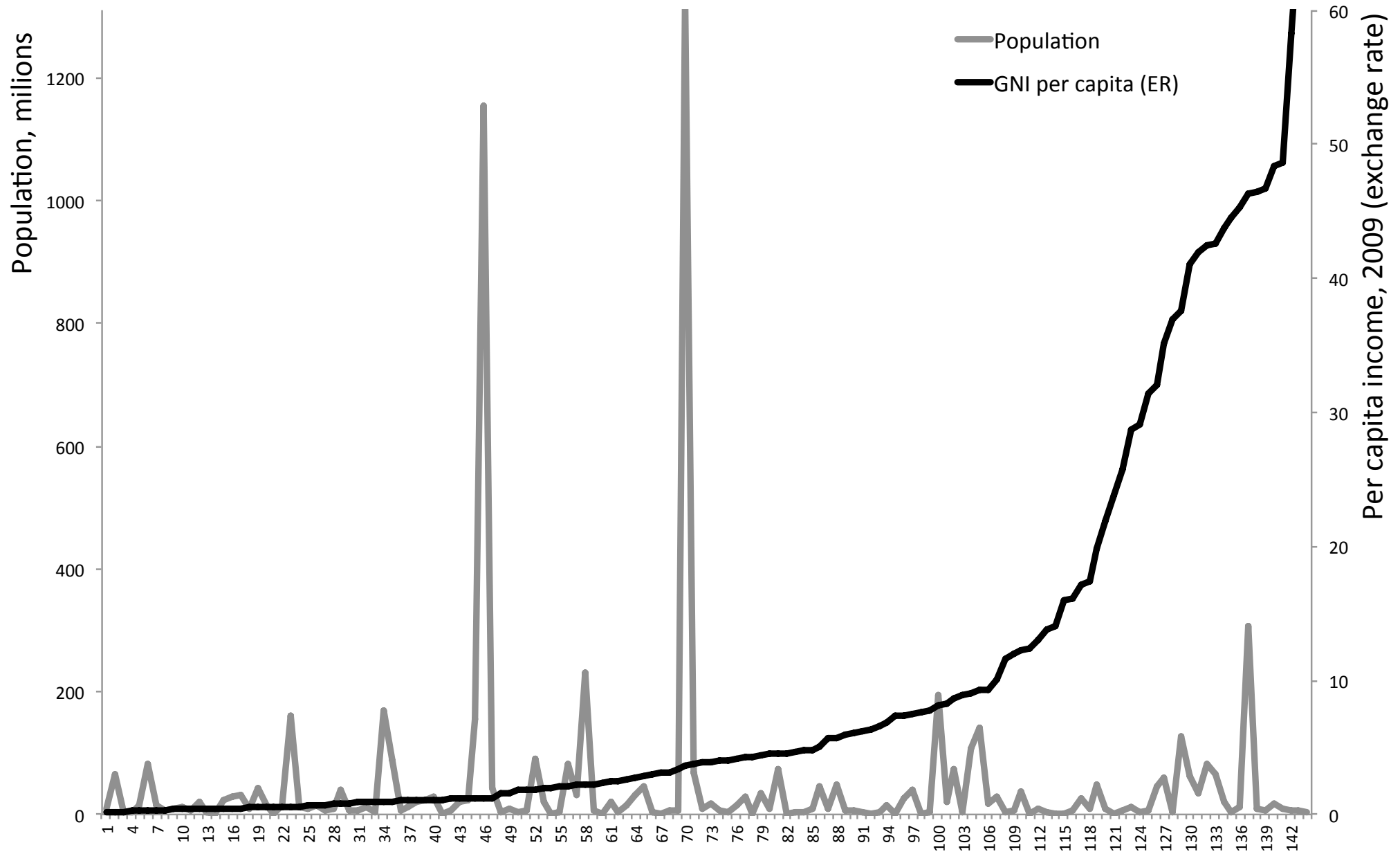
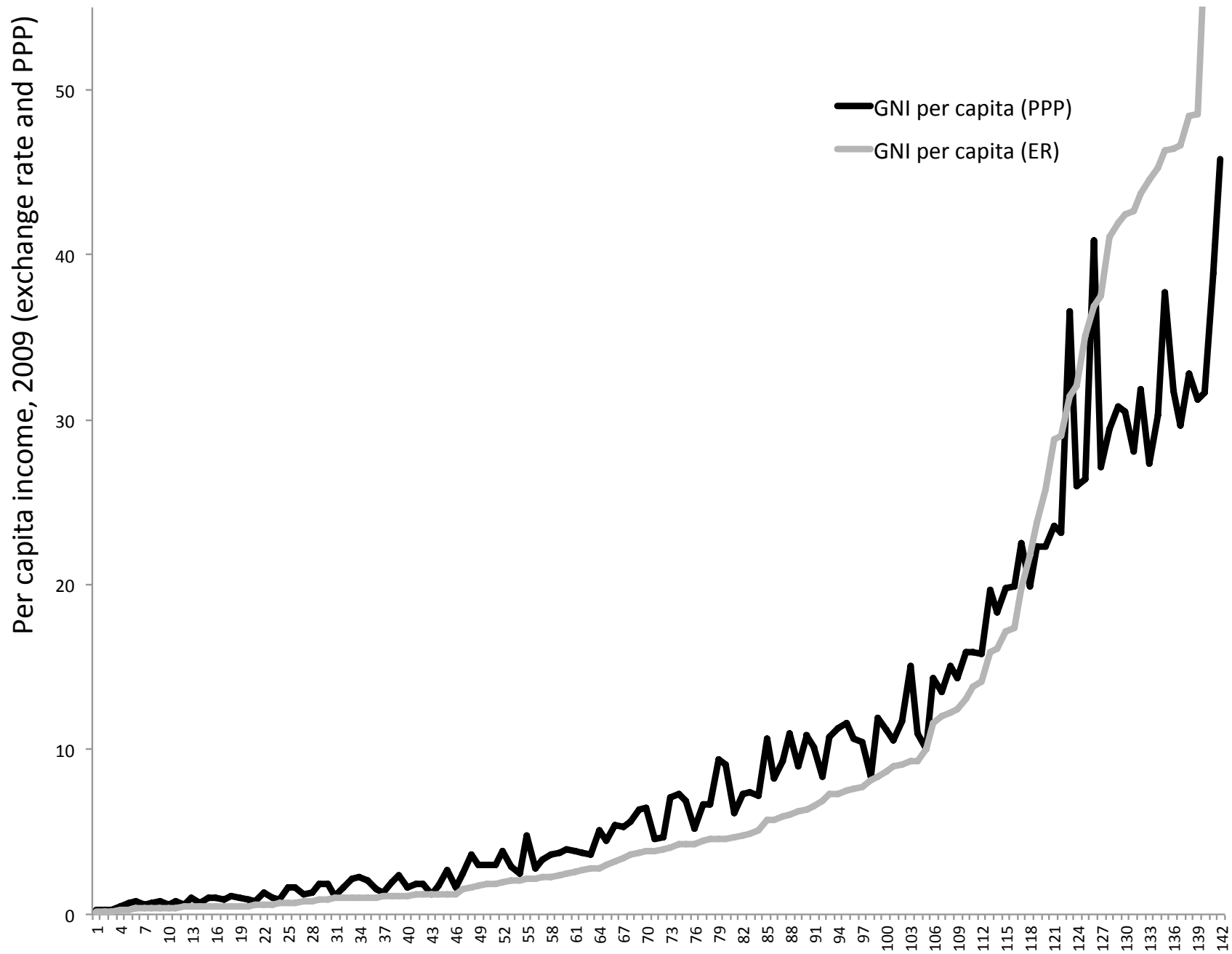


■ Population and per capita GDP (exchange rate method), 2009.



■ PPP versus exchange-rate GDP per capita, 2009.



Definitions (World Bank):

- **Low income countries:** under \$1035. Many African countries, and countries such as Bangladesh, Haiti, Myanmar, Nepal.
846m people, average \$585, urban: 28%, life-expectancy: 59.4 yrs.
- **Low middle-income countries:** \$1036 - \$4085; include Ghana, India, Ukraine, Nigeria, and Bolivia.
2.5b people, average \$1877, urban: 39%, life-expectancy: 65.8 yrs.
- **Upper middle-income countries:** \$4086 - \$12615. include China, Argentina, Brazil, Iraq, Mexico, South Africa and Turkey.
2.39b people, average \$6987, urban: 61%, life-expectancy: 73 yrs.
- **High income countries:** above \$12615. US, Western and Northern Europe, Japan, Singapore, some Middle East countries, Uruguay.
1.3b people, average \$37,595, urban: 80%, life-expectancy: 78.8 yrs.

Over time:

World GDP per capita grew at 1.5% per year over 1970 - 2010.

But lots of variation:

East Asia:

1960 -1990: Japan, Korea, Hong Kong, Singapore, Thailand 5 - 6%

1990 -2010: slower: Japan < 1% (less than world average), rest stayed in the 3s and 4s.

China: 1980 -1990: 7.6%. 1990 -2010: 9.5%.

India: 1960 -1990 : 2.6% ,1990 – 2000: 3.6%, 1990 -2000: 6.2%

Table 2
Fifteen growth miracles, 1960–2000

Country	Growth 1960–2000	Factor increase
Taiwan	6.25	11.3
Botswana	6.07	10.6
Hong Kong	5.67	9.09
Korea, Republic of	5.41	8.24
Singapore	5.09	7.29
Thailand	4.50	5.83
Cyprus	4.30	5.39
Japan	4.13	5.04
Ireland	4.10	5.00
China	3.99	4.77
Romania	3.91	4.63
Mauritius	3.88	4.58
Malaysia	3.82	4.48
Portugal	3.48	3.93
Indonesia	3.34	3.72

Table 3
Fifteen growth disasters, 1960–2000

Country	Growth 1960–2000	Ratio
Peru	0.00	1.00
Mauritania	−0.11	0.96
Senegal	−0.26	0.90
Chad	−0.43	0.84
Mozambique	−0.50	0.82
Madagascar	−0.60	0.79
Zambia	−0.61	0.78
Mali	−0.77	0.74
Venezuela	−0.88	0.70
Niger	−1.03	0.66
Nigeria	−1.21	0.62
Nicaragua	−1.30	0.59
Central African Republic	−1.56	0.53
Angola	−2.04	0.44
Congo, Democratic Rep.	−4.00	0.20

Sub-Saharan Africa: more stagnation.

1980 -1990: decline at 1% annual.

1990 -2000: decline at 0.4% annual.

2000 -2010: growth at 2.2%.

Nigeria: -1.6% in 1980s, stagnation 1990s, 2000 – 2010: 3.9% and

Tanzania: -2.0% in 1980s, stagnation 1990s, 2000 – 2010: 4.0%

Rwanda: -1.2% in 1980s, -0.7% in 1990s , 2000 – 2010: 4.8%

Burundi: -3.2% in 1990s, 2000 – 2010: 0.4%

Zimbabwe: 0.7% in 1980s, -0.3% in 1990s, 2000 – 2010: 4.8%

Latin America:

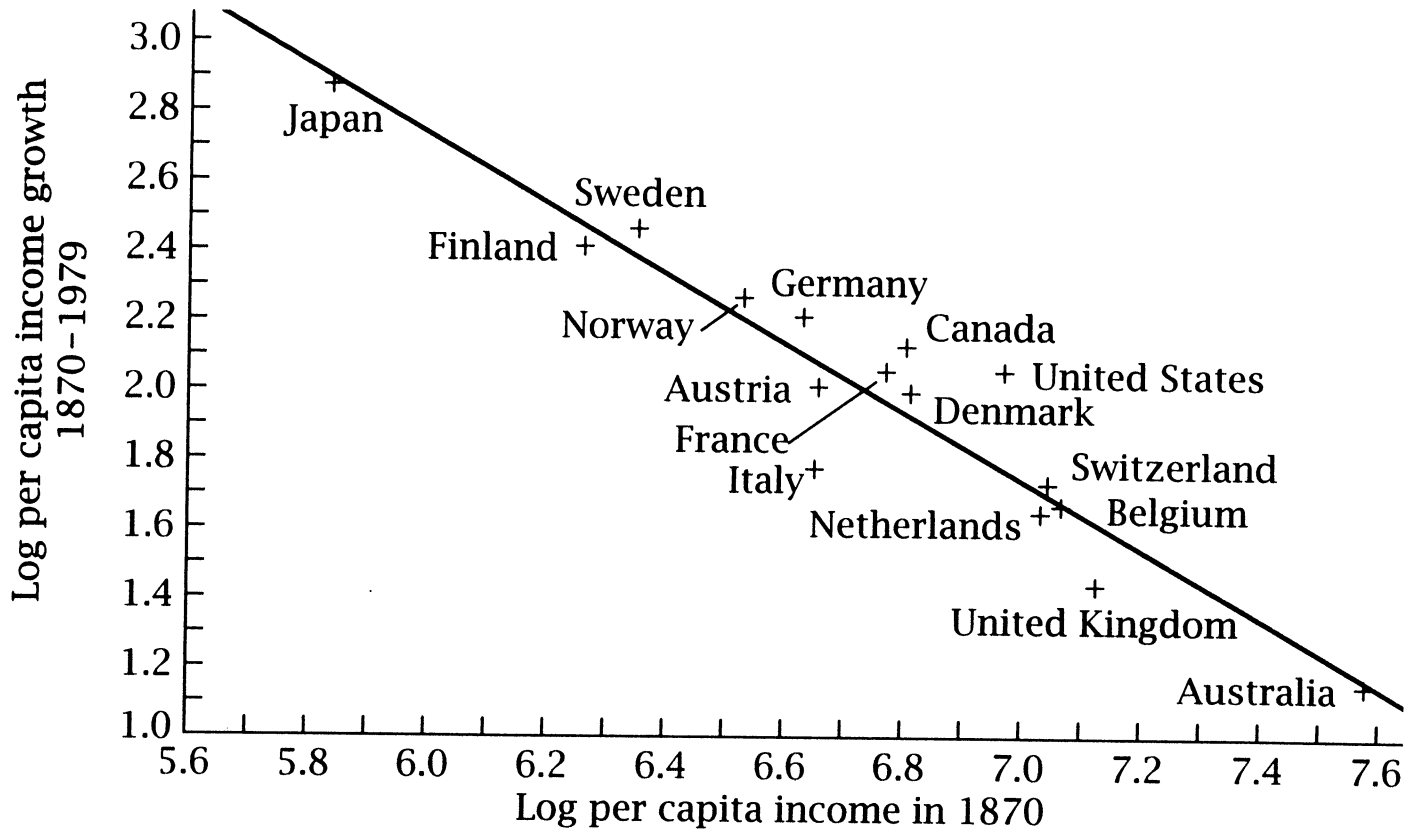
1980 -1990: overall decline of around 10%.

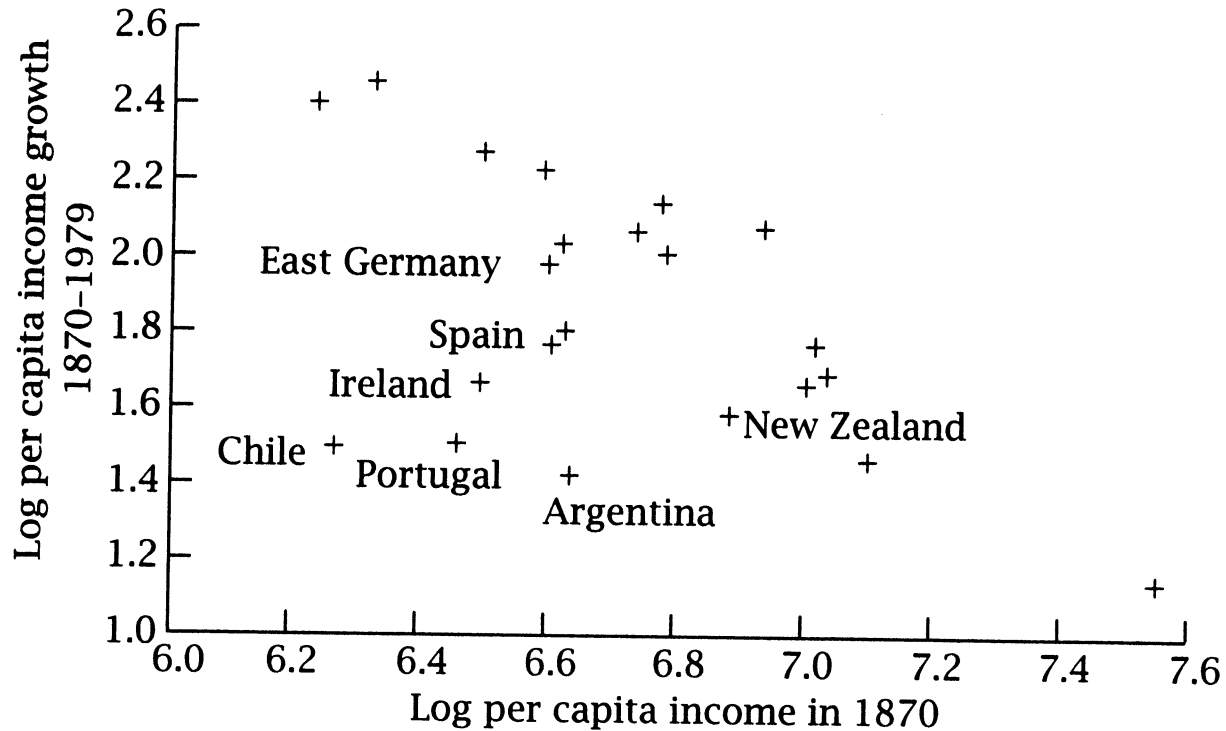
Argentina: -2.9%, Brazil: -0.5%, Mexico: -0.3%, Peru: -3.0%,
Uruguay -0.7%.

1990-2000: still slow, around world average
(exceptions Chile: 4.7%, and Argentina, 3.6%).

2000 – 2010: much better.

Argentina: 3.3%, Brazil: 2.4%, Chile: 2.6%, Peru: 4.3%,
Uruguay 3.0%, Mexico: 0.8%.





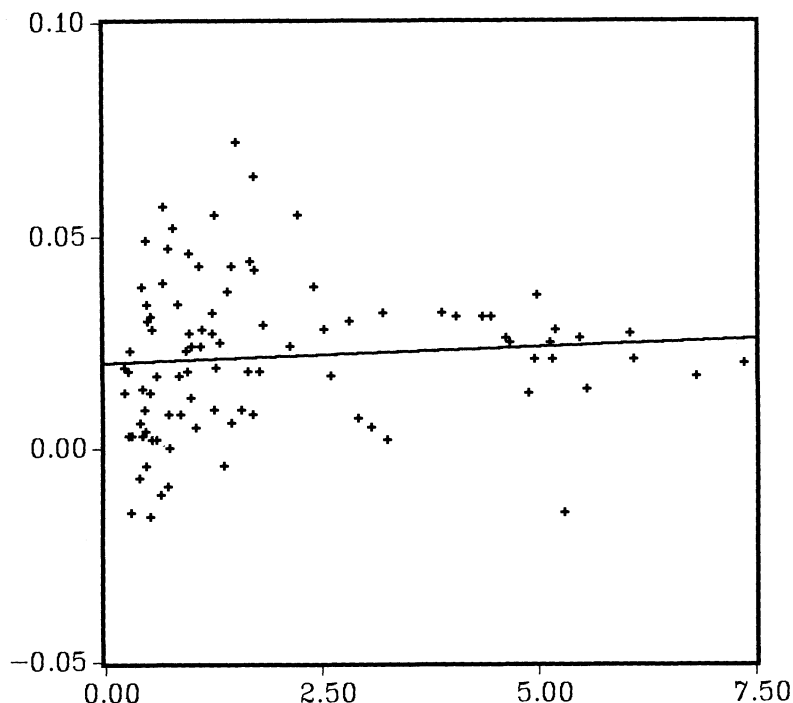


FIGURE I
Per Capita Growth Rate Versus 1960 GDP per Capita

correlation with the starting level of per capita product. Figure I, which uses the data from the Summers and Heston [1988] international comparison project, shows this type of relationship for 98 countries. The average growth rate of per capita real gross domestic product (GDP) from 1960 to 1985 (denoted GR6085) is not significantly related to the 1960 value of real per capita GDP (GDP60); the correlation is 0.09.³ This finding accords with recent models, such as Lucas [1988] and Rebelo [1990], that assume constant returns to a broad concept of reproducible capital, which includes human capital. In these models the growth rate of per capita product is independent of the starting level of per capita product.

Human capital plays a special role in a number of models of endogenous economic growth. In Romer [1990] human capital is

3. I use throughout the values of GDP expressed in terms of prices for the base year, 1980. Results using chain-weighted values of GDP are not very different.

TABLE I
ESTIMATION OF THE TEXTBOOK SOLOW MODEL

Dependent variable: log GDP per working-age person in 1985			
Sample:	Non-oil	Intermediate	OECD
Observations:	98	75	22
CONSTANT	5.48 (1.59)	5.36 (1.55)	7.97 (2.48)
$\ln(I/GDP)$	1.42 (0.14)	1.31 (0.17)	0.50 (0.43)
$\ln(n + g + \delta)$	-1.97 (0.56)	-2.01 (0.53)	-0.76 (0.84)
\bar{R}^2	0.59	0.59	0.01
<i>s.e.e.</i>	0.69	0.61	0.38
Restricted regression:			
CONSTANT	6.87 (0.12)	7.10 (0.15)	8.62 (0.53)
$\ln(I/GDP) - \ln(n + g + \delta)$	1.48 (0.12)	1.43 (0.14)	0.56 (0.36)
\bar{R}^2	0.59	0.59	0.06
<i>s.e.e.</i>	0.69	0.61	0.37
Test of restriction:			
<i>p</i> -value	0.38	0.26	0.79
Implied α	0.60 (0.02)	0.59 (0.02)	0.36 (0.15)

Note. Standard errors are in parentheses. The investment and population growth rates are averages for the period 1960–1985. ($g + \delta$) is assumed to be 0.05.

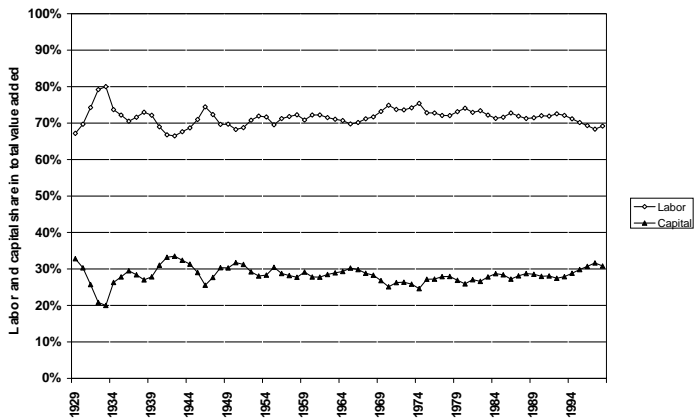


Figure: Capital and Labor Share in the U.S. GDP.

TABLE II
ESTIMATION OF THE AUGMENTED SOLOW MODEL

Dependent variable: log GDP per working-age person in 1985			
Sample:	Non-oil	Intermediate	OECD
Observations:	98	75	22
CONSTANT	6.89 (1.17)	7.81 (1.19)	8.63 (2.19)
$\ln(I/GDP)$	0.69 (0.13)	0.70 (0.15)	0.28 (0.39)
$\ln(n + g + \delta)$	-1.73 (0.41)	-1.50 (0.40)	-1.07 (0.75)
$\ln(SCHOOL)$	0.66 (0.07)	0.73 (0.10)	0.76 (0.29)
\bar{R}^2	0.78	0.77	0.24
<i>s.e.e.</i>	0.51	0.45	0.33
Restricted regression:			
CONSTANT	7.86 (0.14)	7.97 (0.15)	8.71 (0.47)
$\ln(I/GDP) - \ln(n + g + \delta)$	0.73 (0.12)	0.71 (0.14)	0.29 (0.33)
$\ln(SCHOOL) - \ln(n + g + \delta)$	0.67 (0.07)	0.74 (0.09)	0.76 (0.28)
\bar{R}^2	0.78	0.77	0.28
<i>s.e.e.</i>	0.51	0.45	0.32
Test of restriction:			
<i>p</i> -value	0.41	0.89	0.97
Implied α	0.31 (0.04)	0.29 (0.05)	0.14 (0.15)
Implied β	0.28 (0.03)	0.30 (0.04)	0.37 (0.12)

Note. Standard errors are in parentheses. The investment and population growth rates are averages for the period 1960–1985. $(g + \delta)$ is assumed to be 0.05. SCHOOL is the average percentage of the working-age population in secondary school for the period 1960–1985.

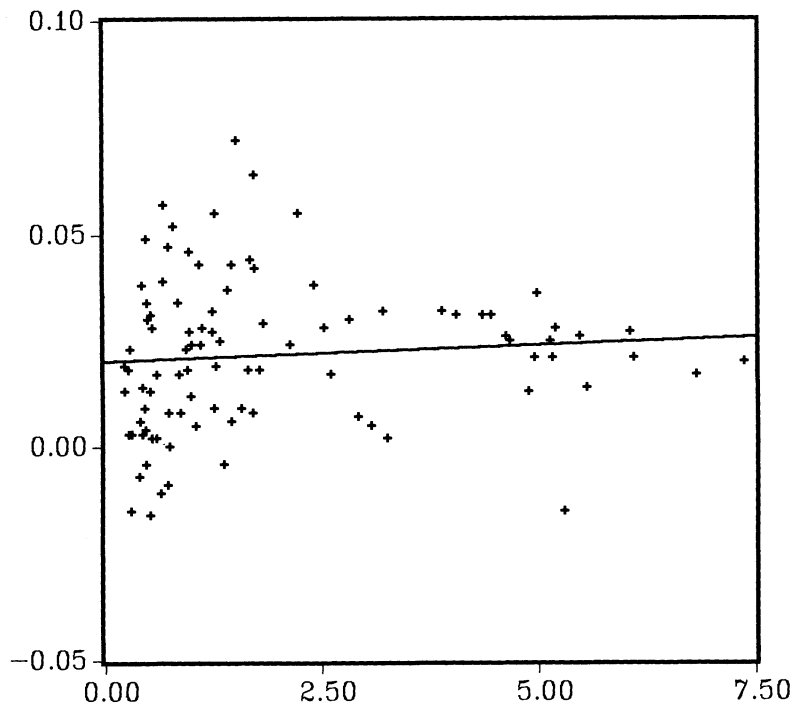
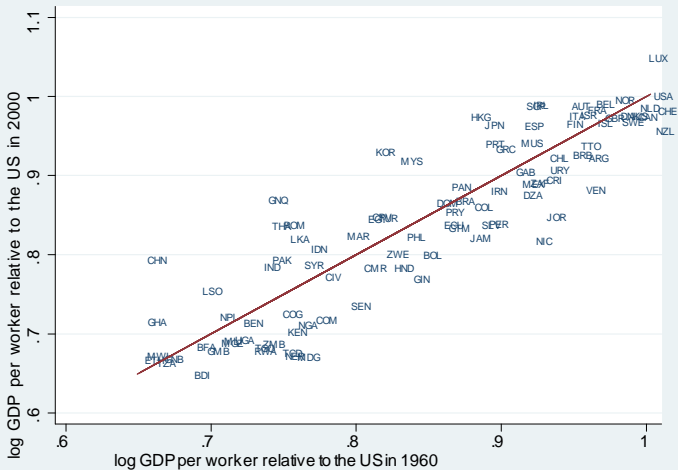
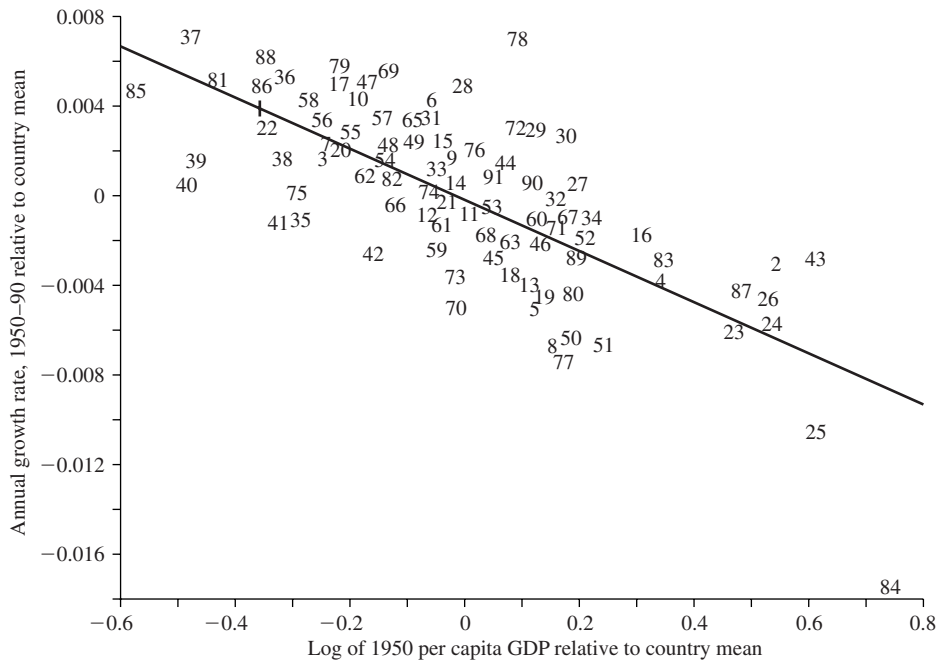


FIGURE I
Per Capita Growth Rate Versus 1960 GDP per Capita





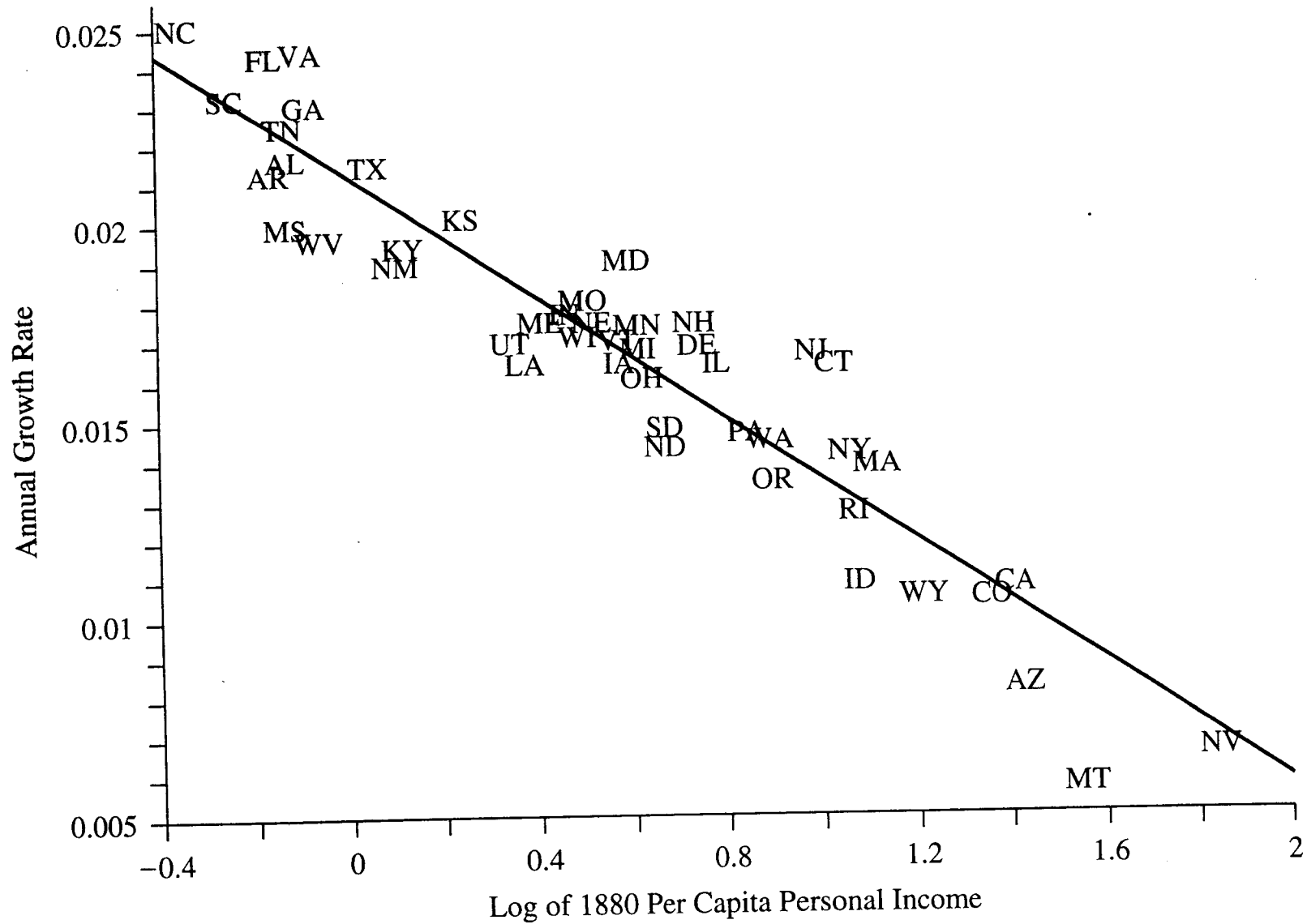


TABLE I
REGRESSIONS FOR PER CAPITA GROWTH

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. var	GR6085	GR6085	GR7085	GR7085	GR6085 (GDP60 > 1)	GR6085	GR6085	GR6085
No. obs.	98	98	98	98	55	98	98	98
Weight	—	—	—	—	—	$\sqrt{\text{GDP60}}$	$\sqrt{\text{POP}}$	—
Const.	0.0302 (0.0066)	0.0302 (0.0068)	0.0287 (0.0080)	0.0294 (0.0082)	0.0406 (0.0077)	0.0334 (0.0063)	0.0360 (0.0055)	0.0288 (0.0065)
GDP60	-0.0075 (0.0012)	-0.0111 (0.0031)	-0.0089 (0.0016)	-0.0071 (0.0048)	-0.0065 (0.0010)	-0.0062 (0.0009)	-0.0074 (0.0009)	-0.0073 (0.0011)
GDP70	—	—	—	-0.0015 (0.0037)	—	—	—	—
GDP60SQ	—	0.00051 (0.00038)	—	—	—	—	—	—
SEC60	0.0305 (0.0079)	0.0323 (0.0080)	0.0331 (0.0137)	0.0350 (0.0128)	0.0211 (0.0079)	0.0258 (0.0069)	0.0261 (0.0075)	0.0254 (0.0110)
PRIM60	0.0250 (0.0056)	0.0270 (0.0060)	0.0276 (0.0070)	0.0279 (0.0072)	0.0180 (0.0077)	0.0198 (0.0060)	0.0254 (0.0051)	0.0324 (0.0077)
SEC50	—	—	—	—	—	—	—	0.0183 (0.0121)
PRIM50	—	—	—	—	—	—	—	-0.0085 (0.0064)

TABLE I
(CONTINUED)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
g^c/y	-0.119 (0.028)	-0.122 (0.028)	-0.142 (0.034)	-0.147 (0.036)	-0.122 (0.032)	-0.106 (0.024)	-0.178 (0.024)	-0.121 (0.027)
REV	-0.0195 (0.0063)	-0.0200 (0.0063)	-0.0236 (0.0071)	-0.0241 (0.0071)	-0.0151 (0.0091)	-0.0192 (0.0067)	-0.0165 (0.0044)	-0.0189 (0.0060)
ASSASS	-0.0333 (0.0155)	-0.0309 (0.0156)	-0.0485 (0.0185)	-0.0490 (0.0188)	-0.0344 (0.0160)	-0.0342 (0.0159)	-0.0241 (0.0271)	-0.0298 (0.0130)
PPI60DEV	-0.0143 (0.0053)	-0.0148 (0.0053)	-0.0171 (0.0078)	-0.0174 (0.0079)	-0.0316 (0.0101)	-0.0237 (0.0069)	-0.0165 (0.0044)	-0.0141 (0.0052)
R^2	0.56	0.56	0.49	0.50	0.63	0.53 (0.72)	0.52 (0.84)	0.56
$\hat{\sigma}$	0.0128	0.0128	0.0168	0.0169	0.0109	0.0131 (0.0115)	0.0133 (0.0120)	0.0129

Table 12.6

Baseline Estimation for All 67 Variables

Rank	Variable	Fraction of Regressions with $ t \text{ stat} > 2$ (1)	Posterior Inclusion Probability (2)	Posterior Mean Conditional on Inclusion (3)	Posterior s.d. Conditional on Inclusion (4)	Posterior Unconditional Mean (3)'	Posterior Unconditional s.d. (4)'	Sign Certainty Probability (5)
1	East asian	0.99	0.823	0.021805	0.006118	0.017935	0.010010	0.999
2	Primary schooling 1960	0.96	0.796	0.026852	0.007977	0.021386	0.012945	0.999
3	Investment price	0.99	0.774	-0.000084	0.000025	-0.000065	0.000041	0.999
4	GDP 1960 (log)	0.30	0.685	-0.008538	0.002888	-0.005845	0.004631	0.999
5	Fraction of tropical area (or people)	0.59	0.563	-0.014757	0.004227	-0.008312	0.007977	0.997
6	Population density in coastal areas 1960s	0.85	0.428	0.000009	0.000003	0.000004	0.000005	0.996
7	Malaria prevalence in 1960s	0.84	0.252	-0.015702	0.006177	-0.003956	0.007489	0.990
8	Life expectancy in 1960	0.79	0.209	0.000808	0.000354	0.000168	0.000366	0.986
9	Fraction Confucian	0.97	0.206	0.054429	0.022426	0.011239	0.024275	0.988
10	African dummy	0.90	0.154	-0.014706	0.006866	-0.002260	0.005948	0.980
11	Latin American dummy	0.30	0.149	-0.012758	0.005834	-0.001905	0.005075	0.969
12	Fraction GDP in mining	0.07	0.124	0.038823	0.019255	0.004818	0.014487	0.978
13	Spanish colony	0.24	0.123	-0.010720	0.005041	-0.001320	0.003942	0.972
14	Years open	0.98	0.119	0.012209	0.006287	0.001457	0.004514	0.977
15	Fraction Muslim	0.11	0.114	0.012629	0.006257	0.001446	0.004545	0.973
16	Fraction Buddhist	0.90	0.108	0.021667	0.010722	0.002348	0.007604	0.974
17	Ethnolinguistic fractionalization	0.52	0.105	-0.011281	0.005835	-0.001181	0.003936	0.974
18	Government consumption share 1960s	0.77	0.104	-0.044171	0.025383	-0.004586	0.015761	0.975
19	Population density 1960	0.01	0.086	0.000013	0.000007	0.000001	0.000004	0.965
20	Real exchange rate distortions	0.92	0.082	-0.000079	0.000043	-0.000006	0.000025	0.966
21	Fraction speaking foreign language	0.43	0.080	0.007006	0.003960	0.000559	0.002204	0.962

22	(Imports + exports)/GDP	0.67	0.076	0.008858	0.005210	0.000674	0.002754	0.949
23	Political rights	0.35	0.066	-0.001847	0.001202	-0.000121	0.000551	0.939
24	Government share of GDP	0.58	0.063	-0.034874	0.029379	-0.002205	0.011253	0.935
25	Higher education in 1960	0.10	0.061	-0.069693	0.041833	-0.004282	0.019688	0.946
26	Fraction population in tropics	0.85	0.058	-0.010741	0.006754	-0.000622	0.002990	0.940
27	Primary exports in 1970	0.75	0.053	-0.011343	0.007520	-0.000604	0.003082	0.926
28	Public investment share	0.00	0.048	-0.061540	0.042950	-0.002964	0.016201	0.922
29	Fraction protestants	0.29	0.046	-0.011872	0.009288	-0.000544	0.003180	0.909
30	Fraction Hindus	0.07	0.045	0.017558	0.012575	0.000790	0.004512	0.915
31	Fraction population less than 15	0.24	0.041	0.044962	0.041100	0.001850	0.012216	0.871
32	Air distance to big cities	0.18	0.039	-0.000001	0.000001	0.000000	0.000000	0.888
33	Gov C share deflated with GDP prices	0.05	0.036	-0.033647	0.027365	-0.001195	0.008087	0.893
34	Absolute latitude	0.37	0.033	0.000136	0.000233	0.000004	0.000049	0.737
35	Fraction Catholic	0.16	0.033	-0.008415	0.008478	-0.000278	0.002155	0.837
36	Fertility rates in 1960s	0.46	0.031	-0.007525	0.010113	-0.000232	0.002199	0.767
37	European dummy	0.19	0.030	-0.002278	0.010487	-0.000068	0.001858	0.544
38	Outward orientation	0.01	0.030	-0.003296	0.002727	-0.000098	0.000730	0.886
39	Colony dummy	0.44	0.029	-0.005010	0.004721	-0.000147	0.001169	0.858
40	Civil liberties	0.15	0.029	-0.007192	0.007122	-0.000207	0.001705	0.846
41	Revolutions and coups	0.07	0.029	-0.007065	0.006089	-0.000202	0.001565	0.877
42	British colony dummy	0.09	0.027	0.003654	0.003626	0.000097	0.000835	0.844
43	Hydrocarbon deposits in 1993	0.01	0.025	0.000307	0.000418	0.000008	0.000081	0.773
44	Fraction population over 65	0.20	0.022	0.019382	0.119469	0.000435	0.018127	0.566
45	Defense spending share	0.26	0.021	0.045336	0.076813	0.000967	0.012992	0.737
46	Population in 1960	0.07	0.021	0.000000	0.000000	0.000000	0.000000	0.806

Table continued

Table 12.6*(Continued)*

Rank	Variable	Fraction of Regressions with $ t \text{ stat} > 2$ (1)	Posterior Inclusion Probability (2)	Posterior Mean Conditional on Inclusion (3)	Posterior s.d. Conditional on Inclusion (4)	Posterior Unconditional Mean (3)'	Posterior Unconditional s.d. (4)'	Sign Certainty Probability (5)
47	Terms of trade growth in 1960s	0.00	0.021	0.032627	0.046650	0.000693	0.008265	0.752
48	Public educ. spend. /GDP in 1960s	0.11	0.021	0.129517	0.172847	0.002698	0.031056	0.777
49	Landlocked country dummy	0.04	0.021	-0.002080	0.004206	-0.000043	0.000671	0.701
50	Religion measure	0.18	0.020	-0.004737	0.007232	-0.000097	0.001233	0.751
51	Size of economy	0.18	0.020	-0.000520	0.001443	-0.000011	0.000218	0.661
52	Socialist dummy	0.00	0.020	0.003983	0.004966	0.000081	0.000903	0.788
53	English-speaking population	0.07	0.020	-0.003669	0.007137	-0.000073	0.001132	0.686
54	Average inflation 1960-90	0.01	0.020	-0.000073	0.000097	-0.000001	0.000017	0.784
55	Oil-producing country dummy	0.00	0.019	0.004845	0.007088	0.000094	0.001193	0.751
56	Population growth rate 1960-90	0.21	0.019	0.020837	0.307794	0.000401	0.042787	0.533
57	Timing of independence	0.11	0.019	0.001143	0.002051	0.000022	0.000324	0.716
58	Fraction land area near navigable water	0.35	0.019	-0.002598	0.005864	-0.000048	0.000875	0.657
59	Square of inflation 1960-90	0.00	0.018	-0.000001	0.000001	0.000000	0.000000	0.736
60	Fraction spent in war 1960-90	0.00	0.016	-0.001415	0.009226	-0.000022	0.001176	0.555
61	Land area	0.01	0.016	0.000000	0.000000	0.000000	0.000000	0.577
62	Tropical climate zone	0.16	0.016	-0.002069	0.006593	-0.000032	0.000864	0.616
63	Terms of trade ranking	0.23	0.016	-0.003730	0.009625	-0.000058	0.001288	0.647
64	Capitalism	0.06	0.015	-0.000231	0.001080	-0.000003	0.000136	0.589
65	Fraction Orthodox	0.00	0.015	0.005689	0.013576	0.000086	0.001804	0.660
66	War participation 1960-90	0.02	0.015	-0.000734	0.002983	-0.000011	0.000377	0.593
67	Interior density	0.00	0.015	-0.000001	0.000016	0.000000	0.000002	0.532

(1) *Political Change—institutional*. “Possibility of institutional framework will be changed within the forecast period by elections or other means.”

(2) *Political Stability—social*. “Conduct of political activity, both organized and individual, and the degree to which the orderly political process tends to disintegrate or become violent.”

(3) *Probability of Opposition Group Takeover*. “Likelihood that the opposition will come to power during the forecast period.”

(4) *Stability of Labor*. “Degree to which labor represents possible disruption for manufacturing and other business activity.”

(5) *Relationship with Neighboring Countries*. “This includes political, economic and commercial relations with neighbors that may affect companies doing business in the country.”

(6) *Terrorism*. “The degree to which individuals and businesses are subject to acts of terrorism.”

(7) *Legal System, Judiciary*. “Efficiency and integrity of the legal environment as it affects business, particularly foreign firms.”

(8) *Bureaucracy and Red Tape*. “The regulatory environment foreign firms must face when seeking approvals and permits. The degree to which it represents an obstacle to business.”

(9) *Corruption*. “The degree to which business transactions involve corruption or questionable payments.”

TABLE I
BUREAUCRATIC EFFICIENCY INDEX

1.5-4.5	4.5-5.5	5.5-6.5	6.5-7.5	7.5-9	9-10
Egypt	Algeria	Angola	Argentina	Austria	Australia
Ghana	Bangladesh	Dominican Rep.	Ivory Coast	Chile	Belgium
Haiti	Brazil	Ecuador	Kuwait	France	Canada
Indonesia	Colombia	Greece	Malaysia	Germany	Denmark
Iran	India	Iraq	Peru	Ireland	Finland
Liberia	Jamaica	Italy	South Africa	Israel	Japan
Nigeria	Kenya	Korea	Sri Lanka	Jordan	Hong Kong
Pakistan	Mexico	Morocco	Taiwan	Zimbabwe	Netherlands
Thailand	Philippines	Nicaragua	Uruguay		New Zealand
Zaire	Saudi Arabia	Panama			Norway
	Turkey	Portugal			Singapore
	Venezuela	Spain			Sweden
		Trinidad/Tobago			Switzerland
					United Kingdom
					United States

BE is the bureaucratic efficiency index, which I compute as the simple 1980-1983 average of three Business International indices: judiciary system, red tape, and corruption. A *high* value of the BE index means that the country's institutions are good.

that richer countries tend to have better institutions than poorer countries, and that fast-growers also tend to be among the countries with a higher bureaucratic efficiency index. Nevertheless, there are a few of surprises. In 1980 BI reported Thailand to be the most corrupt country, yet its economic performance has been relatively good. Korea has been a fast grower, in spite of the fact that it was reported to have relatively inefficient institutions.¹³

Figures I-III provide scatter plots of per capita GDP, the investment rate, and the per capita GDP growth rate versus the bureaucratic efficiency index for the 67 countries for which both Summers and Heston [1988] and BI data are available in 1980-1983. All these correlations are significant at the 1 percent level.

One of the most striking features of the data set is the strong association between bureaucratic efficiency and political stability.¹⁴ Table II arranges the countries in the data set in a matrix, grouping them by quintiles depending on their bureaucratic efficiency and

13. The BI indices refer to the period immediately following the assassination of President Park Chung-hee.

14. Corruption may be more deleterious and thus reported as a more serious problem in politically unstable countries. Shleifer and Vishny [1993] argue that countries with weak (and, therefore, unstable) governments will experience a very deleterious type of corruption, in which an entrepreneur may have to bribe several public officials and still face the possibility that none of them really have the power to allow the project to proceed.

TABLE III
ETHNOLINGUISTIC FRACTIONALIZATION, 1960

100-75	75-55	55-35	35-15	15-5	5-0
Angola	Canada	Algeria	Argentina	Austria	Dominican
Bangladesh	Ghana	Belgium	Australia	Brazil	Rep.
India	Malaysia	Ecuador	Finland	Chile	Egypt
Indonesia	Pakistan	Iraq	France	Colombia	Germany
Iran	Peru	Morocco	Israel	Denmark	Haiti
Ivory Coast	Philippines	New Zealand	Kuwait	Greece	Hong Kong
Kenya	Thailand	Singapore	Mexico	Jamaica	Ireland
Liberia	Trinidad/ Tobago	Spain	Nicaragua	Jordan	Italy
South Africa		Sri Lanka	Panama	Netherlands	Japan
Zaire		Switzerland	Turkey	Saudi Arabia	Korea
		Taiwan	United	Sweden	Norway
		United	Kingdom	Venezuela	Portugal
		States	Uruguay		
		Zimbabwe			

The ethnolinguistic fractionalization index for 1960 is drawn from Taylor and Hudson [1972].

There is a negative and significant correlation between institu

TABLE V
INVESTMENT AND BUREAUCRATIC EFFICIENCY

Row	Dependent variable	Constant	Corruption BI Index	Bureaucratic efficiency BI index	Institutional efficiency BI index	R ²	N
1	Total investment/GDP (1960–1985)	0.086 (4.14)	0.018 (6.43)			0.40	58
2	Total investment/GDP (1960–1985) Instrument: fraction- alization	-0.021 (-0.27)	0.033 (3.04)			(*)	57
3	Total investment/GDP (1960–1985)	0.059 (2.74)		0.022 (7.47)		0.46	58
4	Total investment/GDP (1960–1985) Instrument: fraction- alization	-0.082 (-0.78)		0.043 (2.84)		(*)	57
5	Total investment/GDP (1960–1985)	-0.023 (-0.65)			0.032 (6.73)	0.44	58
6	Total investment/GDP (1960–1985) Instrument: fraction- alization	-0.133 (-1.28)			0.047 (3.37)	(*)	57
7	Total investment/GDP (1960–1985) Instruments: revcoup, assass	-0.014 (-0.25)			0.030 (4.00)	(*)	58
8	Total investment/GDP (1960/1985) Instruments: colonial dummies	-0.148 (-1.77)			0.049 (4.35)	(*)	58
9	Total investment/GDP (1960–1985) Instruments: fract., colonial dummies	-0.119 (-1.66)			0.045 (4.73)	(*)	57
10	Total investment/GDP (1970–1985)	0.066 (3.04)		0.021 (6.94)		0.42	58
11	Total investments/GDP (1970–1985) Instrument: fraction- alization	-0.084 (-0.79)		0.043 (2.88)		(*)	57
12	Total investment/GDP (1980–1985)	0.075 (3.58)		0.019 (6.04)		0.33	58
13	Total investment/GDP (1980–1985) Instrument: fraction- alization	-0.054 (-0.51)		0.037 (2.48)		(*)	57
14	Equipment investment/ GDP (1975–1985)	-0.072 (-0.64)		0.009 (5.44)		0.37	41
15	Nonequipment inv./ GDP (1975–1985)	0.011 (4.40)		0.007 (2.07)		0.07	41
16	Equip. inv./nonequip. inv. (1975–1985)	0.065 (0.87)		0.041 (3.94)		0.21	41
17	Private investment/ GDP (1970–1985)	0.052 (2.26)		0.020 (6.12)		0.40	50
18	Public investment/GDP (1970–1985)	0.022 (3.70)		0.002 (2.00)		0.06	50
19	Private inv./public inv. (1970–1985)	4.715 (2.76)		0.252 (1.17)		0.03	50

A high value of each index means the country has good institutions. One standard deviation equals 1.47 for the institutional efficiency index, 2.16 for the bureaucratic efficiency index, and 2.51 for the corruption index. White-corrected *t*-statistics are reported in parentheses. *N* is the number of observations. Revcoup and assass are the number of revolutions and coups, and assassinations, respectively, between 1960 and 1985, from Barro [1991]. Fractionalization is the index of ethnolinguistic fractionalization in 1960, from Taylor and Hudson [1972]. (*) The R² is not an appropriate measure of goodness fit with two-stage least squares.

TABLE VII
GROWTH ON CORRUPTION, BUREAUCRATIC EFFICIENCY
Dependent variable: Per Capita GDP growth (1960–1985 Average)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	0.05 (0.63)	0.012 (1.63)	-0.049 (-1.53)	-0.034 (-1.33)	0.012 (1.26)	0.019 (1.86)	-0.011 (-0.45)	-0.010 (-0.32)	0.002 (0.23)	0.004 (0.47)	-0.006 (-0.52)	0.006 (0.48)	0.013 (1.12)	0.001 (0.11)	0.007 (0.67)
GDP in 1960					-0.008 (-4.87)	-0.007 (-3.88)	-0.013 (-2.91)	-0.012 (-2.53)	-0.008 (-4.55)	-0.006 (-4.25)	-0.006 (-3.97)	-0.008 (-9.38)	-0.007 (-8.02)	-0.008 (-8.23)	-0.007 (-5.95)
Secondary education in 1960					0.011 (0.81)	0.031 (2.40)	-0.031 (-0.71)	-0.001 (-0.03)	0.005 (0.37)	0.017 (1.42)	0.007 (0.351)	0.020 (2.62)	0.006 (0.95)	0.015 (1.78)	-0.005 (-0.51)
Population growth					-0.654 (-2.85)	-0.395 (-1.88)	-1.077 (-2.04)	-0.564 (-1.66)	-0.519 (-2.35)	-0.318 (-1.81)	-0.246 (-1.24)				
Primary education in 1960												0.018 (2.58)	0.015 (2.42)	0.014 (1.99)	0.007 (1.27)
Government expenditure												-0.114 (-3.66)	-0.095 (-3.22)	-0.108 (-3.76)	-0.082 (-3.36)
Revolutions and coups												-0.008 (-1.25)	-0.010 (-1.45)	-0.008 (-1.24)	-0.009 (-1.66)
Assassinations												-0.218 (-4.11)	-0.190 (-3.57)	-0.210 (-4.29)	-0.173 (-3.98)
PPI60												0.001 (0.06)	0.003 (0.64)	0.003 (0.73)	0.009 (1.86)
PPI60DEV												-0.018 (-2.88)	-0.156 (-2.23)	-0.019 (-3.14)	-0.017 (-3.00)
Africa													-0.017 (-4.26)		-0.021 (-5.21)
Latin America													-0.005 (-1.19)		-0.006 (-1.70)

Political instability index												0.003 (2.35)	0.002 (1.95)	0.003 (2.34)	0.002 (1.82)	
Investment 1960–1985									0.098 (2.82)	0.125 (3.64)	0.230 (3.14)				0.051 (2.16)	0.083 (3.60)
Bureaucratic efficiency index	0.003 (2.58)		0.011 (2.33)		0.006 (3.08)		0.014 (1.88)		0.004 (2.03)			0.001 (1.24)	0.002 (1.89)	0.001 (0.74)	0.001 (1.35)	
Corruption index		0.002 (1.97)		0.008 (2.34)		0.003 (1.91)		0.011 (1.49)				0.002 (1.13)				
Estimation methods	OLS	OLS	2SLS	2SLS	OLS	OLS	2SLS	2SLS	OLS	OLS	2SLS (OI)	OLS	OLS	OLS	OLS	
R^2	0.13	0.07	(*)	(*)	0.38	0.27	(*)	(*)	0.46	0.40	(*)	0.74	0.79	0.76	0.83	

A high value of each index means the country has good institutions. One standard deviation equals 2.16 for the bureaucratic efficiency index, 2.51 for the corruption index, and 1.29 for the political stability index. White-corrected t -statistics are reported in parentheses. There are 58 observations in the case of OLS and 57 in the case of 2SLS. Initial GDP per capita, primary education, secondary education, population growth, the purchasing-power parity value for the investment deflator (PPI60) and its deviation from the sample mean (PPI60DEV) in 1960, the 1960–1985 average ratio of government consumption expenditure (net of spending on defense and education) to GDP, the number of revolutions and coups, and the number of assassinations are from Barro [1991]. 2SLS indicates that the index of ethnolinguistic fractionalization in 1960, from Taylor and Hudson [1972], is used as an instrument. 2SLS(OI) indicates that all 9 BI individual indices listed in Section II are used as instruments. The p -value of the test of the overidentifying restrictions is 7.5 percent. (*) The R^2 is not an appropriate measure of goodness of fit with two-stage least squares.

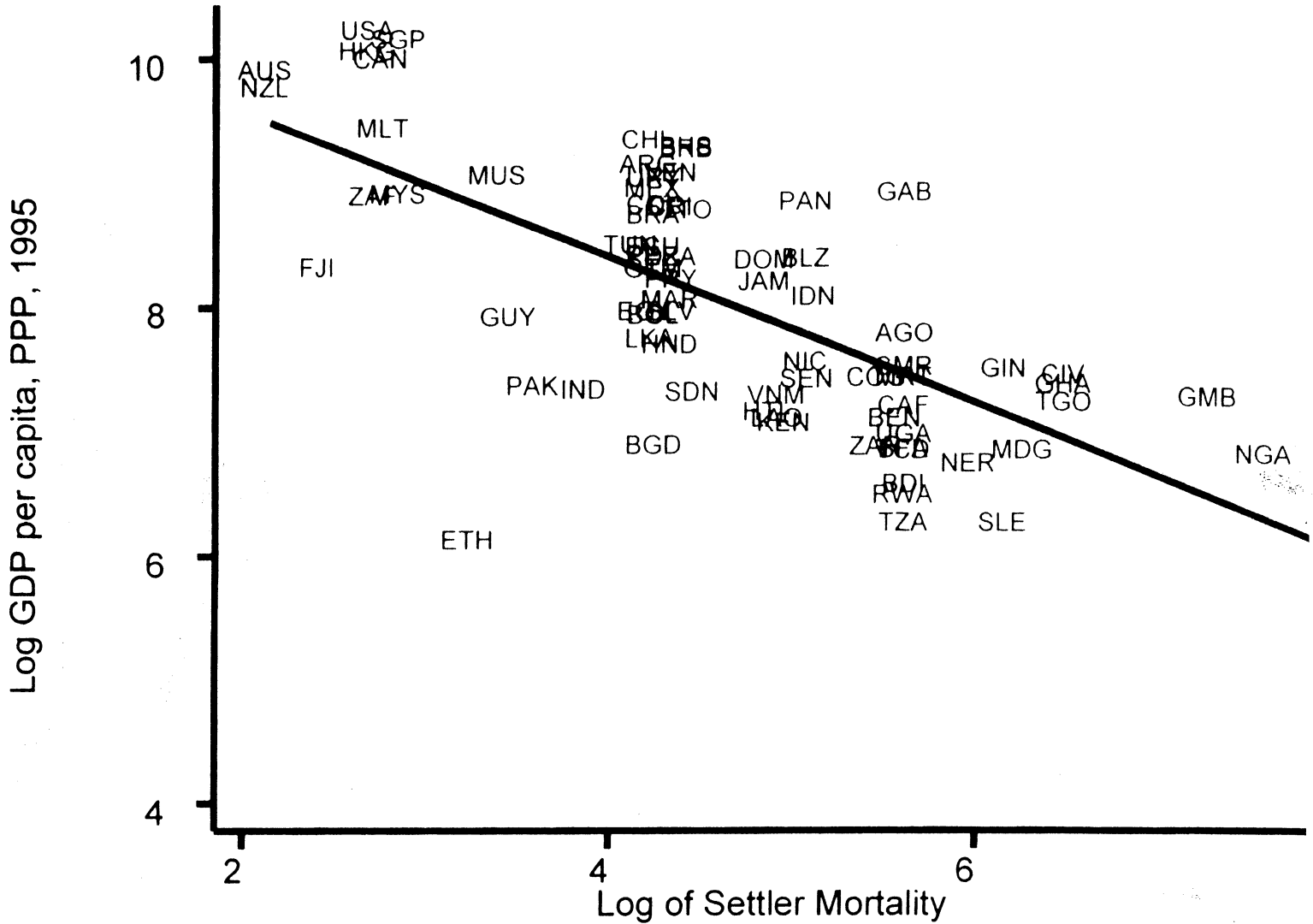


FIGURE 1. REDUCED-FORM RELATIONSHIP BETWEEN INCOME AND SETTLER MORTALITY

TABLE 2—OLS REGRESSIONS

	Whole world (1)	Base sample (2)	Whole world (3)	Whole world (4)	Base sample (5)	Base sample (6)	Whole world (7)	Base sample (8)
	Dependent variable is log GDP per capita in 1995						Dependent variable is log output per worker in 1988	
Average protection against expropriation risk, 1985–1995	0.54 (0.04)	0.52 (0.06)	0.47 (0.06)	0.43 (0.05)	0.47 (0.06)	0.41 (0.06)	0.45 (0.04)	0.46 (0.06)
Latitude			0.89 (0.49)	0.37 (0.51)	1.60 (0.70)	0.92 (0.63)		
Asia dummy				−0.62 (0.19)		−0.60 (0.23)		
Africa dummy				−1.00 (0.15)		−0.90 (0.17)		
“Other” continent dummy				−0.25 (0.20)		−0.04 (0.32)		
R^2	0.62	0.54	0.63	0.73	0.56	0.69	0.55	0.49
Number of observations	110	64	110	110	64	64	108	61

Notes: Dependent variable: columns (1)–(6), log GDP per capita (PPP basis) in 1995, current prices (from the World Bank’s World Development Indicators 1999); columns (7)–(8), log output per worker in 1988 from Hall and Jones (1999). Average protection against expropriation risk is measured on a scale from 0 to 10, where a higher score means more protection against expropriation, averaged over 1985 to 1995, from Political Risk Services. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable definitions and sources. Of the countries in our base sample, Hall and Jones do not report output per worker in the Bahamas, Ethiopia, and Vietnam.

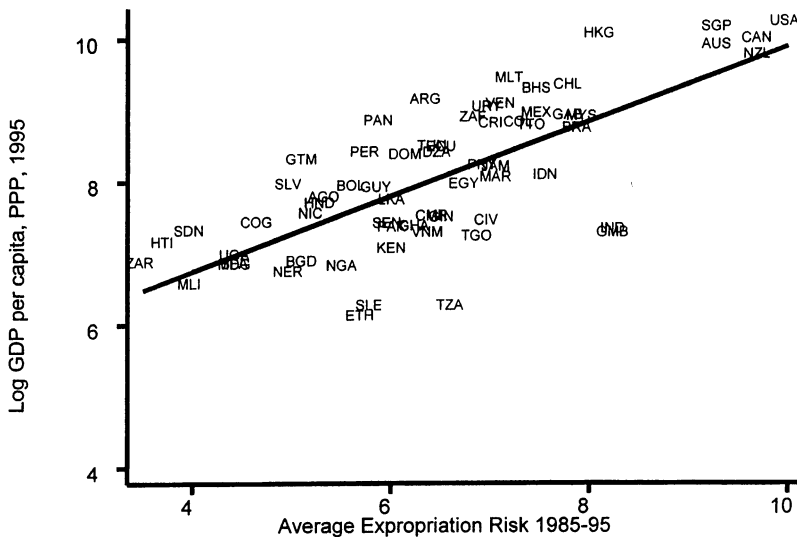


FIGURE 2. OLS RELATIONSHIP BETWEEN EXPROPRIATION RISK AND INCOME

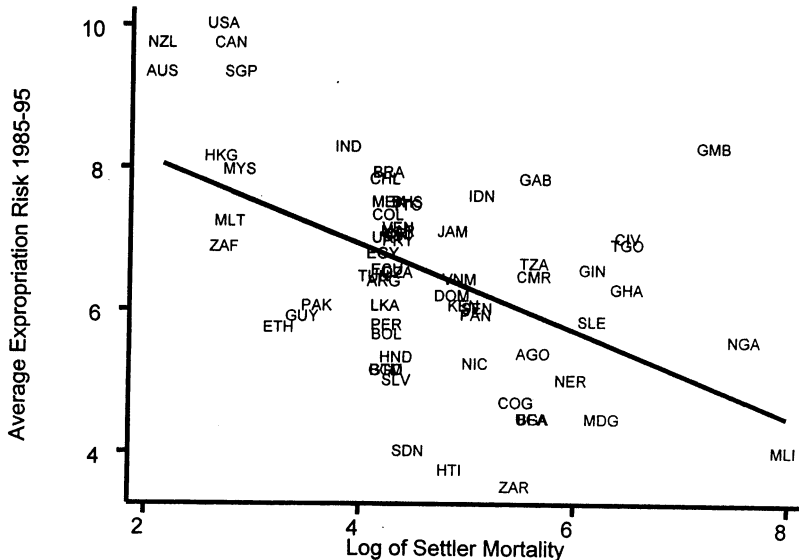


FIGURE 3. FIRST-STAGE RELATIONSHIP BETWEEN SETTLER MORTALITY AND EXPROPRIATION RISK

TABLE 3—DETERMINANTS OF INSTITUTIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A										
	Dependent Variable Is Average Protection Against Expropriation Risk in 1985–1995									
Constraint on executive in 1900	0.32 (0.08)	0.26 (0.09)								
Democracy in 1900			0.24 (0.06)	0.21 (0.07)						
Constraint on executive in first year of independence					0.25 (0.08)	0.22 (0.08)				
European settlements in 1900							3.20 (0.61)	3.00 (0.78)		
Log European settler mortality									-0.61 (0.13)	-0.51 (0.14)
Latitude		2.20 (1.40)		1.60 (1.50)		2.70 (1.40)		0.58 (1.51)		2.00 (1.34)
R ²	0.2	0.23	0.24	0.25	0.19	0.24	0.3	0.3	0.27	0.3
Number of observations	63	63	62	62	63	63	66	66	64	64
Panel B										
	Dependent Variable Is Constraint on Executive in 1900				Dependent Variable Is Democracy in 1900				Dependent Variable Is European Settlements in 1900	
European settlements in 1900	5.50 (0.73)	5.40 (0.93)			8.60 (0.90)	8.10 (1.20)				
Log European settler mortality			-0.82 (0.17)	-0.65 (0.18)			-1.22 (0.24)	-0.88 (0.25)	-0.11 (0.02)	-0.07 (0.02)
Latitude		0.33 (1.80)		3.60 (1.70)		1.60 (2.30)		7.60 (2.40)		0.87 (0.19)
R ²	0.46	0.46	0.25	0.29	0.57	0.57	0.28	0.37	0.31	0.47
Number of observations	70	70	75	75	67	67	68	68	73	73

Notes: All regressions are OLS. Standard errors are in parentheses. Regressions with constraint on executive in first year of independence also include years since independence as a regressor. Average protection against expropriation risk is on a scale from 0 to 10, where a higher score means more protection against expropriation of private investment by government, averaged over 1985 to 1995. Constraint on executive in 1900 is on a scale from 1 to 7, with a higher score indicating more constraints. Democracy in 1900 is on a scale from 0 to 10, with a higher score indicating more democracy. European settlements is percent of population that was European or of European descent in 1900. See Appendix Table A1 for more detailed variable definitions and sources.

TABLE 4—IV REGRESSIONS OF LOG GDP PER CAPITA

	Base sample (1)	Base sample (2)	Base sample without Neo-Europes (3)	Base sample without Neo-Europes (4)	Base sample without Africa (5)	Base sample without Africa (6)	Base sample with continent dummies (7)	Base sample with continent dummies (8)	Base sample, dependent variable is log output per worker (9)
Panel A: Two-Stage Least Squares									
Average protection against expropriation risk 1985–1995	0.94 (0.16)	1.00 (0.22)	1.28 (0.36)	1.21 (0.35)	0.58 (0.10)	0.58 (0.12)	0.98 (0.30)	1.10 (0.46)	0.98 (0.17)
Latitude		-0.65 (1.34)		0.94 (1.46)		0.04 (0.84)		-1.20 (1.8)	
Asia dummy							-0.92 (0.40)	-1.10 (0.52)	
Africa dummy							-0.46 (0.36)	-0.44 (0.42)	
“Other” continent dummy							-0.94 (0.85)	-0.99 (1.0)	
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	-0.61 (0.13)	-0.51 (0.14)	-0.39 (0.13)	-0.39 (0.14)	-1.20 (0.22)	-1.10 (0.24)	-0.43 (0.17)	-0.34 (0.18)	-0.63 (0.13)
Latitude		2.00 (1.34)		-0.11 (1.50)		0.99 (1.43)		2.00 (1.40)	
Asia dummy							0.33 (0.49)	0.47 (0.50)	
Africa dummy							-0.27 (0.41)	-0.26 (0.41)	
“Other” continent dummy							1.24 (0.84)	1.1 (0.84)	
R ²	0.27	0.30	0.13	0.13	0.47	0.47	0.30	0.33	0.28
Panel C: Ordinary Least Squares									
Average protection against expropriation risk 1985–1995	0.52 (0.06)	0.47 (0.06)	0.49 (0.08)	0.47 (0.07)	0.48 (0.07)	0.47 (0.07)	0.42 (0.06)	0.40 (0.06)	0.46 (0.06)
Number of observations	64	64	60	60	37	37	64	64	61

Notes: The dependent variable in columns (1)–(8) is log GDP per capita in 1995, PPP basis. The dependent variable in column (9) is log output per worker, from Hall and Jones (1999). “Average protection against expropriation risk 1985–1995” is measured on a scale from 0 to 10, where a higher score means more protection against risk of expropriation of investment by the government, from Political Risk Services. Panel A reports the two-stage least-squares estimates, instrumenting for protection against expropriation risk using log settler mortality; Panel B reports the corresponding first stage. Panel C reports the coefficient from an OLS regression of the dependent variable against average protection against expropriation risk. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable descriptions and sources.

TABLE 5—IV REGRESSIONS OF LOG GDP PER CAPITA WITH ADDITIONAL CONTROLS

	Base sample (1)	Base sample (2)	British colonies only (3)	British colonies only (4)	Base sample (5)	Base sample (6)	Base sample (7)	Base sample (8)	Base sample (9)
Panel A: Two-Stage Least Squares									
Average protection against expropriation risk, 1985–1995	1.10 (0.22)	1.16 (0.34)	1.07 (0.24)	1.00 (0.22)	1.10 (0.19)	1.20 (0.29)	0.92 (0.15)	1.00 (0.25)	1.10 (0.29)
Latitude		-0.75 (1.70)				-1.10 (1.56)		-0.94 (1.50)	-1.70 (1.6)
British colonial dummy	-0.78 (0.35)	-0.80 (0.39)							
French colonial dummy	-0.12 (0.35)	-0.06 (0.42)							0.02 (0.69)
French legal origin dummy					0.89 (0.32)	0.96 (0.39)			0.51 (0.69)
<i>p</i> -value for religion variables							[0.001]	[0.004]	[0.42]
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	-0.53 (0.14)	-0.43 (0.16)	-0.59 (0.19)	-0.51 (0.14)	-0.54 (0.13)	-0.44 (0.14)	-0.58 (0.13)	-0.44 (0.15)	-0.48 (0.18)
Latitude		1.97 (1.40)				2.10 (1.30)		2.50 (1.50)	2.30 (1.60)
British colonial dummy	0.63 (0.37)	0.55 (0.37)							
French colonial dummy	0.05 (0.43)	-0.12 (0.44)							-0.25 (0.89)
French legal origin					-0.67 (0.33)	-0.7 (0.32)			-0.05 (0.91)
<i>R</i> ²	0.31	0.33	0.30	0.30	0.32	0.35	0.32	0.35	0.45
Panel C: Ordinary Least Squares									
Average protection against expropriation risk, 1985–1995	0.53 (0.19)	0.47 (0.07)	0.61 (0.09)	0.47 (0.06)	0.56 (0.06)	0.56 (0.06)	0.53 (0.06)	0.47 (0.06)	0.47 (0.06)
Number of observations	64	64	25	25	64	64	64	64	64

Notes: Panel A reports the two-stage least-squares estimates with log GDP per capita (PPP basis) in 1995 as dependent variable, and Panel B reports the corresponding first stage. The base case in columns (1) and (2) is all colonies that were neither French nor British. The religion variables are included in the first stage of columns (7) and (8) but not reported here (to save space). Panel C reports the OLS coefficient from regressing log GDP per capita on average protection against expropriation risk, with the other control variables indicated in that column (full results not reported to save space). Standard errors are in parentheses and *p*-values for joint significance tests are in brackets. The religion variables are percentage of population that are Catholics, Muslims, and "other" religions; Protestant is the base case. Our sample is all either French or British legal origin (as defined by La Porta et al., 1999).

TABLE 6—ROBUSTNESS CHECKS FOR IV REGRESSIONS OF LOG GDP PER CAPITA

	Base sample (1)	Base sample (2)	Base sample (3)	Base sample (4)	Base sample (5)	Base sample (6)	Base sample (7)	Base sample (8)	Base sample (9)
Panel A: Two-Stage Least Squares									
Average protection against expropriation risk, 1985–1995	0.84 (0.19)	0.83 (0.21)	0.96 (0.28)	0.99 (0.30)	1.10 (0.33)	1.30 (0.51)	0.74 (0.13)	0.79 (0.17)	0.71 (0.20)
Latitude		0.07 (1.60)		-0.67 (1.30)		-1.30 (2.30)		-0.89 (1.00)	-2.5 (1.60)
<i>p</i> -value for temperature variables	[0.96]	[0.97]							[0.77]
<i>p</i> -value for humidity variables	[0.54]	[0.54]							[0.62]
Percent of European descent in 1975			-0.08 (0.82)	0.03 (0.84)					0.3 (0.7)
<i>p</i> -value for soil quality					[0.79]	[0.85]			[0.46]
<i>p</i> -value for natural resources					[0.82]	[0.87]			[0.82]
Dummy for being landlocked					0.64 (0.63)	0.79 (0.83)			0.75 (0.47)
Ethnolinguistic fragmentation							-1.00 (0.32)	-1.10 (0.34)	-1.60 (0.47)
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	-0.64 (0.17)	-0.59 (0.17)	-0.41 (0.14)	-0.4 (0.15)	-0.44 (0.16)	-0.34 (0.17)	-0.64 (0.15)	-0.56 (0.15)	-0.59 (0.21)
Latitude		2.70 (2.00)		0.48 (1.50)		2.20 (1.50)		2.30 (1.40)	4.20 (2.60)
<i>R</i> ²	0.39	0.41	0.34	0.34	0.41	0.43	0.27	0.30	0.59
Panel C: Ordinary Least Squares									
Average protection against expropriation risk, 1985–1995	0.41 (0.06)	0.38 (0.06)	0.39 (0.06)	0.38 (0.06)	0.46 (0.07)	0.42 (0.07)	0.46 (0.05)	0.45 (0.06)	0.38 (0.06)

Notes: Panel A reports the two-stage least-squares estimates with log GDP per capita (PPP basis) in 1995, and Panel B reports the corresponding first stages. Panel C reports the OLS coefficient from regressing log GDP per capita on average protection against expropriation risk, with the other control variables indicated in that column (full results not reported to save space). Standard errors are in parentheses and *p*-values for joint significance tests are in brackets. All regressions have 64 observations, except those including natural resources, which have 63 observations. The temperature and humidity variables are: average, minimum, and maximum monthly high temperatures, and minimum and maximum monthly low temperatures, and morning minimum and maximum humidity, and afternoon minimum and maximum humidity (from Parker, 1997). Measures of natural resources are: percent of world gold reserves today, percent of world iron reserves today, percent of world zinc reserves today, number of minerals present in country, and oil resources (thousands of barrels per capita). Measures of soil quality/climate are steppe (low latitude), desert (low latitude), steppe (middle latitude), desert (middle latitude), dry steppe wasteland, desert dry winter, and highland. See Appendix Table A1 for more detailed variable definitions and sources.

Table 2

Contracting Institutions: GDP per capita, Investment, Credit, and Stock Market Capitalization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	World		Excolonies Sample				
	OLS	2SLS	2SLS	OLS	2SLS	OLS	2SLS
<i>Panel A: Dependent variable is log GDP per capita in 1995</i>							
Legal Formalism	-0.28 (0.10)	-0.21 (0.10)	-0.18 (0.14)				
Procedural Complexity				-0.047 (0.083)	-0.150 (0.120)		
Number of Procedures						-0.016 (0.010)	-0.026 (0.021)
R-Squared in OLS	0.07	0.07		0.005		0.04	
<i>First Stage for Measure of Contracting Institutions</i>							
English Legal Origin			-1.87 (0.20)		-2.21 (0.28)		-12.38 (2.79)
R-Squared in First Stage			0.58		0.48		0.23
Number of Observations	109	65	65	69	69	70	70
<i>Panel B: Dependent variable is average ratio of investment to GDP in 1990s</i>							
Legal Formalism	-1.90 (0.69)	-1.19 (0.71)	-1.77 (0.94)				
Procedural Complexity				-0.60 (0.60)	-2.10 (0.87)		
Number of Procedures						-0.12 (0.07)	-0.34 (0.15)
R-Squared in OLS	0.07	0.04		0.01		0.04	
Number of Observations	108	65	65	70	70	71	71
<i>Panel C: Dependent variable is credit to the private sector in 1998</i>							
Legal Formalism	-0.16 (0.04)	-0.14 (0.03)	-0.13 (0.05)				
Procedural Complexity				-0.056 (0.029)	-0.120 (0.044)		
Number of Procedures						-0.008 (0.004)	-0.021 (0.008)
R-Squared in OLS	0.16	0.21		0.05		0.06	
Number of Observations	104	65	65	69	69	70	70
<i>Panel D: Dependent variable is stock market capitalization, average over 1990-95</i>							
Legal Formalism (Check Measure)	-0.17 (0.03)	-0.17 (0.04)	-0.16 (0.05)				
Procedural Complexity (Commercial Debt)				-0.072 (0.031)	-0.160 (0.047)		
Number of Procedures (Commercial Debt)						-0.008 (0.004)	-0.027 (0.009)
R-Squared in OLS	0.24	0.26		0.08		0.06	
Number of Observations	90	62	62	67	67	67	67

Standard errors are in parentheses. All regressions are cross-sectional, OLS or 2SLS, with one observation per country. The dependent variable is: in Panel A, log GDP per capita (in PPP terms) in 1995; in Panel B, the investment to GDP ratio, in current prices, average over 1990s; in Panel C, level of credit to the private sector as a percent of GDP in 1998; and in Panel D, the level of stock market capitalization as a percent of GDP, 1990-95. In all four panels the measure of contracting institutions is instrumented using a dummy variable for whether a country has an English legal origin. The first stages are essentially the same in Panels B, C and D as in Panel A. For detailed sources and definitions see Appendix Table A1.

Table 3

Property Rights Institutions: GDP per capita, Investment, Credit, and Stock

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Whole World		Excolonies Sample					
	OLS	2SLS	2SLS	OLS	2SLS	OLS	2SLS	
<i>Panel A: Dependent variable is log GDP per capita in 1995</i>								
Constraint on Executive	0.33 (0.04)	0.32 (0.05)	0.76 (0.15)	0.73 (0.16)				
Average Protection Against Risk of Exprop.					0.52 (0.06)	1.05 (0.19)		
Private Property							0.69 (0.09)	1.57 (0.32)
R-Squared in OLS	0.35	0.34			0.54		0.47	
<i>First Stage for Measure of Property Rights Institutions</i>								
Log Settler Mortality			-0.80 (0.16)			-0.57 (0.13)		-0.40 (0.10)
Log Population Density in 1500				-0.50 (0.11)				
R-Squared in First Stage			0.27	0.19		0.23		0.20
Number of Observations	145	69	69	82	65	65	67	67
<i>Panel B: Dependent variable is average ratio of investment to GDP in 1990s</i>								
Constraint on Executive	1.55 (0.32)	1.33 (0.43)	4.20 (1.08)	4.18 (1.22)				
Average Protection Against Risk of Exprop.					3.00 (0.48)	5.50 (1.12)		
Private Property							3.64 (0.72)	9.23 (2.23)
R-Squared in OLS	0.14	0.12			0.38		0.28	
Number of Observations	144	69	69	82	65	65	67	67
<i>Panel C: Dependent variable is credit to the private sector in 1998</i>								
Constraint on Executive	0.08 (0.02)	0.08 (0.02)	0.25 (0.06)	0.17 (0.05)				
Average Protection Against Risk of Exprop.					0.16 (0.03)	0.37 (0.08)		
Private Property							0.23 (0.03)	0.54 (0.12)
R-Squared in OLS	0.15	0.19			0.33		0.40	
Number of Observations	137	69	69	81	66	66	68	68
<i>Panel D: Dependent variable is stock market cap., average over 1990-95</i>								
Constraint on Executive	0.06 (0.02)	0.06 (0.02)	0.21 (0.06)	0.14 (0.05)				
Average Protection Against Risk of Exprop.					0.14 (0.03)	0.30 (0.08)		
Private Property							0.21 (0.04)	0.43 (0.10)
R-Squared in OLS	0.11	0.08			0.25		0.30	
Number of Observations	103	65	65	65	63	63	66	66

Standard errors are in parentheses. All regressions are cross-sectional, OLS or 2SLS, with one observation per country. The dependent variable is: in Panel A, log GDP per capita (in PPP terms) in 1995; in Panel B, the investment to GDP ratio, in current prices, average over 1990s; in Panel C, the level of credit to the private sector as a percent of GDP in 1998; and in Panel D, the level of stock market capitalization as a percent of GDP, 1990-95. The measure of institutions is instrumented: in columns 3, 6 and 8 using log settler mortality; and in column 4 using log population density in 1500. The first stages in Panels B, C, and D are essentially the same as in Panel A. For detailed sources and definitions see Appendix Table A1.

Table 4

First Stage Regressions for Contracting and Property Rights Institutions

	(1)	(2)	(3)	(4)	(5)	(6)
OLS, Excolonies Sample						
<i>Panel A: Dependent variable is measure of contracting institutions</i>						
	<i>Legal Formalism</i>		<i>Procedural Complexity</i>		<i>Number of Procedures</i>	
English Legal Origin	-1.98 (0.23)	-1.79 (0.20)	-2.28 (0.34)	-2.24 (0.29)	-11.29 (3.31)	-12.39 (2.88)
Log Settler Mortality	0.09 (0.09)		-0.08 (1.32)		1.59 (1.29)	
Log Population Density in 1500		0.04 (0.06)		-0.13 (0.86)		-0.38 (0.84)
R-Squared in First Stage	0.64	0.58	0.47	0.47	0.23	0.22
Number of Observations	53	64	60	68	61	69
<i>Panel B: Dependent variable is measure of property rights institutions</i>						
	<i>Constraint on Executive</i>		<i>Protection Against Expropriation</i>		<i>Private Property</i>	
English Legal Origin	-0.002 (0.48)	0.05 (0.43)	0.60 (0.31)	0.87 (0.30)	0.72 (0.22)	0.73 (0.18)
Log Settler Mortality	-0.66 (0.19)		-0.71 (0.12)		-0.30 (0.09)	
Log Population Density in 1500		-0.40 (0.13)		-0.36 (0.09)		-0.29 (0.05)
R-Squared in First Stage	0.21	0.15	0.50	0.35	0.37	0.47
Number of Observations	51	60	51	57	52	60

Standard errors are in parentheses. All regressions are cross-sectional OLS with one observation per country. The dependent variables in Panel A are measures of contracting institutions: legal formalism, procedural complexity, and number of procedures. The dependent variables in Panel B are measures of property rights institutions: constraint on the executive, protection against expropriation, and private property. For detailed sources and definitions see Appendix Table A1.

Table 5

Contracting vs. Property Rights Institutions: GDP per capita and Investment-GDP ratio						
	(1)	(2)	(3)	(4)	(5)	(6)
	2SLS, with log settler mort. as instrument		2SLS, with log pop. density as instrument		2SLS, with log settler mortality as instrument	
<i>Panel A: Dependent variable is log GDP per capita, OLS or Second Stage of 2SLS</i>						
Legal Formalism	0.05 (0.24)	-0.002 (0.21)			0.35 (0.15)	0.85 (0.45)
Procedural Complexity			0.097 (0.17)			
Number of Procedures				0.02 (0.04)		
Constraint on Executive	0.99 (0.29)	0.88 (0.27)	0.84 (0.18)	0.88 (0.23)		
Average Protection Against Risk of Expropriation Private Property					0.99 (0.16)	2.45 (0.81)
Results in equivalent OLS specification						
Measure of Contracting Institutions	-0.16 (0.10)	-0.13 (0.10)	-0.050 (0.07)	-0.013 (0.009)	0.11 (0.09)	0.01 (0.10)
Measure of Property Rights Institutions	0.31 (0.07)	0.29 (0.07)	0.34 (0.06)	0.32 (0.06)	0.63 (0.08)	0.74 (0.14)
Number of Observations	51	60	60	61	51	52
<i>Panel B: Dependent variable is investment to GDP, OLS or Second Stage of 2SLS</i>						
Legal Formalism	-0.80 (1.55)	-1.34 (1.37)			0.57 (1.08)	3.83 (2.52)
Procedural Complexity			-0.60 (1.10)			
Number of Procedures				-0.08 (0.23)		
Constraint on Executive	4.7 (1.87)	4.24 (1.77)	4.21 (1.20)	4.06 (1.44)		
Average Protection Against Risk of Expropriation Private Property					4.68 (1.11)	13.16 (4.57)
Results in equivalent OLS specification						
Measure of Contracting Institutions	-1.05 (0.83)	-0.94 (0.76)	-0.50 (0.60)	-0.08 (0.07)	0.67 (0.71)	0.14 (0.78)
Measure of Property Rights Institutions	1.08 (0.57)	1.00 (0.51)	1.5 (0.48)	1.31 (0.49)	3.88 (0.65)	4.68 (1.08)
Number of Observations	51	60	60	61	51	52

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; main regressions are 2SLS, with results from corresponding OLS specification shown below. The dependent variable is: in Panel A, log GDP per capita (in PPP terms) in 1995; in Panel B, the investment to GDP ratio, in current prices, average over 1990s. The instruments are English legal origin in all columns; in column 1 and columns 3 through 6 log settler mortality; and in column 2, log population density in 1500. First stages are similar to Table 4. For detailed sources and definitions see Appendix Table A1.

Table 6

Contracting vs. Property Rights Institutions: Private Credit and Stock Market Capitalization

	(1)	(2)	(3)	(4)	(5)	(6)
		2SLS, with log population density in 1500 as instrument			2SLS, with log settler mortality as instrument	
<i>Panel A: Dep. variable is credit to private sector, OLS or 2nd Stage of 2SLS</i>						
Legal Formalism	-0.08 (0.08)	-0.08 (0.06)			-0.01 (0.07)	0.16 (0.14)
Procedural Complexity			-0.05 (0.06)			
Number of Procedures				-0.010 (0.012)		
Constraint on Executive	0.27 (0.10)	0.17 (0.07)	0.24 (0.06)	0.22 (0.07)		
Average Protection Against Risk of Expropriation Property Rights					0.28 (0.07)	0.70 (0.25)
Results in equivalent OLS specification						
Measure of Contracting Institutions	-0.13 (0.04)	-0.11 (0.04)	-0.059 (0.030)	-0.006 (0.003)	-0.09 (0.04)	-0.08 (0.04)
Measure of Property Rights Institutions	0.06 (0.03)	0.06 (0.02)	0.08 (0.02)	0.071 (0.02)	0.13 (0.04)	0.21 (0.05)
Number of Observations	51	60	60	61	51	52
<i>Panel B: Dependent variable is stock market cap., OLS or Second Stage of 2SLS</i>						
Legal Formalism	-0.16 (0.07)	-0.14 (0.05)			-0.10 (0.07)	0.04 (0.10)
Procedural Complexity			-0.11 (0.06)			
Number of Procedures				-0.022 (0.013)		
Constraint on Executive	0.20 (0.09)	0.13 (0.07)	0.19 (0.06)	0.14 (0.08)		
Average Protection Against Risk of Expropriation Property Rights					0.21 (0.07)	0.54 (0.20)
Results in equivalent OLS specification						
Measure of Contracting Institutions	-0.17 (0.04)	-0.15 (0.04)	-0.08 (0.03)	-0.006 (0.004)	-0.15 (0.05)	-0.08 (0.04)
Measure of Property Rights Institutions	0.039 (0.03)	0.04 (0.03)	0.055 (0.03)	0.05 (0.03)	0.10 (0.04)	0.21 (0.06)
Number of Observations	50	59	59	59	50	51

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; main regressions are 2SLS, with results from corresponding OLS specification shown below. The dependent variable is: in Panel A, the level of credit to the private sector as a percent of GDP in 1998; and in Panel B, the level of stock market capitalization as a percent of GDP, 1990-95. The instruments are English legal origin in all columns; in column 1 and columns 3 through 6 log settler mortality; and in column 2, log population density in 1500. First stages are similar to Table 4. For detailed sources and definitions see Appendix Table A1.

	Quarter or less	Quarter to Half	Half to Average	Average to Twice	Twice or more
Quarter or less	88	8	4	0	0
Quarter to Half	48	43	10	0	0
Half to Average	0	28	56	14	3
Average to Twice	0	0	32	42	26
Twice or more	0	3	3	6	88

The Income Mobility of Countries, 1980--2000. 132 Countries

FIGURE 2.1. THE INCOME MOBILITY OF COUNTRIES, 1980–2000.

they were. This is interesting because it suggests that although everything is possible (in principle), a history of underdevelopment or extreme poverty puts countries at a tremendous disadvantage.

There is actually a bit more to Figure 2.1 than lack of mobility at the extremes. Look at the next-to-poorest category (those with incomes between one-quarter and one-half of the world

TABLE I
GROWTH REGRESSIONS FOR 1960–1985

	High-quality sample (<i>N</i> = 46)		Largest possible sample (<i>N</i> = 70)		Largest possible sample			
	OLS (1)	TOLS (2)	OLS (3)	TOLS (4)	(<i>N</i> = 49)		(<i>N</i> = 41)	
	OLS (1)	TOLS (2)	OLS (3)	TOLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)
Const.	3.60 (2.66)	8.66 (3.33)	1.76 (1.50)	6.48 (2.93)	3.71 (3.86)	6.22 (4.69)	6.24 (4.63)	6.21 (4.61)
GDP60	-0.44 (-3.28)	-0.52 (-3.17)	-0.48 (-3.37)	-0.58 (-3.47)	-0.38 (-3.61)	-0.38 (-3.25)	-0.39 (-3.06)	-0.38 (-2.95)
PRIM60	3.26 (3.38)	2.85 (2.43)	3.98 (4.66)	3.70 (3.72)	3.85 (4.88)	2.66 (2.66)	2.62 (2.53)	2.65 (2.56)
GINI60	-5.70 (-2.46)	-15.98 (-3.21)	3.58 (-1.81)	-12.93 (-3.12)		-3.47 (-1.82)	-3.45 (-1.79)	-3.47 (-1.80)
GINILND					-5.50 (-5.24)	-5.23 (-4.38)	-5.24 (-4.32)	-5.21 (-4.19)
DEMOC*							0.12	
GINILND							(0.12)	
DEMOC								0.02 (0.05)
\bar{R}^2	0.28	0.27	0.25	0.26	0.53	0.53	0.51	0.51

The dependent variable is average per capita growth rate over 1960–1985. *t*-statistics are in parentheses. Independent variables are defined as follows:

- GDP60: Per capita GDP level in 1960
 PRIM60: Primary school enrollment ratio in 1960
 GINI60: Gini coefficient of income inequality, measured close to 1960 (see Appendix for dates)
 GINILND: Gini coefficient of land distribution inequality, measured close to 1960 (see Appendix for dates)
 DEMOC: Democracy dummy.

Two-stage least squares regressions use GDP60, PRIM60, literacy rate in 1960, infant mortality in 1965, secondary enrollment in 1960, fertility in 1965, and an Africa dummy as instruments.

Tabellini [1991] report that while the inverse relationship holds for democracies, it does not for nondemocracies. The difference in the results arises mostly because of different data sets on inequality, and to a lesser extent from some differences in specification and definition of democracies.¹³ Finally, column (8) indicates that

13. In a previous version of this paper, we reported weak support for the difference between democracies and nondemocracies using a data set closer to that of Persson and Tabellini [1991]. The present work employs a revised and improved data set, based on recent research by Fields [1993].

Barro (Journal of Econ. Growth, 2000)

INEQUALITY AND GROWTH IN A PANEL OF COUNTRIES

17

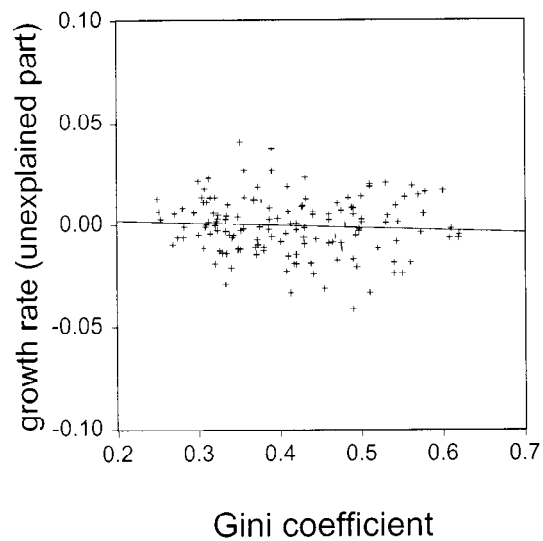


Figure 1. Growth rate versus Gini coefficient.

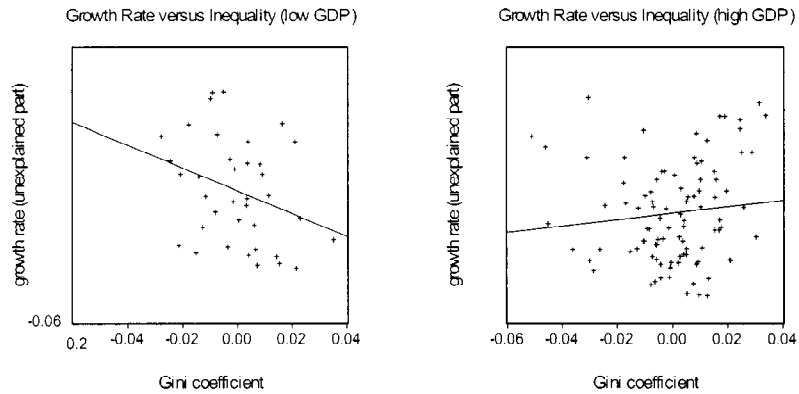


Figure 2. Growth rate versus inequality.

Scatter of Gini against log(GDP)

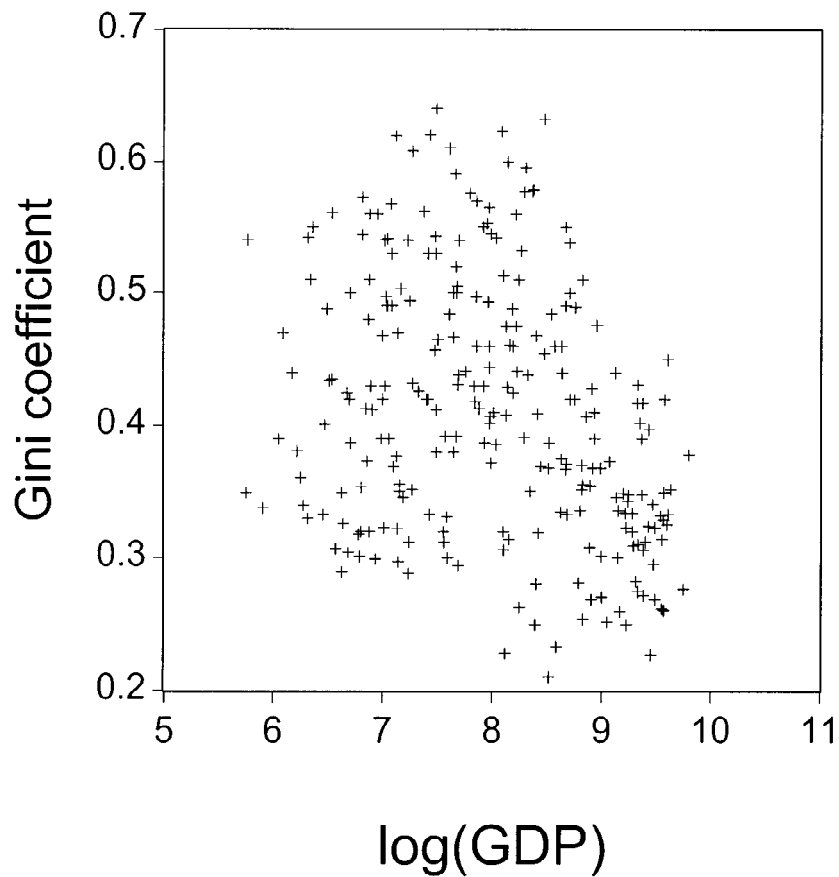


Figure 3. Scatter of Gini against log(GDP).

Table 6. Continued. Determinants of inequality.

Part II: Fixed Country Effects		
Variable		
log(GDP)	0.132 (0.013)	0.127 (0.013)
log(GDP) squared	-0.0083 (0.0014)	-0.0085 (0.0015)
Dummy: net income or spending	-0.0542 (0.0108)	-0.0479 (0.0111)
Dummy: individual vs. household data	-0.0026 (0.0078)	-0.0105 (0.0083)
Primary schooling	-0.0025 (0.0091)	0.0036 (0.0092)
Secondary schooling	-0.0173 (0.0099)	-0.0269 (0.0097)
Higher schooling	0.102 (0.030)	0.116 (0.033)
Openness	—	0.061 (0.025)
Number of observations	36, 56 57, 59	35, 54 53, 54

Gini Coefficient versus log(GDP)

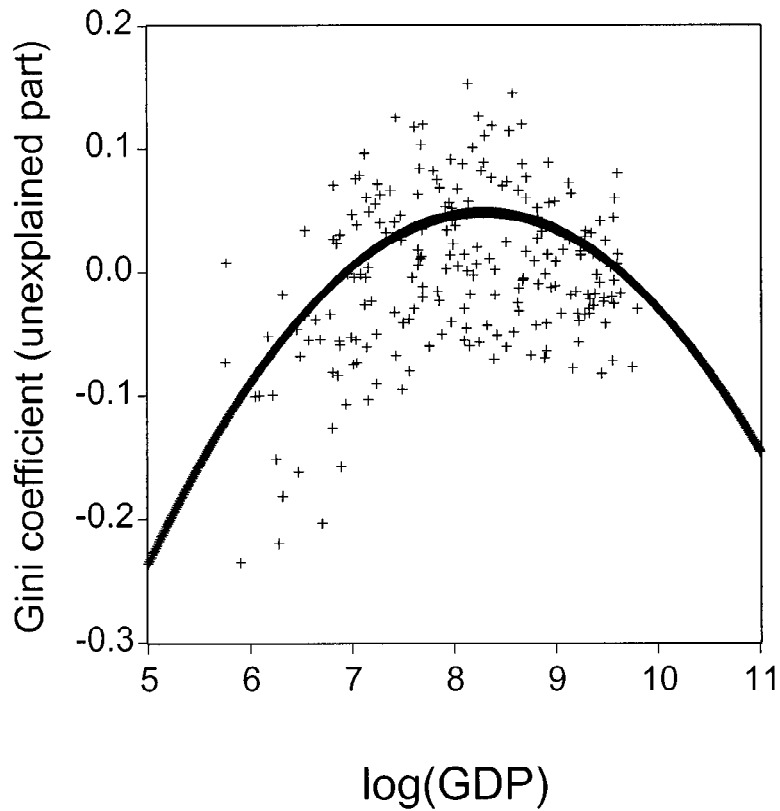


Figure 4. Gini coefficient versus log(GDP).