

DEMOCRACY, DICTATORSHIP, AND INFANT MORTALITY REVISITED

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Back in April 2000, we wrote in these pages about the link between political regimes and rates of infant mortality.¹ Our analysis showed that a country's type of regime—democratic or dictatorial—had an *independent* effect on people's well-being as reflected broadly in the infant mortality rate (IMR) in that country. Virtually without exception—and at *every* level of Gross Domestic Product per capita (GDPpc)—democracies made their inhabitants better off than did dictatorships.

But the best data we could find only went up to 1990. Since that time, the world has changed dramatically, most notably for present purposes through the appearance of a number of relatively democratic regimes in Latin America, Europe, Asia, and Africa.² Has the pattern of democracies outperforming nondemocracies on citizen well-being changed since these new democracies arrived on the scene?

The policy implications of our question are potentially significant. If democracy has an independent effect on welfare once we control for other variables—particularly economic growth or industrialization—then democratization must become a top priority for international organizations and donor nations. The relationship between democracy, dictatorship, and development is hotly contested among experts, of course, with some insisting that democracy is better for development, some holding that nondemocratic rule is probably better, and still others saying that regime type makes little or no difference either way. Several succinct published reviews cover this academic literature quite well.³

Infant mortality is a key measure of overall societal welfare. The IMR serves as a window on the health and nutritional status of young children and pregnant women, and on more besides. It is a famously “sticky” indicator that almost always requires years of sustained effort to bring down.

The IMR influences overall life expectancy (countries where infant mortality is high also tend to be places where the average life span is relatively short) and can be used to predict whether a typical child’s prospects are bright or dismal. It affects women’s decisions and their opportunities. Since infants die for a wide range of reasons, the IMR is also affected by such factors as racial disparity,⁴ access to adequate and safe food, national health policies, air pollution, sanitation, shelter, access to safe drinking water, vector-borne diseases, and environmental-health management⁵—to say nothing of wars, two-thirds of whose victims are estimated to be children. In Angola alone, about a half-million children appear to have died as a result of civil war since 1975.⁶

Today, according to the *UN Human Development Report*, some 11 million children under the age of five still die annually from preventable causes.⁷ About 200 million children under five—two-fifths of all children in the developing world—lack sufficient nutrition to lead fully active lives.⁸ According to the Hunger Project, each day an average of 24,000 people around the world die from causes related to hunger—down from an estimated 41,000 such deaths per day in 1977, but still a horrific figure.⁹ Not surprisingly, less-developed countries tend to have both higher IMRs and higher rates of population growth (nearly all of the world’s population growth now occurs in developing countries). Of the 83 million people who are currently added to the globe’s population each year, only a million live in the industrialized world.¹⁰

The still-widespread neo-Malthusian belief that high infant mortality is somehow nature’s way of dealing with the Third World’s “surplus population” is bogus. High IMRs are a *cause*, not an effect, of relatively high population growth in less-developed countries. When fewer infants die in a country, parents will adjust and have fewer children. Hungry people are rational actors just like the rest of us: If more of their children survive to protect them in old age, mothers begin spacing their births.

Overcoming Selection Bias

As in our earlier study, we treat regime type as a dichotomous variable because we want to know how the type of regime—whether it is best described as democratic or dictatorial—affects infant mortality. And just as before, we draw on Adam Przeworski’s clear-cut definition of democracy as “a system in which parties lose elections.”¹¹ In our data

set, “democracies” are simply those countries that experience elections and alternations of power. Mexico, for example, does not qualify as a democracy for our purposes because for much of the twentieth century it was effectively a one-party state where votes were rigged and power never changed hands.

Everybody agrees that a country’s IMR seems to have something to do with its level of economic development, with higher-income countries having lower mortality rates. But because democracies also tend to enjoy higher levels of development than dictatorships, we must be careful not to jump to a conclusion about the relationship between regime type, level of development, and IMR. If a set of variables simultaneously affects regime type and IMR, a decision on our part to treat regime type as a purely independent variable would plainly bias our results.¹²

The type of difficulty that we must overcome in order to build our model is known as “selection bias.” We can observe the regime type and the IMR in a given country and assume that one explains the other or vice-versa, but what if there is some unknown factor or set of factors that actually accounts for *both*?¹³ If we simply cited the type of regime as accounting for the IMR (in other words, if we used regime type as the only “independent variable”) this would throw off our results.

What to do? The answer is the Heckman Two-Step Method. While this may sound like a new dance craze or the latest exercise machine, it is actually the name of a widely accepted statistical procedure that can help us to take into account—and thus correct for—the bias observed in the world.¹⁴ In a nutshell, we momentarily pretend for theoretical purposes that every dictatorship we observe in any given year existed *simultaneously* as a democracy and vice-versa. Since India was a democracy in 1995, we add to our sample an imaginary “dictatorial 1995 India”—a kind of counterfactual “evil twin” of the real, democratic India that existed in 1995 (and still exists today). This procedure allows us to isolate and compare the unbiased, independent effect that the nature of a country’s government in a given year had on infant mortality.

Our previous article included a generic indicator for education. We have dropped this because education is highly correlated with both GDPpc and access to health, indicators that our model does include. Instead we have sought to improve on our previous model with three new variables. One (labeled IMMUNDPT in Table 2 on page 94) accounts for the effect of immunization, and two new variables account for foreign money inflows: AID for foreign aid, and FDINET for foreign direct investment.

How robust is our new model? Our previous model covered 1950 to 1990, yielded 1,081 observations, and accurately predicted 496 (90.8 percent) of the democracies and 454 (84.9 percent) of the dictatorships, making for an average of 87.9 percent accurate predictions. When we apply our model to the post–Cold War period of 1990 to 1997, it yields

**TABLE 1—INFANT MORTALITY RATE (IMR)
BY LEVEL OF DEVELOPMENT AND REGIME, 1950–89, 1990–97**

1950–89						
Per-Capita Income Level	IMR Dictatorship	No. of Ob- servations	IMR Democracy	No. of Ob- servations	IMR Total	No. of Ob- servations
\$1–1999	122.7	320	95.7	47	119.2	367
\$2000–2999	84.1	57	59.6	38	74.3	95
\$3000–3999	55.1	44	42.6	35	49.6	79
\$4000–4999	43.6	42	28.9	24	38.3	66
\$5000–5999	31.2	26	23.4	48	26.1	74
\$6000+	35.0	15	15.1	385	15.8	400
Total	98.5	504	27.5	577	60.6	1081
1990–97						
Per-Capita Income Level	IMR Dictatorship	No. of Ob- servations	IMR Democracy	No. of Ob- servations	IMR Total	No. of Ob- servations
\$1–1999	82.3	150	65.7	83	76.4	233
\$2000–2999	38.9	30	35.9	37	37.2	67
\$3000–3999	29.8	32	25	50	26.9	82
\$4000–4999	39.5	16	20.9	65	24.6	81
\$5000–5999	23.8	7	17.4	25	18.8	32
\$6000+	15.2	33	8.3	275	9.0	308
Total	58.8	268	22.6	535	34.7	803

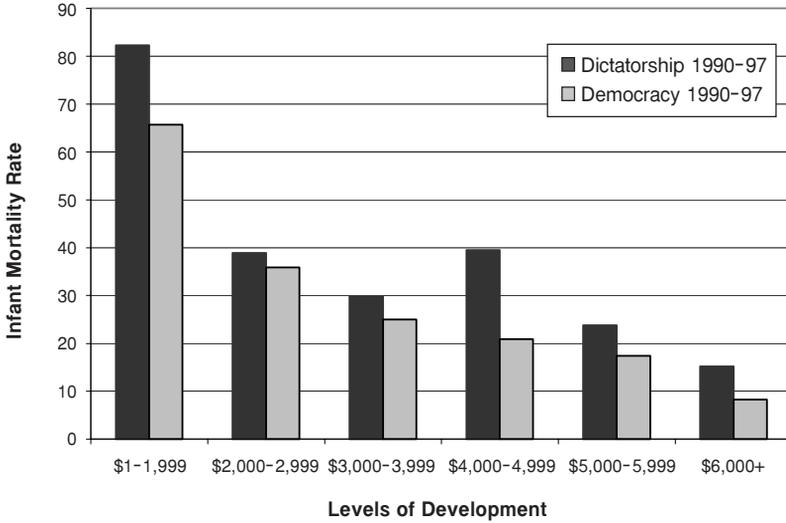
Note: These are countries for which there are both valid IMR and GDP data for the same years. Our sample included 855 valid IMR observations and 803 valid GDP observations.

293 observations, of which it correctly predicts 107 democracies (81.1 percent) and 121 dictatorships (75.2 percent). Overall, the new model predicts 77.8 percent of all regimes correctly and is still sufficiently robust. Statisticians generally deem “robust” a method that will seldom produce wrong conclusions about statistically significant or insignificant results.¹⁵

Consider the descriptive statistics in Table 1 (above), which shows IMRs by regime type and according to the World Bank’s level-of-development indicator (LEVELWB). As expected, there is a selection bias: Even after the Third Wave of democratization, the poorest democracies still account for only about half the number of the poorest dictatorships. There are now 150 valid observations for the poorest dictatorships (those with a GDPpc of less than \$2,000), but only 83 valid observations for the poorest democracies. By contrast, among the wealthiest countries (those with a GDPpc of \$6,000 or higher) the number of democracies still dwarfs that of dictatorships: 275 of the 308 valid observations (or 89.3 percent) are democracies.

As expected, we find that a country’s level of development has a strong independent effect on its IMR, regardless of regime type. Both democracies and nondemocracies show lower IMRs at every level of GNPpc in the period 1990–97 than in the earlier period 1950–89, representing significant improvement from one period to the next by both

FIGURE—IMR BY REGIME TYPE BY LEVEL OF DEVELOPMENT, 1990–97



types of regimes. But democracies still clearly outperformed dictatorships in the more recent period. To be exact, democracies did 62 percent better on average. Democracies’ overall IMR is 22.6 deaths per live births, whereas the parallel figure for nondemocracies is 58.8. Infants, in other words, are still almost three times more likely to die simply by virtue of having been born in countries with nondemocratic regimes.

The Figure above gives a graphic representation of this victory of democracy in social performance across the board. Just as before, the observed IMR is lower under democracy than under dictatorship at every level of development in the years 1990–97. On average, for every 1,000 newborns, 17 more die in their first year of life in the world’s poorest dictatorships (countries with annual GDPpc of less than \$2,000) than die in the poorest democracies. Similarly, in countries with GDPpc of \$6,000 or more, seven more children per thousand live births survive their first year simply because they were born under democracy.

The downward trend is not true across the board, of course: In the new democracies of Bulgaria, Hungary, and Zambia, the IMR *rose* after 1990: Bulgaria’s IMR was 14.4 per thousand live births in 1989, increased to 16.9 in the country’s maiden year as a democracy, went up and down in subsequent years, and reached a peak of 17.5 in 1997. Hungary’s IMR rose from 14.8 in 1990, its transition year, to 15.6 in the year after, and has since fallen continuously. In Zambia, the IMR went down from 113 per thousand live births in 1987 to a low of 108 in 1992, but then rose continuously after its 1991 democratization back to 113 in 1997. This rise in infant deaths is consistent with our expectation of a “shock effect” analogous to the economic and social effects ob-

TABLE 2—IMPACT OF EXOGENOUS VARIABLES ON INFANT MORTALITY RATE BY REGIME-TYPE

Parameter	Dictatorships		Democracies	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-25.5525	20,5629	0.3295	13.3201
FERTIL	13.9885	2.8115**	15.6743	1.7988**
POP	0.0000	0.0000	0.0000	0.0000*
LFPW	0.7427	0.3361*	0.4440	0.1820*
AID	0.8295	0.1618**	-0.4305	0.1928*
FDINET	-0.6601	0.9575	-2.0833	0.6218**
IMMUNDPT	-0.1145	0.1142	-0.1702	0.0829*
LEVELWB	-0.0007	0.0014	-0.0033	0.0007**
LAMBDA	2.2213	6.2871	-4.6436	4.1717
N	88		100	
Degrees of Freedom	79		91	
F	50.54		46.85	
Fit: R-Squared	0.8365		0.8046	
Fit: Adj. R-Squared	0.8200		0.7875	
Durbin-Watson final	1.9739		1.7261	
Final Rho	0.2718		0.6992	

Notes: Ordinary Least Squares Model correcting for autocorrelation. * $p < 0.05$, ** $p < 0.01$. Missing values for the independent variables reduced our sample from 803 original observations to 188. Most individual countries report many indicators only twice a decade. To correct for autocorrelation, we dropped the first valid observations for each country. To retain a sufficiently large sample, we ran the regressions starting with 1985 data, so that by dropping the first observation, we would not lose valid data for the 1990–97 period.

served in Poland immediately after democratization and price liberalization.

Which variables affect infant mortality? Table 2 (above) shows, again as expected, that high fertility (FERTIL) is correlated with high IMRs under both regime types. Population (POP), by contrast, has no statistically significant effect under either regime. The labor-force participation of women (LFPW) is positively correlated with infant mortality under both regimes—the more women work in the labor force, the more children die—and has a slightly stronger effect under nondemocratic rule. Interestingly, immunization (IMMUNDPT) has no effect in dictatorships, but is correlated with lower infant mortality in democracies. The more children are immunized in democracies, the fewer of them die. The same holds regarding the level of development (LEVELWB): it pushes down the IMR in democracies, but its effect under dictatorship is insignificant.

What is the effect of foreign aid and foreign direct investment inflows under the two regime types? Does foreign money help or hurt? In dictatorships, it hurts: AID, as our figures show, makes infant mortality worse. In democracies, by contrast, it helps: Infant mortality goes down when AID goes up. What about net foreign direct investment? FDINET has no effect on the IMR in dictatorships but seems to help lower the IMR in democracies. Donor nations and organizations should take note: Handing out aid or investment money to nondemocratic regimes will

**TABLE 3—PREDICTED INDEPENDENT EFFECT OF REGIME-TYPE
ON INFANT MORTALITY RATE, 1990–97**

Variable	Predicted Mean	Std. Deviation	Predicted Min.	Predicted Max.	Cases
IMR (Dict.)	50.46	37.28	-1.61	160.03	188
IMR (Dem.)	45.86	38.50	-44.75	130.22	188
Difference	4.60	16.22	-28.70	87.79	188

Note: The smaller sample size of 188 observations results from missing values in independent variables and from dropping the first observation for each country in the dataset to correct for autocorrelation.

either make no difference or even hurt the children who are born under that dictatorship. Yet funneling aid or investment to democracies is strongly likely to help their children. To put the policy implication in the plainest possible terms: Pay attention to regime types. They matter. And fund democracies!

Table 3 shows the *unbiased* IMR values predicted for each regime type, all else being equal. Missing data forced us to drop many individual observations from our model. For example, many countries do not report data on Foreign Direct Investment (FDINET). In addition, we dropped observations from many industrialized democracies because they do not regularly report AID—for the simple reason that they do not receive any. Because those countries are missing from our sample, our predicted IMR for democracies is naturally higher than their actually observed IMR. Had we set AID for industrialized countries at zero—a move which would have been “arbitrary” in the context of our model-building effort, but which would have been largely in keeping with the facts of the real world—this would have actually strengthened our findings, for it would have made the democracy-versus-dictatorship IMR gap even wider by bringing the predicted IMR for democracies in our current model (which Table 3 currently lists as 45.86) down closer to their observed IMR of 22.6 infant deaths per one-thousand live births (see Table 1 above).

The predicted IMR for dictatorships (50.46) is only slightly lower than the observed IMR (58.8 in Table 1); this demonstrates the reliability of the model in generating the predicted results. But the predicted IMR for democracies (45.86) in Table 3 is significantly higher than the actually observed IMR (22.6, in Table 1) in 1990–97. This difference is inevitable, since we have excluded industrialized democracies from our sample.

Since the end of the Cold War, the IMR gap between democracies and nondemocracies has narrowed compared to the 1950–1990 period, but it remains pronounced. And the human toll which these numbers bespeak remains staggering. Our model predicts, all other things being equal, that the average country’s IMR is still clearly lower under democracy (45.9) than under nondemocratic forms of government (50.5), meaning that at an equal level of development, on average about five

**TABLE 4—REGIME-TYPE AND IMR BY YEAR
IN SELECTED COUNTRIES AND YEARS**

Country	Year (A)	Regime (B)	Observed IMR (C)	Predicted IMR Dictatorship (D)	Predicted IMR Democracy (E)	Difference F= (D-E)
Angola	1992	Dic	125.0	111.0	109.9	1.1
Argentina	1992	Dem	24.0	20.6	16.6	4.0
Bolivia	1992	Dem	75.0	68.0	64.5	3.5
Botswana	1990	Dic	54.6	72.4	70.5	1.9
Brazil	1990	Dem	47.8	29.0	36.2	-7.2
	1994	Dem	39.0	25.7	31.4	-5.7
Bulgaria	1995	Dem	14.8	14.3	10.2	4.1
Burundi	1990	Dic	118.8	115.4	101.9	13.5
	1992	Dic	122.0	120.3	100.3	20.0
Chad	1990	Dic	118.0	118.3	117.4	0.9
Chile	1992	Dem	14.3	18.1	18.6	-0.5
China	1990	Dic	33.1	33.4	58.3	-24.9
	1992	Dic	38.0	30.7	52.8	-22.1
Ecuador	1992	Dem	40.0	32.8	42.3	-9.5
El Salvador	1990	Dem	45.6	47.1	50.1	-3.0
	1992	Dem	40.0	47.3	50.8	-3.5
Gambia	1990	Dic	108.6	107.0	78.6	28.4
	1992	Dic	97.0	108.1	80.6	27.5
Ghana	1990	Dic	77.2	94.9	97.2	-2.3
	1992	Dic	74.0	91.7	93.8	-2.1
Greece	1990	Dem	9.7	14.4	18.0	-3.6
Guatemala	1992	Dem	51.0	73.9	37.6	36.2
Haiti	1990	Dic	85.4	77.0	85.4	8.4
	1992	Dic	75.0	73.2	83.8	10.6
Honduras	1994	Dem	42.0	60.2	63.1	-2.9
India	1990	Dem	80.0	45.9	74.7	-28.8
	1992	Dem	79.0	43.2	71.2	-28.0
Malaysia	1992	Dic	15.0	32.4	22.9	9.5
Mozambique	1990	Dic	150.4	128.5	93.1	35.4
	1995	Dic	135.0	120.6	73.3	47.3
Nigeria	1992	Dic	84.0	77.1	95.0	-17.9
Philippines	1990	Dem	42.0	49.5	55.6	-6.1
	1992	Dem	48.0	48.0	55.0	-7.0
Poland	1991	Dem	18.2	26.1	21.4	4.7
	1994	Dem	15.1	20.1	14.1	6.0
Romania	1994	Dem	23.9	12.7	9.1	3.6
Tanzania	1992	Dic	93.0	111.3	89.1	22.2
Turkey	1990	Dem	58.0	31.7	37.5	-5.8
	1996	Dem	39.9	24.8	28.3	-3.5
Uganda	1992	Dic	97.0	119.7	104.5	15.1
Uruguay	1990	Dem	21.2	24.5	24.2	0.3
	1995	Dem	19.6	26.3	23.0	3.3
Zambia	1990	Dic	107.3	97.5	86.1	11.4
	1994	Dem	109.0	101.3	86.1	15.2
Zimbabwe	1992	Dic	53.0	67.3	62.6	4.7

out of every thousand newborns will die *only* and needlessly because the land of their birth is not democratically governed.

Table 4 shows that in most countries, the general pattern holds: The predicted IMRs under democracies are lower than the predicted IMRs under nondemocratic rule. There are some noteworthy exceptions, however, and we should comment on these in turn.

China's actually observed IMR is very close to that predicted under dictatorship, but China's predicted IMR under democracy is actually *higher* than the IMR the model predicts under dictatorship. Because of the size of its population (an estimated 1.28 billion people in 2002) and poverty (GDPpc was estimated at \$4,600 in 2002), we would expect China to show a higher IMR than the one that it actually does show. China's coercive population-control policies make it an outlier in our sample. The most populated country in the world has never experienced democracy, but its authoritarian government differs significantly from a typical dictatorship in ways that affect IMR.

Another outlier is India. Its actually observed IMR is similar to that predicted for democracy, but its predicted IMR for dictatorship is also significantly lower than the IMR predicted for democracy. Because our model makes broad assumptions about regime type, it cannot capture the particularities of the Indian caste system. In addition, because the population variable (POP) is significant as a predictor of IMR only in democracies (see Table 2 above), the predicted IMR for dictatorship fails to capture the fact that more-populous countries in general tend to have higher IMRs than less-populous countries.

Nigeria is the third outlier in our selection. Its predicted IMR for dictatorship is lower than that predicted for democracy. The actually observed IMR (for 1992, when Nigeria was still a dictatorship) lies between the predicted values for either regime type. Nigeria's large population (at slightly more than 100 million, it is Africa's biggest), coupled with its political instability and the effect that oil-price fluctuations have on its terms of trade, make predictions less reliable in the Nigerian case than they are regarding other countries in our selection. Figures regarding the FDINET variable, for example, are distorted by the fact that much of the foreign direct investment that goes into Nigeria is funneled straight to the petroleum-export sector, and never really makes its way into the fabric of the domestic economy.

Ghana, on the other hand, shows actual IMR levels that are lower than those predicted for either democracy or dictatorship. A dictatorship in both years shown in Table 4, Ghana's level of development would predict a higher IMR than the one we actually observe. Although it continues to show high IMR levels by world standards (74 in 1992, the latest year in our observation), they are among the lowest in sub-Saharan Africa. Ghana's relatively low levels of infant mortality are likely the result of economic policies that produced 9 percent annual growth

during much of the 1990s and made the country a darling of the international donor community.

For several countries in Latin America, the predicted IMR under dictatorships is marginally lower than that predicted under democracies. In a few cases (such as Chile), the observed IMR is even lower, but in others (such as Brazil), the observed IMR is actually higher than that predicted for either regime type. Because most industrialized nations are excluded from our individual-country selection (since they do not report foreign aid received), Chile is among the most developed democracies in our selection, and our model predicts that when countries get wealthier, the difference in IMR levels between dictatorships and democracies tends to vanish.

In the case of Brazil, the lower value predicted for dictatorship is almost entirely a function of the fact we see in Table 2 above, namely that population (POP) has a significant effect on predicted IMR under democracy but not under dictatorship. Because Brazil with its 175 million people is among the most populous countries in the world (and certainly in our selection), its higher predicted IMR value under democracy should be taken with a grain of salt. Note our model's prediction that Brazil's IMR should be lower than the one actually observed. Gross income and wealth inequality, and regional disparities in access to health and wealth, are probably responsible for Brazil's relatively high IMR.

What Makes Democracy Better?

The reduction of infant mortality rates worldwide was one of the great success stories of the latter half of the twentieth century—in both democracies *and* dictatorships. Worldwide, the infant-mortality rate per one-thousand live births dropped from 156 in 1950 to 57 in 1999.¹⁶ But our study leaves no doubt that in the area of child survival, a widely used proxy for the welfare of society as a whole, democracies outperformed dictatorships significantly throughout that period.

Are we suggesting that democracy is a kind of magical black box where good things just seem to happen for no apparent reason? The answer is no: Recent scholarship has focused on identifying precisely those features of democracy that can account for its superior performance. For example, Adam Przeworski and his colleagues have found that whereas more than half of women in democracies worldwide use contraception, less than a quarter in dictatorships do so.¹⁷ The difference might be due largely to higher social spending by democratic governments: social security and welfare expenditures averaged 2.1 percent of GDP across dictatorships, but almost five times as high (10.4 percent) in democracies.

While we fully endorse efforts to learn why democracy works better, here our purpose has been simply to show that in general democracy

spares more of the most vulnerable from early death than does non-democratic rule, and that this is true in particular not only of long-established democracies, but even of countries that are relative rookies in the democratic field. It seems to be the case that better-functioning democracies turn in better showings on key socioeconomic indicators as well, and that some dictatorships may be outliers in providing better social welfare to their subjects. But even if a few benevolent dictatorships can outperform a few badly working democracies, good democracies always outperform benevolent dictatorships.

Can we generalize this claim? Again, the relative performance of democracies and dictatorships has been hotly debated for decades. A recent study of the macroeconomic performance of developing-world regimes finds that “more-democratic regimes appear to have higher inflation than less-democratic regimes mainly because they have larger fiscal deficits and faster wage growth; this higher inflation, in turn, marginally reduces their growth rates.”¹⁸

But the superior social performance of democracies might be the result of this very willingness to incur inflation in order to invest in the “human-capital potential” of the people whom they represent. One study has found that all societies with low levels of human capital—democratic and nondemocratic alike—tend to have higher fertility (a condition associated with higher IMRs, as we have seen). Low levels of human capital in turn can lead to an inability to operate the available stock of physical capital, creating a trap of underdevelopment.¹⁹ And when people are poor and cannot borrow enough to educate their children, they may feel compelled to keep having more children, since the earning prospects of any one child or handful of children (such prospects being the expected prop of the parents’ old age) are not likely to be bright without education: Here is another vicious circle that can trap a society in poverty.²⁰

As the Nobel Prize–winning economist Amartya Sen pointed out more than a decade ago, democracies tend to move toward breaking these kinds of underdevelopment traps or vicious circles by investing more than dictatorships do in social services. Governments that invest in this way—and to repeat, they tend strongly to be democratic—typically have citizens who are more likely to survive infancy and early childhood, and live longer lives generally, than people in nondemocratic but otherwise similar societies. Commenting on the phenomenon of famine prevention, Sen speculated about the reasons for this:

The connection [to democracy] is most immediate in the case of famine and famine prevention. Major famines have taken place in market economies and in nonmarket socialist economies, but not in any country with a democratic system, with opposition parties, and with a relatively free press. This is a remarkable fact. Famines are, obviously, terrible for the people who suffer and die, but they are often not very expensive for nondemocratic governments, which can survive famines. . . .

There has been no famine in India since Independence. This is obviously partly due to agricultural achievements, but to a great extent, it is because democracy makes famines much more expensive for governments. A government that can be criticized by opposition parties and by the media and that has to seek reelection by the people cannot afford to have a famine. It has to take quick action to prevent it.²¹

Our key finding complements Sen's argument: Democracy works because it respects the people and responds to them. Countries, organizations, and firms that provide aid and investment should take this to heart.

Sending money to dictators is likely to do no good, and may even do harm. Sending aid or investment money to democracies, on the other hand, is likely to make a high-leverage difference for the people those democracies are pledged to serve. Not only do dictators ban political parties and forbid free speech; they also fail their people in much more concrete ways—helping to ensure, as we have seen, that fewer of them will even live to see adolescence. Happily, there is a better way. The democratic embrace of government by consent and liberty under law is superior as regards both political justice and basic well-being. Democracy fosters not only freer but also longer and more flourishing human lives.

Appendix: Variables

The data set used for this paper was Alvarez, Cheibub, Limongi and Przeworski 1997, *ACLP World Political / Economic Database*. ACLP obtained some of its data from other sources. ACLP defines the variables used here as follows:

- AID: Aid (% of imports of goods and services).
- BRITCOL: British colony. Dummy variable coded 1 for every year in countries that had been a British colony any time after 1919, 0 otherwise.
- CATH: Percentage of Catholics in the population.
- COMEX: Primary commodity exporting country, as defined by the IMF.
- FDINET: Foreign direct investment, net inflows (% of GDP).
- FERTIL: Total fertility rate (births per woman).
- IMR: Infant mortality rate per 1,000 live births.
- IMMUNDPT: Immunization, DPT (% of children under 12 months).
- LEVELWB: Level of economic development. Real GDP per capita, World Bank.
- LFPW: Labor force, female (% of total).
- MOSLEM: Percentage of Moslems in the population.
- NEWC: New country. Dummy variable coded 1 for every year in countries that became independent after 1945, 0 otherwise.
- ODWP: Democracies in the world (Percentage). Percentage of democratic regimes (other than the regime under consideration) in the world for the current year.
- POP: Population, in thousands.
- PROT: Percentage of Protestants in the population.
- REG: Regime type. Dichotomous variable. 0 = Democracy, 1 = Dictatorship.
- RELIGION: Percentage of population of the largest religious group, measured

in the year for which data were available (roughly 1976–1985) as presented in *The Economist* (1988) and Vanhanen (1992). Time invariant variable.

- STRA: Sum of transitions to authoritarianism. The sum of past transitions to authoritarianism in a country. If a country experienced a transition to authoritarianism before 1950, STRA was coded 1 in 1950.
- YEAR: From 1986 or date of independence to 1997.

NOTES

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1. Thomas D. Zweifel and Patricio Navia, "Democracy, Dictatorship, and Infant Mortality," *Journal of Democracy* 11 (April 2000): 99–114. The infant mortality rate (IMR) is the death rate of infants under one year of age per thousand live births. Our conclusion that democracies consistently outperformed dictatorships in social performance as measured by the IMR was based on annual observations for 138 countries observed each year from 1950 to 1990 (577 annual observations of democracies and 504 of dictatorships).

2. As a rough measure of the spread of democracy around the world, one could take the figures on Free, Partly Free, and Not Free countries published annually by Freedom House. In 1972, when the survey began, Freedom House found that there were 43 Free countries in the world, 38 Partly Free, and 69 Not Free. In the latest survey, which covers the year 2002, the figures are 89 Free, 56 Partly Free, and 47 Not Free. See "The 30th Anniversary Freedom House Survey: Liberty's Advances in a Troubled World," *Journal of Democracy* 14 (January 2003): 100.

3. Larry Sirowy and Alex Inkeles, "The Effects of Democracy on Economic Growth and Inequality: A Review," *Studies in Comparative International Development* 25 (1990): 126–57; and Mark J. Gasiorowski, "Democracy and Macroeconomic Performance in Underdeveloped Countries: An Empirical Analysis," *Comparative Political Studies* 33 (April 2000): 319–49. See also Thomas Zweifel and Patricio Navia, "Democracy, Dictatorship, and Infant Mortality," 100–2.

4. In the United States, for example, infant mortality for blacks is more than double that of whites: 13.9 deaths per 1,000 live births for blacks, compared to 6.0 per 1,000 for whites (Centers for Disease Control and Prevention, "Trends in Racial and Ethnic-Specific Rates for the Health Status Indicators: United States 1990–98," www.cdc.gov/nchs/data/statnt/statnt23.pdf, January 2002).

5. United Nations, *Indicators of Sustainable Development: Framework and Methodologies* (New York: United Nations, 1996).

6. *World Press Review*, November 1992, 25.

7. Human Development Report 2001, www.undp.org/hdr2001/pr6.pdf.

8. "Population Reports: Winning the Food Race," www.jhucpp.org/pr/m13/m13chap2.stm.

9. See www.thp.org/reports/decline.htm.

10. 2001 World Population Data Sheet. Washington, DC: Population Reference Bureau. [www.prb.org/Content/NavigationMenu/PRB/Journalists/PressReleases/21st_Century_Will_Transform_World_Population_\(May_21,_2001\).htm](http://www.prb.org/Content/NavigationMenu/PRB/Journalists/PressReleases/21st_Century_Will_Transform_World_Population_(May_21,_2001).htm).

11. Adam Przeworski, *Democracy and the Market* (Cambridge: Cambridge University Press, 1991), 10.

12. José Antonio Cheibub had to deal with a similar potential pitfall in singling out truly independent variables while he was trying to analyze the possible effect of regime type on the level of taxation within a country. See José Antonio Cheibub, "Political Regimes and the Extractive Capacity of Governments: Taxation in Democracies and Dictatorships," *World Politics* 50 (1998): 364–67.

13. Adam Przeworski and his collaborators explain the issue as follows: "Suppose that countries are more likely to have dictatorial regimes when they are poor or when their leaders are unenlightened and that the rate of growth is lower when per capita income is lower or leaders are unenlightened. The researcher can observe per capita incomes, but not enlightenment. Then controlling for per capita income in the outcome equation will reduce the error variance, but not the covariance due to enlightenment. The observations will be matched for per capita income, but not for enlightenment: There will be no democracies with unenlightened leaders at low levels. Hence, the observed difference in growth will be due purely to the unobserved difference in enlightenment, not to regimes" Adam Przeworski, Michael Alvarez, José Antonio Cheibub, and Fernando Limongi, *Democracy and Development: Political Institutions and Material Well-Being, 1950–1990* (Cambridge: Cambridge University Press, 2000), 286.

14. A good introduction to the Heckman Two-Step Method may be found in William H. Greene, *Econometric Analysis*, 3rd ed. (Upper Saddle River, N.J.: Prentice-Hall), 978–82. See also James J. Heckman, "Sample-Selection Bias as a Specification Error," *Econometrica* 47 (1979): 153–61.

15. George W. Bohrnstedt and David Knoke, *Statistics for Social Data Analysis* (3rd ed., Itasca, Ill.: F.E. Peacock, 1994), 191.

16. See www.popinfo.org/issues/trends02.htm.

17. Adam Przeworski et al., *Democracy and Development*, 245.

18. Mark J. Gasiorowski, "Democracy and Macroeconomic Performance in Underdeveloped Countries: An Empirical Analysis," *Comparative Political Studies* 33 (April 2000): 319–49.

19. Gary S. Becker, Kevin M. Murphy, and Robert Tamura, "Human Capital, Fertility, and Economic Growth," *Journal of Political Economy* 81 (1990): 279–88.

20. Adam Przeworski et al., *Democracy and Development*.

21. Amartya Sen, Nicholas Stern, and Joseph Stiglitz, "Development Strategies: The Roles of the State and Private Sector," *Proceedings of the World Bank Annual Conference on Development Economics* (Washington, D.C.: World Bank, 1990), 421–35.