Chapter 5

Population Growth, Economic Freedom, and the Rule of Law

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MORE THAN 200 YEARS AGO, the Reverend Thomas Malthus argued that people's tendency to have children would inevitably strain food supplies and limit the standard of living attainable by the mass of humanity. His pessimistic argument has proved remarkably durable, its influence ebbing and flowing through the ensuing centuries. In contemporary form, this contention has been expressed as a "Malthusian population trap" (Todaro 1996).

Malthus's idea was that the growth of human population keeps most people in society at a subsistence level of income. As income starts to go up, people produce more children, so the average (or per capita) income declines or stays at a low level. In the original Malthusian view, there were positive checks on population growth, but these were starvation, disease, and wars. Population growth was limited by the attendant mortality.

In today's neo-Malthusian perspective, preventive checks on pop-

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ulation growth—persuasive and even coercive measures to lower birth rates—are required if people are to escape from mere subsistence living. Lester R. Brown, Gary Gardner, and Brian Halweil (1998, 71) illustrate this view:

> What is needed, to use a basketball term, is a full-court press—an all-out effort to lower fertility, particularly in the high-fertility countries, while there is still time. We see four key steps in doing this: undertaking national carrying-capacity assessments to help governments and the public at large to better understand the urgency of stabilizing population, filling the family planning gap, educating young women, and adopting a worldwide campaign to stop at two surviving children.

Not everyone shares a dread of population growth. In numerous books and articles, the late Julian Simon (1981, 1990, 1995) has documented benefits associated with population growth and has also shown that many apocalyptic nightmares are without foundation. In addition, Esther Boserup (1998 [1965]) took a favorable view of population growth when she said that in comparatively underdeveloped economies it induces technological change and stimulates innovation.

More recently, Bjørn Lomborg (2001) has provided a remarkable array of data showing that human well-being is improving. It is true that population growth is continuing worldwide, largely due to the lag in adjustments in birth rates that follow decreases in mortality rates. However, the striking fact is that mortality rates are declining, and decreased birth rates characteristically follow decreases in mortality rates. So although population growth rates may appear unusually high by long-run standards, the data merely reflect a demographic transition, and dramatic decreases in fertility rates are already evident in many countries. Most important, Lomborg shows that the potentially adverse effects of population growth are swamped by the ever-ubiquitous progress in so many avenues of life, including science, technology, and human productivity.

In spite of these contributions, most of the popular literature on

the subject still echoes the Malthusian concerns. Lindsey Grant (1996, 3) provides a summary of popular sentiment:

> Population growth is leading us to a world that we do not want. It is the most fundamental of the engines of change, and the most ignored. The poor nations face sheer hunger and the destruction of their resources. The "emerging nations," most of them in Asia, are in varying degrees escaping those horrors to face the problems of industrialization. The old "rich" countries confront joblessness, failing social structures, growing disparities between the rich and poor, ethnic conflict, the loss of a shared vision, environmental degradation, and the huge reality that they are changing the climate we all live in. Bringing population growth under control will not necessarily solve those problems, but it is the condition precedent—a necessary condition for their solution.

In this chapter, I address the topic of population somewhat differently. For the purpose of analysis, I accept the received knowledge among prominent policy-makers and cultural elites that population growth has adverse effects that could be quite severe. This neo-Malthusian view will serve as a point of departure for analysis to determine its validity and its policy relevance.

My analysis introduces the role of economic institutions, which so far has been much ignored in discussions of population growth. By *economic institutions*, I mean the formal and informal customs, laws, and traditions that guide behavior. A burgeoning body of research shows that several key institutions—economic freedom, protection of property rights, and the rule of law—are closely linked to human well-being. Consequently, it is reasonable to expect that such institutions can ameliorate population problems.

This chapter reviews several aspects of the so-called population problem, with the goal of shedding light on whether economic institutions affect population growth and, more important, whether they affect conditions, such as poverty and environmental degradation, that population growth is supposed to cause. First, I examine the simple effects

of population growth on human well-being. Second, I look at the role of growth-enhancing institutions as capable of offsetting any adverse effects of population growth. Third, I compare the net effects of population growth and economic institutions on poverty and the environment. Fourth, I look at the effect of economic institutions on fertility. Finally, I calculate the effects of modest institutional reforms on human well-being.

Alleged Adverse Effects of Population Growth

Some observers attribute nearly all of the world's maladies to excessive population growth. More specifically, they claim that population growth has at least three adverse effects on human well-being. First, it increases the number of people that are impoverished, the proportion of the community that is impoverished, and the severity of the impoverishment. Second, it increases environmental degradation—the misuse of natural resources, with adverse consequences on many dimensions of human well-being. And finally, it prevents environmental enhancement by holding back the savings and investment that would permit environmentally sustainable economic growth and retards the agricultural productivity that would encourage environmentally friendly agriculture and conservation (Ahlburg 1994; Kelley and McGreevey 1994).

These assertions can be specified in greater detail and related to widely held assertions among policy makers as well as notable proportions in the scientific and economic communities. However, it should be noted that the negative or apocalyptic views of population growth are far more common among policy makers than economists, and it was policy makers and bureaucrats who ignored or distorted the less pessimistic evidence generated by serious economic analysis (Kelley and McGreevey 1994; Kelley and Schmidt 1996). However, given the wide support for apocalyptic views, a closer look at the details of these assertions is warranted.

Poverty

A core idea of the Malthusian legacy is that population growth depresses wages because it increases the supply of workers and thus directly lowers the wages of workers. Depressed wages are likely to be particularly onerous for the poor because labor earnings constitute the main source of income for the poor, who are less likely to own other income-generating assets, such as land (Kelley and McGreevey 1994).

In addition, the argument continues, population growth strains investment as an economy strives to absorb workers by reducing savings, the supply of funds for investing in capital that will spur economic growth over the long run. This view has been developed in elegant models of economic growth, as in the acclaimed Solow (1956) growth model. Of course, proponents of this view recognize that technological advances or investment can accommodate population growth, but neo-Malthusians argue that the accommodation is more the exception than the rule.

It also merits noting that the neo-Malthusians view poverty as more than income deprivation. Rapid population growth strains the fixed capacities for basic human services such as education, health, and nutrition. Fixed levels of basic infrastructures that are essential for survival and longevity are spread over greater numbers of people and hence the per capita delivery of services is reduced. In short, nonpecuniary measures of poverty also increase (Ahlburg 1994).

Resource Depletion

Some observers claim that resources are harvested at excessive rates due to population pressure (Todaro 1996). The contention is that timber is harvested too quickly in order to supply such products as wood for housing construction. This depletes forests and causes additional environmental problems, such as soil erosion. More generally, the impoverishing effects of population growth make the populace excessively

dependent on natural resource–based activities such as timber production.

Deforestation can cause soil erosion, watershed instability, and loss of carbon sequestration. Agricultural productivity also may fall. Moreover, the poor, it is said, bear a disproportionate part of the costs of deforestation. Deforestation can cause fuel supplies to dwindle, and the resulting costs of more extensive wood gathering are thought to be borne disproportionately by women (Todaro 1996).

Soil erosion, threats to marine ecology, and water pollution are commonly thought to be negative consequences of rapid population growth. Water pollution is often considered the most serious pollution. Todaro (1996) claims that water pollution and water scarcity lead to about two million deaths per year.

Net Savings

Another alleged harm of population growth is reduced savings. Population growth, it is said, diverts resources to child raising and consumption, reducing the proportion of the populace that is engaged in production and reducing the fraction of output that is saved and invested. Modern theories of consumption over the life cycle hold that population growth increases dependency ratios and in turn reduces savings (Kelley 1988). That is, a larger proportion of growing populations is under the age of fifteen. This group has a lower savings rate than adults between the ages of fifteen and sixty-four (Todaro 1996).

Agricultural Productivity

Agricultural productivity permits greater specialization in an economy and generates greater food supplies, but rapid population growth may keep productivity low, depressing wages and keeping people on marginal farms. Indeed, stagnation of agriculture and the failure to adopt innovative technology represent the basic Malthusian apocalypse. There is

ample evidence of insufficient agricultural productivity in relatively poor countries, with corresponding adverse effects on poverty rates and the environment (Todaro 1996).

Evidence of Adverse Effects

To determine how much effect rapid population growth has in these areas, I examine ten specific features of human well-being. Because most of the assertions regarding the adverse effects of population growth pertain to poor countries, the measures are for a sample of countries that are categorized as "developing" by the United Nations (U.N.). The countries consist of those for whom the U.N. has calculated the Human Poverty Index. With few exceptions, one of which is Singapore, the countries are comparatively poor. (The well-being measures are described in more detail in the appendix at the end of this chapter.)

These are the specific indicators of well-being:

Poverty Measures

- United Nations Human Poverty Index
- Proportion of the population not expected to survive to age forty
- Proportion of the adult population that is illiterate
- Proportion of the population without access to safe water
- Proportion of the population without access to health services
- Proportion of the children under age five that are malnourished

Environmental Degradation

- Deforestation
- Water pollution

Table 5.1
Population Growth and Human Well-Being

	POPULATION GROWTH: SHORT TERM			POPULATION GROWTH: LONG TERM		
Measure of Well-Being	*Low*	*Medium*	*High*	*Low*	*Medium*	*High*
U.N. Human Poverty Index	19.3	32.8	34.1	19.6	34.6	25.7
Death by 40	12.6	22.0	22.2	10.9	23.7	16.1
Adult illiteracy	17.9	37.5	38.4	20.6	38.6	32.1
Safe water	23.8	36.1	34.4	28.3	38.4	19.3
Health services	20.8	27.7	37.2	17.9	31.4	21.6
Undernourished children	17.6	23.6	24.3	15.9	25.8	15.5
Deforestation rate	0.320	1.027	0.800	0.727	1.051	0.336
Water pollution	0.209	0.211	0.219	0.214	0.211	0.209
Net savings rate	9.2	5.4	4.0	10.0	4.3	8.8
Agricultural productivity	2,322.3	1,592.8	613.1	2,471.0	1,449.5	1,137.3

Sources: United Nations Development Program (1997); World Bank (2001)

Environmental Enhancement

- Agricultural productivity
- Savings

Table 5.1 contains the average levels for the poverty and environmental degradation and enhancement measures. The measures are calculated for high, medium, and low population growth rates for the short term (1985–1990) and the long term (1970–1990). Examples of countries with high population growth rates are Botswana, Kenya, and United Arab Emirates. Examples of countries with low population growth rates are China, Jamaica, and Mauritius. (A complete list of countries, for both the short term and the long term, is in the appendix.[1])

The data provide some basis for a neo-Malthusian interpretation. Consider the measure for the fraction of the population not surviving to the age of 40. Citizens in countries with low short-term population growth rates are about 10 percent more likely to survive to age 40 than

those countries with high short-term population growth rates (12.6 in column 1 versus 22.2 in column 3). Savings rates are likewise substantially higher in countries with low short-term population growth rates than in those with high short-term growth rates. In the same vein, deforestation rates are higher in countries with high short-term population growth rates. The pattern is common—higher short-term population growth generates negative effects.

However, there are some data in Table 5.1 that do not support the neo-Malthusian view.[2] The gap between medium and high short-term growth rates is often very small. For example, in the death by 40 measure, the high and medium short-term population growth rates differ by only two-tenths (22.2 in column 3 versus 22.0 in column 2). In two measures—access to safe water and the rate of deforestation—the high population growth rate countries are actually better off than the medium growth rate countries.

When the measures of well-being are compared based on long-term population growth rates, the evidence supporting the neo-Malthusian view is even weaker. For a number of measures—the poverty index, under age 40 mortality, adult illiteracy, safe water, health services, undernourished children, the deforestation rate, water pollution, and the net savings rate—the well-being of citizens in high population growth rate countries exceeds the level for citizens in countries with medium population growth rates and, in the case of access to safe water, undernourished children, deforestation, and water pollution, the well-being of citizens in high population growth countries exceeds that of citizens in low population growth countries. In short, the data indicate that whatever ill effects population growth rate engenders, they are primarily tied in to short-term population growth rates.

Economic Institutions and Human Well-Being

There is growing evidence that many of the differences in well-being across countries are directly attributable to the quality of economic

institutions—the existence of property rights, the quality of government, the rule of law, and economic freedom. The evidence is closely linked to the development in recent years of standard measures of institutional quality, developed so that countries can be compared based on these measures and on measures of well-being, such as income and mortality. Two of the more prominent measures are the rule of law and economic freedom.

Countries with a strong legal framework are typically distinguished from countries where the law reflects political struggles for power. Countries with a well-established tradition of the rule of law have greater ability to carry out business transactions (Barro and Sala-i-Martin 1995, 439) and correspondingly greater incentives for investment (Hirshleifer 1987, 53). Knack and Keefer (1995) say that the rule of law "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes."

A company called Political Risk Services ranks countries as part of its *International Country Risk Guide* (1997). Customers use the guide to make decisions about investment and production in foreign countries. In the rule-of-law rankings, higher scores indicate sound political institutions, a strong court system, and provisions for orderly succession of power. Lower scores indicate a tradition of depending on physical force or illegal means to settle claims. Using this database, research by Knack and Keefer (1995) and Barro and Sala-i-Martin (1995) shows that the rule of law enhances economic growth and human well-being.[3]

Economic freedom also enhances growth. The *Index of Economic Freedom* is a comprehensive measure of citizens' rights to own and trade property unfettered by intrusive public policies. The Fraser Institute compiles this index with the assistance of numerous organizations throughout the world.[4] Essentially, the project measures economic freedom as distinguished from political freedom. It emphasizes the ability of people to use and exchange property relatively free of governmental

interference in the form of perverse monetary, fiscal, and trade policies (Gwartney, Lawson, and Block 1996; Gwartney and Lawson, 2000).

A recent compilation by Gwartney and Lawson (2001) ranks countries based on seven broad categories of economic freedom. These are the size of government, the economic structure and role of markets, monetary policy and price stability, freedom to use alternative currencies, the legal structure and security of private ownership, freedom to trade with foreigners, and freedom of exchange in capital markets. These measures, which are composed of twenty-one narrower yardsticks, are used to compile a summary measure of economic freedom for each country.

The role of economic institutions on human well-being can be examined by dividing the sample of countries into groups with low, medium, and high economic freedom and the same categories for the rule of law. It merits noting that because the sample countries are "developing," many of the countries of the world with the highest levels of economic freedom and rule of law are excluded. (That fact in itself says much about economic institutions and the standards of well-being across the world.) Consequently, countries with high economic freedom or strong rule of law would not qualify as such based on total world standards. For example, Chile, Panama, and Singapore all have high economic freedom in this sample. In a broader sample, Chile and Panama would not be viewed as having high economic freedom, although Singapore would. Similarly, China, Cuba, and Namibia are classified as having strong rule-of-law measures. By broader world standards, that conclusion seems questionable. The fact is that the sample of developing countries includes many with abysmal levels of economic freedom—Algeria, Myanmar, the Syrian Arab Republic—or abysmal levels of the rule of law—Bangladesh, Iraq, Peru. (A list of the high and low economic freedom and rule-of-law countries is in the appendix.) Consequently, the comparison is often among countries that exhibit less than ideal institutions.

Table 5.2 contains the measures of human well-being in those

Table 5.2
Economic Institutions and Human Well-Being

	ECONOMIC FREEDOM			RULE OF LAW		
Measure of Well-Being	*Low*	*Medium*	*High*	*Low*	*Medium*	*High*
U.N. Human Poverty Index	38.1	30.5	14.5	31.8	33.0	16.4
Death by 40	29.1	19.4	7.7	19.6	21.7	10.8
Adult illiteracy	39.2	34.7	12.5	32.1	37.8	17.0
Safe water	43.3	34.7	19.5	34.8	36.2	20.1
Health services	40.5	28.5	16.8	41.3	28.0	15.2
Undernourished children	29.1	21.7	13.9	25.0	23.1	14.0
Deforestation rate	0.429	1.351	−0.230	1.336	0.732	0.282
Water pollution	0.200	0.214	0.196	0.202	0.221	0.194
Net savings rates	3.96	7.12	14.78	2.61	6.30	15.96
Agricultural productivity	620.3	1,011.2	6,001.6	1,178.2	1,083.6	4,552.7

Sources: Gwartney and Lawson (2001); Political Risk Services (1997); United Nations Development Program (1997); World Bank (2001)

groups of countries. In all cases except water pollution, countries with low economic freedom are worse off than those in countries with moderate economic freedom, whereas in all cases those in countries with high economic freedom were better off than those in countries with medium economic freedom. By these measures, quality of life is strongly linked to economic freedom.[5]

For the rule-of-law measures, a similar pattern is evident. Well-being is better for citizens in countries with moderate rule of law as opposed to weak rule of law, except for the overall poverty index, adult illiteracy, and agricultural productivity. For citizens in countries with strong rule of law, well-being is uniformly better than in countries with medium rule of law. Thus, the relationship for rule of law is not as strong as economic freedom, but by many measures of the quality of life, life is better when the rule of law is stronger.

Table 5.3
Effects of Changing Population Growth Versus
Effects of Changing Economic Institutions

	POPULATION GROWTH GAP: HIGH MINUS LOW		INSTITUTIONAL GAP: HIGH MINUS LOW	
Measure of Well-Being	*Short Run*	*Long Run*	*Economic Freedom*	*Rule of Law*
U.N. Human Poverty Index	14.8	6.1	−23.6	−15.4
Death by 40	9.6	5.2	−21.4	−8.8
Adult illiteracy	20.5	11.5	−26.7	−15.1
Safe water	10.6	−9.0	−23.8	−14.7
Health services	16.4	3.7	−23.7	−26.1
Undernourished children	6.7	−0.5	−15.2	−11.0
Deforestation rate	0.480	−0.391	−0.659	−1.054
Water pollution	0.010	−0.005	−0.004	−0.008
Net savings rates	−5.24	−1.25	10.82	13.35
Agricultural productivity	−1,709	−1,334	5,381	3,375

Note: The gap for rule of law is strong rule of law minus weak rule of law.

Sources: Gwartney and Lawson (2001); Political Risk Services (1997); United Nations Development Program (1997); World Bank (2001)

Effects of Population Growth and Economic Institutions

One of the difficulties in drawing conclusions from basic statistics is that the role of other factors is easily ignored. For example, the data in Table 5.1 do not reflect differences in economic institutions. A constructive comparison examines the relative effects of population growth and economic institutions on the measures of human well-being. Table 5.3 compares the gap between the high and low categories for both population growth and economic institutions.[6] The data are shown for each of the ten measures of human well-being. For example, the first entry for the under-40 mortality rate (row 2, column 1) is 9.6. The number is the percentage of the population not surviving in countries with high short-term population growth minus the percentage of people

not surviving in countries with low short-term population growth (22.2 − 12.6). The same line for the institutional gap shows the gap (−21.4) between high and low economic freedom countries (7.7 − 29.1). A higher difference means that economic freedom has a greater effect in reducing mortality than comparable population growth has in increasing mortality.

The data in Table 5.3 show two patterns. First, there is the effect documented in Table 5.1—that whatever adverse effects population growth generates, they are always more noticeable in the short term than the long term. Indeed, in several cases—undernourished children, deforestation, water pollution—higher long-term population growth is associated with enhanced well-being.

Second, the beneficial effects of moving from low economic freedom to high economic freedom or from weak rule of law to strong rule of law exceed any harmful effects of increased population growth. The pattern holds for all measures of human well-being except the water pollution measure, where the benefits fall just short of offsetting the harmful effects. In many cases—for example, the under-40 mortality rate or the net savings rate—the numbers are striking. Simply stated, economic institutions are more important than population growth in terms of these measures of human well-being.

The data in Table 5.3 may overstate the harmful effects of population growth because the adverse effects of population growth could be confused with other factors. Clearly, rapid population growth often occurs along with other forces that reduce human well-being (Kelley 1988; Panayotou 1994). For example, rapid population growth is common in many tropical areas of the world. Yet tropical environments retard human productive activity because of heat, endemic disease, and poor soils (Sachs and Warner 1997). It would be easy to conclude that lower productivity is caused by fast population growth when the tropical environment may be the cause.

Where multiple factors determine various outcomes, it is difficult to distinguish cause and effect without simultaneously considering the

Table 5.4
Net Effects of Changes in Population Growth Versus Changes in Economic Institutions

	POPULATION GROWTH		ECONOMIC INSTITUTIONS	
Measure of Well-Being	*Short Term*	*Long Term*	*Economic Freedom*	*Rule of Law*
U.N. Human Poverty Index	0.445	0.186	−0.812	−0.449
Death by 40	0.520	0.415	−0.973	−0.386
Adult illiteracy	0.764	0.596	−0.731	−0.386
Safe water	0.000	0.000	−1.043	−0.450
Health services	0.783	0.000	−1.030	−0.105
Undernourished children	0.000	0.000	0.000	0.000
Deforestation rate	0.000	0.000	0.000	−1.052
Water pollution	0.000	0.000	0.000	−0.256
Net savings rate	0.000	0.000	3.160	1.802
Agricultural productivity	0.000	0.000	1.640	0.000

Note: The numbers represent the percentage change in the measure of well-being owing to comparable changes in population or economic institutions after accounting for landlocked and tropical conditions and the degree of urbanization.

Sources: Gwartney and Lawson (2001); Political Risk Services (1997); United Nations Development Program (1997); World Bank (2001)

effects of other variables. Modern statistical analysis permits analysis that "nets out" the effects of other variables.[7] Using such analysis yields estimates of the effects of population growth on the measure of well-being after netting out the impact of a country being landlocked, tropical, urbanized, and, most important, economically free. Similar analysis can yield the net effects of economic institutions on human well-being after accounting for the effects of population growth, tropical climates, and urbanization. The net effects of population growth, economic freedom, and the rule of law on the well-being measures are highlighted in Table 5.4.

The numbers in columns 1 and 2 represent the effect of a percentage change in short-term population growth on the percentage changes in well-being measures and the comparable effect of long-term popu-

lation growth. All the entries in both columns are less than 1.0, which means that an increase in population growth results in less than a proportionate reduction in the various measures of well-being. Moreover, the magnitudes are greater for the short-term population growth than for the long-term growth, a result that is consistent with Tables 5.1 and 5.3. More important, the effects for all the nonpoverty variables are zero. In essence, when we net out the effects of other influences—economic institutions, tropical climates, and urbanization—there is no evident harm from population growth.

Thus, the data in Tables 5.1 and 5.3 clearly overstate the negative effects of population growth. That conclusion holds for both the short term and the long term. Although the sample is restricted, it includes the most impoverished nations of the world, which are thought to be the most vulnerable to the adverse effects of population growth. The data support at worst a modest and more generally a nonexistent neo-Malthusian world.

The data in columns 3 and 4 of Table 5.4 are in sharp contrast to columns 1 and 2. Increases in economic freedom or the rule of law reduce poverty, reduce deforestation and water pollution, and increase savings and agricultural productivity. Thus, unlike population effects, economic institutions are significant when other factors, such as climate and urbanization, are appropriately considered. Economic freedom tends to dominate rule of law in terms of magnitude of effects, but there are exceptions, such as deforestation or water pollution where the rule of law improves the environment but economic freedom does not. And finally, it merits noting that, as shown in the data presented in Table 5.3, the (absolute) magnitude of the institutional effect (the strongest of the economic freedom or rule of law effect) dominates the magnitude of the population effect. The only exception is adult illiteracy, where the short-term population effect slightly exceeds the economic freedom effect. Thus, the net effects show that institutional reform would more than offset the adverse effects of population growth.

Effect of Institutions on Fertility

The data in the previous section show that economic institutions are dramatically more important than population growth in affecting human poverty and environmental conditions and that the combined effects of economic institutions and population growth render the latter as fairly benign. However, those conclusions still understate the importance of economic institutions with respect to population growth because economic institutions actually affect fertility rates, and hence population growth rates. (Fertility rates are birth rates adjusted for the age composition of the population.)

There are ample grounds to believe people will adjust their fertility, that is increase or reduce the number of children they bear, in light of their human endowments and opportunities. Economists Gary Becker and Robert Barro (1988) have developed a model of human fertility indicating that people choose the number of children in response to changing mortality rates while taking into account the forgone opportunities associated with raising children. If people anticipate that many of their children will die before reaching adulthood, they will have more children. If they are confident that their children, or most of them, will reach adulthood, they will have fewer children. In both cases, they will also consider the costs of lost income and lost free time that occur when raising children. Becker and Barro argue that as education and work experience of females increase and open up more productive opportunities for women, the costs of raising children will increase.

Another reason the costs of having children can increase as income increases is that economic growth depends in large part on increased skills and productivity and specialization. To become productive as adults in developed countries, children must have more education and higher skill levels than those in countries with static economies. Thus, economic growth can be expected to reduce fertility, both because of the higher opportunity costs on the part of the parents and because of the longer and more expensive education required for the children.

It also is true that higher incomes permit people to raise more children, so economic growth could have the opposite effect. Empirical evidence, however, suggests that as economic growth occurs, fertility rates rise only for the poorest segments of the population. For income levels above the poorest, economic growth leads to lower fertility rates (Barro and Sala-i-Martin 1995). Given the link between economic growth and fertility, institutions that encourage economic growth should also encourage reduced fertility.

A simple relationship between economic freedom and rule of law measures and fertility is shown in Table 5.5, using a large sample of countries for which both the fertility rate and the two institutional measures are available (109 countries for the economic freedom measure; 129 countries for the rule of law measure). The countries are divided into three categories for both economic freedom and rule of law. The fertility rate is highest for those countries that have little economic freedom and little respect for the rule of law.[8]

The relationship is a powerful one. Fertility rates are more than twice as high in countries with low levels of economic freedom and rule of law compared with countries that have high levels of those measures. Formal analysis of the data indicates that these differences are not merely random.[9]

The link between these institutions and fertility partly reflects the impact of economic growth—by encouraging economic growth, these institutions indirectly affect fertility. But there also is evidence that these growth-enhancing institutions affect fertility for other reasons. Many developing countries have poorly specified or poorly enforced property rights. When fuel wood and fodder are not owned and formal laws of possession do not govern their harvest and use, people do not bear the full cost of their consumption. They have an incentive to appropriate resources at the fastest rate possible, often leading to excessive harvest. This condition is generally labeled the "tragedy of the commons." What better way to capture open-access resources than to have as many gatherers as possible? Higher fertility is a way to do this.

Table 5.5
Economic Institutions and Fertility Rates

Institutional Measure	*Fertility Rates*		
Economic freedom	*Low Freedom*	*Medium Freedom*	*High Freedom*
	4.27	3.27	1.82
Rule of law	*Weak Law*	*Medium Law*	*Strong Law*
	4.16	3.53	1.55

Note: Total fertility rate is the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children at each age in accordance with the prevailing age-specific fertility rates. Fertility rates are for 1999.

Sources: Gwartney and Lawson (2001); Political Risk Services (1997); World Bank (2001)

Theodore Panayotou (1994, 151) observes that "most contributions by children consist of capturing and appropriating open-access natural resources such as water, fodder, pastures, fish, fuel wood, and other forest products, and clearing open-access land for cultivation." This, he continues, makes "the number of children the decisive instrument in the hands of the household: The household's share of open-access property depends on the number of hands it employs to convert open-access resources into private property." Yet this could "become devastating for the resource, the community, and eventually the individual household."

The absence of economic freedom encourages fertility in another way, too. Arthur De Vany and Nicolas Sanchez (1979) examined fertility patterns in Mexico based on the proportion of private farms and *ejido* farms—communally owned farms organized under the laws enacted following the Revolution of 1910. In addition to incentives to have children in order to appropriate resources, they assert there are incentives to have children in order to transfer property. Because of restrictions on sales of land, many people have the right to use but not sell the land. They can obtain some benefits of selling the land by transferring it to their progeny. More children increase the ability to make such

transfers. On farms without clear ownership, the parents with more children will have a greater chance of at least some children taking over the farm and providing for the parents in their old age.

Finally, there may be a simple pronatalist bias to obtain "free" family farm labor. Not surprisingly, De Vany and Sanchez found that the higher the proportion of *ejidatarios* (workers on communal farms) relative to women or to total farm workers, the higher the fertility. In short, fertility and favorable economic institutions are inversely related. Where property rights are poorly defined and enforced, the incentives to have children are greater than where property rights are well specified and enforced.

Additional confirmation of the link between poorly protected property rights and high fertility comes from two measures produced as part of the Political Risk Service's *International Country Risk Guide*. Comprehensive and standardized measures of land-ownership patterns across countries are not as available as the economic freedom and rule of law measures, but two indices can serve as proxies for ill-defined property rights in land. One index ranks countries by the likelihood that contracts will be broken, and the other by the likelihood that their governments will expropriate property. Knack and Keefer (1995) describe the first measure as the "risk of modification of contract in the form of repudiation, postponement, or scaling down due to budget cutbacks, indigenization pressure, a change in government, or a change in government economic or social priorities." The second is an assessment of "outright confiscation" or "forced nationalization" of property.

Table 5.6 compares fertility rates for relatively poor countries depending on whether they have strong or weak institutions. The sample contains those countries with per capita GDP in 1995 beneath the average (1,579 US$) for the group of countries used in Table 5.1. The countries are divided into those below average and those above average for honoring contracts and not expropriating property. In the weak category are countries where contracts are less likely to be honored and where property is more likely to be expropriated; in the strong category

Table 5.6
Economic Institutions and Fertility Rates: Poor Countries

	TOTAL FERTILITY RATE	
Institutional Measure	*Weak Institutions*	*Strong Institutions*
Honoring contracts	4.88	3.68
Expropriation risk	4.62	3.22

Note: Total fertility rate is the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children at each age in accordance with the prevailing age-specific fertility rates. The fertility rates are for 1999.
Sources: Political Risk Services (1997); World Bank (2001)

are countries where contracts are more likely to be honored and where property is less likely to be expropriated.

Fertility rates are notably lower in the countries that have a tradition of honoring contracts and not expropriating property. These numbers are remarkable because they show that even among the poorer countries of the world, security of contractual relations and the protection of private property tend to lower fertility rates.

When the capture of open-access resources is rendered unnecessary by a system of laws that assigns full ownership and the ability to transfer property, families do not need so many children.

Institutional Reform and Population Growth

The data in Tables 5.1–5.6 build a compelling case for institutional reform as the means to solve problems that are often erroneously attributed to population growth. There are two reasons to advocate institutional reform. First, nations that adopt growth-enhancing reforms, such as better protection of property rights and acceptance of the rule of law, improve people's lives. Favorable economic institutions directly decrease human poverty and environmental degradation and enhance

the environment, improving conditions even in realms where population growth has little effect.

Second, economic freedom, the rule of law, and related market-enhancing institutions also reduce fertility rates, as discussed earlier and shown in Table 5.5. By reducing population growth, they reduce any adverse consequences of population growth.

To illustrate the effects of these institutions, I have constructed a table showing hypothetical changes in the measurements of well-being if economic freedom were increased from low to medium or medium to high levels or comparable changes for the rule of law measure as shown in Tables 5.2–5.4. These direct effects are based on estimates of the relationship between the poverty and environmental measures and economic freedom and the rule of law.[10]

Using the information in Table 5.5, I calculate the indirect effects on human well-being that would derive from lower fertility rates resulting from modest institutional reforms. Going from low to medium economic freedom would lower the fertility rate from 4.27 to 3.27, or one child per woman of childbearing age. Going from medium to high economic freedom would lower the total fertility rate from 3.27 to 1.82, or by 1.45 children. Using the average of the two, approximately 1.2 children per woman of childbearing age, I calculate the degree to which some of the measures, such as adult illiteracy, would fall.

Thus, using the data reported in Table 5.4 (the sensitivity of measures of well-being to population growth), it is possible to calculate the decrease in human poverty measures caused by lower fertility rates. (Recall that lower fertility rates did not affect the environmental factors.) The decreases in poverty measures constitute the indirect effects of institutional reform.

Table 5.7 contains the combined direct and indirect effects. The first column of numbers contains the average levels of the well-being measures for the sample countries. For example, the average fraction of the population that fails to survive to age 40 is 20.8 percent. The last column shows the new average that would result from a modest

Table 5.7
Hypothetical Effects of Modest Institutional Reforms

Measure	*Average*	*Direct Effects*	*Indirect Effects*	*Reformed Value*
U.N. Human Poverty Index	31.01	−5.99	−5.17	19.85
Death by 40	20.84	−4.82	−4.06	11.96
Adult illiteracy	35.14	−6.11	−10.07	18.96
Safe water	34.29	−8.51	—	25.78
Health services	28.14	−10.26	−8.14	9.74
Undernourished children	22.92	—	—	22.92
Deforestation rate	0.902	−0.329	—	0.573
Water pollution	0.212	−0.019	—	0.193
Net savings rate	5.64	4.78	—	10.42
Agricultural productivity	1,564	610.46	—	2,174

Note: The numbers in column 2 are the averages for the measures in column 1. The direct effects are the results from increasing economic freedom (rule of law) from low (weak) to medium or from medium to high (strong) after netting out the effects of other variables. The indirect effects are the results from lower fertility rates that accompany comparable institutional reforms.

Sources: Gwartney and Lawson (2001); Political Risk Services (1997); United Nations Development Program (1997); World Bank (2001)

improvement in either the Economic Freedom of the World Index or the rule of law measure.[11] The results combine the direct and indirect effects of reform.

To see this more clearly, consider the effects of modest institutional reform—an increase in economic freedom from the levels in Colombia or Togo to the levels of Paraguay or Guatemala or an increase in the rule of law measure from the levels in El Salvador or Nigeria to the levels in Egypt or India. The proportion of people not surviving to age 40 would fall to about 12 percent of the population, compared with nearly 21 percent. Similarly, institutional reform would lower the proportion of illiterate adults from 35 percent of the population to just under 19 percent. A modest reform of the rule of law would reduce the deforestation rate to just under 0.6 percent, a notable decrease. Reform

would increase the savings rate from about 5.64 percent to more than 10 percent and raise agricultural productivity from an average of $1,564 (in 1995 US$) to $2,174.

Conclusion

The data presented above lead to four simple conclusions:

- Adverse effects of population growth are small.
- Economic institutions can offset the adverse effects of population growth.
- Market-enhancing economic institutions lower fertility rates.
- Reforming institutions is far more important than controlling population growth.

There is no population apocalypse. Institutional reform can largely offset any population problems, both directly, by improving well-being, and indirectly, by leading to lower fertility rates. Moreover, the results understate the potential benefits of institutional reform because the sample excludes countries in which economic institutions are substantially more supportive of human well-being. Reforming economic freedom to Hong Kong's level or the rule of law to Switzerland's level would surely have substantially greater impact on human well-being. In short, there is considerable basis for optimism.

Yet, despite these findings, there is also considerable room for pessimism. Institutional reform is not free. Numerous nation-states, for various reasons, resist the kind of reform that would ameliorate population problems in particular and human problems in general. This state of affairs is perplexing and troubling. Perhaps the evidence documented here will be used in the debates to help policy makers take action to reform the institutional environment and thus the most basic building blocks of human well-being—markets and growth-enhancing institutions.

Notes

1. The high and low categories refer to countries that are one standard deviation above or below the average (mean). The standard deviation is a conventional measure of dispersion. For normally distributed populations, the interval around the mean would be about 68 percent of the population, and the high and low categories would collectively constitute about 32 percent of the population.
2. For the reader familiar with rudimentary statistical inference, the most compelling evidence against the neo-Malthusian view is that the gap between the high population growth and medium population growth is never both adverse and statistically significant. For nonpoverty measures, the low growth and medium growth difference is not significant in any case except long-run population growth and undernourished children. In that case, however, the proportion of children that are undernourished is lower in the higher-population-growth group.
3. The data were compiled by Political Risk Services (now PRS Group) but were obtained from the Center for Institutional Reform and the Informal Sector (IRIS) at the University of Maryland.
4. The research is discussed in Gwartney, Lawson, and Block (1996) as part of the Economic Freedom Project and by Easton and Walker (1997).
5. The gap between low economic freedom and medium economic freedom is statistically significant for the poverty index, death by age 40, health service, and undernourished children. The gap between high economic freedom and medium economic freedom is statistically significant for all measures except health service and water pollution. For the rule of law, the gap between weak and medium is not statistically significant, but the gap between medium and strong is significant for all but undernourished children and water pollution. However, statistical significance is not a powerful concept unless other factors are also considered. See Table 5.4.
6. For population growth, the statistically significant gaps are the poverty index, death by age 40, and adult illiteracy. All others are not significant. The measured gaps are all significant except for deforestation rates and water pollution for economic freedom, and water pollution and agricultural productivity for the rule of law. The caveat regarding other confounding factors applies here as well.
7. The estimation procedure is the well-established multiple regression technique common in economics and other sciences. The ordinary least-squares technique was used in the estimates. Zero entries represent esti-

mates that are not statistically significant. Unlike the simple averages in Tables 5.1–5.3, statistical significance is crucial here because the effects of other forces—for example, tropical climates—are included in the estimates.

8. The full sample of countries, not just the United Nation's sample of developing countries, is used for this table.
9. In the language of statistics, the gaps are statistically significant well beyond the 99 percent confidence level.
10. For the original estimates, see Norton (2001).
11. The modest improvement is a one-standard-deviation increase in economic freedom or the rule of law.

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Appendix

Sample Countries

Algeria	Guinea-Bissau	Nigeria
Bangladesh	Haiti	Pakistan
Bhutan	Honduras	Panama
Bolivia	India	Papua New Guinea
Botswana	Indonesia	Paraguay
Burkina Faso	Iran	Peru
Burundi	Iraq	Philippines
Cambodia	Jamaica	Rwanda
Cameroon	Jordan	Senegal
Central African Republic	Kenya	Sierra Leone
Chile	Lao People's Democratic Republic	Singapore
China	Lesotho	Sri Lanka
Colombia	Libya	Sudan
Congo	Madagascar	Syrian Arab Republic
Costa Rica	Malawi	Tanzania
Cote d'Ivoire	Mali	Thailand
Cuba	Mauritania	Togo
Democratic Republic of Congo	Mauritius	Trinidad and Tobago
Dominican Repbulic	Mexico	Tunisia
Ecuador	Mongolia	Uganda
Egypt	Morocco	United Arab Emirates
El Salvador	Mozambique	Uruguay
Ethiopia	Myanmar	Vietnam
Ghana	Namibia	Yemen
Guatemala	Nicaragua	Zambia
Guinea	Niger	Zimbabwe

High and Low Population Growth Countries

High Growth Countries	*Low Growth Countries*
Botswana	Cambodia [b]
Cote d'Ivoire	Chile [b]
Democratic Republic of Congo [a]	China
Ethiopia [a]	Cuba
Ghana [a]	El Salvador
Honduras [b]	Haiti [b]
Iran [b]	Jamaica
Iraq	Mauritius
Jordan	Mozambique [a]
Kenya	Myanmar [a]
Libya[b]	Sri Lanka
Malawi	Trinidad and Tobago
Syrian Arab Republic [b]	Uruguay
United Arab Emirates	Yemen [a]

[a] Short-term only [b] Long-term only

High and Low Economic Freedom Countries

High Freedom	*Low Freedom*
Chile	Algeria
Costa Rica	Bangladesh
Guatamala	Democratic Republic of Congo
Indonesia	Guinea-Bissau
Mauritius	Myanmar
Panama	Nicaragua
Paraguay	Nigeria
Singapore	Sierra Leone
Thailand	Syrian AR
Uruguay	Uganda
Zambia	

Strong and Weak Rule of Law Countries

Strong Law	*Weak Law*
Botswana	Bangladesh
Chile	Bolivia
China	Colombia
Costa Rica	Democratic Republic of Congo
Cuba	Guatemala
Ecuador	Guinea-Bissau
Namibia	Haiti
Singapore	Iraq
Tanzania	Mauritius
Thailand	Peru
Trinidad and Tobago	Sri Lanka

Variable Descriptions
Measures of Poverty and Environmental Degradation

U.N. Human Poverty Index	An index of human well-being that focuses on human deprivation of survival, education, and knowledge, and economic provisioning (United Nations Development Program 1997)
Death by 40	The proportion of people not expected to survive to age 40 (United Nations Development Program 1997)
Adult illiteracy	The proportion of adults classified as illiterate (United Nations Development Program 1997)
Safe water	Proportion of the population without access to safe water (United Nations Development Program 1997)
Health services	Proportion of the population without access to health services (United Nations Development Program 1997)
Underweight children	Proportion of children under age 5 who are underweight (United Nations Development Program 1997)
Deforestation rate	The average annual permanent conversion of natural forest area to other uses, including shifting cultivation, permanent agriculture, ranching, settlements, and infrastructure development (data are percentage changes) (World Bank, various years)
Water pollution	Organic water pollution (BOD) emissions in kilograms per day per worker (World Bank, various years)
Net savings rate	Gross domestic savings minus consumption of fixed capital (World Bank, various years)
Agricultural productivity	Value added in 1995 U.S. dollars divided by the number of workers in agriculture (World Bank, various years)