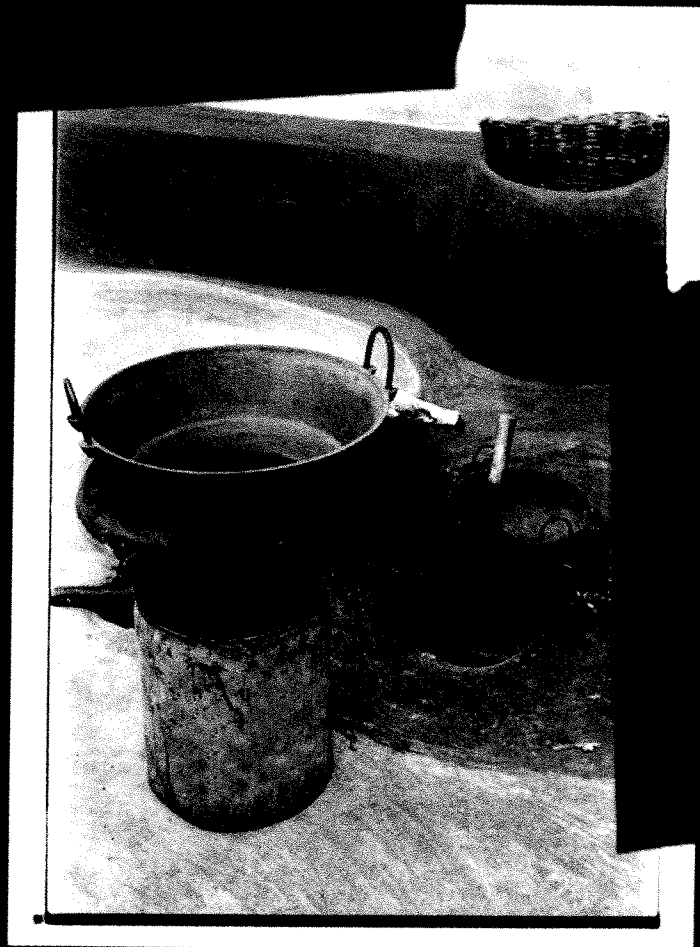# UNDERSTANDING POVERTY

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10

Fertility in Developing Countries

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Rapid population growth blights the lives of a large proportion of the world's people and condemns them to poverty. Many countries still have population growth rates in excess of 2% per annum, a rate that would double the population in thirty-five years. All the developed countries of today have made the transition (the "demographic transition") from the phase of high fertility, high mortality, and high population growth to a phase of low fertility, low mortality, and low population growth. Their growth from poverty to riches has been facilitated by this transition. This essay will discuss some important aspects of high fertility in the developing countries of today and suggest approaches that will hasten their demographic transition. It will also address some disturbing, related problems that are accompanying this transition in some developing countries.

High fertility usually implies rapid population growth. This typically lowers the rate of growth of per capita income and, in addition, has serious consequences for the distribution of income across different classes of people. The growth in per capita income is retarded partly because some production inputs, such as agricultural land, are fixed in supply. Higher populations would mean that each agricultural worker, now having less land to work with, is less productive. And lower productivity implies lower per capita income. If workers also use capital in production, the total capital stock of the country has to rise faster in the face of population growth in order to maintain the amount of capital per worker. If it does not, once again productivity will fall because each worker has less capital to work with than before. In other words, in the face of population growth, the nation's savings rate has to be higher if income per capita is to be maintained. Thus, even if

the production inputs other than labor are not fixed but can be accumulated over time, rapid population growth will impede the elimination of poverty. Population growth also has adverse effects on the environment: Forests are depleted for fuel, groundwater is exhausted, agricultural land is overused, and so on. All of these inputs, which can be interpreted as various forms of capital, contribute to the productivity of labor. Depletion of these through rapid population growth is tantamount to reducing the future productivity of labor and, therefore, the standard of living of those who constitute the poor.

The income distribution consequences of high fertility follow from the fact that the owners of production inputs other than labor typically benefit from population growth. Landlords receive higher land rent, since the productivity of a hectare of agricultural land increases when it is worked by more labor. Likewise, the return on capital increases to the extent that a larger labor force renders capital more productive. Therefore, if everything else is constant, accompanying population growth will be a declining wage rate, an increasing rental rate on land, and an increasing return to capital. Capitalists and landlords will become richer even as workers become poorer. Since the poor in developing countries are typically those without any assets, by skewing the income distribution against the poor, rapid population growth will result in poverty persisting longer than it otherwise would.

Of course, technical progress, which increases the amount of output that can be produced from given amounts of inputs, may come to the rescue. However, the demands on technical progress will be that much greater when population is growing rapidly. It has been proposed that larger populations would induce faster technical progress because there will be more new ideas generated when there are more people.[1] Ideas are public goods: their use by one person does not preclude their use by others. Consequently, an idea can serve an entire population just as well as it can serve a single individual. Alternatively, if production requires firms to incur substantial fixed costs, the cost per unit of output would decline as the output increases—giving an advantage to large populations because they consume more output in total. However, in the populous developing countries of today, it is highly unlikely that these benefits would outweigh the negative effects outlined above. On balance, by slowing down the rate of growth of per capita income, we would expect population growth to retard the alleviation of poverty.

Empirical assessment of the intuitively simple logic outlined above has proven remarkably difficult to conduct because the attempts are plagued by various statistical problems. Kelley and Schmidt (1994) have examined the effect of population growth on the growth rate of per capita income and on the productivity of labor, using compatible data from eighty-nine countries over the period 1960–1990.[2] They found that while population growth had an insignificant effect in the first two decades, in the decade beginning in 1980 it adversely affected the growth rate of per capita GDP. The effect was particularly strong in developing countries. To bring home this point, they conducted the hypothetical exercise of assuming that the population growth rate of the median developing country fell from 2.54% in 1980 to 2.34% in 1990, in contrast to the historical constancy of this rate over the three decades. They found that this assumed decline of 0.20 percentage point in the population growth rate would have increased the growth rate of per capita GDP of the median developing country by 0.41 percentage point. The observed negative impact in the 1980s of population growth also held for the growth rate of labor productivity.

It has been argued that high fertility is a cause of poverty. However, the causation often goes in the opposite direction as well. Poverty encourages high fertility for reasons having to do with old-age security (an issue that is dealt with at length in this essay), and this increases future poverty. Using data on fifty-nine (mostly) developing countries, Eastwood and Lipton (1999) present evidence on the relationship between fertility and poverty and the direction of causation.[3] If poverty were more strongly correlated with lagged values of fertility (e.g., fertility ten years earlier) than with current values, one might infer that the causation goes from fertility to poverty; if the reverse is true, then the inference would be that the causation goes from poverty to fertility. Their finding is that while poverty is correlated with both measures, the correlation with lagged fertility measures is much stronger. They estimate that had the 1980 median country in their sample experienced the median fertility reduction actually seen in their sample during the decade, its poverty level would have fallen from approximately 19% to 14%.

While many factors influence fertility, this essay will focus only on ones that are most relevant to contemporary developing countries. Child labor, a ubiquitous institution in many of the poorest countries, is a particularly relevant factor. When child mortality rates are high, the existence of this institution strongly influences fertility for various reasons. Legislation that bans child labor is virtually unenforceable in the midst of poverty. Therefore, one cannot seriously set about resolving the problem of high fertility in developing countries without concurrently addressing the problem of child labor. Since children's work in developing countries comes at the expense of the education of children to a large extent, compulsory education—if enforced—could have significant effects on fertility.

While the argument (and some evidence) on the link between child labor and fertility will be discussed later in the essay, it may be mentioned here that, in a prescient paper, the demographer Caldwell (1980) identified universal education as having significantly hastened the demographic transition in the now developed countries. Among other things, the laws for compulsory education raised the cost of children to parents and thus lowered marital fertility. In England, for example, the Education Act of 1870 started the move toward compulsory education, which became law in 1880. As Caldwell points out, marital fertility began to fall in England and Wales between 1871 and 1881. The timing is uncanny, especially when we note that per capita income had been rising in England for nearly a century before that (as a result of

the Industrial Revolution), and that had resulted, by the standards of the day, in rapid population growth. Other European countries saw fertility transitions that were synchronous with laws making education compulsory. Weiner (1991, chap. 6) has observed that even if laws banning child labor exist, they can really be enforced only when education is mandatory. Then, the authorities only need peruse the school registers in order to identify potential child laborers.

As noted, many developing countries have rapidly growing populations and exhibit no perceptible approach to the demographic transition. Others, such as the East Asian countries, are rapidly undergoing this fertility transition but are exhibiting a most disturbing feature: a biased sex ratio of children at birth.[4] This, as we shall see, is due to discrimination against females, and discrimination cannot get more extreme than where their very survival is jeopardized.

Table 10.1, using a handful of countries by way of examples, conveys how fertility correlates with some pertinent economic measures. We see that even populous countries tend to have high rates of population growth. (China is an exception, because of the one-child-per family policy implemented in 1979.) The child mortality rates are also largest in the poorer countries. Enrollment in educational institutions not only is low in poor countries but also is skewed against girls, especially in South Asia. Likewise, the economic activity of women outside the home—a measure of the autonomous influence women are likely to have in household decision making—is low in the poorer countries, again especially in South Asia. These impressionistic statistical "facts," presented here in a rough-and-ready manner, are also confirmed by comprehensive empirical studies. For our purposes, Table 10.1 is adequate to highlight the essential ingredients of the discussion to follow.

This essay outlines why fertility is high in many developing countries; why it declines with economic development; why the institution of child labor facilitates high fertility; and why high fertility is intimately tied to the extent of female autonomy in decision making. It then discusses the reasons for the biased sex ratio at birth alluded to above. Finally, the essay concludes with suggestions for policy measures that will address the problems identified here.

CHILDREN AS ASSETS

Before we can determine what can be done about rapid population growth in developing countries, we have to understand what motivates people to have many children. Policy measures that merely increase the number of family-planning clinics and disburse free contraceptives, while useful, could be misguided supply-side responses to the problem. They fail to account for why there is a demand for large families in the first place. Although the opinions of researchers on the effectiveness of family-planning programs are not uniform, the evidence is that they are useful when the desired fertility rate has been lowered but the means to implement it are not readily avail-

Table 10.1 Demographic and Economic Indicators across Selected Countries

	Total Population (Millions) 1999	Population Growth Rate (% p.a.) 1975–99	Mortality for Children under 5	Combined Primary, Secondary and Tertiary Enrollment (%)	GDP per Capita (PPP US$) 1999	Female Economic Activity rate (as % of Male Activity) 1999	Life Expectancy at Birth Females (males) 1999
United States		1.0		99	31, 872	80	79.7
	280.4		8	(91)			(73.9)
Canada		1.1		98	26,251	81	81.4
	30.5		6	(96)			(75.9)
Japan		0.5		81	24,1898	67	84.1
	126.8		4	(83)			(77.3)
Germany		0.2		93	23,742	69	80.6
	82.0		5	(95)			(74.3)
Rep. Korea		1.1		85	15,712	69	78.4
	46.4		5	(95)			(70.9)
Argentina		1.4		86	12,277	45	77.0
	36.6		22	(80)			(69.9)
Chile		1.6		77	8,652	48	78.5
	15.0		12	(78)			(72.5)
Mexico		2.1		70	8,297	47	75.8
	97.4		33	(71)			(69.8)
Brazil		1.1		80	7,037	52	71.8
	168.2		40	(79)			(63.9)
Columbia		2.0		73	5,749	60	74.6
	41.4		31	(73)			(67.8)
Philippines		2.4		84	3,805	61	71.1
	74.2		42	(80)			(67.0)
China	1	1.3		73	3,617	86	72.5
	264.8		41	(73)			(68.3)
Egypt		2.3		72	3,420	44	68.5
	66.7		52	(80)			(65.3)
Indonesia		1.8		61	2,857	67	67.7
	209.3		52	(68)			(63.9)
India		2.0		49	2,248	50	63.1
	992.7		98	(62)			(62.4)
Pakistan		2.8		28	1,834	41	59.5
	137.6		12	(51)			(59.8)
Bangladesh		2.4		33	1,483	76	59.0
	134.6		189	(41)			(58.9)
Uganda		3.1		41	1,167	88	43.8
	22.6		31	(49)			(42.5)
Nigeria		2.9		41	8	56	51.7
	110.8		87	(49)	53		(51.3)
Ethiopia		2.6		19	628	67	44.9
	61.4		76	(26)			(43.3)
Tanzania		3.1		32	501	93	52.2

able.[5] In other words, while they can be very effective in averting unwanted pregnancies at the onset of the demographic transition, they are not equipped to bring about a reduction in the desired number of children.

A very important source of the demand for large families in developing countries is the fact that old-age security for parents comes from children. This is particularly true in South Asia, which is a region of considerable population growth. (It comprises about a quarter of the world's population but accounts for a third of the annual increase in the world's population.) In poor countries—especially in the rural countryside, where the bulk of the population resides—there are few financial assets available for transferring income from one's working life to one's retirement. Parents view children as vehicles for ensuring security in old age. Even when financial instruments are available, they are rarely deemed to be substitutable for children. Adult children can potentially provide security in the innumerable contingencies that can arise in old age. Jensen (1990) has provided compelling evidence for the old-age security hypothesis. Using Malaysian data from a survey conducted in 1982, he examined the decisions of couples to use contraceptives. He found that old-age security concerns were very important: Only couples who had satisfied their perceived old-age security needs opted for contraception.

While security in old age may provide the motivation for having children, it does not follow that the fertility will be more than what would be deemed optimal for the society. Indeed, if a benevolent social planner had the power to impose a fertility level on each family, she would need to consult the fertility preferences of typical parents. If an imbalance arises between the private optimal fertility of a typical couple and that deemed optimal for the society, there must be some mismatch between the benefits and/or costs that a social planner would account for and those for which individual couples would. What are the sources of such a discrepancy?

An important source of socially harmful fertility behavior is that while parents may altruistically consider the well-being of their children, they do not weight it equally with their own. The mechanism, which was first proposed by Neher (1971), runs as follows. Consider a poor country where children are the only assets. An additional child imposes a cost on his parents when young. When the child becomes an adult, he generates income in excess of his own consumption and is therefore a benefit to parents. When the offspring reaches retirement, his consumption again exceeds income and needs to be subsidized by his children. Thus an additional child is a net cost in childhood, a net benefit in adulthood, and again a net cost in retirement. Parents incur the offspring's cost in childhood and reap a benefit in adulthood. But when their offspring again becomes a cost to society in retirement, the parents most likely will be dead. It is therefore very likely that, in contemplating additional children, parents will either ignore or underestimate the cost that their offspring will impose on subsequent generations in their

retirement. However, a benevolent social planner who weights future generations on par with the present one will not. Thus, parents who are not completely altruistic will overestimate the benefits of children relative to the costs imposed on society. As a result, privately chosen fertility levels will be too high relative to what is optimal for society.

ECONOMIC DEVELOPMENT AND FERTILITY

The role played by economic development in eliminating the wedge between private and social net benefits of children can now be readily seen. With economic development come capital markets, offering various financial instruments for saving. Along with these, private firms begin to offer pension plans and the government may offer social security. These greatly reduce the need for parents to use children as vehicles for transferring income from their working life to retirement. Thus, on these grounds alone, one would expect to see declining fertility with economic development.

There are other, equally compelling reasons why economic development results in fertility decline. One of these has to do with the cost of the time of women. Galor and Weil (1996) have proposed that as the capital stock of a nation increases, it impinges differentially on the wages of men and women. While both engage in manual and nonmanual work, men have a relative advantage in manual work and women in nonmanual work. If the increase in the capital stock (through saving) raises productivity of nonmanual labor more than it does of manual labor, the wage rate of women will rise faster than that of men. As a couple becomes wealthier, it may want more children. However, whether, and how many, children women bear depends on their wage rate relative to the couple's income, since that determines the income women forgo by opting out of the labor market during and after pregnancy. The relative increase in the wage rate of women leads to an increase in the participation of women in the labor market and a decline in fertility.

Given the arguments outlined above, the reader might infer that no special measures need be taken with regard to excessive population growth in developing countries if they are showing respectable economic growth. The emergence of financial instruments for saving and the higher cost of children in terms of income forgone will reduce fertility. In the words of a popular quip of the 1970s: "Economic development is the best contraceptive."

Such an inference, however, would be premature. The growth rates of the GDP of many developing countries with high population growth rates are very low. Indeed, as we have seen, part of the reason why per capita GDP grows slowly is that population growth is outpacing the rate at which capital is accumulating through savings. Thus, waiting for economic growth to dilute the incentives of couples to have many children may indefinitely postpone fertility reduction.

THE EFFECT OF CHILD MORTALITY

There are good, additional reasons for the governments of developing countries to be more proactive with regard to population problems. A statistical relationship that demographers have long focused on is the decline in a country's infant or child mortality rate and the population rate of growth. As the country's child mortality rate declines, the population rate of growth subsequently declines. In fact, it is not hard to see that there is a causal connection between the two: all else constant, reductions in child mortality rates are responsible for declines in the rates of population growth.

The reason for this causal connection is that the possibility of the death of children exposes parents to considerable risk. There are likely few things that parents fear more than the possibility of losing their children. This is true also in developed countries, where old-age security concerns do not motivate fertility choice; it is true with even greater force in developing countries, where they do. Faced with the possibility of child mortality, parents with an old-age security motive overcompensate for child mortality.

Suppose the desired number of children for a typical couple is four if all children are assured of survival. When the child mortality rate is 25%, one of the four children, on average, will not survive to adulthood. If parents were merely to compensate for this expected loss, they would increase their fertility to five, and the population rate of growth would stay the same. However, quite apart from the fact that only four out of five children can be expected to survive, on average, there is uncertainty introduced by child mortality. The possibility that they may lose more than one child—and possibly all of them—invariably leads parents to overcompensate for the possible loss by increasing fertility to more than five. In other words, parents tend to "hoard" children to protect themselves against the contingency of being left without support in old age. The extent of the "excess" fertility will naturally depend on the child mortality rate. When the child mortality rate declines, it takes some time before the new level becomes apparent to the populace. Sooner or later, parents perceive a reduction in the need for excess fertility, and thus the population rate of growth declines.[7]

To garner empirical evidence on the effect of child mortality on fertility, one needs to separate out the behavioral response of parents, discussed above, to anticipated children's deaths from the biological response to actual deaths. The latter refers to the fact that, in the case of infants, a death may increase fertility by reducing the sterile period of the mother, and to the fact that birth order may impinge on an infant's health. In a careful investigation, Rosenzweig and Schultz (1983) sought to isolate these effects by analyzing American data for the years 1967–1969. They found that "the average number of children per mother would increase by one-sixth of a child if an infant mortality rate of 0.1 were anticipated." This, it must be noted, is the estimated effect of increased child mortality in a highly developed country where parents do not expect their children to provide old-age security. In a devel-

oping country where parents do, one would expect the response to be even stronger.

THE ROLE OF CHILD LABOR

High child mortality rates in developing countries can induce high levels of fertility for an additional reason that works through the institution of child labor.[8] Although this is hardly a concern anymore in the developed countries, in a developing country investment in a child's education depends on the child mortality rate, for two reasons. First, when child mortality is low, offspring are expected to live long, and so the return on their educational investment is high. Parents will opt to send their children to school and thereby forgo their income from child labor. Where child mortality rates are high, parents will not choose this option (when child labor is a socially accepted institution). Second, not only does high child mortality reduce the rate of return to education, it also renders educated children more risky "assets" than uneducated ones. For both these reasons, people who are poor would rather put their children to work. Among the poor, child labor is promoted by high child mortality rates. In such a scenario, the poor will not educate their children even if credit is made available to them. The rich, on the other hand, do not need the income from child labor, and they can reduce child mortality by expending resources privately on health care. In effect, high child mortality rates encourage high fertility rates, and when child labor laws are either nonexistent or unenforceable, they also increase the incidence of child labor.

Thus reductions in child mortality, apart from directly lowering fertility, would have the additional salutary effect of reducing child labor and increasing the skill level of the labor force of the next generation. Furthermore, since educated parents tend to educate their children, improvements in the health of one generation of children can permanently increase the skill level of the labor force and move the economy out of poverty. And affluence, as we have seen, brings about an independent reduction in fertility rates. When children become expensive—because child labor income is lost to parents and, instead, they need to incur educational expenditures—couples will naturally have fewer children. Parents will then opt for "quality" rather than "quantity" with regard to children. In most of the developed countries of today, the introduction of compulsory education for children was accompanied by a decline in fertility for this reason.

Strictly speaking, the argument made above refers to children who have successfully lived through childhood but die as adults (when they would be of use to parents for old-age security). In developing countries, we would expect the probability of death among young adults to be correlated with mortality rates during childhood—because the predominant cause of both is the prevalence of infectious diseases. It is possible to obtain a rough idea of the magnitude of the relevant probability. For India over the period 1970–

1983, the proportion of fifteen-year-old males (females) who did not survive until they were sixty was 32.8% (29.4%).[9] In other words, around one in three children in India who lived long enough to be able to go through school died before providing old-age security for his parents for the entire length of their retirement.

When parents are imperfectly altruistic, in the sense that they put less weight on their children's well-being than on their own, it is not surprising that the decision on whether to send children to work might differ from that of a social planner. Baland and Robinson (2000) have formally demonstrated that child labor can be socially inefficient even when parents are perfectly altruistic (that is, they assign as much weight to their children's well-being as to their own). It might be construed that if parents leave bequests for their children, then the decisions regarding their children's work/schooling trade-off would be also a social planner's. For if schooling contributes to a child's future earnings, then parents would send the child to school but leave behind a smaller bequest. But this is not so when parents are so poor as to leave no bequest to begin with. Furthermore, even if parents do leave bequests, child labor may be socially inefficient if capital markets are imperfect. Parents who wish to transfer some income from their retirement period to the present may find it expedient to use child labor to effect this transfer when credit markets do not extend them sufficient credit. It must be noted, however, that the formal model of Baland and Robinson generates an ambiguous relationship between child labor and fertility. This link, then, becomes an empirical issue.

Some evidence on the effect of child labor on fertility is provided by Cigno and Rosati (2001), who analyze data gathered in 1994 by the Human Development of India Survey. The data cover around 35,000 rural households in over 1,700 villages drawn from 16 Indian states. Apart from income and other economic variables pertaining to adults, the data contain information on children's work/study status and their health, nutritional, and education status. Cigno and Rosati use the average survival rate at the village level as a measure of the probability of children surviving to age six. They set up two possible theoretical scenarios in which parents choose the fertility, the expenditures that impinge on child mortality, and the work/study decisions of their children. In one scenario, the parents are altruistic, in that they give full weight to their children's well-being; in the other (nonaltruistic) one, they are concerned only with their own well-being. Cigno and Rosati found that, holding income constant, an increase in the number of school-age children increases the probability that the children will work. The probability of an additional birth was also seen to increase with the probability that a child will work when older. Furthermore, they found that when the village-level survival rate increases, so does the probability that children will be engaged in full-time study—which is consistent with the scenario positing nonaltruistic parents (but not with that of altruistic ones). This finding is also

consistent with the arguments made above on the beneficial effect of reduced child mortality on education.

THE IMPORTANCE OF FEMALE AUTONOMY

The role of female autonomy in decision making is increasingly being acknowledged as an important factor impinging on fertility. Dyson and Moore (1983), were the first to discuss this factor in relation to the demographics of Indian states. There is considerable difference in the demographics of the northern and southern states of India. The northern states, characterized by low female autonomy due to kinship arrangements that minimize support to married women, display high fertility and high child mortality rates. Women in these states typically marry relative strangers from other villages and after marriage retain almost no ties with their natal families. In the southern states, women have considerable autonomy: marriages tend to occur within the village to grooms who are not relative strangers, and women maintain considerable contact with their natal families after marriage. Female autonomy is important because it determines the relative bargaining power of women in the household.

Even in developed countries, the relative bargaining power within couples is skewed in favor of males; in developing countries, the disparity is far greater. This asymmetry has many causes. Males are more likely to work in the labor force, and even if the wife earns, the husband's income is likely to be higher. Ownership of property—in particular, land—is vested in the male. Therefore, any credit that may be available to the household is accessible only to the male. Adding to this is the considerable weight of religious, cultural, and social norms that put women in a weak bargaining position relative to men. As remarked above, kinship systems are important cultural and social determinants of female autonomy.

The relative bargaining powers of males and females have considerable influence over a couple's fertility and resource allocation within the household. Child mortality rates depend, to a significant degree, on the extent of discretionary spending on children's nutrition and health care. Child mortality rates are observed to be much lower when mothers exercise control over household resources. Empirical research has sought to identify how a household's expenditures on various goods vary with the identity of the income earner. Hoddinott and Haddad (1995) found that in the Ivory Coast, an increase in the wife's share of cash income significantly increases the share of expenditure on food and reduces the shares of alcohol and cigarettes. In Brazil, Thomas (1990) found that unearned income accruing to the mother has a far greater effect on the family's health than that accruing to the father. In fact, the effect on child survival probabilities is twenty times larger in the former case.

There is a simple economic reason why mothers devote more resources

to the nutrition and health care of children.[10] Since mothers bear a grea... proportion of the costs of children, they prefer to have few children a... ensure their survival by devoting resources to them. Fathers, on the oth... hand, prefer to have many children and to devote little by way of resour... to each of them. Fathers and mothers, in other words, prefer to be at differ... points in the quality-quantity trade-off with regard to children. When ba... gaining power shifts in favor of mothers, the couple will have fewer b... healthier children.

There is an additional benefit to society that accrues from the empow... erment of women. When child mortality falls, the lower risk and high... expected return from the education of children elicits more resources for th... education of children. Thus, an increase in the relative bargaining power o... mothers not only results in fewer and healthier children, but it also generat... a more educated labor force. These various benefits with regard to fertil... alone render the empowerment of women as an important influence on th... speed of the demographic transition.

The move toward fewer children as a result of greater female autonom... is also in line with what would be optimal from the point of view of societ... at large. As we have seen, whenever those who make the decisions share i... the benefits, but do not bear a commensurate share of the costs, the decision... are unlikely to be optimal from society's point of view. Since in patriarcha... societies, males have decision making power in excess—often vastly in ex... cess—of the burden of the consequences of their decisions, the decision... pertaining to fertility and expenditures on the nutrition and health care o... children are unlikely to be optimal.

TRENDS IN SEX RATIOS

A significant aspect of fertility in South and East Asia is the desired se... composition of children: there is a strong preference for male children. Ec... onomically and culturally, males are deemed to be of greater value tha... females. In South Asia, old-age security is expected only from male children... Female children, in contrast, are often seen as economic burdens becaus... they have to be married off with dowries that are worth several years' in... comes of their parents. In East Asia, old-age security may not be the over... riding reason for the biased sex ratio at birth. Nevertheless, sons are muc... more valued because, culturally, sons apparently enhance the emotional an... spiritual goals of their parents, and they also perpetuate the family name.

Preference for children of a particular sex tends to increase fertility. Sup... pose every couple's primary desire is to have two male children. Couple... whose first two children happen to be males will cease to have more children... Couples with one or two female children will continue to reproduce. Thi... will naturally increase the average fertility relative to a population of couple... who desire two children but have no gender preference.

Since male children die slightly more frequently than female children in...

...the first year of their lives, evolutionary forces have led nature to compensate ...for this by making the sex ratio at birth slightly larger than 100. As a result, ...even in developed countries with no discernible preference for children of a ...given sex, this ratio is around 106. There is a disturbing trend in the sex ...ratio at birth in many developing countries: it is often observed to be highly ...skewed against girls. This is particularly true in South Asia (India, Pakistan, ...Bangladesh) and East Asia (China, Taiwan, Korea). The proximate cause of ...this biased sex ratio at birth is sex-selective abortion—female fetuses detected ...by amniocentesis and ultrasound techniques are often aborted—or, in some ...countries, female infanticide. The numbers are alarming. In 1990, this ratio ...was 111.7 in China, 112.5 in South Korea, and 109.1 in Taiwan.[11]

As a result of a strong parental preference for male children, girls often ...do not receive the same medical attention to alleviate illnesses as boys do. ...In India, for example, in the event of an illness boys are, on average, twice ...as likely to be taken to a doctor than are girls. This "benign neglect"—an ...egregious euphemism—results in a biased sex ratio not just at birth but also ...for the population at large. Since, on average, women outlive men in the ...developed countries, this ratio is slightly less than 100 in the developed world ...(e.g., 97 for the United Kingdom and the United States, 98 for Canada). The ...sex ratio for the population at large in developing countries remains higher ...than 100 (e.g., in the year 2000: 106 for China, 106 for India, 101 for South ...Korea).[12]

In cultures with a strong preference for sons, one would also expect that ...discrimination against female children would increase with the birth order ...(parity) of the daughters. There would be greater discrimination against the ...second daughter than against the first, greater against the third daughter than ...against the second, and so on. This is indeed observed.[13]

There are reasons why fertility decline may exacerbate discrimination ...against female infants and children. Suppose the autonomy of adult women ...and/or the cost of their time increases because of better employment op... portunities. This will lead, naturally enough, to a reduction in fertility. How... ever, if cultural biases persist, it may be the case that old-age security still ...can be expected only from male children. Parents with, say, only two children ...will perceive that they can ill afford to have one or both of them be female. ...Thus discrimination against female children will increase. The education of ...all children, and females in particular, may alleviate this problem but will ...not necessarily eliminate it. To the extent that cultural values dictate which ...institutions promote one's self-interest, education may prove ineffective— ...except when it manages to dislodge deleterious cultural norms.

The argument outlined above suggests that the serious problems of high ...fertility and of the changing sex composition of families are separate issues. ...The suspicion that the solution to the former may exacerbate the latter is ...supported by recent data. High fertility arises from the low worth of women's ...time and the fact that old-age security is provided by children. The problem ...of changing sex composition of the family arises when parents perceive that

security of various kinds is provided mostly by male children. Since males and females are not culturally assessed to have such disparate values in African countries, despite their poverty, display sex ratios that are remarkably free of the bias observed in South and East Asia.

The commendable performance in recent decades with regard to fertility and child mortality reduction of the southern Indian state of Kerala lends support to the view that old-age security expectations are responsible for the differential treatment of male and female children. Kerala is unique in that it has had a history of matriarchy among a substantial proportion of its population. Furthermore, in sharp contrast to the strongly patriarchal societies of the rest of India (especially in the north), where women are excluded from the line of inheritance, women in Kerala tend to inherit and hold land and other assets. In 1991, the female literacy rate in Kerala was 87% (as opposed to an all-India average of 39%). One would expect that in such a society, women would have considerable autonomy. In recent decades, the sex ratio for the population at large, the population growth rate, and the infant mortality rate in Kerala have all been vastly different from the respective Indian averages, and approach those in the developed countries.

The social consequences of biased sex ratios at birth are not hard to see. Over decades, an increasing disparity between the numbers of males and females of marriageable age will cause a serious shortage of brides. Since most cultures are averse to polyandry, this will condemn a significant proportion of marriageable men to remain without mates. This will certainly generate intense competition between males for mates. There will likely be escalating violence between males and an increase in forceful abductions of marriageable females. Over the long haul, the scarcity value of females will induce parents to look more favorably on female children and the sex ratio at birth will fall. The problem will ultimately sort itself out, though with considerable upheaval in the intervening decades.

The developed countries did not have to make any special efforts to reduce their fertility rates: fertility declined as a matter of course with development. However, the developing countries of today can hardly afford to passively wait for the higher opportunity costs of children or the emergence of better means of saving to drive down fertility. Feasible actions are urgently needed, and there are several avenues that can be pursued.

POLICY

The arguments outlined in this essay provide a strong case for government intervention to hasten the demographic transition. The traditional policy espoused by demographers for fertility reduction is still a powerful and reliable one: reduction in child mortality rates. This will bring about a more than commensurate decline in fertility. Establishing medical clinics in the rural countryside will prevent the death of children from illnesses and diseases that are easily treated, such as diarrhea, malaria, typhoid, gastroenteritis,

cholera, sleeping sickness, and river blindness. Easy and universal access to health care can drastically reduce child mortality rates even in the absence of rapid growth of GDP. An egalitarian distribution of access to health care can achieve fertility reductions that might otherwise take decades to achieve through economic growth. Kerala is a prime example of how this strategy has been responsible for partly inducing a demographic transition in a state that has even lower per capita income than the all-India average.

Furthermore, as we have seen, when child mortality rates are high, the institution of child labor encourages high fertility levels and leads to a poverty trap. By lowering child mortality rates, governments in developing countries could persuade the poor that the education of children is an acceptable risk. The higher cost of educated children will also reduce fertility.

Improving the bargaining power of women vis-à-vis their husbands induces lower fertility and child mortality rates. How is the bargaining power of women within the household to be increased? There are several avenues, obvious in principle but perhaps not so easy to implement in practice. One is to facilitate greater ownership of land by women. Requiring by law the equal division of inheritance among all of one's children, regardless of gender, is a measure that would help. Providing a greater subsidy for the education of daughters rather than sons is another. Empirically, the education of women is seen to be the single most important factor in the reduction of child mortality.[14] Educated women provide better nutrition, are better able to identify serious health conditions in their children, and are better able to respond to them. Easing access to credit is yet another measure for empowering women, because this enables them to increase their contribution to the household income. This is what the well-known Grameen Bank has sought to do in Bangladesh, with considerable success. Facilitating greater political participation of women would also help.

Empowering women would undoubtedly reduce fertility in developing countries but, as we have seen, it would not address the serious problem of biased sex ratios at birth. When old-age security is provided mostly by male offspring, a reduction in fertility may result in a more blatant discrimination against female children, as is witnessed in China, Korea, and parts of India. Given long-entrenched cultural norms, it is unlikely that women will readily be accepted as equals of men as providers of old-age security. A feasible way to confront this problem is to render both male and female offspring irrelevant for old-age security purposes. Implementation of a national social security system would go a long way toward eliminating the need for children (of either sex) to perform this function. In one stroke, it would reduce fertility and, to a significant degree, also reduce the asymmetry in the treatment parents mete out to male and female children. Using data from around fifty developing countries, Entwisle and Winegarden (1984) found strong evidence indicating that state-sponsored pension programs reduce fertility.[15]

In the manner of their operation on fertility problems, the broad policy proposals suggested above are complementary to the working of an increase

in affluence. The latter, with its attendant increase in the time cost of wom... and the cost of providing children with the human capital they will need... an increasingly modern world, would automatically reduce fertility, but o... in the long run. The former proposals are measures that would work in... relatively short run, and would in fact contribute to the arrival of the reg... where affluence can have its salutary effect on fertility problems. Furth... more, policy measures along these lines would also address other goals th... are important in their own right, such as reduction in child mortality... an improvement in the status of women.

NOTES

I thank Ashok Kotwal and, especially, Roland Benabou for comments on an ear... draft.

1. This has been proposed by Kremer (1993).

2. They also summarize the voluminous literature on this issue and discuss th... statistical problems confronting the empirical investigations.

3. The measure of poverty they use is the proportion of the population wi... consumption less than U.S.$1 a day (at 1985 prices).

4. This sex ratio is defined as the number of male children born for every 10... female children born.

5. See, for example, Bongaarts (1997) for a useful discussion of this debate.

6. The infant (child) mortality rate is defined as the average number of 1,00... infants (children) born today who will die before they are one year (five years) old.

7. For a general demonstration of how reductions in mortality rates can induce... a demographic transition, see Eswaran (1998).

8. This link is examined in Eswaran (2000). Standard references on child labor... are Basu and Van (1998), and Baland and Robinson (2000).

9. Computed by Murray et al. (1992, Table 2–6), using mortality tables. The cor... responding proportion for a developed country is considerably lower; for instance, for Canada in the period 1983–1987, it was 14.3% (7.7%) (Table 2–4).

10. The arguments made in this and the following two paragraphs are drawn from... Eswaran (2002).

11. See Park and Cho (1995).

12. Data from the United Nations Population Division.

13. See Das Gupta and Mari Bhat (1997) for data on select states in India, an... Hull (1990) for data on China.

14. See Schultz (1997) for evidence on this.

15. Interestingly, they also found strong evidence of reverse causation: countr... with reduced fertility levels are more likely to implement pension plans.

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11

Corruption and Development

Jean-Jacques Laffont

Corruption is a particularly serious issue in developing economies. Susan Rose-Akerman (1999), an expert on the subject, observes: "High levels of corruption limit investment and growth and lead to ineffective government. Developing countries and those making a transition from socialism are particularly at risk, but corruption is a worldwide phenomenon."

This essay asks why corruption is so widespread in developing countries. It is organized in three sections. First, I argue that a theory of corruption is needed in order to answer this question. Second, I sketch a theory linking corruption and development. Third, I empirically document the correlation between development and corruption.

THE NEED FOR A THEORY OF CORRUPTION

Corruption is an endogenous phenomenon of organizations and societies. In order to target the right level of corruption in a society, it is essential to design a proper cost/benefit analysis, and therefore to build a good understanding of the mechanics of corruption.

The Origin of Corruption

Corruption opportunities arise from the need for delegation in complex societies. Let me illustrate this through an example, that of a benevolent chief in a traditional village. The chief (the principal) can directly monitor the behavior of the members of the village (the "agents"), and has the authority to inflict the penalties required to eliminate rational misbehavior. He can also directly collect the taxes needed to fund the community's public goods.