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## Fertility, Drought, Migration, and Risk

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ESSAYS ON  
POPULATION ECONOMICS  
IN MEMORY OF ALFRED SAUVY

*Edited by*

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## FERTILITY, DROUGHT, MIGRATION, AND RISK

by *Oded Stark*

Social science phenomena rarely take place in a laboratory context. And when events occur that expose hidden and subtle relationships, the presence of competent social scientists to observe, measure, record, and analyze them is even rarer. John C. Caldwell, P. H. Reddy, and Pat Caldwell were on hand in 1983 when a drought hit nine Indian villages in Karnataka, about 80 miles west of Bangalore. Summarizing the overall response of nearly 400 households to the drought Caldwell et al. (1986, p. 681) point out that «Increasingly, farming households are seeking to insulate themselves from the seasonality of the agricultural cycle and its proneness to periodic disaster. Three-fifths of all families now have at least one member working outside the area, usually in Bangalore city or in the rich irrigated area 60 miles to the south around Mandya on the Cauvery River. In fact, the effort to achieve this situation lies at the heart of the family educational and demographic strategies». This point is repeated throughout the paper. The authors note that «the worst affected [by the drought] were those who had no income outside farming, largely the landless agricultural laborers or the smaller farmers, especially those where no [family] member worked in a nonagricultural job or no son was employed elsewhere» (p. 685); that «the majority of households usually get some money or other help from family members working elsewhere; most felt that this assistance increased during the drought» (pp. 686-688); that when asked to assess the impact of the drought «The critical difference is found between rural families, whether farmers or agricultural laborers, with incomes solely from rural activities and those [with] one or more family members working full- or part-time outside agriculture. In good times, there may be a net flow of assistance from farms to family members in the towns, especially in the form of food from the family land on which all family members have a claim. [But] by mid-1982 the flow was solely an urban-rural one» (p. 691). Equally important they note that «One finding dominated our conclusions about these rural Indian families...:

their chief, all-pervasive worry was the instability of rural incomes, both their seasonality and their longer-term cycles from relative plenty to widespread scarcity. They discussed desired marriages largely in these terms, much preferring daughters' husbands to have urban jobs with guaranteed continuing incomes than to be farmers of even substantial size. For the same reasons, they preferred some of the family to work off the farm, at least part-time, and felt safer if a son had a job in Bangalore, especially a permanent position with the government or in a bank» (p. 696), as «[major] support in the drought came from urban-based relatives or those in nonagricultural employment» (p. 698).

In the wake of these observations, Caldwell et al. make two important connections: first, that the success of urban-based income earners depends on their educational level (see, in particular, pp. 682, 696). Second, that partly due to the costs of educating children and partly due to the growth of nonagricultural employment, the demand for a large number of children on the family farm declines. This is the analytical thrust of the paper: «... The costs of keeping children at school explain the largest demand for family-planning services» (p. 682); «Demographic behavior [meaning fertility behavior] has changed only because there are new strategies for reducing risks that were not previously available» (p. 699). The emerging thesis has far-reaching policy implications: since children *as migrants* diversify the family's sources of income more effectively than children as farm workers, a risk-averse family is able to meet its insurance needs by relying on fewer children; hence the demand for children and consequently fertility levels will decline. Taken to its logical conclusion the argument views rural-to-urban migration as a powerful contraceptive!

Because of its potential policy implications, this argument must be examined. Is this a valid argument?

Suppose a family's son takes a job in the urban sector. Unlike saving accounts, which have no will of their own, children do. Ruling out pure altruism as a motive (see Lucas and Stark, 1985) why would the son assist his rural family during a drought? If his income is certain – in the words of Caldwell et al. – «guaranteed» (p. 696) – he will not have to worry about his income in a downturn, and will have no incentive to support his family. And for an insurance-motivated incentive to work, the son, too, must be risk averse and the exchange of insurance promises with his family must dominate alternative insurance arrangements.

Taking this argument a step farther, the family may not want the son's income to be too secure. That is, the family's best interest might not be served by a very successful son because the family wants to preserve an appropriate incentive structure. This might entail a preference for a job that pays only reasonably well and is only moderately secure. If the job pays *too* well, the migrant may save enough money to reduce his dependence on the family. On the other hand, if the job pays very badly or is very insecure, the family may be required to support the son for a long time, an outcome which the family will also regard as unfavorable. The hypothesis that such «strategic considerations» impinge on the labor market success of migrant children deserves further exploration.

The relevance of a strategic consideration is reflected as well in the family's choice of which child should be selected to migrate. Institutional, cultural, and familiar factors might condition children's susceptibility to manipulation, for instance, sons versus daughters. Since the parents will attach a value not only to the earning power of the children as migrants but also to their manipulability, the child chosen to migrate need not be the one whose earning power is maximal. Perhaps this is why in some countries migration is male (sons) selective whereas in others, such as the Philippines and Latin America, it is female (daughters) selective (see Lauby and Stark, 1988). A similar consideration affects targeting the investment in human capital. Parents may need to decide between investing a relatively large amount of human capital in one child, or a smaller amount in several children. The latter option might remove the threat that too much earning power will be placed in the hands of one child, exposing him to too little manipulation. If efficiency considerations call for concentrating human capital investment in one migrant child, that is, if the returns to the human capital investment are convex, manipulation considerations support an alternative allocation; if the returns are concave, the manipulation consideration reinforces an efficiency derived consideration advocating a spread.

What emerges then is a context in which the behavior of children as migrants is critically important to their capacity to be insurers, and as a result, parents are anxious to adopt methods to induce the desired behavior. One tool for structuring incentives is family property. The parents can condition the transfer of wealth on the child's support in times of need, but the effectiveness of the condition would naturally

depend on a credible threat. This leads to the idea that the effective scheme must be a joint bequest-fertility strategy. The parents will make bequests so as to extract from their children the desired level of support, and produce that number of children which, in conjunction with such manipulative behavior, results in optimal extraction. Since one child represents a natural monopoly, whereas two or more children need to collude, or form a single bargaining unit to secure a similar position, there are distinct implications for fertility. As the presence of another child reduces the bargaining power of a given child, an incentive prevails to bear more than one child. Since an extra child is required to fulfill this diluting role *as an adult*, high infant and child mortality will require a large number of children. Children are thus needed to fulfill *two* distinct roles: first, to support their parents, and second, by eroding the bargaining position of their siblings, to ensure that such support is supplied and at an affordable cost. Since the parents may extract the optimal level of support from their children through strategic behavior, and since success may depend on the number of children, child-bearing affects parental well-being in part through the strategically stimulated provision of the desired support. As the possibility of enhancing or eliciting support through strategic behavior raises the benefit of having children, fertility levels may rise.

High levels of fertility benefit parents in a number of ways. First, the presence of siblings enhances the parents' ability to punish any particular child. Since an only child has a virtual monopoly in supplying support to his parents, it is difficult to punish him effectively. When the parents have two or more children, it is possible to threaten to disinherit any particular child partially or completely by promising a portion of the miscreant child's share to each good child. While the parents may later wish to deviate from this promise, they cannot do so without bearing a cost. If we assume, as seems plausible, that the parents' utility is quasi-concave in the resources of their children, then it is less costly (in terms of the parents' utility) to disinherit a child if the parents can redistribute that child's share among many siblings. The extent of this gain depends upon the curvature of the parents' utility function; the gain disappears entirely once it is credible to disinherit each child completely.

Second, a large number of children hinders collusion. The incentive schemes mentioned above effectively induce the desired patterns of

behavior only when the parents can count on children to act competitively. Although the children could collude among themselves, such collusion becomes more difficult to enforce as the number of children rises. By definition, an only child presents a united front, while a large group of siblings may have difficulty agreeing, particularly if the parents offer large incentives for any child to defect from that agreement.

Third, it is less expensive to obtain support from many children. Since parents are concerned primarily with the total level of support, under standard assumptions (quasi-concavity of the utility functions of the children), the parents must offer each child a larger sum to compensate for each incremental unit of support. By spreading their support requirements over several children, the parents succeed in purchasing the same total level of support at a lower cost.

Of course, additional children will affect the parents' well-being even if they choose to act passively<sup>(1)</sup>. While the use of strategic incentives raises the parents' total welfare for any fixed number of children, it has an ambiguous effect on the marginal benefit of having additional children, and therefore on fertility. Suppose, for example, that the parents wish only to achieve a certain target level of total support. In general, they can accomplish this objective with fewer children when they act strategically than when they act passively.

Yet in practice the effect of strategic behavior on fertility may be clear-cut. It is certainly obvious that the marginal benefit of having one child is greater when the parents actively structure incentives than it is when they behave passively (the marginal benefit of having one child is equal to the total benefit of having one child). Furthermore, it seems likely that the marginal benefit of the second child is also higher when the parents behave strategically. Indeed, Bernheim, Shleifer and Summers (1985) note that parents use financial incentives to facilitate intrafamily exchange only in families with two or more children. Thus

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(1) If support from one child does not significantly affect support from another, increased fertility will benefit the parent. On the other hand, if children view support of their common parent as a public good, children in large families may tend to shirk this responsibility. Increased fertility might then benefit the parents very little, if at all.

when the desired number of children is low, strategic behavior should unambiguously raise fertility.

At first this conclusion might seem unexciting. Certainly it is important to understand the determinants of fertility when birth rates are high. But a moment's reflection suggests that high levels of fertility are consistent with a low derived demand for children. To the extent that support provided by the children represents activities undertaken during the parents' advanced age (such as providing the family with support when farm production fails), this derived demand refers to surviving adult children. And in societies where child survival probabilities are low, there is a great difference in the number of children born and the number that reach adulthood.

In sum, once it is realized that children working as urban migrants will not automatically support their rural families in adverse circumstances, parents must behave strategically to procure desired levels of support. Thus there is an important additional benefit to having additional children. To the extent that strategic behavior shifts the derived demand for surviving adult children, it may have profound positive effects on fertility.

Of course, it is very difficult to test directly for strategic behavior. However, given the distinct fertility predictions advanced by Caldwell et al. on the one hand, and the strategic behavior argument on the other, it is instructive to determine which of the arguments is supported by evidence. Our evidence also pertains to India where rural-to-urban migration plays a relatively small role in total migration. Based on a 5 percent sample of the 1981 Population Census of India (Sundaram, 1989; Skeldon, 1986), which provides reasons for migration for the first time, the net outflow from rural to urban areas between 1971 and 1982 amounted to only 2.2 percent of the 1971 rural population. In 1971 the net outflow of migrants looking for work amounted to only 1.6 percent of the rural population and 8 percent of the urban workforce. Net rural-to-urban migration contributed less than 19 percent to the total growth in urban population between 1971 and 1981.

Overall, however, rural mobility is not low. The census reveals that almost 30 percent of the population in 1981 (196.3 million people) was composed of individuals who did not live in their birth place. Most important, approximately 80 percent of these «lifetime migrants» were women, whose marriage was the principal reason for their move. Thus



conventional employment-based explanations of migration appear ill-suited to explain this scenario. Caldwell et al., who see investment in the education of children as a crucial prerequisite of their success as migrants do not allow for instances when migration is largely a marriage-related rural-to-rural phenomenon, rather than an income-enhancing rural-to-urban process.

Recent longitudinal data from Southern India is consistent with the positive fertility prediction<sup>(2)</sup>. Rosenzweig and Stark (1989) test for the idea that arranging marriages of daughters to distant kinship-related households is a manifestation of an implicit inter-household contract aimed at mitigating income risks and facilitating consumption smoothing in an environment characterized by information costs and spatially covariant risks. Inter alia we find that marriage cum migration contributes significantly to a reduction in the variability of household food consumption and that farm households that face widely variable profits tend to arrange marriages with more distant partners. In this way daughters are assigned a special role in the family through which the household's consumption can be delinked from the performance of its home village. Since the more daughters there are to be married out to locationally distant *and dispersed* households the less vulnerable the household is to a decline in income, an incentive for bearing and rearing *more* daughters may exist<sup>(3)</sup>. Note that the implicit contractual

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(<sup>2</sup>) The data survey six villages that the International Crops Research Institute for the Semi-Arid Tropics collected during a 10-year period starting with the crop year of 1975-76. Information on family membership, income, expenditure, and production was collected for 40 households in each village. In 1984 a retrospective questionnaire was used to obtain additional information on family background, marriages, and inheritances for these villages as well as for additional villages. In 1985 more details were recorded for three of the villages concerning kinship relationships between marital partners and the distances associated with marital migration.

(<sup>3</sup>) Studies show a high differential mortality for female children in Southern India (as well as in such countries as Bangladesh and Pakistan). The assumption is that parents benefit more from the expected labor market returns of sons than daughters. The question is: if the labor market returns from daughters are so much less than those of sons, why are girls not discriminated against *more*? Our findings could provide an answer: daughters assume a valuable role in facilitating consumption smoothing. Consequently, the returns from daughters should not be measured by the size of their outside earnings but rather by the certainty equivalent income accruing from their dispersion. (In poor countries, the marketplace does not offer an easy conversion of *more* income into less

insurance-cum-transfers arrangement does not seem to support a regime wherein a household only marries daughters out and avoids taking daughters-in-law in. The presence in household B of a member of household A not only supplies household A with a reinforcement device but also introduces a verification and monitoring capacity. The virtually uniform migration of brides to the village of their grooms appears to ensure that no household can escape being monitored. If every household has sons and daughters, every household ends up being monitored by daughters from other households.

Indeed, complementing the findings of Rosenzweig and Stark (1989), Caldwell et al. (1986, p. 695) suggest that it may not be in a household's interest to refuse to accept daughters-in-law. They report that in the villages studied, the most important source of help during drought conditions was the birth family of the head's wife. This observation is corroborated by a finding based on the ICRISAT data (Rosenzweig, 1988), that the rise of household net transfer income parallels the number of resident daughters-in-law. Households whose head has more siblings (who reside outside the household), *more* migrant members, and *more* daughters-in-law have higher income transfer rates, controlling for fixed attributes of the household.

We conclude that the leap of logic from the observed transfer of resources from migrant children to their home families, to the implied assertion that families will bear fewer children is false. The capacity of children to mitigate income risks and facilitate consumption smoothing intrinsically depends on having many children. The arena for further analysis and especially for empirical study is open.

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uncertain income). Given this result, a plausible reason why daughters are not that much more discriminated against is identified. Consequently, if policies to reduce the ex-ante risks that farm households face are enacted *and* a deterioration in the health and nutritional status of young girls is to be avoided, it will be necessary to *simultaneously* improve the labor market opportunities for women.

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#### ABSTRACT

If children confer new insurance benefits or are more reliable suppliers of old insurance benefits, demand for offspring may rise. Although it might be costly to prepare children to provide enhanced benefits, the costs might be even higher when the family has only a small number of children. Hence the possibility exists that the demand for children and consequently the level of fertility will rise. If, in environments characterized by spatially covariant risks, such as rural India, the insurance benefits are provided by daughters who marry into distant households, more daughters (and more children) – not less – would be required to create a spatially diversified, income-pooling family that can mitigate the hazards of agricultural production and reduce income variability.