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During the 1970s China's fertility fell at an extraordinarily rapid pace not previously experienced by any other population over a comparable span of time. Up to 1970 fertility had been high and relatively stable at about six births per woman, except during crisis periods. By 1980 fertility had dropped to 2.2 births per woman. The previous world record holder, Japan, achieved a reduction of "only" 56 percent during a comparable period of time: from 4.5 births per woman in 1947 to 2.0 in 1957. Although China's fertility rose slightly in 1981 and 1982, preliminary estimates for 1984 indicate that the total fertility rate has been reduced further to near 2.0 (Banister, 1985). As long as current population policies continue, fertility is likely to remain near or possibly even sink below present levels.

Although rapid socioeconomic change and government policies in many areas have made important contributions to the current low fertility, this outcome is largely attributable to the later-longer-fewer and one-child birth limitation campaigns initiated by the Chinese government.[1] These campaigns have, however, had a number of undesirable consequences, foremost among them the social and economic costs imposed on China's families. Unfortunately, the very success of these policies has somewhat muted criticism, and the search for alternatives may have been less vigorous than would otherwise have been the case.

This paper seeks to widen the scope of discussion by considering both problems with and alternatives to China's present policies. In the first three sections past policy developments and their likely potential demographic and socioeconomic effects are briefly reviewed. The next three sections then explore a two-child policy alternative whose key elements are delayed childbearing and spacing. Although previous policies employed in China have included similar elements, here we combine them in a different way, and incorporate

variations in the timing of childbearing into a new projection methodology that yields estimates of their impact on population size that many demographers will find surprisingly large. These estimates demonstrate that a two-child policy, if accompanied by delayed childbearing, can be as effective as a one-child policy in achieving China's current demographic goals. Furthermore, the policy we present would be easier to implement and would have fewer detrimental consequences for the society and economy.

Stabilizing the population size at 1.2 billion by the year 2000 is the current demographic objective of the Chinese government. Since examination of the social and economic desirability of this target is outside the scope of this study, we accept it as given and use it as the basis for our analysis of alternative population policies.

The one-child policy and its antecedents

Like many areas of policy in China, population policy has followed a cyclical pattern, gaining strength and support during periods of pragmatism, and losing them during periods of political extremism.[2] Thirty-six years have produced four birth limitation campaigns. The first two were relatively limited, ineffective efforts that were halted by the Great Leap Forward and the Cultural Revolution (for details see Aird, 1972). The 1970s and 1980s have seen two increasingly large-scale, effective programs to control births, the later-longer-fewer campaign and the one-child policy.

Launched in 1971, the later-longer-fewer (*wan xi shao*) campaign introduced three reproductive goals—later marriage, longer spacing between first and subsequent children, and fewer children. By later marriage, policymakers generally meant ages 28 and 25 for men and women in the cities, and 25 and 23 for men and women in the countryside.[3] Longer spacing was generally interpreted as four years between first and subsequent children in the cities and three years in the countryside. The notion of fewer children was initially interpreted as three children for rural dwellers and two for urbanites, but in 1977 a limit of two children was established for all couples.

Following Mao Zedong's death in 1976 the new leadership was even more strongly committed to developing the economy and controlling population growth. The regime of Deng Xiaoping argued that rapid population growth would retard achievement of the "four modernizations" (in industry, agriculture, science and technology, and defense) by hampering attainment of full employment and by cutting into increases in capital accumulation, living standards, and education (see Chen, 1979; Liu, 1981: 8–10). Another rationale for drastically limiting population growth was suggested by studies of optimal population size. Projections based on three types of considerations—economic development, food resources and diet, and ecological balance and fresh water

resources—indicated that China would achieve the highest levels of well-being in the mid-twenty-first century if it could reduce its population to 650–700 million (Song, 1981; see also Song, Tuan, and Yu, 1985). Relying on these kinds of macroeconomic rationales (especially the former; arguments about optimal population size have largely dropped from sight), the post-Mao leadership established new legal and administrative structures to limit population growth. The Constitution of 1978 declared state advocacy of birth planning, while the Marriage Law of 1980 required every couple to practice birth control.

Although the steps leading to the decision to move to a one-child policy remain obscure, a precipitating factor was the government's realization that the young age structure of the population would generate growth for decades if couples were permitted two children. The one-child policy was apparently decided on in mid–1978 (Banister, 1984), and announced in early 1979. During 1979 the government's commitment to the one-child limit intensified rapidly (Banister, 1984). The new stronger position was reflected in the statement made by Party Chairman Hua Guofeng at the Fifth National People's Congress in 1980. Hua announced that in order to stabilize the population at 1.2 billion by the end of the century, the State Council had deemed it necessary to launch a crash program for 20 to 30 years calling on each couple of the dominant Han nationality to have only one child. A small proportion of couples in extenuating circumstances would be allowed to have a second child; in 1980 this share was set at 5 percent of urban couples and 10 percent of rural couples. Although the major emphasis was to be laid on the single child, "appropriate stress" was to be placed on late marriage and late childbearing (Central Committee of CPC, 1983). (As the policy has been applied, delayed marriage and childbearing appear to have received much less attention than limiting the number of children.)[4]

The new policy was to be implemented by ideological education (persuasion), supplemented by economic and administrative incentives for one-child families and penalties for families having third and higher order births.[5] Where those techniques failed, abortion and sterilization quotas were used as a fallback method. Although a family planning law was drafted, no national law was passed, apparently because of objections to making childbearing a legal matter. In its absence, provinces and municipalities were supposed to draw up local regulations that accorded with the spirit of the draft law but that based specific incentives and disincentives on local conditions.[6]

The years 1980–83 brought little change in basic policy, but shifting tides of high and low pressure on local birth planning cadres were evident (Aird, 1985). Obstacles to implementation were numerous, stemming not only from "feudal ideas" of the people, but also from state policies, such as the new Marriage Law, which effectively lowered the age at marriage, and the agricultural responsibility system, which strengthened motivations for large families by shifting responsibility for production from the collective to the household (these and other policy conflicts are elaborated below).

Facing public resistance and even attempts to undermine family planning work, in early 1984 the Party Central Committee reviewed its stand on fertility control, and on 13 April issued Central Document 7, which has guided birth planning policy up to the present. Although the text of Document 7 has not been made public, its basic contents can be inferred from discussions of it reported in the press and from provincial regulations that have been drawn up in accord with it.

First and most important, the document reaffirms the critical importance of family planning, and reemphasizes the need to promote the one-child family in order to achieve the four modernizations, quadruple industrial and agricultural output, raise per capita income to $800, and hold the population at 1.2 billion by the end of the century (*Jihua Shengyu Ban,* 1985; Li, 1985).

Second, Document 7 is slightly more permissive toward second children among rural couples and those with "real difficulties," as long as second births are carried out according to plan and do not jeopardize achievement of the 1.2 billion goal. This greater permissiveness is reflected in an increase in the number of conditions under which couples in various provinces are allowed to have a second child (*Anhui Ribao,* 1984; Chen and Cheng, 1985; Nanning Guangxi Regional Service, 1985; Qin, 1985; Shanghai City Service, 1984; *Shenyang Ribao,* 1984). In at least two localities, Guangxi and Guangdong, couples whose first child is a daughter are allowed to have another child (in Guangxi this applies to Han as well as Zhuang nationality couples; see Nanning Guangxi Regional Service, 1985; *Xinhua,* 1985). In most of the localities for which regulations are available the second child must be spaced so that it comes a given number of years after the first.

In response to high levels of opposition to the one-child policy, Document 7 urges adapting propaganda and work style more closely to the needs of the local population. As State Family Planning Minister Wang Wei put it, family planning workers "must not be too rigid in delivering a sermon to the masses" (Beijing Domestic Service, 1985). Rather, they must "become bosom buddies with the masses" (visit them more often), "seek truth from facts" (discover the actual situation), and "avoid demanding uniformity in everything" (stop forcing all couples to adopt one method of birth control) (Dong and Wang, 1985; She and Shao, 1985).

Finally, Document 7 upholds the principle of local discretion in devising regulations and setting targets in accordance with local conditions (*Jihua Shengyu Ban,* 1985; Sun and Zhou, 1984). As long as it is consistent with the 1.2 billion goal, measured local autonomy should be upheld, and cases such as Mian County, Shaanxi, where officials established different sets of conditions for different types of areas, should be applauded and emulated (*Jihua Shengyu Ban,* 1985; Liang and Peng, 1984). Discussing recent policy directions, officials of the State Family Planning Commission have taken pains to point out that the one-child policy has emphasized diversity from the beginning, for it established different regulations for state cadres, urban residents, rural dwellers, and national minorities (Liang and Peng, 1984). Current policy, then,

shows no movement toward the development of a uniform national policy or the enactment of a national family planning law.

Potential demographic effects of China's population policies

Although the immediate demographic results of the later-longer-fewer and the one-child campaigns are most readily measured by the recent rapid reduction in fertility (documented in Coale, 1984; *Renkou Yu Jingji,* 1983), their principal objective was to curb future population growth. To assess the potential effectiveness of these programs in controlling growth, we now briefly examine their projected effect on the size of China's population through the middle of the twenty-first century. Despite the existence of a large number of projections for China, we make a new set here because past projections do not serve our specific needs (a review of projections up to 1982 can be found in Chen and Kols, 1982). Related trends in other demographic variables such as the age structure will not be discussed in detail because China's overriding concern at present is with overall population size. (Analyses of future changes in China's age structure can be found in King, 1984; Keyfitz, 1984; and Hou, 1981.)

Estimation of the future reductions in population size that may be attributed to specific past birth control policies requires three long-range population projections:

(1) A ''no policy'' projection (1970–2050), which attempts to forecast future demographic trends that might have been observed without the birth limitation efforts of the 1970s;

(2) A ''later-longer-fewer'' projection (1980–2050), which takes into account birth policies in effect between 1971 and 1979 but ignores the impact of the one-child campaign;

(3) A ''one-child'' projection (1980–2050), in which the total fertility rate is assumed to equal 1.0 until the beginning of the next century.

The difference in population size between projections 1 and 2 in any future year provides an estimate of the impact of the later-longer-fewer campaign, while the difference between projections 2 and 3 estimates the potential additional effects of a one-child policy.

All three projections were made according to the standard component method. Each projection requires the specification of a set of input variables to describe, among other things, the assumptions regarding future trends in fertility, mortality, and migration. Briefly, migration was assumed absent and the trend in mortality, as measured by life expectancy at birth, was in all projections set equal to the levels incorporated in the medium variant of the latest UN projections (United Nations, 1985). (Further details about the input data are provided in Appendix A.) The assumptions regarding future levels of fertility are crucial and therefore deserve further comment. Table 1 provides a summary of fertility and mortality levels for the three projections.

TABLE 1   Fertility and mortality levels incorporated in projections of population trends associated with different birth control policies and in the United Nations medium variant projection

Year	Total fertility rate (births per woman)				Life expectancy at birth[a] (years)	
	Projection 1 "no policy"	Projection 2 "later-longer-fewer"	Projection 3 "one-child"	UN medium variant[a]	Females	Males
1970–75	5.39	—	—	—	60.9	57.4
1975–80	4.84	—	—	—	66.5	62.6
1980–85	4.29	2.30	1.00	2.33	69.4	65.5
1985–90	3.75	2.30	1.00	2.00	70.8	66.9
1990–95	3.20	2.30	1.00	1.90	72.0	68.1
1995–00	2.65	2.30	1.00	1.90	73.0	69.1
2000–05	2.11	2.30	1.27	1.90	73.9	70.0
2005–10	2.11	2.30	1.82	1.90	74.7	70.9
2010–25	2.09	2.30	2.09	1.90	76.2	72.5
2025–50	2.08	2.30	2.08	—	77.5[b]	73.8[b]

NOTE: See text for explanation of projections 1, 2, and 3.
[a]1982 assessment, here and elsewhere excluding Taiwan (United Nations, 1985).
[b]Extrapolated.

In the first projection, the future reduction in fertility that would have occurred in the absence of the policies of the 1970s is necessarily speculative. Fertility would undoubtedly have declined in response to socioeconomic development, but the rate of decline would have been slower than has actually occurred in the past 15 years. We accept as plausible the assumption of a linear decline to replacement fertility between 1965–70 and 2000–05, which is incorporated in the medium variant of a set of projections of China's population made by Frejka in the early 1970s (Frejka, 1973). (A new projection is made here because more accurate estimates of fertility and population size in 1970 are now available.) Between 2000 and 2050 fertility is held constant at the replacement level of about 2.1 births per woman. In effect this pattern of fertility decline assumes that the attainment of replacement fertility would have been delayed from the early 1980s until the beginning of the twenty-first century if the government had not mounted efforts to reduce fertility.

The trend in fertility for projection 2 is also speculative. Without the one-child campaign, fertility would probably have fallen below the observed 1978 level of 2.7 births per woman, but it would not likely have declined below 2.0, except perhaps for brief periods, because the later-longer-fewer policy permitted two children per family. Lacking obvious alternatives, we accept the total fertility rate estimate of 2.3 after 1980 as proposed in a population projection by Song et al. (1982). According to Chen and Kols (1982) Song's projection was influential among top policymakers who designed the one-child policy. Song demonstrated that even with near replacement fertility of 2.3 births per woman between 1980 and 2000, China's population would grow to 1.28 billion in the year 2000.[7] This was apparently unacceptable to the Chinese government. It should be noted that this projection assumes some

laxity in implementation of the later-longer-fewer policy. Strict enforcement of all aspects of this policy, in particular the stop-at-two rule, would have yielded lower fertility.

Finally, in the third projection the total fertility rate is assumed to equal 1.0 between 1980 and 2000; it then rises linearly to 2.1 in the year 2010 and remains at replacement thereafter. This is a rough approximation of the ideal trend in fertility desired by government officials when they announced the one-child program. As noted earlier, the single-child policy was to be an interim measure that would last 20 to 30 years, starting around 1980. Of course, observed fertility in the early 1980s has not followed this pattern, and it is unlikely that future total fertility rates will decline to 1.0. Nevertheless it is useful to make this hypothetical ''one-child'' projection to provide a baseline for comparison with other projections.

The principal results of the three new projections are summarized in Figure 1 and Table 2. According to projection 1, without the birth limitation campaigns of the 1970s, population size would have grown from 0.818 billion in 1970 to 1.58 billion in 2000 and 2.41 billion in 2050. This is not the place to assess the potential difficulties this trend might have entailed for raising standards of living in China. Clearly, the Chinese leadership considered them serious enough to conclude that strong action was needed to reduce population growth. As projection 2 indicates, the later-longer-fewer program would have reduced population growth significantly. In this projection, population size

FIGURE 1   Population size of China, 1970–2050, according to projections incorporating alternative birth control policies and according to the United Nations medium variant projection
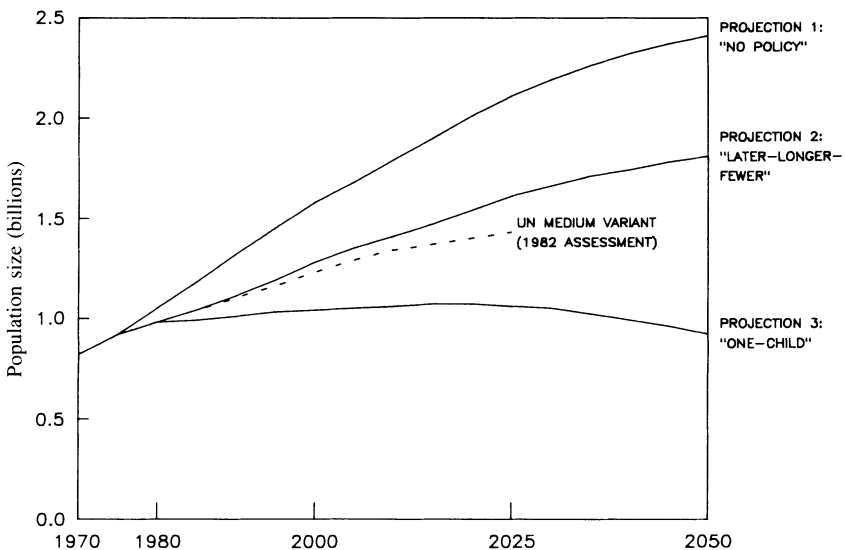
NOTE: For underlying assumptions, see Table 1. See also Table 2 for numerical figures for selected years.

TABLE 2   Population size in selected years, 1980–2050, according to projections incorporating alternative birth control policies and according to the United Nations medium variant projection

	Population size (millions)			UN medium variant[a]
Year	Projection 1 "no policy"	Projection 2 "later-longer-fewer"	Projection 3 "one-child"	
1980	1,050	978	978	984
2000	1,576	1,280	1,043	1,232
2025	2,106	1,607	1,064	1,433
2050	2,408	1,807	917	—

[a]1982 assessment (United Nations, 1985).

reaches 1.28 billion in 2000 and 1.81 billion in the year 2050. Compared with projection 1, population size is reduced by about 300 million in 2000 and by twice that amount in 2050.[8] While a difference of 600 million people in the year 2050 is substantial, the later-longer-fewer trajectory still leaves eventual population size well in excess of the 1.2 billion goal stipulated by the Chinese leadership as a desirable limit. The one-child campaign was intended to solve this problem. And indeed, as projection 3 indicates, a completely successful implementation of this policy would virtually stop future growth in population size: the population would reach 1.04 billion in 2000, inch up to 1.06 billion in 2025, and fall to 917 million in 2050 (see Figure 1 and Table 2).

Although the Chinese government has a clear preference for the population trajectory estimated in projection 3, this trend is not likely to become reality. During the five-year interval 1980–84, the actual period total fertility rate was 2.3, more than double the 1.0 level assumed in this projection. The difference is in part an effect of a change in the timing of first births that resulted from enactment of a new marriage law in 1980 (Coale, 1984). Although the Marriage Law increased the legal ages of marriage from 18 to 20 for women and from 20 to 22 for men, it invalidated the higher de facto age limits that had been in effect during the later-longer-fewer campaign of the 1970s, and effectively lowered the age of marriage.[9]

Successful enforcement of the one-child policy has been constrained by a variety of factors. Prominent among these have been the decentralized nature of policy administration and the inability of enforcement mechanisms to adjust to the rapid change in the economy.

Administration of the one-child policy is highly decentralized. Localities are responsible for generating and enforcing their own regulations. While this system has allowed adaptation to differing conditions and reduced the costs of enforcement to the state, it has created severe obstacles to implementation. Some types of obstacles, including political/administrative and economic problems, are manifest on the local level, while others, such as imbalances in success rate, are apparent only from the national level.

The fundamental political/administrative problem is that in the absence of a family planning law, higher level cadres have limited ability to compel lower level cadres to comply, and lower level cadres have few good reasons

to comply (these arguments are elaborated in White, 1983). The difficulties are most acute at the brigade and team levels, where the responsibility for implementation ultimately lies. (Brigades have very recently been replaced by villagers' committees [*Xinhua*, 1985a]. Presumably brigade-level birth planning cadres will continue to perform the same functions in the new administrative structure.) Top-down pressures for stronger enforcement combined with bottom-up demands for more children leave local cadres in an untenable position. Their close attachment to local society, coupled with lack of compensation for basic-level birth planning work and abuse and even violence against family planning workers, often argues for resolving the conflict through superficial compliance, which may involve tampering with birth records, "looking the other way," and so forth (Davin, 1985; White, 1983).

Administrative decentralization also creates economic problems that compound enforcement difficulties. Under the one-child policy, one of the major motivations for limiting childbearing is the expectation of economic incentives, including wage supplements and priority in housing, schooling, medical care, and the like (see Chen and Kols, 1982). (Severe penalties and cadre pressure are also important motivating factors.) The costs of these incentives are borne by local work units, whose resources vary widely. Where units are poor, few couples sign up for one-child certificates, because benefits are poor or fail to materialize (White, 1983). Where units are rich, many couples sign up, and the value of the benefits is watered down: everyone having priority is tantamount to no one having priority (Croll, 1985).[10]

Political and economic problems at the local level combine to create a third difficulty—unit and regional imbalances in success rates—that policymakers consider a major obstacle to reducing fertility (Wang, 1985). In fact, real imbalances may be much greater than measured imbalances. The system of birth reporting allows for no independent verification of local records (White, 1983). Since basic-level cadres have many incentives to manipulate figures to match quotas, and higher level cadres have few incentives to uncover errors, data deficiencies created at the bottom of the administrative hierarchy are likely to be passed upward, multiplying as they rise (see White, 1983; Wolf, 1985: 238–239, 250).

A second set of problems stems from the inability of family planning administrators to keep up with the swift changes in China's economy. In the countryside the responsibility system introduced in 1980–82 has severely undercut the single-child policy.[11] By shifting the unit of management and accounting from the production team (a unit of 20 to 50 households) to the family, the responsibility system has simultaneously reduced the common funds of teams (from which rewards are paid) and increased the private wealth of families. These changes have disrupted the system of rewards and penalties, for they leave cadres less able to pay benefits or extract penalties, and families less concerned about sanctions for excess births (Cao, 1985; Xu, 1982; Zhao and Zhu, 1983). If the responsibility system has reinforced the economic value of children and increased motivations for large families, so too have other

changes in the rural economy such as the proliferation of sideline activities and small-scale enterprises. A number of mechanisms have been introduced to counteract these tendencies. These include revised sets of incentives and disincentives (Davin, 1985), a double contract system linking production contracts to family planning contracts, and a cadre responsibility system tying bonuses for brigade and commune cadres to fulfillment of family planning quotas (Chen and Kols, 1982). Although these measures appear to have had some success in keeping fertility down, whether they can continue to do so as the rural family economy develops remains uncertain.

In the cities, a series of reforms begun in 1979 and greatly expanded in 1984 has generated another sequence of changes that has opened myriad loopholes for those desiring more than one child. Introduction of economic contracts into enterprises has resulted in the dismembering of carefully constructed birth monitoring systems (Qinsi, 1985). People excluded or extruded from the formal economy have fallen out of the family planning net. Such individuals, increasing in number daily, include workers removed from overstaffed enterprises, owners of individual enterprises, business people working outside their native localities (contract workers, traders, and the like), and those without job or income. Surveys show that these categories of people have higher fertility than those under surveillance of family planning workers (Chen, 1985; Qinsi, 1985; Xu, 1985). In both rural and urban areas, then, demographic policy is at variance with the general trend of reform, which is to promote individual initiative and reduce state and collective control.

In light of these large and growing problems of implementation, it seems likely that without major new birth control initiatives, the total fertility rate will not drop far below 2 births per woman, let alone reach 1.0. A not implausible scenario for future changes in fertility is incorporated in the medium variant of the 1982 United Nations population projection for China (Table 1). It assumes the total fertility rate will decline to 1.9 by 1990–95, a level that is maintained thereafter until 2025. The resulting population size trajectory is included in Figure 1 and Table 2. According to this projection, China's population will reach 1.23 billion in 2000 and 1.43 in 2025. This estimate for the year 2025 is considerably higher than the desired maximum of 1.2 billion. (United Nations projections stop at the year 2025, but the positive growth rate between 2020 and 2025 and the population momentum inherent in the age structure suggest that the population will keep growing for some time after 2025.) Even if the UN medium projection is somewhat on the high side, it vividly demonstrates the difficulty of stopping China's population growth.

Social and economic problems with the one-child policy

The one-child policy was the outcome of a series of calculations about presumed relations between macrodemographic and macroeconomic growth. Possible microsocial effects on the family unit were largely ignored. Yet, as China's

leaders have since increasingly recognized, microlevel effects may be important. These effects are critical both because the family is the unit that must make the sacrifice entailed in the policy, and because it is the basic cell of the society and economy. Because the family is the basic building block, changes on the domestic level percolate up to produce changes in national-level aggregates.

To date much attention has been focused on the detrimental effects of the one-child policy on the age structure of the population (Gui, 1983; Xi, 1984), intrafamilial relations (Zha, 1982), psychosocial characteristics of only children (Gu and Li, 1983; Xie and Shi, 1985), and gender inequality (Croll, 1984; Saith, 1984). While important, these problems may be only the tip of the iceberg. By fundamentally altering the basic social and economic unit, the one-child policy may tear the fabric of Chinese society in a way that uproots people's sense of their place in the world; undermines the family's ability to take care of the old; and precludes the kind of economic development that has spurred the post–World War II industrial miracle in other parts of East Asia. These problems have already begun to emerge, and would likely grow much more severe if the one-child program were implemented with complete success.

Traditionally and to a large extent even today, the basic domestic units of Chinese society are the economic family (*jia*) and the descent line. The family is a contemporaneous unit of males and females that lasts until its members die or the unit divides. The line is something entirely different. A conceptual unit only, the descent line includes a living male and all his ancestors and descendants stretching back into the remote past and forward into the unseeable future. While the family is concerned with short-term tasks of production and consumption, the line is concerned with long-term matters of inheritance, succession, and intergenerational continuity.

For males, the dominant members of this patrilineal society, the individual was traditionally considered insignificant, merely the living link in a great chain of being. (Females were secondary links who became part of the chain after death.) The individual did not even own his body, for he had received it from his parents and merely held it in trust for his sons (cf. Baker, 1979: 26–28). An individual's place in the descent line gave him a sense of immortality and lent meaning to his existence. At the same time it prescribed his duties in life. The most basic duty of all was to reproduce the line by giving birth to a son. Reproduction of the line was a man's most fundamental obligation, a repayment to the ancestors who had given him life and the means of subsistence. In prerevolutionary China failure to reproduce the line was considered an offense to the ancestors, the ultimate unfilial act that brought disgrace in the eyes of the ancestors and opprobrium in the eyes of the community (Fei, 1939; Hsu, 1967; Yang, 1945; Yang, 1959).[12]

While Chinese society has undergone many changes since mid-century, the notion of a descent line is still very much alive, especially in the countryside, which contains 80 percent of the population (see, e.g., Xin, 1982; Wang et al., 1981; Wolf, 1985: 247–248). Under the one-child policy, however, this

idea has come under sustained attack. A one-child limit would imply that fewer than half of all couples will have a surviving son. If this limit were reached, the policy would break over 50 percent of the descent lines, preventing the majority of men from fulfilling their duty to their ancestors and uprooting their sense of continuity and purpose in life. This is one reason for the widespread resistance and, in some areas, for the physical abuse against first-born daughters and their mothers (Yan, 1983). Indeed, it should be obvious that women's physical safety, not a belief system, is the major short-run victim of the clash between the one-child policy and the descent line ideology. However, the long-run cultural impact should not be overlooked. If the one-child policy removes these basic cultural bearings before alternative belief systems are in place, it may produce a kind of cultural disorientation whose broader effects are hard to predict.

Traditionally in China the family was the source of old-age security. Filial support of parents was the last in a series of intergenerational exchanges that played itself out over the family developmental cycle. In this exchange parents provided children with training, job, spouse, and, for sons, portions of the family estate at the time of division. In return, all children were expected to contribute to the family economy, and sons were also obliged to support the parents in old age. Parental support, then, was more than a moral obligation; it was an economic obligation that repaid the older generation for their investments and transfers of resources.

Since the founding of the People's Republic, the family has continued to provide social security for all but the minority of workers in the state sector. Now, however, its ability to do so is being threatened. The one-child policy undermines the family's ability to provide security for its aged, not only by severely reducing the likelihood that there will be a son (a problem that has been widely discussed in China), but also by intervening in the exchange of intergenerational obligations and upsetting the balance of rights and duties on which filial support of parents rests. Let us take these separately.

The first and more immediate threat comes from the shrinking probability that there will be a son. When there is no son and the only daughter marries out, she has a legal duty to support her parents (specified in the Constitution), but whether she has a cultural duty depends on whether daughters have become substitutes for sons in intergenerational patterns of exchange. The evidence suggests that in the cities married-out daughters have begun to provide some assistance to their parents (Wolf, 1985). In the vast countryside few such shifts have been observed.

Even where there is a son, however, the one-child policy poses a threat to the familial system of social security. Under the one-child policy the benefits heaped on only children are provided by the state or collective work unit, rather than by the parents. To the extent that the work unit intervenes in intrafamilial exchanges, supplanting the parents as providers, the system of mutual obligations will be disturbed.[13] Over time it may become increasingly difficult to enforce the private system of old-age support, forcing a switch to a public system whose costs will be enormous.

As in many other peasant societies, in traditional China the family was the unit of production. Because it was vertically and horizontally extendable, the family was a highly efficient productive unit (some of these points are illustrated in Myers, 1970). Vertically, the combination of several generations into a single economic unit provided a large and cheap labor force and allowed a high degree of role specialization by sex and generation. Role assignment and other transaction costs were low because the family had a built-in authority hierarchy based on position in the kinship system. Horizontal extension also enhanced the efficiency of the agricultural family firm. The more working-age members, in particular males, the greater the family's ability to obtain credit, accumulate tangible resources, disperse workers to new economic niches, and diversify its economy so as to improve and secure its economic well-being.

In the post–World War II era, neighboring societies in South Korea, Taiwan, and Hong Kong have found that the family is also an efficient unit of industrial production. (Since the family institutions of these societies are similar in key respects to those of China their experience is particularly germane.) Because it can adapt rapidly to change in the market, exploiting social networks to obtain capital, labor, technology, and market information, the family firm has been particularly successful in labor-intensive export-oriented industry. Family extendability remains the key to family firm success: in Taiwan, for example, the more extended the family unit, the more firms it controls and the greater its assets, work force, and sales (Greenhalgh, 1986). In part because of its organizational advantages, the family firm has been the predominant form of industrial organization and an engine of rapid economic growth in all the developing market-oriented economies of East Asia (Brown, 1971; Greenhalgh, 1984; Mason et al., 1980; Myers, 1984).

Since late 1978 China has moved to expand the role of the private sector, not only in agriculture, but also in commerce, services, and industry. However, by simultaneously implementing the one-child policy, it may be precluding the formation of the kinds of productive units that have spurred private sector growth elsewhere in East Asia. A family with a single son is a very minimal family firm that can realize the organizational benefits of vertical extension, but none of the growth benefits of horizontal extension. With a single daughter, even the benefits of vertical extension are restricted, for, unless her husband can be convinced to join the firm, they come to an end when she marries. In short, by drastically restricting childbearing, China may be limiting its productive capacity and undermining its ability to foster the kind of development that it now believes is crucial to achieving the four modernizations.

A two-child policy and its fertility implications

In view of these problems with the one-child policy, it would be desirable to find an alternative that would entail fewer difficulties and be more acceptable to the people, but still keep population size within the limits now planned by the government. Such an alternative, we believe, exists. It consists of two key

elements: (1) a stop-at-two rule and (2) a minimum age of at least 25 for the first birth, combined with a spacing interval of several years between the first and second birth.

This idea is of course not entirely new, since it contains features similar to those of the later-longer-fewer policy. There are important differences, however. One is the change of emphasis from a minimum age at marriage to a minimum age at first birth.[14] This leaves couples free to marry when they wish (but in accordance with the Marriage Law), provided they delay their first birth until a certain age. Another and crucial change is the further increase in the age at first birth. As we demonstrate in the next section, a few additional years of delay have a major influence on population growth.

We now examine in detail the consequences for fertility of each of the two elements of this alternative policy.

A two-child limit

Limiting the number of births per woman to no more than two yields a total fertility rate of well below 2.0. This fact, at first perhaps surprising, is a consequence of the inability or unwillingness of a proportion of women to have two children. Populations that do have total fertility rates of 2, therefore, must have some women reaching parity three or higher to compensate for those with fewer than two births. In general, the parity distribution among women at the end of the reproductive period has a substantial variance, with nonzero proportions at parities zero and one regardless of the population's overall level of fertility.

China's total fertility rate of 2.24 in 1980 can be decomposed by birth order as follows:

Birth order	Total fertility rate
1	0.87
2	0.56
3	0.33
4	0.20
5 +	0.28
All	2.24

SOURCE: *Renkou Yu Jingji*, 1983.

If no births of order three and above had occurred in 1980, the total fertility rate would have been 1.43 (i.e., 0.87 + 0.56) instead of 2.24. Of course, this example exaggerates the effect of a simple two-child limit because in 1980 a one-child policy was in effect that reduced the number of second births. Furthermore, changes in timing may have had an effect on the rate of first births (Coale, 1984). A more realistic assessment of the fertility impli-

cations of a two-child limit can be obtained with the simple numerical exercise described next.

In the absence of births of order three and above, the total fertility rate of a cohort of women can be estimated as:

$$F = P_1 + P_1 \times P_2$$

where

F = the cohort's total fertility rate, i.e., the average parity at the end of the reproductive years;

P_1 = the proportion of a cohort that ever reaches parity one;

P_2 = the proportion of women with one birth that will ever reach parity two.

If all women have a first and second child, then both P_1 and P_2 equal 1.0 and $F = 2.0$. However, a number of voluntary and involuntary factors prevent a proportion of women from having two births, so that P_1 and P_2 are less than 1.0 in all known populations. Involuntary factors include sterility, celibacy, and marital disruption. A voluntary decision not to have two children may be based on economic, social, or other considerations. In the population projections for China presented later in this paper, the following numerical estimates of these factors are used:

Failure to reach parity one:

— primary sterility: variable, e.g., 5 percent at age 25 and 8 percent at age 30[15]
— celibacy and marital disruption: 2 percent
— voluntary childlessness: 0 percent

Failure to reach parity two among women with one birth:

— secondary sterility: 1.0 percent per year subsequent to the first birth between ages 25 and 35[16]
— marital disruption: 0.5 percent
— desire to have only one child: 10 percent

With the exception of the sterility levels, these estimates are to some extent arbitrary, but probably conservative. Since primary sterility varies with age, and secondary sterility depends on the interval between births, the cohort's total fertility rate varies with the timing of childbearing. The value of P_1 declines from 0.931 to 0.907 as the age at first birth rises from 25 to 29 years, and the

value of P_2 changes from 0.878 to 0.842 as the interval to the second birth increases from 2 to 6 years. Corresponding total fertility rates (F) are:

Age at first birth	Years between births		
	2	4	6
25	1.75	1.73	1.71
27	1.73	1.71	1.69
29	1.70	1.69	1.67

These results confirm that a strict stop-at-two rule produces cohort total fertility rates well below 2.0. They also suggest that the timing of either the first or the second birth has relatively little effect on fertility. This is indeed the case for the total fertility rate of *cohorts,* but, as discussed below, variations in the timing of childbearing have a crucial impact on *period* total fertility rates, hence on population growth rates.

Delayed childbearing

Previous research on the link between cohort and period fertility has demonstrated that an increase in the mean age at childbearing of cohorts temporarily depresses period fertility even if cohort fertility remains constant (Hajnal, 1950; Ryder, 1956, 1983; Coale, 1984). The principle involved is readily illustrated with a hypothetical example. Assume that childbearing has been constant for successive cohorts, with all women having only one birth at the same exact age, say 23. Assume further that starting in 1990 all women reaching age 23 delay childbearing for three years, until exact age 26. The resulting pattern of childbearing yields a period total fertility rate of 1.0 until the end of 1989. The total fertility rate equals zero during 1990, 1991, and 1992 and then again becomes 1. The three-year delay in the age of childbearing has eliminated fertility for the three years 1990–92. If the delay had been two or four years, the effect on period fertility would have been correspondingly smaller or larger. The direct link between delayed childbearing and a reduced period total fertility rate found in this simple example also exists in more realistic settings, in which fertility is distributed over a range of ages and transitions in cohort fertility occur more gradually. In general, a rise of N years in the average age at childbearing of successive cohorts whose total fertility rate is constant at F births per woman produces a cumulative loss of $N \times F$ births per woman in the period total fertility rates over the duration of the transition (Ryder, 1983; Coale, 1984).

These findings have crucial implications for China's population policy because they permit resolution of the conflict between the government objective of low period fertility, which is needed to control population size, and individual desires for at least two children. In fact, with the additional requirement

of a delay in childbearing, a successful stop-at-two policy can be as effective in curbing population growth as a successful one-child policy. The question then becomes how to achieve an increase in the mean age at childbearing of cohorts. Probably the simplest and most equitable approach would be to set a minimum age for the first birth and a minimum interval for spacing between first and second births. In general, the higher the minimum age at first birth and the longer the spacing interval, the greater the impact on period fertility. To illustrate this point, Table 3 presents the estimated trends in period fertility that would be observed in China if three alternative policies, with minimum ages at first birth of 25, 27, and 29 years, were successfully implemented in mid-1985. For simplicity the minimum spacing interval to the second birth is kept constant at 4 years. As expected, period fertility is reduced most if the minimum age of childbearing is 29 years, but even a minimum age of 25 provides a significant reduction of period fertility compared with a stop-at-two policy without the requirement of an additional delay in childbearing. In each case the largest induced decrease in the total fertility rate is observed in the 1985–90 period, and by 2005 the transition to the new fertility regime is completed. The last columns of Table 3 provide the mean ages at first and second births after the year 2005, when cohort and period fertility patterns are once again the same. The mean ages at first birth slightly exceed the corresponding minimum ages, because there are inevitable voluntary and involuntary delays (due to difficulty in conceiving, spontaneous abortion, postponement of marriage, etc.). For similar reasons the average time between births slightly exceeds the minimum interval of 4 years. For example, with a minimum age of 27 and a minimum spacing interval of 4 years, the average ages of first and second births are 27.8 and 32.5. The overall average is 30.0 years, which is 4.7 years more than the 25.3 that would have been observed without new timing rules. The resulting reduction in fertility between 1985 and 2005 is equivalent to setting the period total fertility rate at zero for 4.7 years. The macrodemographic effect of additional delays in childbearing is clearly large.

TABLE 3   Total fertility rates (1980–2050) by minimum age at first birth and average age at childbearing (2005–50) under a hypothetical stop-at-two policy initiated in 1985 (assumed minimum spacing interval between births is four years)

| Minimum age at first births | Total fertility rate (births per woman) | | | | | Average age at childbearing (2005–50) | | |
	1980–85 (observed)	1985–90	1990–95	1995–00	2005–50	First birth	Second birth	All births
25	2.30	0.92	1.57	1.71	1.72	25.8	30.5	28.0
27	2.30	0.44	1.34	1.68	1.69	27.8	32.5	30.0
29	2.30	0.15	0.98	1.59	1.67	29.8	34.5	32.0
No minimum age[a]	2.30	1.76	1.76	1.76	1.76	24.4	26.3	25.3

[a]Age pattern of fertility after 1985 is assumed to be the same as observed in 1980–81.
SOURCE: Appendix B.

Potential demographic effects of the two-child policy

The substantial fertility inhibiting effects of a stop-at-two policy combined with delayed childbearing would, of course, reduce population growth rates well below present levels. To estimate this effect, we have made a new set of population projections. Combining minimum ages at first birth of 25, 27, and 29 years with minimum delays between births of 4 and 6 years yields a total of six projection variants: 25-4, 27-4, 29-4, 25-6, 27-6, and 29-6. To simplify the comparison of different projections, we assume that the new childbearing rules in each variant take effect in 1985 for all couples. The resulting changes in period total fertility rates are estimated with a procedure described in Appendix B (see Table 3 for examples). With respect to mortality and migration assumptions, the projections are the same as those discussed earlier.

The six new projections of total population size are presented in Figures 2 and 3 and Table 4. To put these results in perspective, Figures 2 and 3 also include the United Nations medium projection and the population trends associated with a successful interim one-child policy. (The one-child projection is the same as before except for the TFR in the 1980–85 interval, which is set

FIGURE 2   Projected population size of China, 1985–2050, according to the United Nations medium variant, the one-child policy, and variants of a hypothetical stop-at-two policy, assuming four years of spacing between children
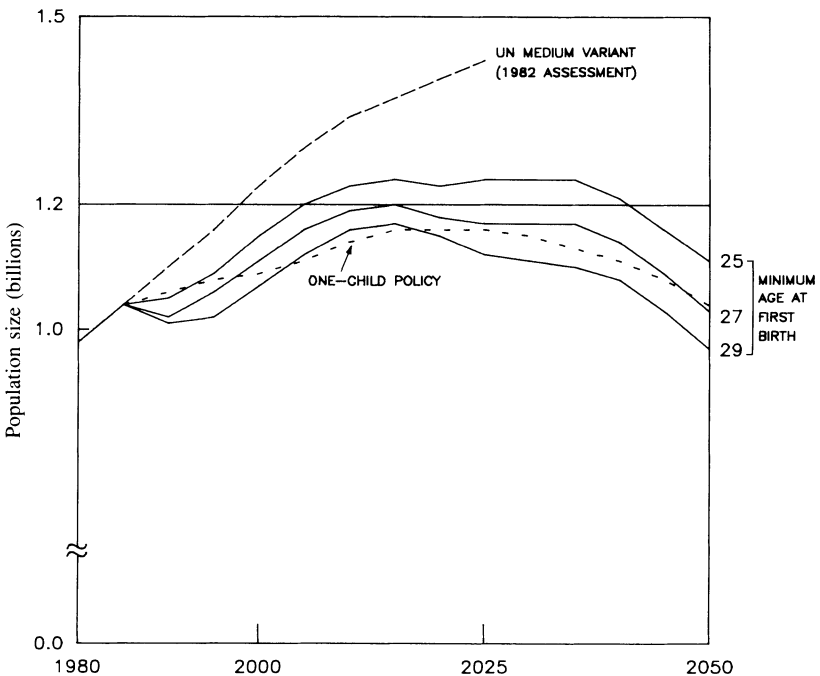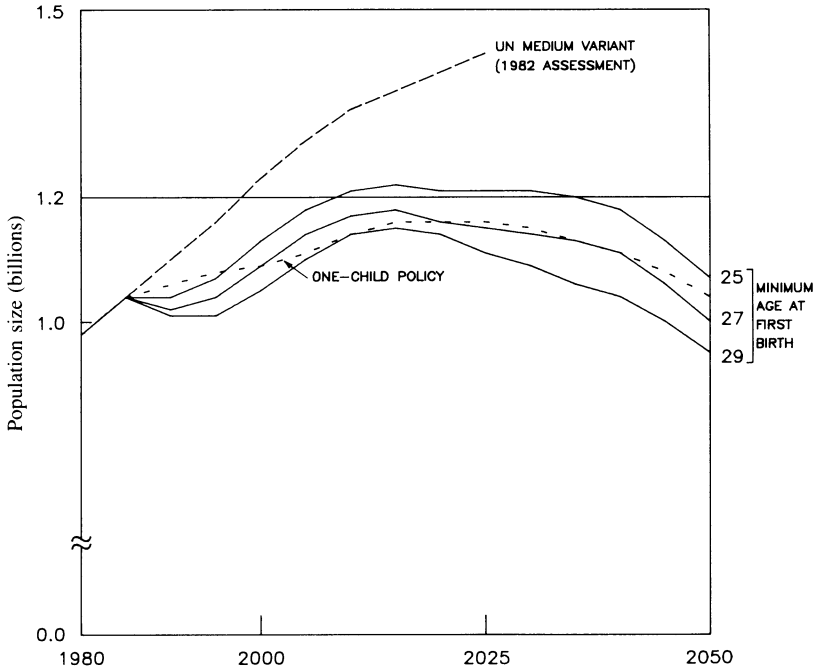
FIGURE 3   Projected population size of China, 1985–2050, according to the United Nations medium variant, the one-child policy, and variants of a hypothetical stop-at-two policy, assuming six years of spacing between children

at the observed value of 2.3.) Several conclusions can be drawn from these projections:

— None of the variants of the two-child policy exceeds the population size target of 1.2 billion in the year 2000.

TABLE 4   Projected total population size (millions) in 2000, 2025, and 2050 by minimum age at first birth and minimum spacing interval for a hypothetical stop-at-two policy initiated in 1985

Minimum age at first birth	Year		
	2000	2025	2050
	Minimum spacing 4 years		
25	1,149	1,237	1,110
27	1,112	1,174	1,033
29	1,073	1,121	972
	Minimum spacing 6 years		
25	1,130	1,206	1,074
27	1,094	1,150	1,000
29	1,052	1,115	953
One-child policy after 1985	1,091	1,157	1,045

— All but the 25-4 and 25-6 variants remain below 1.2 billion throughout the projection interval. The maximum for the 25-4 variant is 1.24 billion in the year 2030.

— The population trajectories of the six variants are similar in shape to the one-child projection. In each case population size rises to a maximum around the year 2025 and declines thereafter. After 2025 the variants with a minimum age at first birth of 27 years differ little from the one-child projection.

— All six variants of the stop-at-two policy yield population trends that are well below the UN medium projection, and the differences between them increase over time. For example, the UN trend exceeds the 27-4 variant by 120 million in 2000 and 259 million in 2025.

— For some of the variants population growth is negative between 1985 and 1990. This is the result of the very low period fertility for several years that would follow the successful introduction of a minimum age at childbearing. With extremely low fertility, the birth rate drops below the death rate, thus producing negative population growth. This issue would not arise if the new policy were phased in over a number of years.

— Raising the minimum age at first birth is more effective in reducing population growth than an equivalent rise in the minimum spacing interval. For example, a change from a 25-4 to a 27-4 policy would produce a population size lower by 63 million in 2025, while a change from 25-4 to 25-6 would make a difference of only 31 million in the same year. This finding is not unexpected, since a change in the minimum age at first birth affects the timing of both births, while a change in spacing affects only the timing of the second birth.

The most important conclusion from the comparison of these different projections is that limiting population size to less than 1.2 billion in 2000 is possible under a strictly enforced stop-at-two policy with a minimum age at first birth of as low as 25 years, even though this involves an increase in the average age at first birth of only about 1.4 years (from 24.4 to 25.8, see Table 3). A second key finding is that up to the mid-twenty-first century there are only minor differences between a one-child policy and a stop-at-two policy with a minimum age at first birth of 27 years. The latter conclusion holds also if one examines trends in demographic variables other than total population size. For example, Figure 4 plots broad features of the population age structure from 1980 to 2080. In both cases the proportion of the population under age 15 drops sharply in the 1980s and then stabilizes, fluctuating slightly at a level just under 20 percent of the total. (These fluctuations would be less pronounced if the stop-at-two policy were introduced gradually.) The proportion over age 65 rises substantially until the year 2050 and declines thereafter. This "aging" of the population is often mentioned as a significant drawback of China's one-child policy. Given the expected pattern of mortality change, a sustained decline

FIGURE 4   Projected proportions of China's population aged 0–14, 15–64, and 65 and over, for the stop-at-two policy (27-4 variant) and the one-child policy
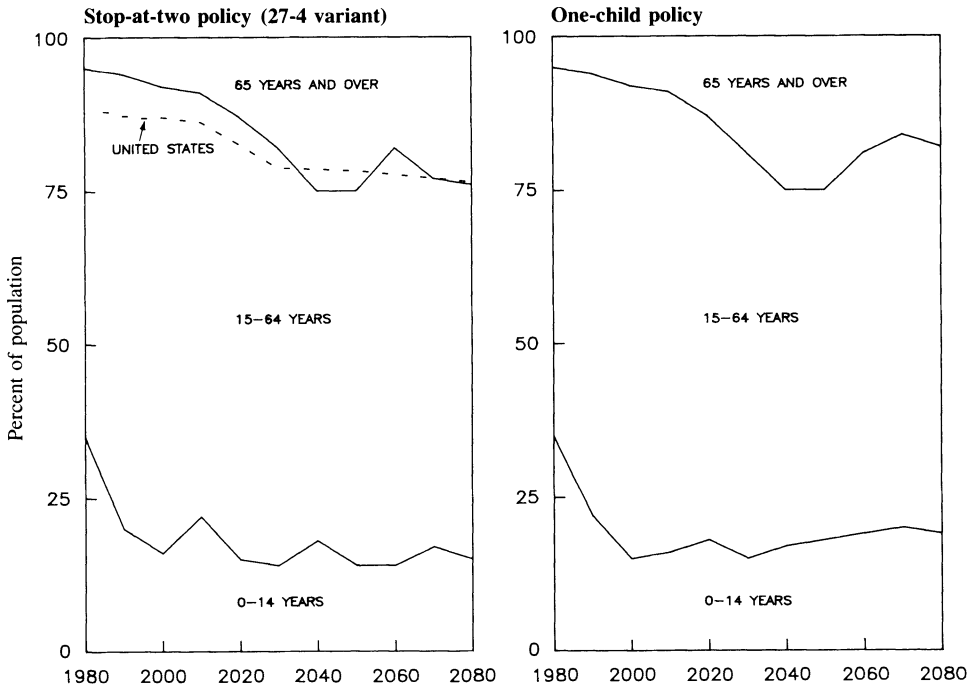
in fertility to low levels inevitably produces a major increase in the proportion of the population aged 65 and over; nevertheless, China's experience in this respect will not be unusual. The United States and Western Europe will also experience an aging of their populations, although at a slower pace. As Figure 4 indicates, over the next century the proportion of the population over age 65 in the United States will reach levels similar to those projected for China (US Bureau of the Census, 1984).

What is important to note in this comparison of macrodemographic effects is the very different microdemographic implications of the one- and two-child policies. A simple hypothetical example will suffice to demonstrate this. If perpetuated for successive generations, the one-child policy implies that all children born under the aegis of the policy would be without siblings; and they would have no nieces or nephews. These children's children would in turn have no uncles or aunts and no cousins. Moreover, as noted earlier, fewer than half of all parents would have a surviving son at any point in their life cycle. On the other hand, if every couple is allowed to have two children (subject to the timing stipulations described above) then most children would

have a brother or sister. When grown, they would have nieces or nephews and their children would have aunts or uncles. A large majority of parents would have a surviving son throughout their lives. A two-child policy therefore implies a family and kin structure that is very different from the one that would prevail under a one-child family policy.

Social and economic advantages of the two-child policy over the one-child policy

If the one- and two-child policies have comparable macrodemographic results, the two-child policy outlined here has clear advantages in other areas. While also a policy that imposes heavy burdens of compliance on couples, a two-child policy would entail fewer problems in the areas of implementation, local politics, sexual inequality, and socioeconomic change.

The one-child policy has been difficult to implement, perhaps most fundamentally because it runs counter to the desires of individual families. Because it offers more options, and more flexible options, a two-child policy would doubtless be more appealing to the Chinese population than the current policy. Under the two-child program couples would have the choice of having two children, subject to the stipulated timing restrictions, or having a single child any time. Women who accidentally (or voluntarily) become pregnant before age 25 (or any specified minimum age) might choose to have this child on their own time schedule, and forego the two-child option. Another possibility whose demographic implications we have not explored here but that could be explicated easily through analogous projections is to expand the range of timing rules, introducing other options such as 24-6 or 24-8.

Other obstacles to implementation of the one-child policy have arisen from some of the methods used to enforce it: political/administrative difficulties rooted in the inability of higher cadres to force compliance among uncooperative lower cadres; and economic difficulties entailed by the high cost to local units of one-child incentives. While a two-child policy would probably not be fully enforceable either, its implementation would be less onerous and subject to less laxity than is the case with the current policy.

First, by establishing a single, more permissive limit for all couples (albeit at the cost of more stringent rules as to timing of childbearing), a two-child policy would be expected to increase the extent of fully voluntary compliance. By mitigating the sources of local cadres' opposition—mainly, couples' demands for more children that, when unmet, sometimes lead to abuse of cadres—this should ease political problems at the bottom of the administrative hierarchy.

Second, depending on the means adopted to enforce it, the two-child policy might also entail fewer or less heavy economic costs. If the government were to continue the use of incentives, shifting them to two-child families, the move to a two-child policy would be unlikely to reduce costs. In fact, unless

benefit levels were reduced to take account of the greater popularity of the two-child option, the costs of incentives would probably climb because many more couples would choose this option. If, as may be expected, a majority of couples deemed a two-child policy a preferable option to the choice offered by the one-child policy, then policymakers might be able to substantially reduce incentives for compliance and rely to a greater extent on sanctions aimed at discouraging contrary behavior. If such a move were feasible, the direct economic costs of implementation would fall substantially. Other costs of enforcement—such as expenses for ideological work, monitoring of births and their timing, contraceptives and medical services—would probably be substantially the same as under the one-child policy.

We have seen that under the one-child policy, enforcement is assigned to local cadres, whom higher level cadres have limited ability to control. This has left the door wide open to local-level politicking, in which official position, kin ties, clout, and similar factors have played a role in determining how the policy is applied to individuals. While these conditions may still pertain under a two-child policy, by giving couples a choice of childbearing options a two-child policy presumably would be more acceptable and would actually satisfy the needs of many couples. This is particularly true if we assume that economic and cultural modernization will continue apace, bringing lower fertility aspirations in its train. Even at this stage of modernization, however, indications are that a two-child, delayed-fertility policy would find much more acceptance among the population than the current policy.[17] In view of its greater acceptability, movement to such a policy should reduce the extent to which discrimination, forceful methods, and other objectionable practices occur at the local level.

While in theory the one-child policy upholds the principle of sexual equality, in practice it has had deleterious effects for women, leading to cases of female infanticide, abuse of wives, and the like. Since promulgation of Document 7, gender inequality has been incorporated into some provincial regulations by allowing a second child if the first is a daughter.[18] While family planning officials have not, to our knowledge, commented on this feature of the provincial regulations, presumably they are uncomfortable with it for it is in direct contradiction to China's official ideology. Although a two-child policy would not reduce the desire for sons, by allowing a majority of couples (about two-thirds) to have a son it should greatly reduce hostile acts against women. (Women with two daughters, however, would remain vulnerable.) Furthermore, by establishing a uniform policy for all areas of the country, it would supersede provincial regulations and allow China's leaders to bring official policy in line with official ideology.

The one-child policy has begun to have wrenching effects at the microlevel, changing the family in ways that jeopardize its ability to care for its old, undermine its productive capacity, and challenge people's sense of continuity and purpose of life. In each of these areas movement to a two-child policy would greatly reduce, if not eliminate, the potential harm.

First, by allowing a majority of couples to have a son, and by permitting intergenerational exchanges to operate more or less on their own (this assumes low or no benefits for two-child families), a two-child policy would enable the majority of families to support their older members. As the proportion of China's elderly within the total population increases rapidly, unless the state can continue to relegate support of the elderly to the family, the costs of social security will absorb growing chunks of public revenues and reduce the amount of state funds available for economic development.

Second, by doubling the number of children each family is allowed to have, a two-child policy would permit the formation of horizontally and vertically extendable family firms. While China's family firms would be smaller than those in other developing societies of East Asia, they would still have the organizational capabilities that have made those firms key to the rapid industrialization of the rest of the region. Since 1978 China's leaders have carved out increasingly large roles for the private sector in the country's modernization. By allowing families a little more demographic elbow room, China's policymakers will promote a kind of production unit that may be ideally suited to developing this sector in agriculture, industry, and a wide range of services.

Finally, by enabling families to have two children, the policy we have described would allow the reproduction of a substantial majority of male descent lines, hence help more people preserve a sense of continuity and purpose in life. A more widespread sense of social well-being would surely be a great asset to the country as the race to modernize brings new and unexpected forms of political and economic change.

Conclusion: Policy options at mid-decade

While the one-child policy has been remarkably successful in achieving China's demographic goals, it has cost the country dearly in ways we and others have described. Keenly aware of a wide range of problems associated with the policy, China's leaders appear to be searching for ways to address them, while continuing to restrain population growth so as to achieve their 1.2 billion target by century's end. It is impossible to know what shifts they may be considering, but recent statements suggest that some relaxation may be forthcoming. Remarkably, within a year of issuance of Central Document 7, both the State Family Planning Commission and the Ministry of Public Health announced that family planning work was satisfactory and population growth under control (Bai and Feng, 1985; *Jihua Shengyu Ban*, 1985).[19] Also suggestive of impending change, recent discussions of the rationale for family planning have stressed that change is fundamental to dialectical materialism and that, by the same token, population policy is not immutable (Li, 1985; see also Liang and Peng, 1984; Wu, 1985). If the policy is relaxed, however, it is likely to be accomplished not by increasing the number of children allowed, but by selectively raising the share of couples permitted to have two children. Furthermore,

such shifts are likely to move in the direction not of unifying policy nationwide, but of increasing local diversity in targets and regulations. A shift in these directions is signaled by a proposal advanced by the State Family Planning Commission in 1984. The Commission suggested that the share of rural couples allowed two children should be 10 percent or higher, that the precise share should be determined locally, and that the percentage with two children should rise with rising levels of economic and cultural development (Li, 1985).

While a relaxation of this sort will help to ease political tensions, if it retains the principle of local autonomy within limits and increases the share of two-child families in an ad hoc, locally determined fashion, China will face growing spatial inequalities in the level of fertility, hence in the rate of natural increase.

We have outlined another way by which China could modify its population policy. By moving to a uniform two-child-with-spacing rule, the demographic goals set by the Chinese government could be achieved and many of the problems caused by the one-child policy could be reduced. This two-child alternative might be an interim measure to be applied for a limited time. It is to be expected that modernizing change will gradually reduce the desired number of children, making stringent limits on childbearing unnecessary. When China is able to eliminate strict birth control regulations, the problems created by the one-child policy and still present, if to a reduced degree, under the two-child policy should disappear altogether.

To ease the transition to the two-child policy, the necessary measures could be introduced in two steps. In the first step couples would be given a choice between having one child without stringent restriction as to timing, and receiving single-child benefits, or having two children, appropriately timed, and receiving more limited benefits. In the second step the two-child policy, with stipulated spacing rules, would be extended to all couples. While 27 is the minimum age at first childbearing that, when combined with 4-year spacing, would keep the population from ever reaching 1.2 billion, the 25-4 combination performs almost as well in serving the macrodemographic objective, since it keeps the population below the target until after 2000, and exceeds the target by only a small margin in the early years of the twenty-first century. After the transition to the two-child regime, couples presumably would be free to have only one child without restriction as to timing. However, they would receive reduced benefits no different from those received by couples with two children.[20]

The upward shift in the age at first childbearing required by the two-child policy described here is more practical than it may at first appear: adoption of the 25-4 option, for example, would require an increase of only 1.4 years in the mean age at first birth over the mean age prevailing in the early 1980s. Although traditionally marriage was considered inseparable from childbearing, evidence from the cities suggests that this attitude may be alterable without major difficulty (Duan and Yang, 1982; see note 17). While preference for early childbearing is no doubt more deeply rooted in the countryside, it is

likely that given the strong desires for more than one child, waiting one, two, or three years to start a family would be considered a relatively small sacrifice for the opportunity to have two children. Furthermore, in assessing the hold of traditional ideas, it is important to note that current efforts to have a child immediately after marriage may be not so much a traditional holdover as a contemporary reaction to the one-child policy and the fears it has generated among couples that if they do not have a child as soon as they are permitted, the policy might become even more restrictive. It may be conjectured that if the policy were relaxed to allow couples to have two children if they wait until their mid-20s, most couples would willingly delay childbearing. As we already noted, those not wishing to wait would retain the option of having one child whenever they wish.

In the past decade China has made great progress toward reducing a rapid population growth rate that, if unchecked, would have posed a threat to the future well-being of the country. Yet even if one accepts the macrodemographic objectives of China's leaders, one must question whether the means adopted for attaining them represent a least-cost solution. We believe we have demonstrated that there are alternative options that, upon examination, might prove preferable.

Appendix A

The computer program used for the population projection requires specification of a set of input variables. The following assumptions were made for these variables:

— Total fertility rates: See Table 1.
— Life expectancies at birth: See Table 1.
— Age patterns of fertility:
   Projection 1: Observed age pattern in 1970 was assumed to prevail before 1970, and observed 1980 pattern was used after year 2000 with linear interpolation between 1970 and 2000 (see Table A-1).
   Projection 2: Age pattern 1980–2050 equal to observed 1980 pattern.
   Projection 3: After 2010 same as projec-

tions 1 and 2; between 1980 and 2000 age pattern equal to observed distribution of first-order births in 1980; linear interpolation between 2000 and 2010.
— Age-specific mortality rate: From Coale–Demeny model life tables, West family.
— Migration rates: Set equal to zero.
— Age-sex composition of initial population:
   Projection 1: 1970 distribution from United Nations, 1985, adjusted to give total population of 818 million (State Statistical Bureau, PRC, 1984).
   Projections 2 and 3: 1980 distribution as given in Hill (1985).
— Sex ratio at birth: 1.05.

TABLE A–1   Observed percent distribution of fertility by age for all births in 1970 and 1980 and for first births in 1980

	TFR percent distribution by age (observed)						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
1970 (All births)	3.9	24.4	26.9	21.3	15.4	7.2	0.9
1980 (All births)	2.2	31.7	42.4	14.4	6.1	2.5	0.7
1980 (First births)	5.9	53.6	37.4	2.9	0.2	0.0	0.0

SOURCE: *Renkou Yu Jingji*, 1983.

Appendix B

The first step in the calculation of period age-specific fertility rates is the estimation of the cohort fertility rates that would prevail under a stop-at-two policy with a given minimum age at first birth and a given minimum spacing interval between births. This pattern of cohort fertility is obtained by assuming that among the women who have at least one child, 75 percent will bear their first child within one year after the minimum age (e.g., between exact ages 27 and 28 if the minimum age is 27), 20 percent during the second year, and the remaining 5 percent in the third year. It is further assumed that among the women who have a second child, 80 percent will have their second birth in the first year after the minimum spacing interval, and the remaining 20 percent in the second year (e.g., with 4-year minimum spacing, the interval would be between 4 and 5 years for 80 percent of the cohort and between 5 and 6 years for the remainder). With these assumptions Table B-1 indicates the age-specific fertility rates (births per thousand women per year) that would be observed in a cohort with a minimum age at first birth of 27 years and a minimum spacing interval of 4 years. Thus, these assumptions imply: $P_1 = 0.914$, $P_1 \times P_2 = 0.780$, and TFR = 1.694.

This age pattern of fertility would be observed in cohorts that have been subject to the stop-at-two policy throughout their reproductive lives. If this policy is implemented in 1985, then the above pattern would also prevail in each period after the year 2005, when all fertility is attributable only to cohorts that have not yet reached age 15 in 1985.

For the period between 1985 and 2005, additional calculations are required in each year during the interval, because some fertility is contributed by cohorts that have started childbearing before 1985. Each of these cohorts was assumed to complete its childbearing according to the age pattern prevailing under the stop-at-two policy (see Table B-1). The proportion of these cohorts ever reaching parity one was assumed to be P_1, and the proportion ever reaching parity two was set equal to $P_1 \times P_2$. For example, an estimated 52.7 percent of the cohort that reached exact age 24 in 1985 had already had a first birth. Therefore, the remaining 38.7 percent ($P_1 - 0.527$) of this cohort was permitted to bear a first child after 1985, but not until after exact age 27 (giving age-specific fertility rates of 290, 77, and 19, for ages 27, 28, and 29, respectively).

The above procedure requires an estimate of the distribution of women by age and parity for 1985. This was obtained by projecting forward for three years from the 1982 distribution using the age-order–specific fertility rates observed in 1980–81.

TABLE B–1   Projected cohort age-specific fertility rates by birth order under a two-child policy with a minimum age at first birth of 27 years and minimum spacing interval of 4 years

Age	First births	Second births	All births
25			
26			
27	685		685
28	183		183
29	46		46
30			
31		234	234
32		355	355
33		152	152
34		35	35
35		4	4
36			

SOURCE: *Renkou Yu Jingji*, 1983.

Notes

1 These policies have probably had a greater impact in the countryside, which contains about 80 percent of the population, than in the cities. In the urban areas changed socioeconomic conditions, including the large-scale entry of women into the labor force, the provision of old-age pensions for state-sector workers, and the lack of new jobs for the younger generation, appear to have contributed to lower childbearing aspirations. However, if socioeconomic factors initiated the decline in urban fertility, the birth limitation policies of the 1970s greatly accelerated it (Kane, 1985; Whyte and Parish, 1984).

2 The classic study of policy cycles in China is Skinner and Winckler, 1969. Given space limitations, here we can only briefly review the evolution of family planning policy, focusing on the most recent decade and a half. For more comprehensive treatment of earlier policy developments see Chen, 1976; Orleans, 1981; Tien, 1973.

3 These guidelines were interpreted slightly differently by different regions.

4 One indication of the low priority assigned to these goals is how little is written about them in comparison with the one-child goal. The few available field reports of enforcement techniques also suggest the secondary nature of these objectives. For example, in rural Hua Shan Commune, Hubei, late childbearing was verbally encouraged, but cadres assumed that newlyweds would want a child immediately and so did little to discourage them. A high rate of late marriage was one of five specific targets local cadres worked toward, but its value, in terms of cadre bonuses, was insignificant in comparison with the value of meeting one-child quotas. Furthermore, in this commune no statistics were kept on late childbearing or late marriage (White, 1983; research conducted in 1981). In the larger cities these features may be given slightly more emphasis. For example, cadres may discourage early marriage and enforce late childbearing through the allocation of birth permits to different couples (Chen and Kols, 1982: J607).

5 The call for penalties for noncompliance has been interpreted differently by different localities. While a few areas (e.g., Shanghai Municipality, Shanxi Province) have imposed economic penalties on couples having second births, in most regions such couples are required only to return the benefits they received

upon having the first child (see Chen and Kols, 1982: J603; for a case study of a county emphasizing penalties for third and higher order births see Lin and Zhou, 1980).

6 The extent to which local regulations are in fact based on local conditions is difficult to determine and may be relatively slight. An example of such regulations, those adopted by Shanxi Province in 1982, was published in *Population and Development Review* 9, no. 3 (1983): 553–560.

7 This projection was made in the late 1970s; for further details see Song et al. (1982). A new projection is made for the present study, since more up-to-date information on population size and age structure in 1980 is now available from the 1982 census (Hill, 1985).

8 The average growth rate between 2000 and 2050 is higher in projection 1 than in projection 2 despite the higher fertility stipulated in the latter, because the age structure in 2000 in projection 1 has a greater built-in population momentum. The larger momentum is due to the higher fertility between 1970 and 2000 compared with projection 2, and this in turn yields an age structure with a greater potential for future population growth for any given level of fertility after the year 2000.

9 The government probably allowed the marriage age to fall because of concern over unrest among unemployed youth, and because the high age limits in effect in the 1970s were virtually impossible to enforce (cf. Chen and Kols, 1982). The full fertility consequences of this shift may not have been anticipated.

10 Penalties extracted from couples with higher order children appear not to offset the costs of benefits paid to one-child families. There is very little evidence on penalties for excess children, and what is available suggests great reluctance on the part of cadres to impose the penalties spelled out in local regulations (Davin, 1985: 51; White, 1983).

11 This issue is explored in greater depth in Davin, 1985; Saith, 1984; White, 1983; and Zhao and Zhu, 1983.

12 The most devastating consequences of failing to have a son were felt by women. Until a woman provided a son she had no status in the family. If she remained sonless for years, her husband could divorce her or take in a concubine. Under the one-child policy there

have been numerous cases of maltreatment of women whose first child is a daughter. Because this subject has been treated extensively elsewhere (e.g., Croll, 1984; Saith, 1984), we discuss it only briefly here.

13 While some of the benefits to the only child (e.g., wage supplements) come from the work unit through the parents to the child, others (e.g., priority in schooling, medical care, job assignment) more closely resemble direct transfers from the work unit to the child. Throughout the post–1949 period the government's ideal has been to reduce the power of parents over children. However, this ideal has never had high priority, and it has not been enforced by any campaigns or administrative measures. Careful study of urban and rural family relations in the 1970s reveals that, although parental power has softened, because contemporary institutional arrangements reinforce traditional intergenerational ties, parents and children continue to be bound by strong sentiments of respect and mutual obligation (Parish and Whyte, 1978; Whyte and Parish, 1984).

14 Although official statements of the current one-child policy accord "appropriate stress" to delayed childbearing, in practice late childbearing appears to be little emphasized. (See also note 4.)

15 The sterility pattern estimated by Henry (1965) is assumed to prevail. This pattern is a widely used standard, and recent research has indicated that there is relatively little population variation in levels of natural sterility (Bongaarts and Potter, 1983). According to Henry, levels of sterility increase with age as follows: 3 percent at age 20, 5 percent at age 25, 8 percent at age 30, 15 percent at age 35, and 32 percent at age 40. Interpolation is used to obtain estimates of sterility for single years.

16 The risk of acquiring secondary sterility is taken from the Henry standard schedule, which estimates a rise in sterility of 10 percentage points between ages 25 and 35 (see note 15).

17 In Wolf's study, one of the few conducted by a Western scholar, 22 percent of urban respondents considered one child ideal, while 62 percent thought two children were ideal ($N = 87$). Among rural informants, 15 percent felt one child was optimal, while 55 percent said two children were ideal (Wolf, 1985: 255). Chinese surveys also show a strong preference for two children (Cheng, 1982; Croll, 1984: esp. 88–103). On the basis of their evidence from Beijing, two Chinese researchers conclude that young people are willing to put off childbearing on their own (Duan and Yang, 1982). It should be noted that these preferences are likely to be influenced by the existing policy environment: were a two-child policy in effect, the number of respondents preferring three or more children might be higher.

18 Even before Document 7, local regulations made tacit concessions to the preference for sons. For example, the Shanxi Province regulations drawn up in 1982 permit rural couples to have a second child if there has been only one son for three generations in a row (see note 6).

19 These announcements may, however, indicate more about top-level politics (efforts of one faction to appease another) than about trends in demographic policy. The precise meaning of such official statements is impossible to ascertain.

20 Although a reduction of benefits for single-child couples would probably produce a fall in the share of one-child families and a corresponding rise in the share of two-child families, as long as the timing rules are followed an increase in two-child families will not affect attainment of the macrodemographic objectives. This is explained in the section on the fertility implications of the two-child policy.

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