Demographic Transition in China and its Implications

ATHAR HUSSAIN *
London School of Economics, UK

Summary. — The aim of this paper is to chart the demographic transition in China, identify its proximate causes and analyze its socioeconomic implications with reference to, first, the proportion and composition of the dependent population, second, the age structure of the labor force and, third, the size and composition of households. Defined as a steady deceleration in population growth to a nonrising total, the onset of the demographic transition in 1970 predates the one-child policy. Thus far the transition has had its largest impact on the proportion of children in the population, which has fallen. Next in magnitude is a rise of in the share of working-age adults. These two changes dwarf the rise in the share of the elderly on which much of the discussion in China tends to be focused. The crude dependency ratio has been falling and will continue to do so for another two decades or so. It is pointed out that the change in the age structure has significant distributive implications. The last 20 or so years have seen a substantial change the size distribution of households. The average household has shrunk in size from 4.5 in 1982 to 3.5. This is important because the distribution of the population into households has a significant impact on the household expenditure pattern. In particular, controlling for per capita expenditure, smaller households spend more on food per capita than do larger households.
© 2002 Published by Elsevier Science Ltd.

Key words — China, fertility decline, impact of the demographic transition

1. INTRODUCTION

The aim of this paper is to outline the demographic transition in China, consider its proximate causes and analyze its socioeconomic implications with reference to the following three:

—the proportion and composition of the dependent population;

—the age structure of the labor force;

—the size and composition of households.

The principal focus of the paper is on the period since the early 1980s when, after a total statistical blackout of almost two decades, a population census was taken and annual household surveys were re-started. This paper draws on the following data sources:

—urban and rural household data released by the State Statistical Bureau (hereafter referred to as SSB);

—returns from the 1982, 1990 and 2000 population censuses;

—recent annual population sample surveys.

The demographic transition is defined here as a steady deceleration in population growth to a nonrising total instead of as a downward trend in the total fertility rate (TFR) approaching the replacement level of around two. In the present context the TFR is of importance only because of its implications for the size and the composition of the population. Though the above two characterizations are closely related, the demographic transition defined in terms of population growth both starts and ends later than that defined in terms of the TFR because of the inertia of the above-replacement TFR.

There are two reasons for taking an interest in the demographic transition: first, the concern with the size of the population because of limited natural and environmental resources, and, second, because of changes in the age composition that can have far-reaching implications for welfare (Demeny, 1996). China is of special interest on both counts. If a rising world population over the long run is regarded as unsustainable, then the demographic transition in China commands special interest due to the simple fact that it will for some decades remain the world's most populous country.

Historically, the massive size of China's population has among outside observers either conjured the fear of being overwhelmed or seen as the repository of a huge market. Recent years provide examples of both. An example of the fear is the specter of a food crisis brought on the world by the growing indirect grain consumption (via meat) of the Chinese (Brown, 1994). Though Lester Brown's "wake-up call for a small planet" is a hyperbole (World Bank, 1997), nevertheless, the point remains that the consumption pattern of the Chinese population because of sheer size has a global significance.

By international standards, the process of the demographic transition in China has been extraordinarily rapid with associated changes in the age structure of the population crowded in a short period which elsewhere have been spaced over a much longer period (Feeney, 1996). Excepting the post-Communist countries of the ex-Soviet Union, the Chinese TFR has fallen to a level lower than in any low- and middle-income economy of the world (World Bank, 2001). These changes are intertwined with two other transitions that China is also currently undergoing, i.e.:

—the process of economic development involving a massive movement of the population;

—the transition from a planned to a market economy.

2. POPULATION, COMPOSITION AND THE GROWTH PATTERN

Currently totalling close to 1.27 billion the Chinese population is growing at 0.54% per year (2000 figures)—a low growth rate, which, nevertheless, translates into the large annual increment of roughly 6.7 million. The population divides 64:36 into rural and urban (SSB, 2001a). The high percentage of the rural population reflects less the importance of agriculture as a source of livelihood than the administrative control on rural-to-urban migration dating back to the 1950s. Urban registration, if not inherited from the mother, is difficult to acquire, especially for large cities such as Beijing and Shanghai. But recent years have seen a considerable loosening of restriction on migration to small and medium towns. When interpreting rural and urban in the Chinese context, it is important to keep in view that these are administrative categories and fit in loosely with the socioeconomic classification

in terms of population density and sources of livelihood. Over a third (34.2%) of 499 million strong rural labor force is engaged full-time in nonfarming activities (SSB, 2001b, p. 7) and many of the rural counties around cities derive all but a small percentage of income from nonfarming activities and resemble urban conurbation in terms of population density.

As an historical background, Figure 1 shows the trend in the population growth rate since 1950. The precipitous drop in 1961–62 reflects the death toll of the famine brought on by the tardy recognition by the leadership of depredations of the Great Leap Forward compounded by natural disasters (Drèze & Sen, 1989). The end of the famine in 1962 after a lag triggered a rise in the population growth rate due presumably to a bunching of births and marriages postponed due to the famine. The demographic transition in the sense of a steady deceleration in the population growth rate dates from 1970, though, as we shall see below, the transition in the sense of the onset of a downward trend in fertility began a little earlier. In contrast to the monotonic decline in the 1970s, the population growth rate during 1981–88 fluctuates. The principal causes include the echo of the high birth rates of the 1960s and a temporary rise in the fertility rate in urban areas (Table 1). Except for a few years, the population growth rate has since 1976 been below 1.5%, which by international standards may be taken as the dividing line between high and low growth (Leete & Alam, 1993). Even though the TFR has since 1991 has been below the replacement rate of 2.1 (Figure 2), the population is expected to keep on rising for some decades, driven by the inertia of above-replacement fertility rates until the recent past. The exact time path of the approach to a nonrising total will depend on the future course of the fertility rate. Given the government commitment to maintaining the stringent limit on births in the foreseeable future, this may be considerably shorter than 50 years it roughly takes for the population to stabilize at the replacement fertility rate.

Figure 3 and Table 1 present the rural and urban TFRs, the summary indices of childbearing experience in particular years expressed as the expected number of births per women over her life. Since they are not fully commensurate, the rates are presented separately for the period up to and from 1981, which straddles the 12 months covered by the third population census and coincides with the introduction of
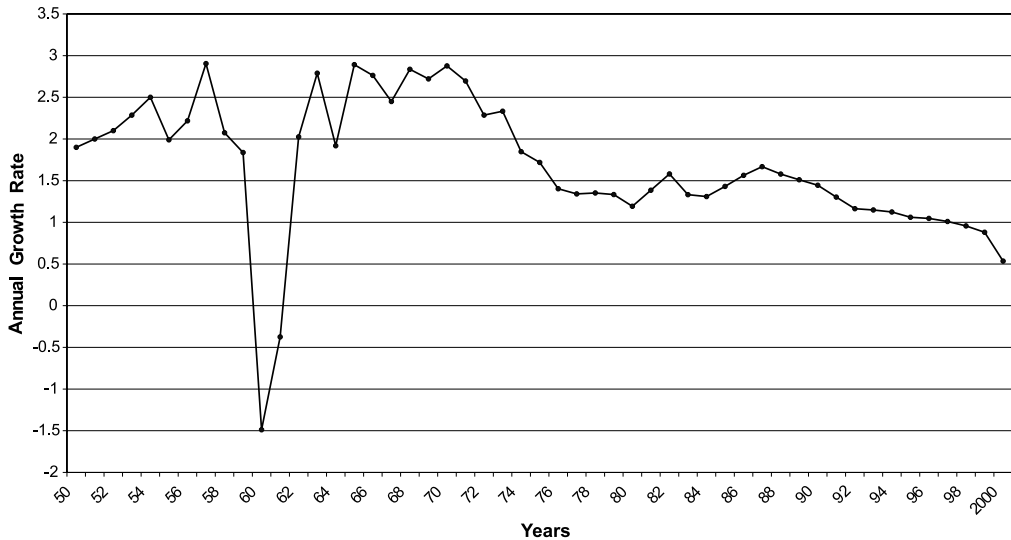
Figure 1. *Population growth rate 1950–98.*

Table 1. *Fertility rates in urban and rural areas*

	1981	1989	1995	1996	1998	1999
National	2.63	2.47	1.46	1.67	1.60	1.47
Urban	1.39	1.59	1.16	1.62	1.51	1.17
Rural	2.9	2.57	1.58	1.69	1.66	1.63

the "one-child policy" and the first round of economic reforms. While the TFR series up to 1981 (Figure 3) is derived retrospectively from the census data, that since 1981 is based on cross-section data from the population censuses in 1982 and 1990 and sample surveys, which can vary widely from one year to next because of a comparatively small sample size (Table 1). Strictly speaking, the "one-child policy" is an inaccurate description of birth control, which in its rigor has varied over time, across provinces and between rural and urban areas (Milwertz, 1997). The national TFR closely tracks the rural rate given the high proportion of the rural population in total. Figure 3 shows a steady downward trend in TFR from 1963 in urban areas and from 1969 in rural areas. In contrast, the post-1981 period (Table 1) presents a varied picture, while the rural TFR continues to fall steadily, the urban TFR, which by 1981 had for some years had been well below the replacement rate, fluctuates. One may note that the urban TFR estimates for 1995 and 1999 are comparatively very low, which may be ascribed to sample variation.[1]

Inferred from outcome, the aims of the "one-child policy" have been to, first, lower the rural TFR below the replacement rate and, second, to stop the urban TFR from rising above the replacement rate. As a result, the gap between the rural and urban rate, which in 1981 was wide, has by 1996–98 narrowed down to insignificance. Thus the main accomplishment of China's birth control policy, of which one child per couple is a component, is the exceptionally low fertility rate not so much in urban areas but among its huge and low-income rural population Figure 4.

A clear message from Figure 3 is that the one-child policy, rather than initiating, followed the fertility decline by around 16 years in urban areas and 10 years in rural areas. This points to other causes which divide into two groups: first, those particular to China and, second, the ones which elsewhere in Asia have played a central role in fertility decline. The first includes intrusive government and social interventions in matters matrimonial and reproductive. Prior to the introduction of the one-child policy a common form of these have been various campaigns such as the one in the 1970s prescribing the birth pattern as "late, spaced and few" (*wan, xi, Shao*). The success of these campaigns was not due just to coercion, which they undoubtedly involved, but also to the spread of female education and participation in work outside home, which preceded anti-natalist campaigns by a decade and half.
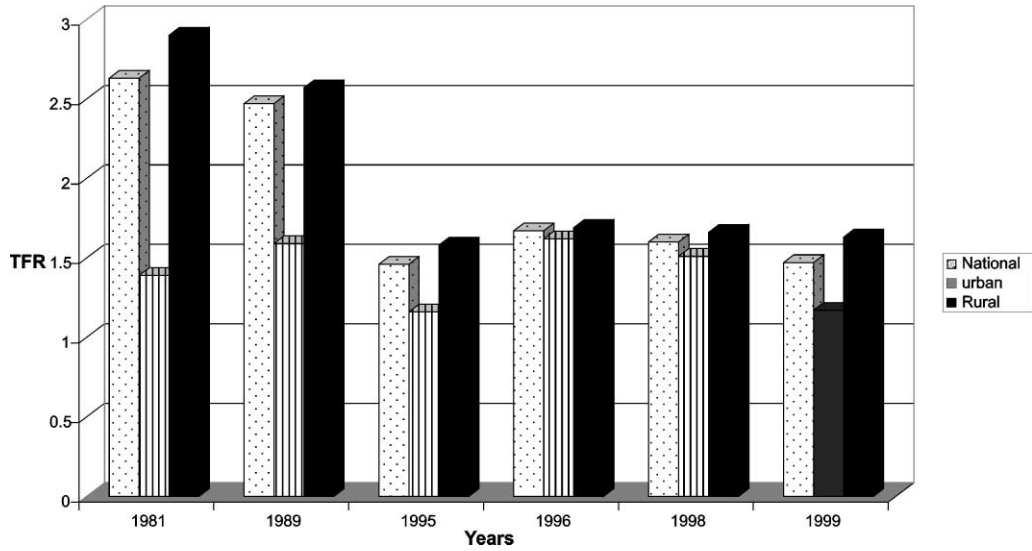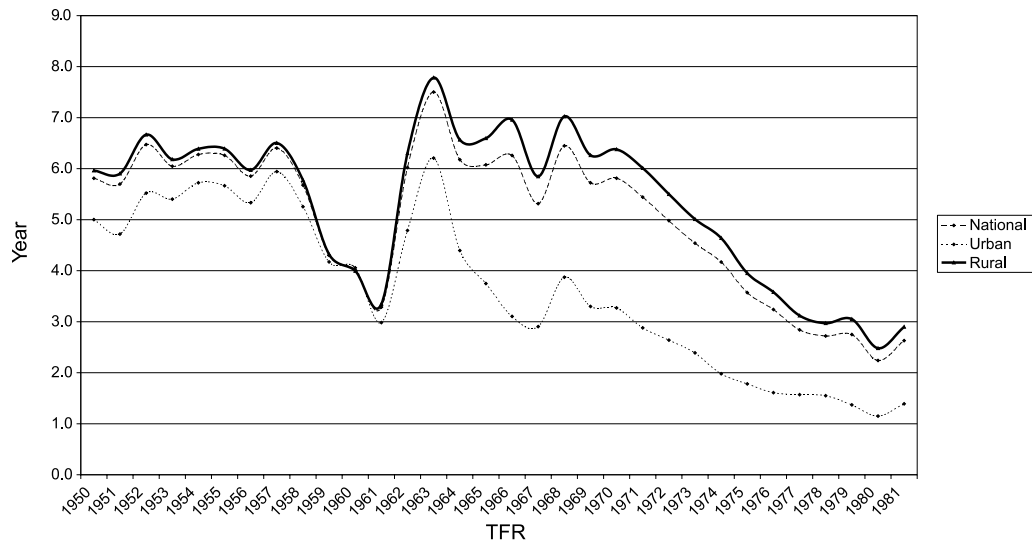
Figure 2. *TFR.*

Figure 3. *TFR 1950–81.*

An indication of their likely role in the fertility decline in China is provided by the experience of Hong Kong, Singapore and Taiwan, which share, with China common language and culture but not intrusive government interventions in decisions concerning marriage and births. Like China, these countries too have experienced a substantial fertility decline (Coale & Freedman, 1993). Likely causes include rising education among women and a transformation in their economic role and also a high level of urbanization. The first two were also present in China from the 1950s but not the last. Hong Kong and Singapore are city-states and Taiwan has been far more urbanized than China. Arguably social and economic transformation alone would have led to a substantial fall in the TFR in not only in urban but and also in rural
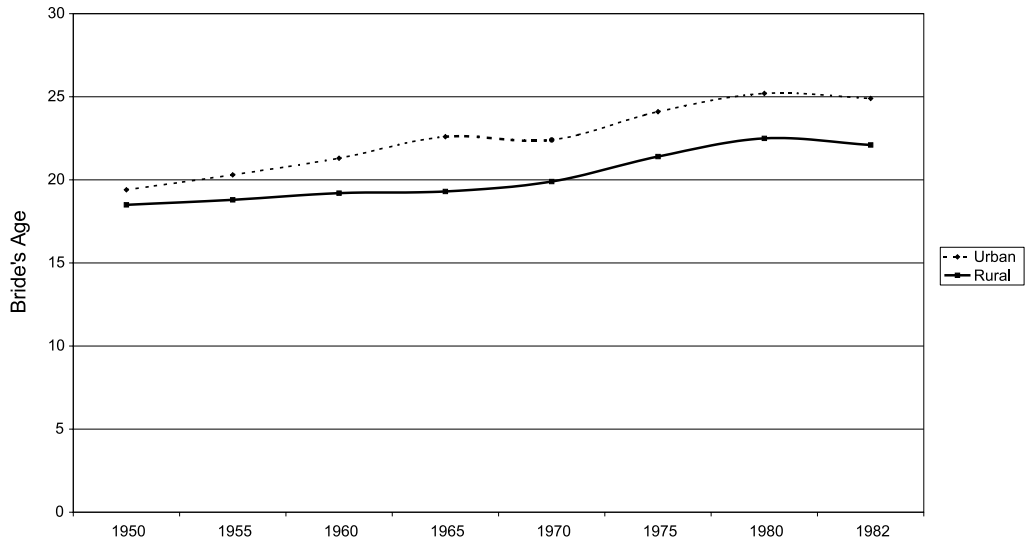
Figure 4. *Average bride age at first marriage.*

China, though at a slower pace. Arguably the urban TFR in the 1990s would have been below the replacement rate even without a birth control policy. [2]

A crucial link in the chain from circumstantial causes to the fertility decline has been the steady rise in brides' average age at first marriage both in rural and urban areas, a trend that dates back to 1950 well before the appearance of anti-natalist policies (Table 2). The trend derives its importance from a large overlap between the causes of a rise in marriage age and those responsible for a shift in preference toward fewer children.

A rise in marriage age has a temporary as well as a permanent downward impact on the TFR. The temporary impact consists of a postponement of births in tandem with a delay in marriage but without a reduction the TFR, which initially lowers the fertility rate in younger age groups and then after a delay raises the fertility rate in older age groups. The converse happens when marriage age drops, as in the early 1980s. When marriage age is rising, as it was up to 1980, the downward trend in the observed TFR exaggerates the decline in the underlying TFR. By the same token, the observed rise in the urban TFR (Figure 2) is due partly to the unwinding of the transitory drop in the TFR in the 1970s and also to the transitory impact of a drop in the marriage age (Table 2).

In the 1970s the anti-natalist policy was directed principally toward raising marriage age; the prescribed marriage age was 25 for women and 30 for men (Hull & Yang, 1991). By 1980 the target marriage age for women was achieved in urban areas due not only to the prescription but also, as important, to sending urban school leavers to the countryside from the early 1970s, which amounted to a forced postponement of marriages and births. Thus the introduction of birth control in 1979–81 did not mark the beginning of government intervention in reproductive decisions but only a shift in its primary target from marriage age to the number of births. The mandatory limit on births was first mentioned in 1979 coinciding with the start of market-oriented reforms. It was aimed at containing the prospective surge in fertility set off by a loosening of collective control on the personal sphere and allowing the rusticated youth to return home, some after 10

Table 2. *Average age of the bride at first marriage*

Year	National	Urban	Rural
1950	18.7	19.4	18.5
1955	19.1	20.3	18.8
1960	19.6	21.3	19.2
1965	19.7	22.6	19.3
1970	20.2	22.4	19.9
1975	21.7	24.1	21.4
1980	23.1	25.2	22.5
1982	22.7	24.9	22.1

Li (1992, p. 175), see also Hull and Yang (1991).

years. The average marriage age fell between 1980 and 1982, which may partially account for the rise in the urban fertility rate in the 1980s (Figure 2).

3. IMPLICATIONS OF THE DEMOGRAPHIC TRANSITION

As sustained deceleration in population growth, the demographic transition began in 1970 and is at least three to four decades away from a nonrising total population. In 30 years to 2000, the total population increased by around 436 million at the rate of just over 1% per year. This contrasts with the average annual rate 1.96% between 1949 and 1970. At this rate, the population would have grown by 627 million during 1970–2000, 191 million more than the actual increase and the age structure would be very different from that in 2000.

The economic impact of a deceleration in the population growth rate operates through two channels: first, a smaller absolute increment than what it otherwise would be and, second a change in the age structure. This paper concentrates on the second. To outline the change in the age composition over 30 or so years since the start of the demographic transition, the paper relies on the usual division of the population into children (0–14), working-age adults (15–64) and the elderly (65+). Children are dependent on economically active adults and so too are the elderly when their upkeep is financed on the pay-as-you-go basis either by their children or through a social contrivance. Old-age pensions or support funded through savings over working life alter the pattern of dependency, but, as these play a minor role in China, the paper proceeds on the assumption that the current working population finances old-age support. Though both are dependents, children and the elderly differ in two important respects. First, their consumption needs are different. Second, children require investment in education and training which determines their future productivity. The cutoff age of 15

for childhood in demography happens to fit in with the statutory minimum of nine years of schooling in China which, although promulgated in 1986, has yet to be fully implemented in rural area. But, the cutoff age of 65 dividing working life from old age does not correspond to the current practice in China. The retirement age for wage-employed labor force is significantly earlier than 65, and strictly speaking there is no definite retirement age for much of the rural population, a large majority of which is self-employed. Thus the age division adopted here should be taken as an illustrative benchmark rather than as a description of the reality.

Table 3 presents both the numbers and the percentage share of the three age groups at the national level in the census years of 1964 and 1982 and in 1998 and the population project for the 2020.

The change over 1964–99 is large and its pattern clear (Table 3). Whereas the 1964 age structure resembles that in many developing economies, the 1999 age structure is akin to those of populations in latter stages of the transition (Demeny, 1996). The largest change is the drop in the percentage of children by almost 17% points, and next in magnitude is a rise of 13.3% points in the share of working-age adults. These two changes dwarf the rise in the share of the elderly by 3.2% points. Compared with the 1999 population composition, in 2020 there would be 23 million fewer children, 68 million more elderly people and 137 million more working-age adults. The rise in the ratio of the elderly to the total population and working-age adults, on which much of the discussion in China tends to be focused, will be accompanied by a drop in the ratio of children and also in their absolute total. As shown by the last row, the combined effect of these shifts is a drop in the dependency ratio (unadjusted by an equivalence scale). The rise in the percentage of the elderly will be more than offset by a drop in the ratio of children. The implication is that the currently topical issue in China of supporting the elderly population has little to do with the demographic transition.

Table 3. *Age structure of population (numbers in rounded millions)*

	1964	1982	1998	2020 Hypothetical
Children (0–14)	279 (40.4%)	336 (33.5%)	301 (23.9%)	278 (19.3%)
Working-age adults (15–64)	381 (55.1%)	617 (61.5%)	862 (68.4%)	999 (69.3%)
Elderly (65+)	31 (4.5)	50 (5)	96 (7.6)	164 (11.4%)
Dependency ratio (0–14 & 65+)/(15–64)	81.5%	62.6%	46.1%	44.3%

In terms of absolute numbers, thus far the demographic transition has only affected the numbers of children and younger working-age adults (aged 15–30). The numbers in 30+ group is not affected. The rise in the numbers of elderly persons by 65 million during 1964–98 would have taken place regardless of the transition.

An exclusive focus on the ratio of the elderly, as the index of the burden of old-age support, is misleading for two reasons. First, it concentrates on the adverse side and neglects the huge economic bonus provided by a declining ratio of children. Accruing first, the benefit will continue to outweigh the cost until 2020, if not later (for a similar argument in relation to the United States see Cutler, Poterba, Sheiner, & Summers, 1990). Moreover, the cost associated with the rise in the ratio of the elderly relative to working-age adults is further mitigated by the fact that China is, and would for sometime remain, a surplus labor economy. This is taken to mean that the withdrawal of a substantial percentage of working age adults from the labour force, which is what the rise in the ratio of the elderly means, would have no or little effect on the burden of supporting the dependent population. The implication is that China has more time to adjust to the ageing population than is generally believed. China's old-age pensions system is beset with major problems, but these are due far more to the design faults of the system than to the process of ageing associated with the demographic transition. Second, the ratio of the elderly gives a distorted picture of the geographical distribution of the burden of supporting elderly population. In terms of the ratio of the elderly alone, compared to the interior provinces, the coastal provinces carry a higher burden of supporting the elderly population. But most of these tend to have a lower ratio of children to the population because of their lower fertility rates. As a result, the total dependency ratio, including both children and the elderly, is generally lower in richer coastal than in the poorer interior provinces. To give an example: Shanghai, the (city) province with the highest per capita income, has the highest ratio of the elderly of all provinces. Guizhou, the poorest province in terms of per capita income, has a low ratio of the elderly but a higher total dependency ratio than that of Shanghai, 51.9 compared to 37.4 (SSB, 2000). To explore the full ramifications of the demographic transition for social welfare, it is necessary to go beyond the crude dependency ratio and examine changes in the composition of various age groups. These are divided here into the "dependent" (or nonactive) population (children and the elderly) and working-age adults, which are discussed in turn.

The economic implications of the demographic transition depend not only a shift in percentage shares but also on absolute changes. It is these rather than percentages which matter for schooling and training of children, provision of jobs and support of elderly population. The principal impact of the transition has been on the number of children. During 1964–99 the number of children (0–15) increased by a mere 22 million out of a total population increase by 554 million. One may note that the number of children has actually fallen by 35 million over 1982–99, a phenomenon found in populations in only final stages of the demographic transition (Demeny, 1996). Further, if the current fertility pattern is maintained, then the number of children will fall by a further 23 million during 1999–2020. To the extent there is a link between schooling (length and depth) and the size of school-age cohorts, the initial impact of the demographic transition is on the educational level of the labor force.

4. COMPOSITION OF THE DEPENDENT POPULATION

The composition of the dependent population matters for two reasons. First, the respective needs of children and the elderly differ, a feature that is captured by equivalence scales (see for example, Cutler *et al.*, 1990; Deaton, 1997). Second and more important for the present purpose, the pattern of financial support of children is different from that of the elderly. Thus with the dependency ratio held constant, a shift in the composition of the dependent population away from children toward the elderly, as has been happening in China, has significant distributive implications. Much of the financial cost and personal care of children falls on households. But a large part of their cost of education is met from public resources, though over the reform period the proportion of cost borne by parents has steadily risen. Currently financial support for the elderly population is split between households and the "society" (which in China means the government and work units), with the former carrying the main burden. Taking 60 as the benchmark retirement age, [3] only 38.8 million (28%) of the

140 million aged over 60 receive pensions and all but a small percentage of these are in urban areas. The remaining 72% are mostly rural residents dependent on their children, predominantly sons, for financial support. There are now collective (community) pension schemes in rural areas, but these are still in the development stage and cover only part subsistence.

Taking the current arrangements for old-age support as givens, the government, enterprises and families will all feel the financial impact of the rising elderly population. In urban areas the cost will fall mainly on work units (including their employees) and the government. For the latter, with all else held constant, it will be offset by the declining ratio of children, though not necessarily completely. State-owned units (including government and public organizations), which already carry a heavy burden of old-age pensions, will be most adversely affected by the trend as they will receive none of the dividends from the falling ratio of children. Currently, over 71% of retirees are ex-state sector employees (SSB, 2001b, p. 490) and this percentage will rise over the next two decades because of the higher median age of the state-sector labor force compared to that of the nonstate sector. Given the high percentage of the urban elderly population receiving old-age pensions, urban households would feel the financial impact of the rising elderly population largely in the form of higher taxes (including social security contributions) rather than in the form of providing direct financial support for elderly parents. In contrast, rural households would feel the economic impact of the changing age structure largely through expenditure on children and elderly relatives. With the development and extension of rural collective pension schemes a part of the cost will be shifted to the community or the local government and show up as contributions to the pension schemes or local taxes.

Focusing on the elderly, the distributive implications of old-age financial support through pensions (on a pay-as-you-go basis) and by families are very different. Leaving aside the cost borne by work units, support through pensions distributes the burden across all households regardless of their age composition. In contrast, old-age support by families concentrates the burden on a proportion of households, those with dependent elderly relatives. As increasingly realized in China, the current heavy reliance on the family for old-age support goes against the grain of the demographic trend and socioeconomic changes. Because of the birth control policy, which in many localities means one child per couple, the future cohorts of the elderly will have fewer children to depend on than does the present cohort. An extreme example, which is often cited in China, is a future hypothetical family of comprised of two earners and five dependants, consisting of working couple (both single children themselves), their single child and their four elderly parents. Thus a crucial issue facing China is the progressive replacement of family financial support with old-age pensions.

5. AGE-STRUCTURE OF WORKING-AGE ADULTS

The age structure of working-age adults matters because age, either on its own or as a correlate of features such as educational attainment and experience, is a central consideration in hiring decisions (see Figure 5). Having started in the late 1960s the demographic transition has begun to have a perceptible impact on the age structure of China's working-age population that has multiple ramifications for social welfare. To show this, Table 4 compares the age structure of working age adults in 1982, when the effect of fertility decline from the late 1960s had yet to feed through to the population of working-age adults, and in 1999. The latter includes birth cohorts (aged 15–29) affected by the fertility transition and which received most, if not all, of their education in the reform period since 1979, benefiting from the revival of the educational system after the Cultural Revolution.

The change in the age structure over the 16 years is striking (see Figure 6). The percentage of younger working-age adults (aged 15–29) has dropped by over 12% points. In absolute terms, only 23 million (8.0%) of the 286 million increase in the numbers of working-age adults is in the 15–29 age group and the remaining 263 million (92%) are in the 30–64 age group. One straightforward implication of the change in the age structure of the labor force is a reduction in the problem of finding jobs for school-leavers, which would diminish still further as the effect of fertility decline feeds through to the labor force. Added to this, the change has implications for the age structure of the unemployed workers who have risen sharply in numbers in recent years. As a benchmark, if all unemployed
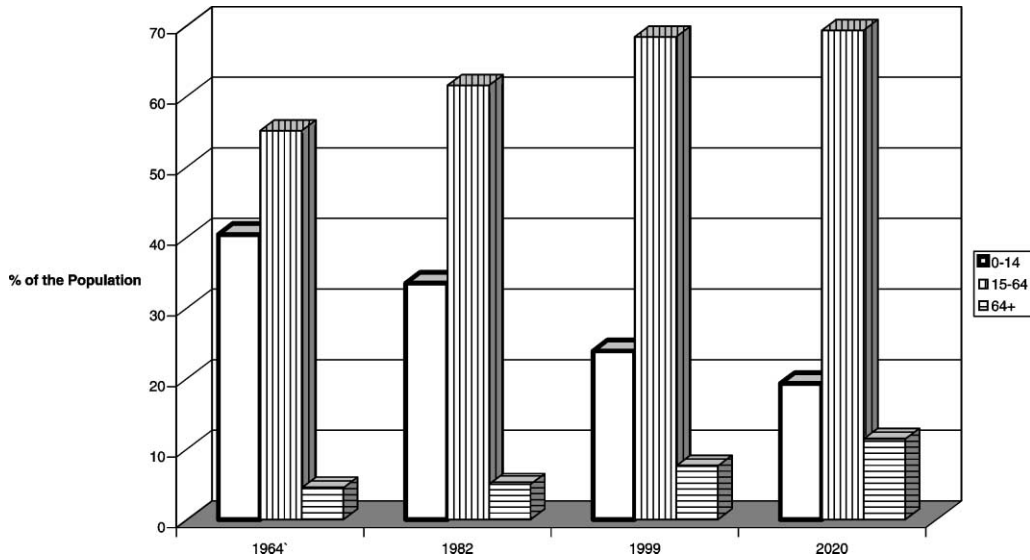
Figure 5. *Age structure.*

Table 4. *Age structure of working-age adults: 1982 and 1999 (number in millions)*

Age group	1982	1999
Aged 15–29	47.3% (292)	34.9% (315)
Aged 30–64	52.7% (325)	65.1% (588)

persons have an identical chance of finding a job then the unemployment spell will be the same of all age groups. But, as in other economies, in China the spell of unemployment tends to be longer for older than younger workers. The available evidence strongly suggests that older workers (above-40 among men and above-35 among women) face lower chances of finding another job than younger workers do. The problem of unemployment among older workers in China is compounded further by their much lower educational attainment than that of younger workers. Because of the adverse impact of the Cultural Revolution (1966–78) on secondary and higher education, a large proportion of birth cohorts from 1953 to 1963 (aged 37–47 in 2000) missed out entirely on post-basic education and occupational training. In contrast, the post-1970 birth cohorts (aged 30 or younger in 2000) have largely escaped the
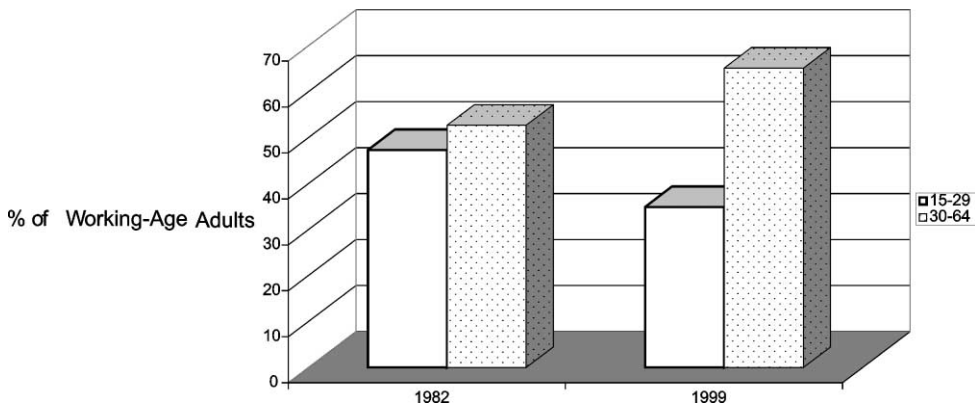

Figure 6. *Age structure of working-age adults.*

deleterious effect of the Cultural Revolution. The implication is that China faces a serious problem of long-term unemployment due to the combination of the deleterious effects of the Cultural Revolution on education and training and of the impact of the demographic transition on the age structure. Further the problem of unemployment among older workers is likely to get worse over the next 10–15 years because of a rising trend in the median age of the labor force driven by the falling size of cohorts entering the labor force.

6. HOUSEHOLDS

There are in all around 348 million households in China. Since the 1982 population census, there has been a marked change in the size and the composition of households, both of which have ramifications for the consumption pattern and the living standard. As shown by Figure 7 and Table 5, during 1982–99 (the period which broadly coincides with the one-child

regime) the size distribution of households has shifted to the left and become more compressed. As a result the average household has shrunk in size from 4.5 in 1982 (the date of the third population census) to 3.5 in 1999.

Compared to their counterparts in other developing economies, Chinese households are small and also, as outlined below, very different in composition. Rural households are on average larger than urban households are but by a surprisingly small margin of less than one. Though it has to be said that with the extended family living in close vicinity, a household in rural area does not have the same significance for intrafamily sharing of income and consumption as it does in urban areas.

The leftward shift and the compression of the size distribution of households have gone together with a large change in household composition. In comparison with those in 1982, the average urban and rural households in 1998 are smaller with fewer children and also fewer adults (aged 15+), three in 1982 compared to 2.8 in 1999, but with different age composition.
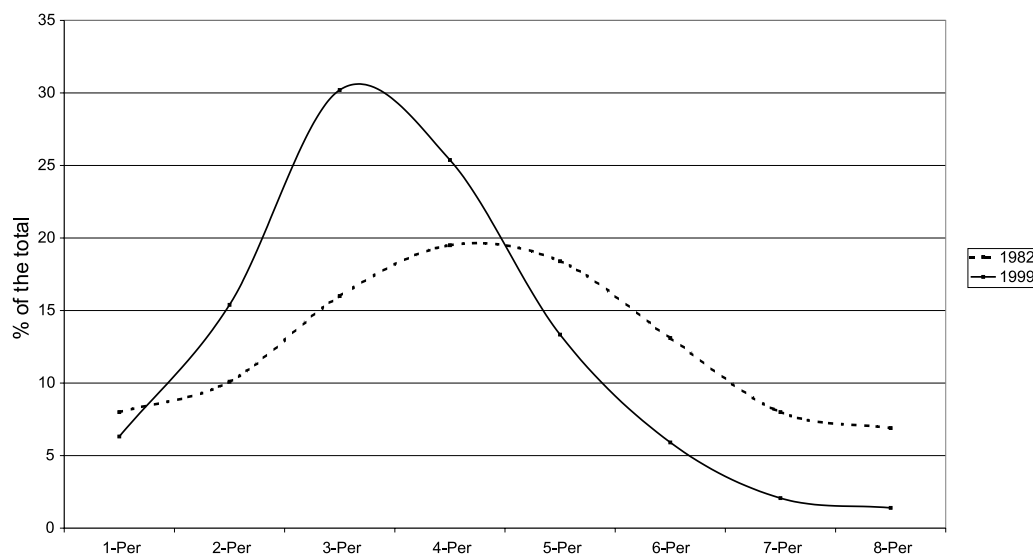

Figure 7. *Household size.*

Table 5. *Distribution of household size 1982 and 1999*

	1-Per	2-Per	3-Per	4-Per	5-Per	6-Per	7-Per	8+
1982	8.0	10.1	16.0	19.5	18.4	13.1	8.0	6.9
1999	6.3	15.4	30.2	25.4	13.3	5.9	2.1	1.4

SSB (1982) and SSB (2000).

Working-age adults are fewer and elderly persons more numerous. This change in the size and the composition of households between raises the issue of its impact on household consumption. This paper concentrates on the impact of the reduction in size and relies on the following proposition in Deaton (1997) that is also borne out by Chinese household data.

With per capita expenditure (PCE) held constant, smaller households have a higher food share in total expenditure and thus spend more on food per capita than do larger households.

The first part of the proposition appears paradoxical if the food share is taken as the index of the living standard, as Engel postulated, because it suggests that smaller households behave as if they are poorer than larger household with the same PCE. The paradox disappears if Engle's postulate is discarded, however, it is the second part of the proposition that is important. The implication is that the demographic transition leads directly to an improvement in nutrition independently of its indirect impact via per capita income or expenditure.

7. CONCLUSIONS

The decline in the TFR in China predates the introduction of "one-child policy" (more accurately a mandatory limit on births) by 10 years in rural areas and 16 years in urban areas.

Broadly, the causes of fertility decline in China divide into two groups: first those particular to China, and, second, which elsewhere in Asia have played a central role in fertility decline. The former includes intrusive government and social intervention in matters matrimonial and reproductive. The second group includes rising education among women, a rise in brides' average age at first marriage and labour participation outside home.

Arguably a crucial link in the chain from circumstantial causes to the fertility decline has been the steady rise in age at first marriage in both rural and urban areas from the early 1950s.

Focusing on the age structure of the population, the demographic transition has had its largest impact on the proportion of children in the population, which has fallen by almost 17% points during 1964–99. Next in magnitude is a rise of 13.3% points in the share of working-age

adults. These two changes dwarf the rise in the share of the elderly on which much of the discussion in China tends to be focused. The crude dependency ratio has been falling in China since the start of the demographic transition around 1970 and will continue to fall for another two decades or so.

In terms of absolute numbers, thus far the demographic transition has only affected the numbers of children and younger working-age adults (aged 15–29). The numbers in 30+ group is not affected. The rise of 65 million in the numbers of elderly persons during 1964–99 would have taken place regardless of the transition.

To the extent there is a link between schooling (length and depth) and the size of school-age cohorts, the main impact of the demographic transition in its initial stages is on the educational level of the labor force. Next in importance is a change in the age structure of the labor force, consisting of a decline in the proportion of younger workers. The socioeconomic effects of the change in age structure of the labour force in China are mediated through the deleterious effect of the Cultural Revolution on education and training. A large proportion of birth cohorts over 1953–63 (aged 37–47 in 1998) missed out entirely on post-basic education and training. Because of the interaction of the demographic transition and labor retrenchment in the state sector, China faces a potentially serious problem of long-term employment among older workers.

As a result of the demographic transition, the composition of the dependent population is shifting away from children toward elderly population. This has significant distributive implication because of the difference in the sources of financial support for children and elderly persons. Urban households would feel the financial impact of the rising elderly population largely in the form of higher taxes (including social security contributions) rather than in the form of direct financial support for elderly parents. In contrast, rural households would feel the impact of the changing age structure of the dependent population largely through direct expenditure on children and elderly relatives.

The period between 1982 and 1999 has seen a substantial change in the size distribution of households. The average household has shrunk in size from 4.5 in 1982 to 3.5. This is important because the distribution of the population into households has a significant impact on the

household expenditure pattern. Controlling for PCE, smaller households spend more on food per capita than do larger household. This is of particular significance in the context of a developing economy where adequate nutrition is an important consideration.

NOTES

1. The fertility data from the 2000 population census, which would provide an accurate estimate of the TFR, were not available at the time of writing.

2. The same could also have been true for the 1980s, but the fertility pattern in the 1980 is colored by the return of urban youth sent down to the countryside in the 1970s.

3. The current official retirement age in China is low by international standards, ranging between 50 and 60. The actual retirement age is a distribution rather than a number and the choice of 60 as the benchmark retirement age does not affect the argument here.

REFERENCES

Brown, L. (1994). *Who will feed China? A wake-up for a small planet*. New York: W.W. Norton.

Coale, J., & Freedman, C. (1993). Similarities in the fertility transitions in China and three other East Asian populations. In R. Leete, & I. Alam (Eds.), *The revolution in Asian fertility—dimensions, causes and implications*. Oxford: Clarendon Press for International Studies in Demography.

Cutler, D. M., Poterba, J. M., Sheiner, L. M., & Summers, L. H. (1990). An aging society: opportunity or challenge. *Brookings Paper on Economic Activity, 1*, 1–78.

Deaton, A. (1997). *The analysis of household surveys*. Baltimore: Johns Hopkins for the World Bank.

Demeny, P. (1996). World population growth: trends and prospects, 1960–2020. In B. Colombo, P. Demeny, & M. F. Perutz (Eds.), *Resource and population*. Oxford: Clarendndon Press.

Dréze, J., & Sen, A. K. (1989). *Hunger and public action*. Oxford: Clarendon Press for WIDER.

Feeney, G. (1996). Fertility in China: past, present, prospects. In W. Lutz (Ed.), *The future population of the world—what can we assume today?* London: Earthscan Publications for International Institute for Applied Systems Analysis.

Hull, T. H., & Yang, Q. (1991). Fertility and family planning. In J. Wang, & T. H. Hull (Eds.), *Population and development planning in China*. Allen and Unwin Australia for International Population Dynamics Program, Sydney.

Leete, R., & Alam, I. (1993). *The revolution in asian fertility—dimensions, causes and implications*. Oxford: Clarendon Press for International Studies in Demography.

Li, C. (1992). *A study of China's population*. Beijing: Foreign Languages Press.

Milwertz, C. N. (1997). *Accepting population control—urban Chinese women and the one-child policy*. London: Curzon Press for Nordic Institute of Asian Studies.

SSB (1982). *1982 population census statistics*. State Statistical Bureau, Beijing.

SSB (2000). *China population statistics yearbook 2000*. State Statistical Bureau, Beijing.

SSB (2001a). *China statistics yearbook 2001*. State Statistical Bureau, Beijing.

SSB (2001b). *China labour statistics yearbook 2001*. State Statistical Bureau, Beijing.

World Bank (1997). *China 2020*. World Bank, Washington DC.

World Bank (2001). *World development report 2000/ 2001*. World Bank, Washington DC.