Demography India
Vol. 18 (1989), pp. 201-209

P. M. Kulkarni

Regional Variations in Fertility in China — The Role of the Minority Population Factor

THE results of the 1982 census in China and the data generated by the one-in-thousand survey that was conducted at about the same time have given convincing evidence of a remarkably rapid fertility decline. There has, however, not been a consensus among demographers on the relative importance of socio-economic development and the official population policy and programme in effecting this decline. Some analysts have argued that the government birth planning programme has been the principal factor in achieving the fertility decline in China, especially in the rural areas (Bongaarts and Greenhalgh 1985; Wolf 1986; Whyte and Gu 1987). Some social scientists and demographers, while not denying that an important contribution has been made by the birth planning programme, have argued that the recent decline need not be attributed solely to it (Tien 1984; Poston and Gu 1987). This argument is supported by the existence of substantial variations in fertility among China's regions which would not have been the case had the programme been implemented in a mechanical and monolithic fashion. Further, regions with a high level of socio-economic development exhibit relatively low fertility. Regression analyses by Birdsall and Jamison (1983) and Poston and Gu (1987) have shown that some indicators of socio-economic development do have significant negative effects on fertility.

At this stage, an important question that needs to be addressed is: whether there are factors, other than socio-economic, that are causing the inter-region variations? Through the late 1970s and the early 1980s, the provinces which consistently showed high fertility (total fertility rates near or above 4) are: Guizhou, Ningxia, Guangxi, Qinghai, Xinjiang, and Yunnan. Though the rankings differ from year to year, and one or two other provinces fall in the high range occasionally, the six provinces listed above can be clearly identified as regions with high fertility. And in each of these over one-fourth of the population belongs to minority nationalities (unfortunately, comparable data on fertility are not available for Xizang, which has the highest minority concentration). Data from the one-per- thousand survey show that the minority nationality population as a whole had substantially higher fertility as compared to the Han population (Sheng Li 1984). Poston's analysis of contraceptive practice in sub-regions of China also showed a high inverse relationship between minority population proportion and contraceptive use (Poston 1986). Clearly, minority proportion is a potentially important contributor to regional variations in fertility.

The level of concentration of minority population could affect fertility independently of socio-economic development possibly because of certain cultural factors and because the official birth planning programme had given some concessions to minority populations. At the same time, the regions with high minority population are likely to be at a lower stage of socio-economic development, and hence have a higher level of fertility. Therefore, it would be useful to assess the net effects of socio-economic and minority population factors on fertility. This has been attempted in this paper.

Minority Nationality Regions

Minority nationalities in China are not necessarily racial groups, rather they are cultural and linguistic groups differentiable from the majority Han population (for a description, see Orleans 1972 and Poston and Shu 1987). Though the share of minorities in the total population of China is quite small, about 6.7 per cent, given the size of the Chinese population the minority population total is nearly 70 million, outnumbering most of the countries in the world. There are a large number of minorities, and they do not form a homogeneous group. The largest single group is Zhuang (over 13 million), followed, in order of population size, by Hui, Uygur, Miao, Manchu, Zang, Mongol, and many others. They are concentrated in the outlying provinces (autonomous regions are also labelled as provinces here) with high minority population are: Xizang (Tibet), Xinjiang, Qinghai, Guangxi, Ningxia, Yunnan, and Guizhou, in that order.[1]

Before proceeding further, it would be useful to know whether the minority regions were characterised by high fertility even in the past. The data on fertility in provinces provided by Coale and Sheng Li (1987) from the one-per-thousand survey fertility histories can be used for this purpose. The data are considered to be of fairly good quality and the sample sizes in provinces were quite large (for details, see Coale 1984; Coale and Sheng Li 1987; Banister 1987). A scan of the trends (Table 1) reveals that from 1945 up to the mid 1960s, the minority regions did not necessarily exhibit high fertility.[2] During the late 1960s, however, there was a notable rise in the level of fertility in the minority provinces (more specifically, in the rural parts of these). Further, during the 1970s, the fertility decline in the minority areas was not as rapid as that in the Han-dominated areas. Thus, the high (higher than average) fertility among provinces with large minority concentrations is a new phenomenon that has emerged with the onset of fertility transition in China. The reasons for this, therefore, must be sought in the present programme and socio-economic settings.

1 There are 29 major administration units in the area that is currently under the jurisdiction of the People's Republic of China—21 provinces, 5 autonomous regions, and 3 large municipalities. Seven of these have high minority concentrations: Xizang (95 per cent of the total population belongs to minority nationalities), Xinjiang (60 per cent) Qinghai (39), Guangxi (38), Ningxia (32), Yunnan (32), and Guizhou (26). Of the remaining regions, only Inner Mongolia (16 per cent) has a moderate minority population: in the remaining provinces, the share of minorities is less than 10 per cent.

2 Barclay et al. (1976) and Wolf (1984) have given information on interregional variations in fertility in pre-revolutionary China from tabulations of the 1929-31 Chinese farm survey data.. The survey, however, did not cover the western and northern portions of China which have high minority concentrations.

Role of Socio-economic Development and Minority Population in Fertility Variations: The Model and the Data

The conceptual framework that has guided this analysis is given in Figure 1.

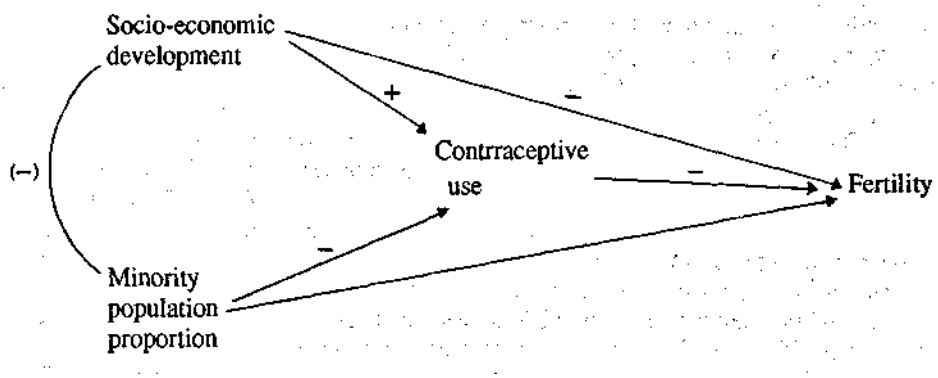

Figure 1. A Model Used to Study the Relationship Between Socio-economic Development, Minority Population Proportion, and Fertility.

TABLE 1 : TRENDS IN TOTAL FERTILITY RATES IN PROVINCE GROUPS WITH DIFFERENT LEVELS OF MINORITY NATIONALITY POPULATIONS

Period	*Province Group*		
	A	*B*	*C*
1945-49	5.03	5.14	5.54
1952-56	5.81	5.94	6.15
1964-68	6.66	6.20	3.13
1971-75	5.81	4.44	2.09
1977-81	4.16	2.60	1.40

SOURCE: Computations based on the total fertility rates given by Coale and Sheng Li, 1987.

Notes: 1. Province group A: Six provinces/autonomus regions with high (over 25 percent) minority population: Xinjiang, Qinghai, Guangxi, Ningxia, Yunnan, Guizhou.
Province group B : Nineteen provinces/autonomus regions with low (less than 25 per cent) minority population: three municipalities are excluded
Province group C : The three municipalities, Beijing, Tianjin, Shanghai.

2. For each province, the median TFRs in each of the periods were first computed: the unweighted means of these median values are given in the table.
3. The period 1957-63 is ignored because the large fluctuations during this are not relevant here.

Socio-economic development is expected to affect fertility mainly through contraceptive use, and the direct path from socio- economic development to fertility is to take into account the residual effect of factors such as late marriage associated with development Both the direct and the indirect effects on fertility are expected to be negative. The inclusion of the development factor in the model requires no explanation here since the effect of development on fertility is well recognised in demographic literature.

The minority population proportion is postulated to have a negative effect on contraceptive use and, through it, a positive effect on fertility. It is possible that certain cultural practices associated with the minorities are not conducive to the adoption of contraception. But in the context of the Chinese programme, a more important point is that special concessions have been given to minority nationality populations in the implementation. In Chinese policy statements, there is a frequent mention of the sparsely populated regions and the small size of the minority populations. In the early stages, the minorities were either exempted altogether from the birth limitation programme or allowed to have their own rules. Even as recently as in 1983, there were debates on whether at least the large minority groups or those residing in urban areas should be subject to the same rules as the Hans (for details, see Banister 1987: 248 ff). Some very recent regulations (cited by Hardee-Cleaveland and Banister 1988) indicate that certain exemptions continue to be given to the minorities. Thus the negative path from minority population to contraceptive use is, at least in part, dictated by Chinese policy measures. It is also postulated that there is a negative association between socio-economic development and minority population proportion. Since the effect of socio-economic development on fertility is expected to be negative, part of the total effect of minority proportion on fertility would be jointly with socio-economic development. Finally, a residual path linking minority population proportion directly to fertility has been provided without hypothesising any sign for it.

Data on a number of socio-economic factors are available at the province level from the publications of the Chinese State Statistical Bureau and many indices based on these are given by Poston and Gu (1987). These include measures of industrial production, employment in non-agricultural sectors, per capita peasant expenditure on food, clothing, etc., and literacy. Given the high degree of intercorrelation, it was decided to choose a small number of key variables as indicators of socio-economic development. The variables selected for this purpose are: female literacy (percentage of females of age 12 or more that are literate) and urbanisation (percentage of population living in urban areas). Since the focus of this paper is on the role of the minority population factor vis-a-vis socio-economic development, no attempt has been made here to interpret the effects of the two indicators individually. They are used, jointly, as proxies for socio-economic development and the effects examined as such.

The variable used to measure contraceptive practice is simply the contraceptive use rate, i.e., percentage of married fecund couples who were contracepting in 1981, called BCRATE by Poston and Gu (1987), and fertility is measured by the total fertility rate in 1981.

3. Some variations in the choice of variables as well as in the conceptual framework were attempted as will be noted later.

- 4. Total fertility rates 1981 are given by Coale and Sheng Li (1987) from the fertility histories of the one-per-thousand survey. These correspond very closely to the figures given by Poston and Gu which are used here.

Minority nationality proportion is obtained from the 1982 census data for each province.ions are treated as minorities. A list of variables is given in Table 2, and the zero-order correlation matrix in Table 3. Since data on some of the variables are not available for Xizang, the analysis is based on the remaining 28 provinces.

TABLE 2 : LIST OF VARIABLES USED IN REGRESSION ANALYSIS

Description	*Mean*	*SD*	*Source*
Urbanisation: Percentage of population living in urban areas (in 1982)	25.81	15.55	Poston and Gu (1977)
Female literacy: percentage of females of age 12 or over who are literate (in 1982)	55.80	13.07	Poston and Gu (1977)
Minority population: percentage of population belonging to minority nationalities (in 1982)	10.68	15.36	State statistical bureau (1982)
Contraceptive use rate: Percentage of fecund couples of reproductive age using contraception (in 1981)	77.66	9.02	Poston and Gu (1977)
Fertility: Total fertility rate (in 1981)	2.69	0.83	Poston and Gu (1987)

TABLE 3 : ZERO-ORDER CORRELATION COEFFICIENTS BETWEEN THE VARIABLES USED IN THE MODEL

	Urbanisation	*Female literacy*	*Minority population proportion*	*contraceptive use rale*	*Total fertility rate*
Urbanisation	1.0				
Female literacy	0.700	1.0			
Minority pop. prop.	0.141	-.222	1.0		
Contra, use rate	0.350	0.488	-.774	1.0	
Total fertility rate	-.586	-.600	0.765	-.859	1.0

SOURCE: See Table 2.

Results

Table 4 gives the results of the regression analysis carried out to estimate the paths in Figure 1. Only the standardised regression coefficients and the R^2 values are given. The coefficients are first obtained by suppressing the minority population variable. Thus Equation 1 shows that urbanisation and literacy jointly explain only about 24 per cent of the variation in contraceptive use. The net effect of female literacy is moderately high, but

urbanisation has little direct effect on contraceptive use. Inclusion of the minority population variable (in Equation 2) leads to a large increase in R^2, from 0.24 to 0.70. The net effect of minority population is very high and negative (standaridised regression coefficient=-.700). Thus, even when controlling for the two given indicators of development, minority regions tend to have substantially low use of contraception. Clearly, the low use of contraception among minority regions is mainly the effect of minority characteristics *per se* and not attributable to the presumed low level of development in these regions. Moreover, as can be seen from Table 3, though socio-economic development and minority population proportion are negatively correlated, the relationship is quite weak (the zero-order coefficients are not significantly different from zero).

TABLE 4 : SOCIO-ECONOMIC DEVELOPMENT, MINORITY POPULATION AND FERTILITY : RESULTS OF REGRESSION ANALYSIS (STANDARDISED COEFFICIENTS)

	Dependent Variable					
	Contraceptive Use Kate		*Total Fertility Rate*			
	Eql	*Eq2*	*Eq3*	*Eq4*	*Eq5*	*Eq6*
Urbanisation	0.017	0.037	-.313***	-.330***	-.325	-.344***
Female literacy	0.477*	0.307	-.020	-.089	-.373	-.210
Minority pop. prop.	-	-.700 ***	-	0.393***	-	0.670***
Contr. use rate	-		-.739***	-.396***	-	-
R^2	0.24	0.70	0.83	0.89	0.41	0.84

Notes : 1. Eq. 1,3, and 5 are run without the minority population variable.
2. *, **, ***, indicate that the corresponding regression coefficients are significant at 10%, 5%, and 1% level respectively.

In the equation for total fertility rate, a large portion of the variation is explained (R^2 = 0.83 in Equation 3) even when the minority population variable is suppressed. But most of this is the contribution of contraceptive use rate. Female literacy has negligible direct effect. The introduction of minority population (Equation 4) brings about a much smaller improvement in R^2. The net effect of contraceptive use rate, however, falls notably from -0.739 to -0.396. The direct effects of urbanisation, contraceptive use, and minority population are significant and of the same order of magnitude, the first two negiative, and the last one positive, and the effect of female literacy is negligible. The indirect effects of development and minority population variables on fertility through contraceptive use can be computed from the co-efficients of Equations 2 and 4. Such an effect of minority population proportion is sizeable (- .700 x -.396 = 0.277); but parallel effects of urbanisation (.037 x -.396=-.015) and female literacy (.307 x-.396 =-.122) are much smaller.

In an alternate analysis (results not shown), proportion married was included as another intermediate variable to explain fertility, but neither the/? value nor the coefficients of other variables changed notably. It appears that the form in which this variable w;-n available is not very helpful. Similarly, inclusion of infant survival as an endogenous variable did not change the findings materially. Use of some other indicators of socio-economic development, in addition to or instead of the two used above, did neither increase R^2 substantially, nor erode the effect of the minority variable.

Finally, the effects of socio-economic and minority factors on fertility were explored by dropping the intermediate variable altogether from the model. The two socio-economic indicators together explain 41 per cent of the variation in TFR (Equation 5), but the inclusion of the minority variable increases the *R* value substantially *(R* = .84 in Equation 6).

Thus, the regression results indicate that the minority population variable makes a major contribution to variations in contraceptive use and fertility. The higher the minority population the lower is the use of contraception leading to higher fertility. Moreover, even when controlling for contraceptive use rate, the minority proportion has a direct positive effect on fertility. This is probably due to a lower age at marriage among the minorities. It has been observed that marriages take place earlier among the minority populations than the Han (Bignang and Qingping 1984). It is also likely that users of contraceptives among minorities are older than Han users on an average and hence the fertility impact of contraceptive use is relatively less among the minorities. Better information on nuptiality and contraceptive use pattern would have aided the interpretation of the observed direct effect on fertility.

Discussion

The fact that there are large regional variations in fertility in China clearly shows that the Chinese birth planning programme, however strong, has not been implemented in a rigid manner to bring about near uniform fertility behaviour in the population. But to what extent are the variations in socio-economic development across the regions of China responsible for the fertility variations? The preceding analysis shows that though certain development indicators do appear to be depressing fertility, a considerable portion of the inter-province variation is attributable to minority population proportion. Controlled for the level of development, regions with high minority concentrations tend to have low contraceptive prevalence rate and high fertility. Clearly, the fertility in minority population regions is high not only because these regions are at a low level of development but mainly because of certain factors related to the minority nationality nature itself. Besides, until the 1960s, the minority population areas, taken together, were not characterised by high fertility. What has been observed is a more recent phenomenon that corresponds to the introduction of the birth planning programme. It is possible that some minority characteristics hinder the introduction of contraceptives and the acceptance of the small family norm. But a more likely explanation is that the Chinese programme has operated in a different manner in the minority areas allowing the fertility to remain at a relatively high level.

The special status of the minority nationalities, and the importance of not forcing Han norms on the non-Han populations have been repeatedly stressed during the Chinese liberation struggle as well as after the formation of the People's Republic. The birth planning programme, in line with the overall policy towards the minorities, has also adopted a more liberal approach in the minority areas. Minorities are exempted from certain disincentive schemes and minority and sparsely populated regions are allowed to set the family size norm at a higher level. This has apparently led to relatively low prevalence of contraceptives and high fertility in these regions.

It is not that *all* minorities have high fertility. As noted earlier, there are variations across minorities as well, and some, notably the Koreans and the Manchus, have very low fertility. These groups are also advanced in terms of literacy and are concentrated in the relatively more developed north-eastern region. But over time, probably because of migration as well as assimilation, the share of minorities in this region (which was popularly known as Manchuria) has fallen with the result that it may no longer be considered as a minority region. Special policies for minorities are less relevant here and presumably not employed. On the other hand, the concentration of minorities is higher in the western and southern provinces, the minorities in these regions are generally less advanced in terms of socio-economic development and therefore these provinces would be candidates for certain exemptions. The liberal policies have probably operated mainly in these provinces allowing the fertility to remain moderately high and thus contributing to regional variations.

Finally, the role of socio-economic factors. Even when controlling for the minority proportion, as done in the present analysis, indicators of socio-economic development have shown a negative though small effect on fertility. Some analyses at the individual level (Freedman et al. 1989; Wang 1988) have also shown that these factors do influence fertility even in the presence of a strong programme like China's. But, as observed by Wang, the effect has become weak over the years. Thus, though fertility behaviour is not uniform across individuals or across regions, socio-economic variables do no longer play a major role in explaining the variations.

Conclusions

Large inter-province variations in the level of fertility have emerged in the course of the recent rapid fertility decline in China. The analysis in this paper shows that a major part of these variations is explained by the minority population factor rather than by socio-economic development. Therefore, using the presence of regional variations in fertility as an evidence of the role of socio-economic development in the fertility transition in China would tend to overrate the importance of such a role. This is not to understate the part played by socio-economic development in Chinese fertility transition. It is possible that the socio-economic changes that have been brought about in China since the liberation provided a setting conducive to the successful implementation of the birth planning programme. But the differential impact of the programme across the provinces may be attributable more to a liberal implementation in the minority population areas than to regional variations in the level of socio-economic development.

References

Banister, Judith, 1987. *China's Changing Population,* Stanford, Standford University Press.

Barclay George W., Ansley J. Coale, Michael A. Stoto, and T. James Trussell, 1976. A reassessment of the demography of traditional rural China, *Population Index, 42:*606—135.

Bignang, Shen and Ma Qingping, 1984. Recent nuptiality of rural women of Han and minority nationalities, in *Analysis of China's One-per-Thousand population Fertility Sampling Survey* (English edition), Beijing, China Population Information Centre: 131—4.

Birdsall, Nancy and Dean T. Jamison, 1983. Income and other factors influencing fertility in China, *Population and Development Review, 9:* 651-75.

Bongaarts, John C. and S. Greenhalgh, 1985. An alternative to the one-child policy in China, *Population and Development Review,* 11:585-618.

Coale, Ansley J., 1984. *Rapid Population Change in China, 1952-1982,* Washington D.C., National Academy of Sciences.

_____, and Chen Sheng Li, 1987. *Basic Data on Fertility in the Provinces of China, 1940-1982,* Honolulu, East-West Centre.

Freedman, Ronald, Xiao Zhenyu, Li Bohua and William Lavely, 1988. Local area variations in reproductive behaviour in the People's Republic of China: 1973-1982, *Population Studies, 42:*39-57.

Hardee-Cleaveland, Karen and Judith Banister, 1988. Fertility Policy and Implementation in China 1986-88, *Population and Development Review,* 14: 245—86.

Orleans, Leo A., 1972. *Every Fifth child: The Population of China,* Stanford, Stanford University Press.

Poston, Dudley L., Jr., 1986. Patterns of Contraceptive Use in China, *Studies in Family Planning,* 17: 217-27.

_____, and Jing Shu, 1987. The demographic and socio- economic composition of China's ethnic minorities, *Population and Development Review,* 13:703—22.

Poston, Dudley L.. Jr. and Baochong Gu, 1987. Socioecpnomic development, family planning and fertility in China, *Demography,* 24:53—51.

Sheng Li, Chen, 1984. Fertility of women during the 42 year period from 1940 to 1981, in *Analysis of China's National One-per-ThousandpopulationFerlility Sampling Survey* (English edition), Beijing: China Population Information Centre: 32—58.

State Statistical Bureau, 1982. *The 1982 Population Census of China (Computer Tabulation),* Hong Kong.

Tien, H. Yuan, 1984. Induced fertility transition: impact of population planning and socio-economic change in the People's Republic of China, *Population Studies,* 38:385-400.

Wang, Feng, 1988. The roles of individual's socio- economic characteristics and the government family planning programme in China's fertility decline. *Population Research and Policy Review, 7:*255—76.

Whyte, Martin King and S.Z. Gu, 1987. Popular response to China's fertility transition. *Population andDevelopment Review,* 13: 471-93.

Wolf, Arthur, 1984. Fertility in pre-revolutionary China, *Population and Development Review,* 10:44—70.

Wolf, Arthur, 1986. The pre-eminent role of government intervention in China's family revolution, *Population and Deve.lnnment Review, 12:* 101-16.