Introduction

Concern with below-replacement fertility first emerged in Europe in the 1930s. At the end of a steep decline in marital fertility that had begun in most of western and central Europe in the last third of the 19th century, total fertility fell below two in several countries, and in many urban areas, even in countries whose national fertility remained above replacement level. This was a cause of great alarm to governments wherever it occurred, raising the spectre of absolute declines in population size in the near future (Teitelbaum and Winter 1985). Dire economic and political consequences were predicted for countries whose populations failed to replace themselves (Reddaway 1939). The postwar baby boom of the 1950s and early 1960s generally erased such fears, but they have returned, albeit in somewhat less strident form, over the last two decades. Ever since the 1930s the concern with low fertility has been strongest within developed countries and especially in Europe. The theoretical frameworks used to explain such low fertility have been, therefore, almost exclusively oriented towards conditions in the rich world.

Today however, we are rapidly moving into a world in which below-replacement fertility is common in both developing and developed countries. As is shown below, 50% of the world’s population now live where total fertility is 2.3 or less. Given the pace of fertility decline in most countries, it is virtually certain that a majority of the world’s people will live in places where fertility is below the level of long-run replacement by 2010, probably by 2005. This radical change to the demographic regimes of developing countries calls for a fundamental reassessment of fertility theories. Since below-replacement fertility will soon be a very general phenomenon, it cannot be explained solely in terms of factors that apply mostly or solely in developed countries. We must broaden our theoretical frame so as to encompass explanations for very low fertility in a wide range of economic and social circumstances. This paper is a first step towards such a re-orientation.

Rather than consider the issue of low fertility in terms of a demographic transition model, the paper uses the notion of demographic convergence as its organising principle. The concept of
convergence lies at the heart of demographic transition theory. However, as Oeppen (1999: 11) puts it, “Despite this, there seems to have been no attempt to address convergence in a formal way.” This is in marked contrast with economics, where quantitative assessments of convergence form a central part of modern economic growth theory (Barro and Sala-i-Martin 1999, Jones 1997, Landau et al. 1996). Oeppen’s work on life expectancy and that of Chesnais (1997) are among the few papers to deal with convergence explicitly, while Heuveline (1999) considers the consequences of convergence on a regional and global scale. The present paper builds on results presented in Wilson (2001) to consider the theoretical implications of the global convergence in fertility that has occurred since 1950.

The paper begins with a consideration of the data available for the study of convergence, before going on to assess the scale and nature of convergence in fertility since 1950. It then considers two case studies of below-replacement fertility in two developing country populations that stand as examples of the “unlikely” circumstances under which very low fertility can occur. The cases chosen for detailed examination are the capital city of Ethiopia, Addis Ababa, and the most socially and economically disadvantaged group in Kerala State, India, the Scheduled Castes. The paper concludes by outlining the main implications for theory of the observed trends and suggesting directions for future theoretical development.

Data on convergence in fertility

Of all the data collection and production tasks carried out by the various organisations of the United Nations, none is more helpful to a demographer looking to assess long-term trends than the regularly-revised *World Population Prospects* (United Nations 1999). For sheer comprehensiveness, few documents in any field of social science compare with these volumes. For almost every member state of the United Nations (only countries with tiny populations are treated separately), and a number of other territories (184 entities in all in the 1998 Revision), the work gives detailed demographic estimates from 1950 on, as well as making projections for future populations. The validity and utility of the projections as a forecasting tool can be debated (NRC 2000), and forecasts beyond 2005 are not used in this paper. However, the value of the comprehensive estimates of demographic variables for virtually all nations and territories over the last fifty years is beyond dispute. The inherently egalitarian nature of the process (at the national level) is exemplified by the fact that all states and territories receive equal treatment in the main tables. Iceland (with a population in 2000 of 268,000) occupies the same space, and on the immediately preceding pages, as India (where the population exceeds one billion). This provides a level of coverage of demographic estimates that has few, if any, parallels in other aspects of social
or economic life. Thus, the most recent version of the *World Population Prospects*, the 1998 revision, is used as the basis for most of the results presented in this paper.

As any scholar who has examined the *World Population Prospects* soon realises, however, the quality and extent of the basic information from which the UN’s demographers derive their estimates is highly variable. For most of Europe, North America, Australasia and Japan there are abundant and accurate resources in the form of census and vital registration data for the whole period since 1950. However, the situation in much of the rest of the world is less favourable. Almost all developing countries have problems with their data for the early decades under consideration, and a large fraction still lack fully complete vital registration. The lack of data reaches extreme levels for very poor countries that have also suffered from extended internal conflicts, such as Angola or Afghanistan. In spite of the fact that a good deal of the basic input remains problematic, the authors of the *World Population Prospects* manage to produce internally-consistent and plausible estimates for all countries from 1950 on. Scholars may debate the accuracy of many of the specific statistics, but the broad patterns in the levels and trends of fertility are almost certainly beyond dispute. In any event, many of the assumptions and estimates for the earliest dates, for which there is the greatest uncertainty, are unlikely ever to be subject to serious challenge, as the absence of primary data means that the true situation will never be known. Thus, in the large majority of cases, the UN’s estimates are probably the best available for the earlier decades under consideration here.

When dealing with more recent estimates, there is a possibility that so large an enterprise as the *World Population Prospects* may lead to some tardiness in revising estimates according to rapidly changing circumstances. Examination of national estimates does indeed suggest a certain homogenising tendency, in which the diversity of individual country experience is somewhat muted. For example, earlier revisions of the estimates seem to have been slow in integrating very rapid declines in fertility, such as that seen in Iran since the mid-1980s, and discussed in his paper for this meeting by Jalal Abbasi-Shavazi. However, the overall picture that emerges from the UN’s work is very similar to estimates made by other organisations. For example, the Population Reference Bureau (PRB) draws on a variety of sources, but especially on the work of the US Census Bureau’s International Division, in making its estimates of current demographic trends. When comparing estimates of total fertility for the year 2000 made by the UN and the PRB there is a difference of less than 0.2 children per woman in the weighted average of all nations (Population Reference Bureau 2000). However, no other organisation produces such comprehensive tabulations.
of its estimates for so long a period as the UN. All in all, the comprehensiveness and accessibility of the UN’s estimates outweigh any quibbles over specific estimates.

Within this general picture, two countries deserve special attention. The sheer scale of the national populations of India and China intrudes into any attempt to summarise the state of the world’s population. In 1950 China’s 555 million inhabitants comprised 22 percent of humanity, while India’s 358 million made up 14 per cent. In 2000 the giants represented 21 percent and 17 percent. Any consideration of cumulative population, as presented in this paper, becomes unavoidably discontinuous if India and China are retained as entities. A graph of the kind presented in Figure 1, for example, takes on a “step-pyramid” appearance. Fortunately the two behemoths are among the better-documented parts of the developing world. Thus it is possible, with only modest recourse to assumption and interpolation, to assess the demographic characteristics of China’s provinces and India’s states for much of the last fifty years. The Registrar General of India provides data on the main states of India throughout this period, and fertility surveys are relatively abundant for the 1980s and 1990s. In addition, a number of scholars, mostly notably Bhat et al. (1984), have analysed the official data in order to extract the most plausible estimates for the larger states before the 1980s. These secondary sources can be drawn upon to provide reasonably solid estimates of total fertility for periods in which the official data are scanty. Data on China’s provinces are also fairly solid and readily available. Coale and Chen (1987) provide a provincial level analysis of fertility based on the results of the 1982 One-per-Thousand survey, while recent official statistics and Chinese secondary sources can fill in the period since then. Taking a broader perspective, compared with the truly heroic scale of the assumptions that underlie the United Nations’ estimates for some developing countries, the extent to which we need to interpolate or adjust the Indian and Chinese data is modest. Details of the sources and assumptions used to estimate the regional information used in this paper are given in Appendix 1.

Although the approach taken in this paper, of treating the states of India and the provinces of China as equivalent to nations, is not conventional, it does have merit. Firstly both countries have a good deal of regional variation in their demographic characteristics that is lost when a strictly national perspective is taken. Moreover, the resultant entities are scarcely small. For example, if the Indian state of Uttar Pradesh were an independent nation, it would today be the fourth most populous on Earth (assuming China and India are disaggregated), with more inhabitants than Pakistan or Russia. China’s most populous province for the last half century, Sichuan, has recently been divided into two, but using the definition that applied from 1950 to 1997, it is home to more than 120 million people. This would be the ninth largest population in the world, and substantially
more than Nigeria, for example. In fact, in the data arrangement used here, of the 25 most populous entities in 2000, 13 are pieces of India or China. Similarly, of the 50 largest populations, 25 are subdivisions of the two giants. All in all, the pieces of India and China are in many respects readily comparable with other nations. One result of taking this disaggregating approach is that no individual element constitutes a particularly large fraction of the world’s total population. The United States is the largest element, constituting 6.3 percent of the total in 1950 and 4.6 percent in 2000.

**Results**

Figure 1 plots out the changes over time in total fertility for the global population, presenting cumulative proportions of the world’s population experiencing given levels of fertility. The graph is arranged so that falls in fertility move populations from left to right across the figure; this involves using a reversed scale. The results are plotted for 1950-55, 1975-80 and 2000. The graph also shows horizontal lines representing the median and upper and lower quartiles of the world’s population. Table 1 investigates the cumulative distributions further, giving the 10th, 25th, 50th, 75th and 90th percentiles.

In order to flesh out the details of change more fully, Figure 2 presents essentially the same information in the form of histograms while Table 2 provides the data that are plotted there. Table 2 and Figure 2 distinguish between developed and developing countries and the former Communist states of the Soviet Union and Eastern Europe. Any definition of developed and developing nations is in some degree arbitrary. However, the fundamental differences in the respective histories of the First, Second and Third Worlds over the last 50 years justifies the trichotomy. In this article, “Communist” is defined as the Soviet Union and all European countries ruled by Communist parties in the Cold War era. The “Developed” category comprises everywhere else in Europe (not including Turkey), along with the United States, Japan, Canada, Australia and New Zealand. “Developing” is everywhere else.

The change over time is striking, with the curves in Figure 1 shifting from a convex to a concave pattern. The line for 1950-55 rises rapidly at high levels of fertility, indicating that large proportions of the world’s population experienced these conditions. At that time, the median human lived in a country or region where the total fertility was 5.4 children. After this initial rise, the 1950s curve flattens off, with relatively few populations having fertility in the range 3.5 to 5 children per woman. The line rises again to the left, as the populations of the more developed nations enter the cumulation. In short, as Figure 2 makes clear, in the early 1950s there were two distinct fertility
regimes: developed and developing. To the right of the figures are almost all the populations of Europe, North America and Australasia, with total fertility below 3.5. To the left, the majority of the world’s population lived in developing countries with high fertility. Few people lived in places where fertility fell between these two regimes.

Figures 1 and 2 and Tables 1 and 2 about here

By the later 1970s, change was already substantial. By then the populations of the world were located along an almost linear gradient in terms of fertility, and the median individual lived where total fertility was 3.6. After a further two decades of demographic transition, the curve for 2000 delineates a world that has been transformed. Today the median individual lives in a country or region in which total fertility is 2.3. Given the extent to which fertility has been declining in almost all countries, it seems virtually certain that a majority of the world’s people will live in places where fertility is below the level of long-run replacement by 2010, quite possibly by as early as 2005. In these countries and regions the only significant population growth to be expected in the course of demographic transition is that occasioned by demographic momentum (Bongaarts and Bulatao 1999).

It is also noticeable that the right-hand end of the fertility distribution has moved from almost exactly two to little above one. In only one country was total fertility below two in 1950 (Luxembourg with 1.98), whereas in 2000 almost 40 percent of humanity lived where the TFR was below two. As is evident from Table 1, in the early 1950s almost no country had fertility below the replacement level; the 90th percentile was 2.5, and the upper quartile almost 3.5. As mentioned above, the median value in 1950-55 was 5.4 children per woman, while more than a quarter of the world’s population lived in places where the TFR exceeded six. By 2000 the situation had been revolutionised. The median is now close to the replacement level and the lower quartile (3.2) is actually below the value for the upper quartile half a century earlier. Only ten percent of people live in areas where the TFR is above 4.8, compared with 63 percent in the early 1950s.

A further aspect of the situation in 2000 is evident when examining Figure 2. Today it is difficult to make any clear distinction between developed and developing countries in terms of their fertility, and many developing country populations are to be found intermingled with the developed nations at the right hand side of the figure. For example, fertility in the Indian states of Kerala and Tamil Nadu, as well in such countries as Sri Lanka and Thailand and much of China, is below that in the United States. As the paper for this meeting by Abbasi-Shavazi indicates, recently collected
data from Iran indicate that it has joined the growing ranks of countries with total fertility below two. In short, we are moving into a world in which the distinction between developed and developing countries is of greatly diminished relevance to fertility. It is certainly true that no developed country is to be found in the left-hand tail of the distribution, but the overwhelming trend is for low fertility to become a general feature of both poor and rich countries alike.

While the main conclusion to be drawn from this exercise is certainly that convergence in fertility is substantial, even in 2000, a significant tail of high-fertility populations remains to the left of the graph. Similarly, Table 1 indicates that the value for the 10th percentile has declined by a smaller proportion than the higher percentiles. In other words, while most of the developing world has moved rapidly towards convergence with the developed world, a significant minority remains with much higher fertility. In fact, roughly 1.4 billion people live in countries or regions in which total fertility is 3.5 or higher. A regional breakdown of this 1.4 billion is revealing. By far the largest contributions to this group come from Sub-Saharan Africa and northern parts of the Indian subcontinent. Both these zones contribute more than 550 million to the population with total fertility of 3.5 and above, with smaller contributions from a few countries in Latin America, the Middle East, South-East Asia and the Pacific. Although comprising less than a quarter of the world’s population, in any of the UN’s future scenarios, the remaining high-fertility regions provide the majority of the population growth expected for the next fifty years. It is not surprising, therefore, that addressing the reproductive health needs of these segments of the world’s population remains of the highest priority for international population policy. However, the definition of high fertility today serves to indicate the scale of change; 3.5 children per woman was scarcely regarded as “high” fertility in the early 1950s, when only 25 percent of the world’s population had a TFR below this level.

In order to gain insight into the phenomenon of very low fertility in poor countries the following sections investigate two such examples: the capital city of Ethiopia, Addis Ababa and the most socially and economically disadvantaged groups in Kerala state in India, the Scheduled Castes.

**Case study 1: Addis Ababa, Ethiopia**

Ethiopia is, by any standards, a very poor country, with very low levels of most development indices at the national level. GNP per head for its 64 million people is among the lowest in the world, life expectancy is 46 and fewer than ten percent of women use modern contraception. Moreover, there has been no effective national family planning programme. Not surprisingly, in this
context, the total fertility rate is over six children per woman. Yet in the capital, Addis Ababa, fertility has fallen so rapidly over the last twenty years that it is now below the replacement level. This extraordinary contrast is the largest urban-rural fertility differential ever recorded.

Figure 3 shows the trend in total fertility in Addis Ababa from 1970 to 1994 derived from the 1984 and 1994 censuses by own-children methods. After an initial rise from about five to six, fertility fell steadily to below two in 1994. Kinfu (2000) has analysed this phenomenon in detail, using all available data. He demonstrates convincingly that the fall is genuine, and not the result of some artefact in the data. Moreover, he also provides information on the proximate determinants of this remarkable fertility pattern, and on its institutional context. Table 3 shows a pattern of change in nuptiality that would have delighted Thomas Malthus. Between 1967 and 1995 the female singulate age at marriage (SMAM) rose by more than seven years to 26.5, while for males, for whom the SMAM was already over 26 in 1967, the value rose to 33.6 in 1994. Expressed in terms of Coale’s $I_m$, (a weighted index of proportions married) this amounts to a fall of almost 50 percent, from 0.6276 to 0.3191. Alternatively, expressed as Bongaarts’ index of marriage, $C_m$, the value for 1995 is 0.36. Thus, a remarkable shift in nuptiality has played a crucial role in the development of below-replacement fertility in Addis Ababa. In addition to delayed marriage, increased contraception has been a significant, if secondary, factor, with the Bongaarts’ index of contraceptive use, $C_c$, standing at 0.63 in 1995. In contrast, induced abortion plays a negligible role. As Kinfu (2000, 74) puts it, “The transition to low fertility was mainly a ‘Malthusian transition’, led by both non-marriage and delayed marriage rather than by high contraceptive use.”

What can explain the emergence of this pattern of low fertility in a very poor country like Ethiopia? In order to answer this question we need to investigate the institutional context within which reproduction occurs. In turn this requires an awareness of the cultural traditions and political history of the country.

“The origin of these institutional changes is to be found in the country’s 1974 revolution. The revolution instituted measures that fundamentally altered the nature of society and the country’s economy, including the rights and limits to property ownership, the structure of opportunity and of access to services particularly where relevant to reproduction (such as education, employment and housing), ideas on gender equality and the role and relevance of traditional forms of power relations and social control in the area.” (Kinfu 2000, 75).
In the context of this brief paper there is no space to review in detail the social and economic transformations wrought by Ethiopia’s Marxist rulers after 1974. However, a brief summary is needed. Broadly speaking, within Addis Ababa the Marxist government instituted many of the social and economic changes that were characteristic of Communist governments worldwide. Access to education and basic health care was increased, women were encouraged to break traditional inhibitions on education and labour force participation, and all aspects of the economy were taken under government control. While the improvement in the ‘social agenda’ of health, education and gender equity led to changes in aspirations and values, the poor performance of the economy created numerous practical difficulties, notably significant unemployment and an acute shortage of housing. People responded to these changes and challenges by delaying marriage and, to a lesser degree, by increasing the use of family planning. The nuptiality changes draw on a long-standing tradition in Ethiopian society, especially among the Amhara (the dominant ethnic group in Addis Ababa), that emphasises the need for newly-married couples to form a separate household. Fertility outside of marriage is strongly discouraged, and can be regarded as negligible for practical purposes. The similarity of these arrangements to those of traditional western European family organisation is striking; Thomas Malthus would have approved of the chosen response, if not of the political ideology that generated the conditions for its adoption.

In contrast with the transformation of fertility in Addis Ababa and some other urban areas, rural Ethiopia remains a place of very high fertility. In the countryside there has been much less increase in education and health care provision, and such economic changes as did take place under the Marxist government may have worked to promote fertility. For example, land was redistributed to peasant households solely according to family size. With limited change in the circumstances of everyday life and no sign of ideational change, there has been little or no move towards lower fertility in rural areas. There is also relatively little return migration from Addis Ababa to rural Ethiopia, further restricting the impact of social change away from the city.

To sum up, Addis Ababa presents a remarkable ‘Malthusian’ fertility transition. It serves an example of the diversity of circumstances under which below-replacement fertility can emerge. Even in a country in which fertility in general is high and largely unchanging, very low fertility can occur in specific contexts.
Case study 2: The Scheduled Castes of Kerala, India

The South Indian state of Kerala is famous among demographers for the speed with which its fertility has fallen over recent decades. This has happened in spite of the fact that the state's GDP per head and level of industrialisation have remained low, even compared with the rest of India. In general, explanations for these changes have tended to regard Kerala as a homogenous entity, and paid little attention to internal differentials. However, studying differential fertility in Kerala provides insights of considerable value. In particular, fertility is lowest among the most socially and economically disadvantaged group in Keralan society, the Scheduled Castes. These are the former “untouchables” of the traditional caste system. Thus, not only is Keralan fertility low (the TFR is 1.8), but for Scheduled Castes it is even lower (their TFR is 1.3). This reversal of normal expectations requires careful examination, as it may have implications for fertility theory more widely.

In addition to the educational and health reforms for which it is famed, Kerala also has a number of other distinctive characteristics. For example, in the 1970s it implemented the most successful land reform of any Indian state, and since that decade its people have been remarkably migratory, with large numbers of Keralans now living and working abroad, especially in the countries of the Persian Gulf. There has also been an unprecedented transformation of the traditional caste system of social stratification. The combined effects of migration, land reform and the reduction of caste-derived discrimination have produced a social system in which occupational and status mobility is a feasible ambition for all groups. These changes have led to an especially rapid transformation of fertility among the formerly most disadvantaged groups in Keralan society, the Scheduled Castes. Although the origins of the social category now given that title go back centuries, the specific term is of recent coinage and refers to the Scheduled Caste Order. This is a list of specific groups who are entitled to benefit from a variety of affirmative action programs, such as quotas of reserved places in employment and education, and soft loans. This Schedule was originally promulgated by the British Government of India in 1936, but the term Scheduled Castes only became widely used after Independence. The terms *Harijan* and “untouchables” are also used to denote the same groups of people. As the former untouchable castes of Hinduism, the Scheduled Castes of Kerala are thus among the most disadvantaged groups in Keralan society. In India as a whole, the Scheduled Caste population according to the 1991 census was 138.2 million, 16.7 per cent of India's total. In 1991 in Kerala they accounted for 9.9 per cent of the total population, 2.9 million people.

Pallikadavath and Wilson (2001) study one specific Scheduled Caste group, the Vettuvans of Engandiyour village in the central coastal region of Kerala. Economically and
socially, the village is typical of much of Kerala, while the Vettuvans can be regarded as broadly representative of the Scheduled Caste population. Like all Keralans today, this group is universally educated and enjoys excellent health facilities compared with any other developing country population. Land reform has also given the Vettuvans the land on which their homes are built, though rarely any more than this (the median area of land owned is less than 1/10 acre or 400 square metres). There has been some occupational mobility, away from unskilled labouring and into skilled or semi-skilled work, but as a group they remain extremely poor. The scale of their poverty can be grasped by the limited ownership of household items: only 44 percent of households own a chair, 32 percent own a table, 14 percent have a fan. Most home are thatched with palm leaves and only 30 percent are connected to the electric grid. These are poor people by any standards.

Fieldwork carried out in 1997 showed that this group had a total marital fertility rate of 2.0 and a total fertility rate of 1.2. This extremely low fertility is based upon a remarkable, almost elemental, reproductive regime. This can be summarised as follows: get married, have two children quickly and then get sterilised. In the small study population fertility is concentrated into just three female age groups. No women had children before age 20 or after 35. A larger sample would probably have found somewhat greater diversity of age pattern, but not much. There is no childbearing before or outside marriage, and the mean age at marriage is 23.9 for women. The reason for the zero fertility rates at older ages is apparent in Table 4, which gives the current users of family planning according to the method they use. In a large majority of couples beyond age as 35 one or both partners has been sterilised. The level of sterilisation must be one of the highest seen, comprising virtually all contraceptive use at any age, and literally all at higher ages. The resulting age at sterilisation is also possibly the youngest ever reported. 25.5 for women and 28.4 for men. What can explain why this extraordinary fertility pattern has been adopted by the Vettuvans? In order to answer this question we need to understand parental motivations in childbearing and its relation to social mobility.

The idea that social mobility and fertility are related has a long history in demography. As far back 1890 (in what might be thought of as the prehistory of modern demography) Arsène Dumont proposed the concept of “social capillarity” to explain why the upwardly mobile in nineteenth century France had few children. More recently Kingsley Davis’ idea of “multiphasic response” in demography (Davis 1963) developed the discussion of a mobility-fertility linkage. In the empirical sociological literature, mobility and fertility have been regarded as linked through such factors as social isolation, stress, status enhancement and relative economic status (Bean and
Swicegood, 1979). Other demographers, in studying fertility in developing countries have emphasised security goals (Cain 1977, 1981). Security and mobility can be thought of as two sides of the same coin. Parents aspire to achieve the best outcomes possible for themselves and their children. In some contexts stability and security is the best that can realistically be hoped for, whilst in other social settings mobility is a viable prospect. The approach taken here follows the suggestions and example of Greenhalgh (1988) in emphasising the value of children to parents in achieving society-specific mobility goals. What factors are influencing the Vettuvans’ childbearing in this way? In addition to the institutional changes in Keralan society already discussed, it is also essential to consider the nature of their family system and the aspirations of parents.

The Vettuvan family system is based on a patrilocal stem family, with strictly partible patrilineal inheritance. In other words, all sons are expected to inherit on an equal basis, while daughters marry out and become part of the households of their husbands. Although this clearly disadvantages females in terms of inheritance, whether or not the system can be termed patriarchal is open to question. Daughters are clearly highly valued, and there is little or no evidence of discrimination during childhood in favour of sons. However, there are very different expectations of, and thus aspirations for, the two sexes. Sons are seen as the key to financial security, providing security for old age. In contrast, while daughters provide non-material assistance to elderly Vettuvans, their role is seen as principally providing domestic, rather than monetary, support. For both sexes, education is seen as the key to advance. For sons it is the means to gain a job in a higher-status activity, while for daughters it is an essential pre-requisite for a good marriage. Thus, all Vettuvans interviewed expressed a very strong commitment to the education of their children. A commitment matched by the financial support of children during their education. In interview, 60 percent of parents said they expected to support their sons’ education “As long as they can study”, whatever the cost, while 51 percent felt the same commitment was appropriate for daughters.

However, while parents had high aspirations for the occupational and social mobility of their children, severe constraints exist, limiting the scope for the number of children they can hope to provide for. With strict partibility, the tiny landholdings of the Vettuvans raise great difficulties if parents have more than one son, as there is limited scope for division. Similarly, a large number of daughters would place a huge financial burden on parents, given the current marriage and dowry practices. Traditionally Vettuvans did not pay dowry, and marriage was not generally arranged, rather a young couple eloped for a period, enabling parents to avoid any significant
marriage costs. However, this practice, with its connotations of poverty, has been abandoned in recent decades in favour of elaborate marriages and huge dowry payments. Thus, parents face the classic dilemma of a quantity-quality trade-off in an extreme form. One son and one daughter are seen as highly valuable, but two or more of either sex would be problematic.

To investigate this further, Vettuvan parents were asked a series of interview questions concerning the benefits and disadvantages of having one son or more than one son, and one daughter or more than one daughter. Given the virtually orthogonal expectations concerning the nature of support from the two sexes there would be no value in asking about the number of children without specifying sex. Parents consistently pointed out the value of one son and the difficulties faced if parents had more than one. Disputes over property were the single largest difficulty foreseen for a family with more than one male heir. In analogous fashion, one daughter was deemed highly valuable, but two or more raised difficulties, with dowry costs the main negative factor. Tables 5 and 6 summarise the information collected on parental perceptions of the costs and benefits of sons and daughters. The distinctions could scarcely be more apparent.

Questions of ideal family size are often hard to interpret; as Lesthaeghe et al (1981:170) noted, they may be “rather slippery pieces of information”. In the Vettuvan case, these expressions of value must be seen as much more than theoretical. Having had two children, in the large majority of Vettuvan couples either the husband or the wife, or both, are sterilised. There could scarcely be a clearer expression of the rigidity of the perceived constraints on their childbearing. The Vettuvans are one small group in one country. Moreover, institutional arrangements impinge upon them with unusual clarity. But their example highlights some general issues that are considered in the final section of this paper.

**Discussion and Conclusions**

This paper has ranged over a wide intellectual terrain, from considerations of global trends to the specific institutional contexts that determine fertility in two poor populations in developing countries. The case studies serve to exemplify the global pattern. We are moving into a world in which low fertility is the norm of experience for rich and poor nations alike. This has considerable implications for fertility theory. To date the overwhelming majority of the literature that aims to explain below-replacement fertility has focussed on developed countries. This focus needs to be broadened. Within the near future more people will live in developing countries with total fertility below two than in the developed world. Thus our explanations of the phenomenon need to encompass the widest possible range of economic circumstances. The trend towards low fertility is
so general today that the most plausible assumption for the future is that it will become a universal feature. In short, there is no society anywhere in the world whose social and economic circumstances are inimical to the establishment of low fertility. However, as the case studies show, within this broad global trend there can be great diversity in the immediate institutional determinants of fertility. Our theoretical models need to recognize the simultaneously global and local nature of fertility trends.

If we consider the process of demographic transition in the light of broader modernisation theory, it is clear that social and demographic change has progressed far more rapidly than economic development. A large majority of the world’s population is (or soon will be) demographically “modern” by any definition. It will be a very long time indeed before a majority will be rich. Indeed, the title of a review of long-run change in income per head (Pritchett 1997) suggests that economic trends are best described as “Divergence, big time.” In contrast with the enduring economic gulf between rich and poor countries (Maddison 1995), many aspects of the social agenda of development, particularly education, have shown a considerable narrowing of the gap between developed and developing counties. The demographic convergence outlined here can, perhaps, be seen as one dimension of that increasing social similarity. However, a comparison of the demographic changes outlined in this paper with trends in literacy (UNDP1999) and urbanization (UN 1995) indicates that those dimensions of development have shown slower rates of convergence than is seen for fertility.

In sum, while huge economic gaps remain between rich and poor countries, we are moving into a world in which that distinction is of diminishing demographic relevance. A final set of simple comparisons can serve to illustrate this observation. In 2000 total fertility in the United States was 2.1, compared with a global median of 2.3. In contrast, GNP per head in 1998, calculated on a purchasing power parity basis, was $30,600 for the United States, while the global median was $3,030 (World Bank 2000, India 1998, Liu et al 1996). The challenge for fertility theory is to explain why low fertility is now a feature of both rich and poor societies. It is likely that this will necessitate the adoption of different explanatory models from those with which demographers have addressed this issue to date.
Appendix 1 – Data organization

Demographic series
Estimates of total fertility in the United Nations’ publication World Population Prospects: the 1998 Revision form the basis of the results presented in this paper (United Nations 1999). For all countries and territories given in that volume, except for China and India, this is the sole source of data on fertility. The estimates total fertility given there for 1950-55 and 1975-80 are used directly. The data for 2000 are an average of the values given for 1995-2000 and 2000-05. By this means it is hoped to arrive at estimates of fertility as close as possible to the current situation. In order to weight each country by its population, the paper uses the estimates made by the United Nations for 1950, 1975 and 2000.

China and India are handled differently. As mentioned in the text, the paper uses data for the provinces of China and the states of India. The process by which the national data were disaggregated into these regional components involves drawing on a variety of sources and making a number of assumptions. It is hoped that that these inevitably somewhat arbitrary assumptions do not introduce any major distortions into the overall results. The disaggregation of both India and China uses the UN’s national estimates for each country, as used for all other countries, as the targets for the summation of the regional figures. Thus, for example, the UN estimates that total fertility in China in 2000 was 1.82. When the provincial estimates were made, I ensured that the weighted average of the provinces matched this target, in order to ensure comparability with the UN estimates.

The regional estimates for India were based on several sources. The population of each state was taken from census results, with an interpolation between 1971 and 1981 made to provide a 1975 estimate. No estimates for total fertility for the 1950s were available, however, the crude birth rate (CBR) is available for each of the larger states (India 1973). Since the correlation between total fertility and the crude birth rate is usually high, these CBR estimates were used to estimate the fertility in each state, relative to the all-India figure of 5.97 given in the UN estimates. Total fertility estimates for the 1970s, again for the larger states, were taken directly from Bhat et al (1984). Information for later dates is readily available from the Sample Registration System and the National Family Health Surveys (Gandotra 1998, India 1999).

The largest basic deficiency in the Indian data used here is the lack of information for many of the smaller states and territories until relatively recently. For example, of the seven states of
North-East India, I was able to find official estimates of total fertility for the 1950s and 1970s only for Assam. Similarly, estimates were only available for the recent period for most of the Union Territories, Himachal Pradesh and Goa. Information on the state of Jammu and Kashmir was also very limited, presumably because of the political and military situation that has prevailed there for much of the last half-century. Fortunately, the total population within these areas of limited data availability is small compared with the rest of India. Thus the states for which estimates are readily available constitute between 94 and 96 percent of the total population at the three dates used in this paper. In this light, the impact of the assumptions made to estimate fertility for these smaller states is limited. The strategy chosen was to assign to each of the missing cells an estimate based on the crude birth rate, where available. When even a crude rate was missing, the state was given the same value as the state whose fertility most closely matched the missing population at the next date. When no suitable comparison state was available, the all-India value at the date in question was used.

The population of each of China’s provinces was taken from Yao and Yin (1994), and fertility estimates from Coale and Chen (1987), Peng (1991) and Yao (1995). In order to estimate TFR for 2000, the most recently available provincial data in Yao (1995), for 1990, were reduced pro rata by the ratio of the national TFR in 1990 (2.31) to the UN estimate for 2000 (1.82). This assumption of homogeneous change over the 1990s is unlikely to be valid, but at the time of writing I had no information available upon which to base a more judicious adjustment.

Urbanisation, literacy and GNP per head

Although not presented in detail, the paper also makes reference to the scale of convergence in other aspects of social and economic development. Data on urbanisation and literacy were taken from United Nations publications, and from the national census results and statistical yearbooks of India (UN 1995, UNDP 1999). Chinese data on these aspects of development come from Fan (1995) and Yao and Yin (1994). In order to calculate the cumulative GNP per head, I took national purchasing power parity estimates from the World Development Report 2000. Estimates for the states of India come from the Government of India’s Economic Survey 1997-98, and Chinese province-level data from Liu et al. (1996). As with the demographic series, the intra-country GNP estimates were scaled pro rata by the size of each region’s population, to ensure that the national total equalled the value for China given in the World Development Report. Strictly speaking the Chinese and Indian data are not fully adjusted for purchasing power differences, as they do not reflect regional price differentials within China and India. However, no internationally comparable
regional data were available. Moreover, it is unlikely that the biases thus introduced are significant compared with international differences in purchasing power.

References


