

Chapter 2 The Determinant Factors of Fertility

This chapter explores theoretical explanations for the causal mechanisms of fertility decline. Key forces behind the recent fertility decline including social, cultural and economic factors are emphasized.

The underlying assumption of demographic transition theory is that economic development, industrialization, urbanization, and changes in social values and norms are preconditions to fertility transition (Notestein, 1953; Caldwell, 1982; Srikantan, 1982). Other factors to be emphasized as determinants of fertility transition are morality decline and the migration and the onset of mortality decline is generally regarded as the starting point in the analysis of fertility transition (Nerlove and Schultz, 1970; Schultz, 1973). It is argued that a profound shift in values and attitudes regarding marriage, lifestyle choice, parenthood and gender revolution are the driving forces behind the dramatic changes in the fertility behavior.

2.1 The Cultural Factors and Fertility

Cultural factors affect the level of fertility. In western societies, reproductive behavior involves some utility maximization in childbearing decision-making by individuals or couples. By contrast, in societies like China, where family-centered collectivism is the norm, it is not the cost-utility theory of economics but the traditional culture embedded in the patrilineal joint family system that can explain unprofitable reproductive behavior (Fei, 1999).

Cultural support for high fertility, even if not wholly or any longer economically rational, was central to Notestein's theory. Some of his followers often spoke of cultural props. Notestein (1945) wrote: "any society having to face the heavy

mortality challenges of the premodern era must have high fertility rates in order to survive. Religious doctrines, moral codes, laws, education, community customs, marriage habits, and family organizations are all focused toward maintaining high fertility. These phenomenon changes only gradually and in response to the strongest stimulation”. [Notestein \(1953\)](#) also argued that these arrangements are strongly supported by population beliefs, formalized in religious doctrine, and enforced by community sanctions. They are deeply woven into the social fabric and are slow to change.

2.1.1 Religion and Fertility

[Caldwell \(1999\)](#), examining what he regarded as the surprisingly late fertility decline in Victorian England, concluded that the advent of the decline had been postponed both by an inability of partners to discuss contraception and by the related failure to invent and market suitable contraceptives, a situation brought about by an adherence to what was perceived as Christian family morality. Christianity made interpretive pronouncements about parenthood and childbearing. These doctrines were usually fashioned to influence cultural attitudes among the people where the churches flourished. The Eastern Orthodox Church viewed marriage and sexual relations primarily as a means for procreation of children. Any form or method of contraception was condemned as evil.

In ancient Hebrew Culture, the bearing of many children was viewed as evidence of divine approval and blessing ([Jennings, 1970](#)). A simplistic explanation for this attitude is to attribute it to obedience to God’s injunction to Adam, “be fruitful and multiply” which was reiterated to Noah, and to Jacob.¹ Such thinking promoted a rapidly expanding population to foster an abundant society where a man was

¹ See <http://quod.lib.umich.edu/cgi/r/rsv/rsv-idx?type=DIV1&byte=1801>.

surrounded by many children to care for him in old age, to expand flock and field, and to increase the tribe's population with numbers and prosperity for strength and security in the nation. This attitude also met the concern to preserve the family name and lineage, thereby insuring inheritance continuity which is a theme that reinforced the abundant society goal, for to fail to have offspring to carry on the family name was a misfortune imperiling the social structure.

In Catholicism, marriage became a sacrament intended to sanctify married activity primarily for producing offspring (Jennings, 1970). While permission was given to couples to practice the rhythm method for contraception, the Roman church condemned "artificial" contraceptives in maintaining that coitus is ultimately justifiable only for begetting children. Protestantism originally shared Roman Catholic views by opposing birth control by contraception. However, the tendency has been increasingly to view marriage as a function for companionship and parenthood with the conclusion that the former does not require the latter to justify marriage relations.

According to Fagley's survey (Fagley, 1960), outside of predominantly Christian communities, religious views and cultural settings affecting human fertility vary considerably. Among Hindu and Buddhist peoples there are few religious or legal restrictions preventing artificial means of birth control. The portentous population growth in countries like India and China are due to other cultural factors; contraception is legal and sterilization is usually allowed on both social and eugenic grounds.

The pro-fertility patterns rest upon a cultural system where children are much desired for having labor services relating to employment on the land when the children are young. Having numerous children also enhances parental prestige as much honor is ascribed to large families.

2.1.2 Family Tradition and Fertility

A woman's fertility is influenced by a large number of factors: her education, her wealth and income, where she lives, who she marries, etc., and of course, her preferences over family size. The latter, as shown in [Fernández and Fogli \(2005a\)](#), have a systematic component that depends upon the woman's heritage (i.e. her parents' country of origin). Although economists have long stressed the importance of incentives for human behavior, it is only recently that there has been rigorous work showing that incentives operate within a framework given not only by markets, but also by institutions and, as a small but growing literature aims to show, by culture.

[Fernández and Fogli \(2005b\)](#) pointed out that it is not only personal experience (as reflected in the number of siblings a woman has) that matters to a woman's fertility, but also that her culture (as embodied in the TFR in her country of ancestry) plays a role. Using several years of the GSS, [Fernández and Fogli \(2005b\)](#) found that even after controlling for various characteristics and family background of a woman, both her own personal experience and her culture play a role in influencing her fertility.

Kin altruism appears to influence an individual's evaluation of the reproductive decisions of other people. Industrialization introduced cheap mechanized means of transport and allowed family members to pursue economic opportunities great distances from their place to birth. Family members began to spend less time with each other as opportunities for employment and education outside the home develop ([Notestein, 1945](#)). Individuals with wider social networks are the first in a population to adopt family limitation ([Axinn and Barber, 2001](#)). Reproductive decisions that limit family size might be adaptive in environments in which resources are restricted ([Mace, 1998](#)).

2.1.3 Son Preference and Fertility

Limitation of family size was considered extremely risky because of an awareness of the possibility that all one's children might die. The rare cases of an entire family perishing were widely reported and long remembered. According to [Caldwell and Caldwell \(1997\)](#), these attitudes to reproduction were underpinned by remnants of ancient religious beliefs in which gods or ancestors were concerned with continuance of the family. High fertility was seen to be not only a divine reward but also evidence of correct behavior. People who did not have a son to perform the correct burial rituals become unhappy wandering ghosts. Thus, even if raising many sons was extremely costly, the cost of not having a surviving son was incalculable in cultural terms.

Son preference is one of the oldest issues in societies in South Asia and developing countries ([Abeykoon, 1995](#)). A common perception of preference for a son over a daughter was the ascribed ability of sons. Sons were more desirable because they could contribute more to family income, provide adequate support to parents in old age; carry on the family name and impose minimal financial burdens on their parents ([Shah, 2005](#)). Traditional ideological views such as “appreciate male and depreciate female”, “have a son to carry on the family name”, and “having a son is in accordance with filial duty”, are major reasons why sons are still preferred in Chinese society.

When a woman married into a family, her major responsibility was to have at least one son. If she failed to do so, she should be harshly treated by parents-in-law and face great social pressure from relatives and friends. Women without sons may feel inferior in their kinship relations and their status position at home is dependent upon their ability to bear children, especially a son. Once the goal is achieved, her

position at the new family will be ensured.

However, an increasing number of young people and couples express no gender preference in their desire for children. Some even consider daughters to be more favored as they think that daughters provide better companionship, and are more likely to take care of parents when they are old.

Cultural differences can also be a significant influence on the status of women. While women still face many socioeconomic obstacles in Southeast Asia, the situation is quite different from the patriarchal societies of East and South Asia. Southeast Asian kinship systems are typically bilateral with equal importance attached to the husband's and wife's families. For the most part, there is no strong gender preference for children in Southeast Asia nor are there strong requirements for a wife to reside with the groom's family after marriage. Cultural variables are difficult to quantify, especially at the micro level, which makes it difficult to estimate their relative role in shaping fertility levels and change, but it seems likely that greater freedom for women to pursue nonfamilial roles and to influence household decision making have been important factors in the region's rapid fertility decline.

2.2 The Social Factors and Fertility

A demographic transition starts with a decline in mortality while health improvements allow people to live longer. In developing countries, improvements in public health, especially through vaccinations, antibiotics, and antimicrobials, combined with improved sanitation and safer water, have helped increase life expectancy significantly. The most significant impacts are on the health of children which produces falling levels of infant mortality. In contrast to Malthusian theory, demographic transition is completed as fertility also begins to fall. When parents realize that newborn babies are much more certain to survive to adulthood, they

devote themselves to their careers and they choose to invest more in their children, offering each child higher standards of education, health care, and nutrition. They therefore seek ways of reducing fertility, through contraception, later marriage, and changing family structures.

2.2.1 Modernization, Globalization and Fertility

Hoffmann-Nowotny (1987, 2001) has sketched a useful framework for the understanding of developments in fertility and family formation. The framework integrates macro-sociological, macro-sociological, and economic theories. At the macro level, demographic changes are largely a consequence of societal changes, often labeled as “modernization”. The conditions of modernity imply diminishing constraints and an increase in behavioral options. Strong normative pressures to become a parent have weakened; effective contraception has opened up the possibility of choosing a “child-free” life. Individuals and couples dispose of a set of resources: biological resources, economic resources, socio-cultural resources (educational status, nationality, political or religious affiliation), and social-psychological resources (socialization, self-perception, social integration). Resources are linked with beliefs, values, and norms. Facilitators and restrictions influence the behavior of individuals and of couples. Examples of such facilitators and restrictions are economic conditions (e.g. costs of rearing a child, family allowances), social stratification (social class which may stimulate or prohibit childlessness) and bio-technological opportunities (assisted fecundity to solve problems created by involuntary childlessness).

Within this theoretical perspective, modernization is understood to lead to a partial loosening of structural ties. Traditional binding orientations, such as religion, become weaker. Actors are confronted with an increasing volume of options. At the same time, the openness of modern societies promotes an achievement ideology and a

climate of competition. As a consequence, more frequently people tend to consider alternative routes to self-fulfillments than parenthood.

A tide of globalization and the movement of capital and people around the world have influenced population dynamics through effects on economic restructuring, job opportunities, spread of medical technology, women's status, value orientation, and other conditions that affect fertility, mortality and migration (Kim, 2005). Globalization is therefore a broader concept. One of the most salient features of globalization has been the internationalization of labor markets, especially in highly skilled areas. This has been partly driven by demographic necessity whereby fertility decline has meant a drastic reduction in the numbers of locals entering the labor market (Hugo, 1998). However it also has been driven by globalization which is leading to increased competition among OECD nations for skilled people who can contribute significantly to national prosperity. The result has been an increased focus on skilled workers as the expense of traditional motherhood roles.

There are decisions which have been significantly effected by globalization. Moreover globalization has facilitated the spread of Western cultural practices an exposed them to different ways of doing things. Undoubtedly this has seen them challenge many traditional authority structures and perhaps also experience disorientation caused by the dilemmas of day to day experience of clashes between traditional and modern values and norms (Sheng, 2004).

2.2.2 Old-age Security and Fertility

In the Barro and Becker model, parents have children because they perceive their children's lives as a continuation of their own. Barro and Becker (1989) suggest, on the basis of a partial equilibrium analysis, that a growing lump-sum social security system should lead to a decrease in fertility and an increase in the capital-output ratio;

on the other hand, a social security system financed with a tax on labor income may lead to an increase in fertility when the cost of raising children consists mostly of time.

In the [Boldrin and Jones' \(2002\)](#) framework, parents procreate because the children care about their parents' utility, and thus provide their parents with old age security or caretakers. This is a formal implementation of what a number of researchers in demography would call the "old age security" motivation for childbearing. When this motive dominates, one would intuitively expect that higher social security benefits lead to lower fertility. In this model, increases in the size of the public pension system always decrease fertility, regardless of the type of costs incurred to raise the children and of the lump-sum nature of the tax. Since government provided pensions are a larger portion of retirement savings for families at the low end of the income distribution our results are also consistent with the empirical finding that fertility has declined more for those individuals.

[Boldrin et al. \(2005\)](#) found the effect on fertility in Barro and Becker model depends on whether child rearing costs are primarily in goods or in time, but that the size of the effect is always very small. In the Boldrin and Jones model increases in the size of the public pension system always decrease fertility, regardless of the type of costs incurred to raise the children. They also found that, in the Boldrin and Jones model, access to capital markets has important quantitative effects on fertility choices, and could potentially, account for as much of the change in fertility seen in developed countries over the last 70 years as the increase in the size of Social Security systems.

2.2.3 Marital Status and Fertility

Trends in fertility rates are also affected by marital status of mothers. While information is sparse, in most countries married women have a higher fertility rate

than unmarried women. As the share of women that are unmarried has increased over time, this may be expected to have depressed total fertility rates. However, childbearing patterns of non-married women have also changed significantly over this period. One manifestation of these changes is the increasing importance of birth outside marriage, as a share of all births. More than half of all births occur today outside marriages in the Nordic countries, as compared to 1 in 10 in 1960; the same share is close to 45% in France, and to 35% in the United States and other OECD countries; much lower shares are observed in Southern Europe and Japan (D'Addio and Mira d'Ercole, 2005).

Attempts to attribute fertility decline in the developing countries typically try to separate out the impact of increasing ages at marriage and falls in fertility within marriage. But the experience of the developed countries suggests that where marriage is concerned, what might eventually have a greater impact on TFR is not later marriage as much as non-marriage. Delayed marriage not only push up the mean age at childbearing but also change period fertility rates.

In many parts of the below-replacement fertility world, and especially in those countries in which TFR has fallen to unusually low levels even by sub-replacement standards, increased levels of non-marriage are an important reason for low TFR. That is, it is not so much that marital fertility levels have descended to unprecedented lows as the fact that fewer women are contributing to these TFR because a larger number of women are not getting married at all. High levels of non-marriage are of course important in observed fertility declines primarily in societies which frown upon cohabitation outside marriage is rare in the Mediterranean countries (Basu, 2003).

Couple attitudes regarding pregnancy wantedness determine the number of children. Most research focuses on women's attitude. The proportion of women desiring to stay childless or to have only one child is generally low while the choice of

having two children remains by far the most popular. Women prefer more children than they actually realize. The gap between desired and achieved fertility suggests that the existence of a welfare problems for individuals, and the scope for policies to help couples meet their desires.

Cohabitation grew while marriage receded, and having babies in consensual unions became increasingly acceptable. The onset parenthood, partly in response to longer education of both men and women was pushed to this century and mean age of childbearing increased. Permanent voluntary childlessness spread in most developed countries. These trends contributed to or accompanied a rapid reduction in fertility ([Lesthaeghe and Surkyn, 2002](#)). Growing individualism, changing tastes and expectations, diminishing religiosity, economic independence of women and gender quality seem to be important reasons for changing marital status in many countries.

2.2.4 Education and Fertility

[Macunovich \(2003\)](#) considered education is also seen as a significant factor. Researchers tend to find a U-shaped effect of education on fertility: both low and high levels of education produce relatively high fertility, while middle levels result in the lowest levels of fertility. Although this may seem counterintuitive, the explanation given is that the first few years of education contribute to women's basic knowledge of nutrition, the causes of disease, and the functioning of their own bodies, and as a result produce a healthier population in which mortality and morbidity levels are reduced and women's fecund ability rises. Middle levels of education enable women to understand and accept a wider array of contraceptive methods. And at the highest levels of education it is possible that high wages give them the ability to purchase low-cost replacements for their own time with children.

However, education may also affect demand for children through a change in

preferences and the supply of children may be changed by improved health and diet (Honda, 2000). Some demographers thus hold that the lowering of the death rate, including infant mortality, is the main determinant of the decrease in fertility because when death rates are high, the supply of surviving children often does not meet demand, even if fertility is high. But when survival increases, the supply of children exceeds demand unless there has been a decrease in fertility. In this case the negative relation between education and deaths can help in the understanding of some of the effects of education on fertility. Furthermore, most of the regression studies (Easterlin, 1980; Becker, 1991) find that the level of education reduces fertility, but although these studies make significant contributions their weakness is that they attempt to make correlation equal causality.

Longer periods in education have increased the mean age of women at first childbirth and reduced the number of years in which they can have additional children. In addition, higher educational achievement has contributed to higher female labor force participation, changed their desires for children as compared to other goals, and provided them with greater autonomy in many spheres of life. Better educated women are also more aware of health problems and contraception technologies and thereby more capable of avoiding undesired pregnancies and births.

In general, increase in women's educational level and employment delay their age at first marriage, encourage the use of contraception (Moore, 1998), and improve women's status in family and society (Yadava and Yadava, 1999). All of these trends reduce fertility.

2.3 The Economic Factors and Fertility

The dynamic relationships between fertility and the economy have been of interest to economists at least since the time of Malthus' pioneering work in the late

eighteenth century. Among the reasons for such sustained interest in dynamic demographic-economic relationships are their important implications for understanding past, current and future economic development.

2.3.1 Malthus and Neo-Malthus

[Malthus \(1798\)](#) stated that “population increases in a geometric ratio, while the means of subsistence increases in an arithmetic ratio.” This observation Malthus connects to another: there are two principal hungers that nature has instilled in man, that for food and that for sex. Malthus was of the view that neither of these hungers could ever be quelled or controlled. That, in time, because of an ever increasing population rate, man will come up against a ceiling, one created by the fact that the world’s resources needed for life, are, limited. Once these resources are exhausted, or spoiled, life as we know it will come to an end. The essence of the doctrine is that the population level cannot keep increasing without, at some point, pressing on the limits of the means of subsistence. Ironically in 1997, population growing was fast than ever and kept on increasing with time passing while Malthus’ theory could not interpret the information during this period.

Those who believe we are running out of resources and need to act swiftly to prevent an eventual population and environmental apocalypse are often called neo-Malthusians. They acknowledge Malthus as the first spokesman for concern about overpopulation. Neo-Malthusians do not normally label themselves as such (the label is given by others), but they see themselves as Malthus’ intellectual descendants.

In their book *Betrayal of Science and Reason*, Paul and Anne Ehrlich state: “Ever since Reverend Thomas Malthus at the end of the eighteenth century warned about the dangers of overpopulation, analysts have been concerned about maintaining a balance between human numbers and the human food supply ([Ehrlich and Ehrlich,](#)

1996). That concern remains valid today. Humanity must recognize that “exponential growth never can go on very long in a finite space with finite resources” (Meadows et al., 2004) and therefore that growth must be curbed. On that basis, neo-Malthusians advocate short- and long-term policies.

In the short term, they propose government controls to restrain population and consumption. In *One with Nineveh*, Paul and Anne Ehrlich (2004) favor policies that promote birth control, remove explicit and implicit government incentives to have or maintain larger families, expand access to abortion services, and impose penalties on parents who exceed a mandated family size. They also want governments to bring market prices in line with the cost that, in their view, human consumption imposes on the environment (Ehrlich and Ehrlich, 2004).

These policies are designed to intervene directly in markets and private lives to bring incentives in line with sustainable values. Direct intervention is required, neo-Malthusians argue, because fundamental change in priorities takes a long time. The long-term neo-Malthusian policy goal is a change of heart. Human nature must be reformed by changing people’s values. The underlying genetic makeup provides the palette upon which human nature is formed, but it is given shape and form by culture—different sets of cultural values represent alternative paths of human evolution. Because humans can consciously choose to alter their values, people can change the direction of human evolution.

2.3.2 The New Home Economics Model

The model, first suggested by Becker is, in short, neo-classical microeconomic demand theory, which has incorporated household production theory and time allocation theory (Becker, 1965). The model has been further elaborated and important contributions are attributed to Mincer (1963) and Willis (1973). The focus

is on the household's decision-making and the way a couple decides what quantity and quality of children to have. The basic assumptions are rationality, which children are normal goods and, given the quantity-quality trade-off that parents attempt to get an optimal number of children that maximizes their utility (Becker, 1991). Parents also aim at having their children at an optimal point in time. Irrespective of whether parents expect net monetary returns or receive direct utility from their children, the demand for children is the same as the demand for producer goods or consumer durables. Given the costs and benefits of children, the relative prices of children as well as of other commodities, tastes and total household income; the household wishes to maximize its utility, subject to budget constraints. Over time, the net costs and benefits of children vary with production and consumption streams as well as with price movements.

Fertility decline is explained as a decrease in the demand for children, caused by an increase in the relative price of children partly ascribed to the cost of children of certain qualities, mainly ascribed to the increased opportunity cost of the mother's time in the rearing of children. The decrease in the demand for children is also ascribed to a change in preferences and an increased demand for children of higher quality. Mincer shifted the emphasis from income effects to substitution effects and suggested that the female wage could be used as a measure of opportunity cost in the model as price of time devoted to childrearing. The acknowledgement of the importance of parental time and especially the importance of the mother's time is important from a gender perspective. The number of children is negatively related to the value of women's time just as it is usually positively related to the value of men's time that is the wage rate or earnings of men (Becker, 1991). Therefore, in times of increasing female wages and/or female human capital investment, the price of children increases and in the face of a price rise there is an incentive to defer and to

postpone childbearing. [Willis \(1973\)](#) showed that the negative price effect of women's wages could offset the positive income effect, and thereby turn a positive relationship between income and fertility into a negative one if the economic contribution of working women increased.

Among tests on macro-level data, [Butz and Ward \(1977\)](#) analyzed period measures of fertility from 1921-1940 and 1948-1974 and found a negative relationship between women's wages and fertility and a positive relationship between men's income and fertility. Their results indicate that the driving force behind fertility movements is an increase in female wages. With increasing female wages and increasing female labor force participation, the negative price effect of an increase in female wages outweighs the positive income effect of increasing male incomes. Thus, the baby boom coincides with increasing male incomes and a low level of female labor force participation whereas the baby bust coincides with increasing female wages and female labor force participation, which means an increase in the opportunity cost of the time of women. Whether or not Butz and Ward did see the emergence of counter-cyclical fertility has been contested. It has been disputed whether procyclical fertility really was the historical rule ([Olsen, 1994](#)) and whether their data and methodology are to be relied upon ([Macunovich, 1995](#)).

2.3.3 The Easterlin Model

Easterlin's contributions broadened the theoretical view by incorporating demographic and sociological considerations by making a distinction between desired fertility and natural fertility ([Easterlin, 1975](#)) and by discussing taste formation and the way taste influences the demand for children. This offered a plausible resolution to the problematic relation between income and fertility.

In the Easterlin model, preferences are endogenous and the term relative

income, i.e. income in relation to material aspirations, is used to indicate shifts in preferences over time. With economic growth, each generation supposedly experiences increasing income and higher standard of living, yet temporary reversals occur due to economic as well as demographic fluctuations. The standard of living in the parental home sets the standard for material aspirations of the young. The prospects of a young individual are to a high degree determined by the relative size of the cohort to which he or she belongs, because the relative size of a birth cohort inversely affects the cohort's earnings potential in relation to material aspirations (Easterlin, 1980).

Young individuals belonging to a large cohort will meet an unfavorable future with tough labor market conditions, high youth unemployment and relatively low age specific wages. As the relative earnings potential of the young is reduced it will be hard to realize material aspirations. Individuals belonging to a large cohort tend to react to the gap between income and material aspirations and distinguish themselves, on an aggregate level, in relation to smaller cohorts, by increasing rates of crime, divorce and suicide. More frequently, they tend to adjust by postponing marriage and by postponing and reducing childbearing and increasing female labor force participation rates. Young individuals belonging to a small cohort will meet a more favorable future.

Butz and Ward (1977) also tested Easterlin's hypothesis. They found the hypothesized positive effect, but it was not consistent. Macunovich argue that Butz and Ward miss an indirect effect of relative income on fertility as they ignore relative income as a predictor of female labor force participation (Macunovich, 1996). The driving force behind fertility movements as well as behind changes in female labor force participation is, in the Easterlin model, the will of young individuals to meet their material aspirations. With large cohorts in childbearing ages and decreasing

relative prosperity of the young, female labor force participation increases and young couples postpone or reduce fertility, which results in low fertility. Following this reasoning, high fertility and baby booms coincide with relatively small cohorts of childbearing ages and relative prosperity of young people.

2.4 Summary

The determinants presented in this chapter show that the decline in fertility rates has many explanations. Low fertility is a widespread phenomenon and is expected to exist in the foreseeable future. This chapter investigates the cultural, social and economic factors of low fertility. Human behavior is hard to explain and predict. It is also difficult to clearly classify factors into three separate categories because these factors simultaneously interact with each other and blur the lines of classification.

This chapter has highlighted the root causes of the delay and decline in fertility rates. The theories discussed above show that in many respects economy, society and culture are inseparable. They cannot be used simply as dummy variables, because they may proxy important economic, social and structural elements. They proxy structures of institutions, and values that guide behavior and they facilitate communication, especially about intimate subjects.

Without a doubt, the factors discussed above are prominent conditions and underlying forces in fertility decline. When socioeconomic changes result in the decline of dominance over economic resources and affects social values and attitudes including the role and status of women, it creates the conditions necessary for fertility decline.