as access to legal abortion, child tax credits, or day care services indirectly influence fertility behavior.

Although the demographic transition theory has been widely applied, it has also been criticized extensively because of its Western-centric biases and its failure to account for myriad variations such as higher fertility levels, alternative forces associated with the decline in mortality, and social and cultural issues.[3] The failure of the demographic transition theory to explain differences in demographic events across countries has meant that its two key components (mortality and fertility) typically receive individual focus. This chapter looks at fertility, its determinants, and policymakers' ability to influence it. Complicating matters, however, is the fact that there is little agreement on what constitutes a desirable rate of population growth. Is it sufficient simply to replace the current generation? What are the political, economic, and social implications of below-replacement fertility? Can societies with below-replacement fertility, such as many European countries, survive politically and grow economically? In such countries, governments may actively promote fertility through **pronatalist** policies, typically by providing financial incentives to couples. Yet, how can governments speak of needing to increase fertility when there is an abundance of it elsewhere that could be used to augment growth in the developed world through immigration? Elsewhere, countries with rapid population growth will attempt to reduce fertility and slow population growth, with China's experiment at fertility control being the most widely known. Using both historical and current examples from the developed and the developing worlds, this chapter illustrates both the potential and shortcomings of fertility policy. The outcomes of both pronatalist or **antinatalist** policies are difficult to assess since fertility policies are often confounded by the unanticipated outcomes or effect of other policies. Every aspect of society influences fertility behavior. In turn, fertility and childbearing impact all of society. The interconnections are both minute and large, straddling political, economic, and social ideologies, meaning that the control of fertility behavior and the design and implementation of fertility policies are difficult tasks. Of interest too is the apparent paradox of concurrent fertility promotion and reduction.

WHAT DETERMINES FERTILITY?

Characteristic of preindustrial societies, survival in prerevolutionary Russia was difficult. Life expectancy was just over thirty years. Infant death rates might have reached upwards of 30 percent of all live births, and 50 percent of all children died by the age of five. In response to such high death rates, families were large; cultural practices, including early

marriage before the age of twenty, reinforced the family structure, and any form of birth control was a criminal offence.[4] To remain single was a disgrace, and divorce was a sin. Within forty years of the revolution, fertility rates had declined to levels comparable with most Western societies.

While social, economic, and environmental considerations necessitated large families in prerevolutionary Russia, the Hutterites, a devoutly religious group found in the United States and Canada, value large families and in the early 1900s had a recorded average of eleven children.[5] Even at its peak, the fertility of this group fell far below the biological maximum, defined by **fecundity**, or the physiological ability of individuals to have children. Less evident are the social dimensions that work to keep fertility below its maximum level, including the roles played by economic issues, the government, and other institutions in altering fertility behavior. Similarly, cultural values regarding family size and the social roles of men and women alter fertility and the timing of fertility reduction. In many African states, for example, women enter into sexual unions at younger ages, and contraceptive use remains low, but families average six or seven children, far below the maximum. Cultural practices, including breast-feeding, abstinence from intercourse after birth, and indigenous birth control techniques, help to keep fertility below its maximum.

We can look at the experiences of Russia, the Hutterites, and other countries to generalize about the determinants of fertility. On an abstract level, demographer John Bongaarts identified four variables that explain nearly all of the variation in fertility levels across populations.[6] These include the proportion of the population that is married or in a sexual union, the proportion using contraceptives, the proportion of women who are infertile, and the incidence of abortion. First, in all societies, marriage has clearly promoted fertility. The longer women wait to enter sexual unions, the lower the fertility rate. Conversely, where women marry at a young age, fertility rates tend to be higher due to increased chances of pregnancy. Cultural values and practices relating to sexual activity, childbearing outside of marriage or union, and contraceptive use have an impact on fertility decisions as well. In the past, the age at entry into marriage and the age at entry into a sexual union were the same, but due to the increasing availability of modern birth control techniques and acceptance of premarital intercourse, this is no longer the case. Celibacy, abstinence, be it voluntary or involuntary (i.e., due to impotence), and frequency of intercourse within a union will either eliminate or alter the risk of pregnancy.

Second, contraceptive use and abortion are the key determinants of fertility in most developed countries. The "reproductive revolution," signaled by the availability and development of modern and effective family-planning methods such as the birth control pill, made it easier to avoid pregnancy. Increased access to methods of birth control and the desire to limit

family size helped fertility reduction, and when these tactics have been used in developing countries, fertility decline has been much more rapid than that developed countries experienced during their **fertility transition**. Despite the reproductive revolution, contraceptive use varies dramatically over space and echoes variations in fertility levels. Among women in sexual unions and of reproductive age in the United States and Canada, for example, the rate of modern contraceptive usage is 69 percent.[7] Somewhat lower levels of use are observed in Europe, particularly in Eastern Europe, where contraceptive use rates are approximately 42 percent.

In the developing world, contraceptive use lags behind usage rates found elsewhere, but family-planning programs have had a strong influence on fertility by raising the awareness of means of, as well as the need for, contraception and control. Contraceptive use is lower in Asia, Latin America, and Africa as well, with less than 10 percent in the later using modern birth control methods in some areas. Instead, the regulation of fertility largely lies with traditional methods (i.e., withdrawal), and the low incidence of contraceptive use is attributed to religious beliefs or societal values. Various governments have also decried the use of birth control methods as an unwanted intrusion of lax Western morals, even in the face of the HIV/AIDS epidemic, the spread of which can be reduced through condom use.[8] When and how birth control is practiced also varies. Women in developed countries tend to start using birth control in their late teens or early twenties to delay childbearing and, following the birth of a child, to achieve the desired spacing. In the developing world, contraception use frequently starts after the desired family size is achieved.

Third, abortion is one of the most common forms of modern birth control in the world and is assumed to be an important reason for low birth rates in much of the developed world.[9] Legal in much of the world, including Canada, the United States, most of Europe (except Ireland), China, India, and Russia, abortion rates are highest in China and Russia (approximately 55 and 31 per 100 in 1990, respectively),[10] and having an abortion is easier than accessing contraceptive devices in Russia.[11]

Finally, the inability to conceive is associated with voluntary or involuntary fecundity. Breast-feeding, for instance, reduces (but does not eliminate) the likelihood of pregnancy for as long as twenty-one months.[12] With modernization, breast-feeding has tended to decline, which may be of particular concern within the developing world where, in the absence of other birth control techniques, fertility may increase. Sterilization also provides a method for lowering fertility, although this is a more popular procedure in developed countries where it is generally used to prevent further pregnancies after the desired family size has been achieved.

Together, these four variables explain nearly all variations in fertility, with the importance of each determinant depending on the cultural,

economic, health, and social factors within a population. In many African societies, babies are breast-fed until age two or three, and women may be expected to abstain from intercourse for up to two years after giving birth, both of which tendencies increase the spacing between births. Although Bongaarts provides insight into the key determinants of fertility, the question remains as to what determines the social forces that mould fertility choices. Why, for instance, would marriage be delayed? Why would contraceptive use increase? How do the cultural values attached to children change?

To answer these questions, we must turn to theories of fertility transition over time and space.[13] These may be roughly distinguished by microeconomic interpretations characterized by Richard Easterlin's "supply and demand" framework,[14] along with the "diffusion-innovation" perspective proposed by a number of authors.[15] Both frameworks find their roots within the demographic transition theory, which ascribed declines in fertility to societal changes related to industrialization and urbanization. In the face of declining mortality and improved economic opportunities, the demographic transition theory implies that people will eventually realize that more children will survive into their reproductive years than they can afford, resulting in a decline in fertility that preceded modern birth control methods. Urbanization and industrialization therefore set the stage for declines in fertility, such as in pre–twentieth century Europe and North America, creating a way of life that made it more expensive to raise children.[16] Rather than using children to augment household income, parents "invested" in them through such means as providing educational opportunities.

The linkages among **urbanization**, industrialization, and fertility within the demographic transition theory were, however, criticized, especially within the context of the developing world, where the correlation between development and fertility is weak. Several countries in Asia (e.g., Bangladesh) and Latin America (e.g., Haiti) remain poor and underdeveloped with low levels of urbanization but are also experiencing fertility declines. In other words, development and economic security are not sufficient conditions to cause fertility to decrease. The neoclassical theories of fertility decline build on the demographic transition theory. Easterlin's classic supply-demand framework defines fertility choice as the outcome of a rational calculation of the costs and benefits associated with fertility behavior, contextualized relative to cultural and household expectations. Families try to maintain a balance between the potential supply of children and the demand for surviving children. Where death rates are high, high fertility ensures the survival of children to an economically active age, and there is no incentive to control fertility. The response to high mortality reflects the valuing of children as a source of security and labor, a preference

for sons, or the desire to "replenish" the population. In effect, children may be likened to pension plans, contributing to production and income within the household or the care of elders, making large families a necessity and an investment in future security.

If, on the other hand, supply exceeds demand, fertility regulation becomes important. The decision to control fertility is then based on the financial and social costs of raising a child as more children are being produced and surviving into their reproductive years. Casting fertility behavior as an economic choice means that children are, in many ways, seen as luxury items, subject to both time and investment. Investment is represented by the *direct costs* of education, clothing, food, and so forth, as well as *opportunity costs*, such as foregone investments and purchases of other consumer goods. Parents are then faced with a trade-off between quality and quantity. In the developed world, quality is emphasized, with resources concentrated on a relatively small number of children. Children in the developed world are not expected to contribute to the economic well-being of the household or to support parents in their old age. Instead, they represent large direct costs associated with education, clothing, and food, along with the indirect, or opportunity, costs of having children at a time when the same dollar value could be spent on other consumer goods and demands for leisure time.

Criticism of neoclassical determinants of fertility behavior has lead social scientists to link changes in fertility behavior to the diffusion of ideas across space.[17] As with any process, diffusion of social norms or new ideas varies spatially, with the timing of the fertility transition hinging on the diffusion of social norms and new ideas, including birth control techniques. In the past, the preference for small families diffused from urban areas and from high- to low-income groups. Although important, diffusion is not a spatially smooth process. For instance, poor or inadequate transportation or communication infrastructures, which are especially evident in **rural**, agricultural, and poor regions of the world, create barriers that alter the diffusion of new ideas or norms. Religious ideology remains a persuasive force limiting the success of family-planning programs and the promotion of birth control methods. Cultural practices may likewise preclude the use of contraceptive devices, such as the condom, which is viewed as interference during sexual intercourse.

The uptake of new ideas or norms also depends on the individual. If new ideas, such as birth control, are to be accepted, individuals must feel that they exert some power or control over life events. In societies where women lack control and power, fertility rates tend to remain high. The key, therefore, is to produce greater equity between males and females, which is accomplished by making improvements in educational attainment, occupational status, or income opportunities. Improved education status and

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paid employment have reduced fertility, with a near universal relationship between improved educational levels among women and decreased fertility. Women with higher levels of education also tend to have a higher uptake of family planning, to wait longer between pregnancies, and to stop bearing children at an earlier age than those who are less educated. There is an even stronger relationship between women's education and child health, with higher educational attainment linked to healthier and better-nourished children, which in itself promotes a reduction in fertility. Although the exact relationship is unclear, completion of education may delay entry into marriage and expands employment options, suggesting that women delay fertility in order to earn an income. Employment also exposes women to new ideas, behaviors, and influences outside of the family. However, gender equity in employment is vital: if employment does not translate into power and enable women to make decisions regarding health care, contraception, the timing of children, and so forth, then declines in fertility are unlikely to occur.[18]

THE ROLE OF THE STATE: FERTILITY REDUCTION

There has been growing recognition since the 1980s of the need to control population growth within developing countries. Despite its complexity, governments have not stopped attempting to influence fertility behavior. Although reductions in fertility have occurred, many governments, including those of Saudi Arabia, India, Sri Lanka, Pakistan, Niger, and Peru, still view their population growth rates as being too high. In response, they have enacted programs to reduce population growth rates by controlling fertility behavior and have met with varying levels of success. Two long-term and well-known examples are discussed below, both of which provide insights into the successes and shortcomings of fertility policy.

China

Identified as one of the most successful, albeit controversial, fertility-control programs, China's one-child policy has received considerable lay and academic attention.[19] Initially, China's government viewed family-planning and fertility-reduction programs as suspect, assuming instead that socialism would ensure the equitable distribution of resources across society. By the late 1960s, however, China's leadership recognized the limits to population growth and the need for population control. With a TFR in excess of 7.0, rapid growth was acknowledged to hinder attempts to improve the economy and raise the standard of living. Beginning in 1979, the Chinese government advocated its one-child program, with the goal of