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Population, Human Capital, and Economic Growth in Iran*

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Introduction

In 1989 the government of the Islamic Republic of Iran reversed its pro-natal policy to launch an ambitious family planning program with the slogan, “Fewer children, better life.” Less than ten years later, the program had delivered on its first promise: fertility had declined by one-third. The promise of a “better life,” however, still eludes the average Iranian family, whose income has not risen in the intervening years. Although economic theory suggests a strong link between the decline in fertility and economic growth, the latter does not automatically follow the decline. It is a potential that can be fulfilled only if investment in physical and human capital responds positively to the decline in fertility. In this chapter I examine the potential created by fertility decline in Iran for an increase in human capital. I show, first, that if the lower fertility level endures, the age structure will change dramatically, such that the number of adults per child will at least double in the next twenty years. The greater adult-child ratio represents the potential that has been historically associated with take-off into long-term growth. Barlow (1994) calls this potential the “demographic window of opportunity” (see also Tunali, 1996), and Bloom and Williamson (1998) label it the “demographic gift” (see also Tunali 1996 and Salehi-Isfahani 2000). They emphasize the consequences of the changing age structure for labor force growth and savings. In light of the importance of human capital for growth, it seems only natural to consider the effect of age structure on human capital accumulation as well.

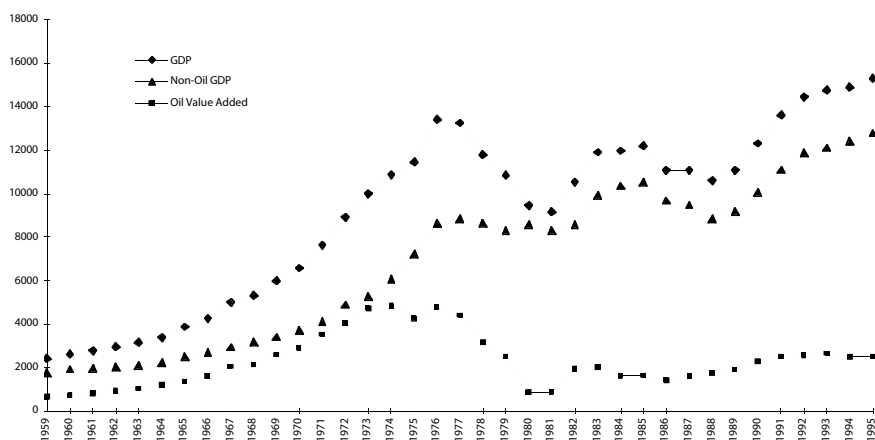
Secondly, I examine the conditions that would help Iran take advantage of the demographic window of opportunity. How Iran will spend its demographic gift is crucial to its economic growth during the next twenty years. As far as the accumulation of human capital is concerned, a positive outcome depends on whether the government and families are willing to increase their investment in children. The government’s response to the decrease in the number of pupils in the last few years has not been encouraging. Where student numbers have fallen, rather than increase school quality, it has made a proportionate reduction in education expenditures. A much greater potential for human capital accumulation exists in the response of the families to lower fertility. Proper incentives may induce them to use their increased resources, especially time, to invest in the human capital of their children, i.e., substitute quality for quantity. I argue that distortions in the incentives provided by the educational system and the labor market pose serious obstacles to human capital accumulation. This perspective not only presents old policy issues in labor market and educational reform in a new light; it adds urgency to their implementation. Provided the right incentives are put into place, in addition to increased savings and

labor supply, a favorable age structure would contribute to growth through the accumulation of human capital as parents and schools increase expenditures of time and resources per child. If not, the historic opportunity will be lost. With this in mind, I discuss the reforms that are needed to increase the efficiency of human capital accumulation in families and schools.

Looking back at the last forty years, the overriding impression that one gets from the record of economic growth in Iran is one of boom and bust rather than steady growth. There was a period of steady growth between 1959 and 1976, which has not been repeated since (Figure 6.1). The last twenty years have seen a 35 percent decline in per capita income, which occurred during 1976–80, followed by zero growth during 1980–98. This is a very poor performance even in comparison to the sluggish MENA region (see Shafiq, 1997), and one that is beaten by only a few African countries. There have been growth spells, but all have followed a rise in oil income. In view of the poor prospects for a dramatic turnaround in the world oil market, for its future growth Iran must rely on a more fundamental source, human capital.¹ Calls for reducing dependence on oil, most recently echoed in President Khatami’s “Plan for Economic Reorganization” of 1998 (Plan and Budget Organization, 1998), recognize the limited role that oil has played in fostering economic growth in Iran. Against this background of dimmed prospects for oil-based growth, thanks to the recent decline in fertility a bright spot has emerged which offers a new prospect for expansion of human capital and, in turn, long-term growth. Iranian couples who marry in the 1990s have on average half as many children as their parents did in the 1970s, enabling them to substantially increase their investment in the human capital of their children.

Inside the Iranian family, women play a key role in child rearing. Therefore, how they use the time saved from childbearing will greatly influence the rate of accumulation of

Figure 6.1: GDP, Non-oil GDP and Value Added from Oil
(constant 1982/83 billion rials)



Source: Bank Markazi of the Islamic Republic of Iran, Annual Reports, various years.

human capital in Iran. They face three choices: The first is to work outside the home. This is the option that most women in other countries have been inclined to choose, and it has been responsible for a large share of the input-based growth all over the world. However, in Iran, except for the most highly educated group, it may not be viable because of the limited job opportunities for women and the cultural stigmas. If women are unable to work outside the home, they will increase their leisure or time in home production. They may choose more traditional home activities (homemaking) or invest in the human capital (health, nutrition, and education) of their children. For those who are unable to take advantage of outside opportunities, the choice to invest in their children offers the greatest potential for economic growth. Good policies can affect their choice to achieve the best results. Whether or not young mothers choose to spend more time educating their children, and what types of skills they choose to foster, depends on the incentives they are given. Because these incentives are generated primarily in the labor market and shaped by the formal education system, they are at present highly distorted, and there is a risk that parental time will not be used optimally. To take advantage of its demographic window of opportunity, Iran must remove distortions that impede investment in human capital and provide incentives that induce parents to teach their children not the habits and skills that serve them in the present distorted environment, but those that are truly productive.

The chapter is organized as follows. The next section is a brief review of the theoretical underpinnings of the link between population, human capital, and long-term growth. In section 2, I review the evidence pertaining to the decline in fertility, and, in section 3 I analyze the effect this has on the age structure, using a simple demographic projection model. In section 4, I examine labor force participation of women, and in section 5 the role of family in Iran in production of human capital. In sections 6 and 7, I describe the incentives that parents encounter in the present system of formal education and the labor market, respectively, and discuss the role of public policy in shaping incentives that affect family investment in human capital. Section 8 concludes.

1. Population, Human Capital, and Long-run Growth

New empirical evidence and theoretical developments in the economics of growth support the view presented in this chapter that Iran can benefit from shifting its main source of growth from hydrocarbons to human capital. Sachs and Warner (1995) present cross-country evidence to show that the performance of resource-exporting countries as a group lags behind that of other developing countries with comparable economic standing. At a theoretical level, new growth theory has emphasized human capital over physical capital as a source of growth (Lucas, 1988; Barro, 1990; Becker, Murphy, and Tamura, 1999; Mankiw, Romer, and Weil, 1992). Thus, the oil boom of the 1970s, which created a period of intense physical capital accumulation without concurrent changes in the human resource situation, most importantly decline in fertility, could not last beyond the oil boom itself.

The shift in emphasis from physical to human capital has dramatically altered the way in which economists view the role of population in long-run growth. Whereas in the traditional growth theory (Solow, 1956) population figured as an exogenous factor that impeded capital deepening, new growth models grant a central role to population (Becker, Murphy, and Tamura, 1990; Galore and Weil, 1996) and emphasize the intergenerational

transfer of human capital and its accumulation. Becker's work, summarized in Becker (1992), provides the most direct link between population and economic growth: lower fertility provides an opportunity to increase human capital, which in turn helps sustain lower fertility. This view places family decisions regarding fertility and child education at the heart of the development process. For example, in Becker, Murphy, and Tamura (1990), the choice between raising a large family or having fewer children and investing more in each child is critical for long-term growth. Each generation's level of human capital plays a crucial role in this choice. The more educated the parents are, the more likely they opt for smaller families because not only do they have a higher opportunity cost of time, but also they can teach their children more effectively. Thus, in this scheme, high levels of human capital can sustain long-term growth because they cause low fertility and high investment in human capital.

The traditional approach to the link between demographic transition and economic growth emphasizes the role of increased savings and labor supply (Barlow, 1994; Tunali, 1996). The human capital approach offers a richer dynamic, leading to the possibility of multiple equilibria. One equilibrium, well known in the development literature as the low-level equilibrium trap, exists because high fertility (and mortality) prevents human capital accumulation, which in turn helps sustain high fertility. A higher equilibrium is made possible by the 'benevolent circle' of low fertility and high human capital, as described above. The incorporation of human capital into the dynamics of population and growth introduces a new rationale for public action. Governments should not only initiate and assist the control of fertility; they should also provide the necessary incentives for parental investment in human capital accumulation. The success achieved by East Asian countries in entering a phase of sustained growth has been attributed to favorable demographics as well as a favorable policy environment (Cinotta and Engelman, 1997).

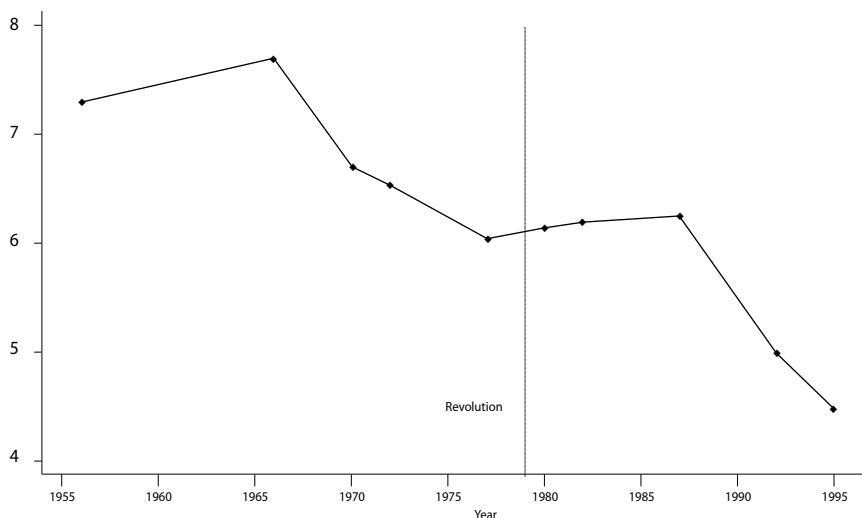
2. The Rise and Fall of Fertility in Iran

Immediately after the revolution period fertility increased, but only temporarily, as it resumed its course of decline in the mid-1980s (Aghajanian, 1991, 1995; Mehryar 1995). A rise followed by a sharp decline in fertility provides Iran with the most advantageous age structure for accumulation of human capital and growth for the next twenty years. The ratio of parents to children (or teacher to student) was important to the past and will be to the future course of fertility. In this section, I examine the data on past levels of fertility and discuss its future course.

The rise and fall in fertility is in part due to the changing rates of population growth. The inter-censal rate fell from 3.1 percent during 1956–66 to 2.7 percent in 1966–76, but unexpectedly increased to 3.9 percent during 1976–86 (see also Table 6.1 below). The last census (1996) revealed a much lower rate of growth, just below 2 percent per year. A similar pattern is visible in the percentage of 0–4 year-olds in the population, which fell from 17.6 percent in 1966 to 16.1 percent in 1976, increased to 18.2 percent in 1986,² only to fall to a mere 10.3 percent in 1996. Annual surveys conducted by the Ministry of Health show much of the drop to have happened in the 1990s, from 2.7 percent per year in 1992 to 1.75 percent in 1995.

Estimates of the Total Fertility Rate (TFR) present a similar pattern of in terms of rise and fall (Figure 6.2). According to these figures, TFR started its decrease sometime in the

Figure 6.2: Total Fertility Rate, 1955–95

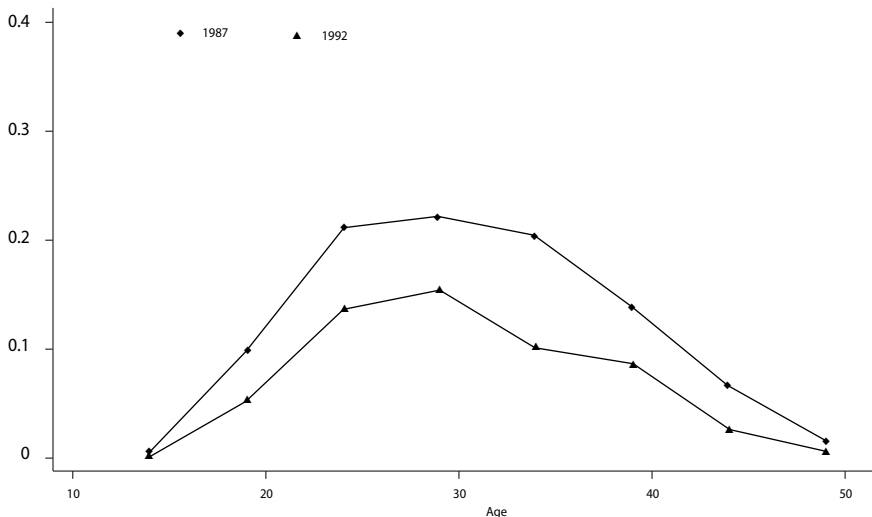


Source: World Bank, World Development Indicators, 1997.

1960s and continued until the late 1970s, when the revolution interrupted its course and it began increasing for a few years. In the late 1980s, coinciding with the end of the war with Iraq, the beginning of the reconstruction period under President Rafsanjani, and the resumption of the family planning program, fertility resumed its course of decline once again. This time the pace was fast, as the TFR dropped from 6.2 in 1987 to 4.5 in 1995. Kenneth Hill (1994), who carefully examined the 1986 and 1991 population data, also supports the view of an increase in the birth rate in the early 1980s, followed by a sharp drop—of as much as 40 percent—from around 1986 to the early 1990s. There is evidence that the recent decline in fertility is broadly based, among women of all ages and in both rural and urban areas. Figures 6.3a and 6.3b depict age-specific fertility rates computed from the 1987 and 1992 integrated household surveys. The largest drop appears to be in the 30–39 age category.

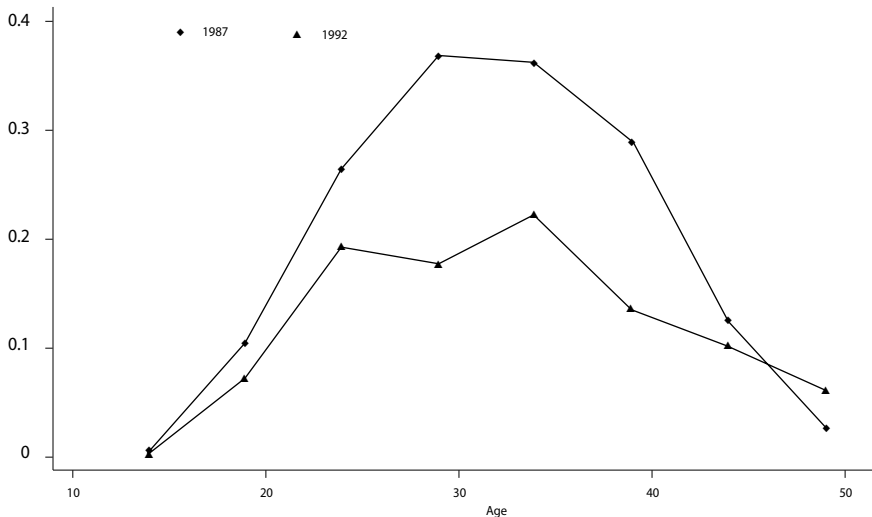
Despite overwhelming evidence pointing to a transition in fertility in Iran, predicting fertility for the future is difficult. In projecting fertility for the next twenty years, we should use the current and past levels of fertility with caution for two reasons. First, there is no agreement among demographers as to the current level of fertility. The Ministry of Health estimates, calculated from its own surveys, show TFRs of 4.2 and 2.7 for rural and urban women, respectively, which are considered too low by many demographers in Iran. Second, even a consistent secular trend is not an adequate indication of the future levels of fertility, much less a fluctuating pattern as observed in post-revolution Iran. The fact that the most recent fertility decline was preceded by a rise complicates the prediction of future trends. If the decline were in some way a compensation for the rise, then it may overstate the future trend in lifetime fertility. There are two reasons why the rise and fall may have been connected to each other. First, the rise and fall in period fertility may have been relat-

Figure 6.3a: Age-specific Fertility Rates for Urban Areas, 1986 and 1991



Source: Computed by the author from “Socioeconomic Characteristics of Households in Iran,” 1987 and 1992.

Figure 6.3b: Age-specific Fertility Rates for Rural Areas, 1986 and 1991



Source: Computed by the author from “Socioeconomic Characteristics of Households in Iran,” 1987 and 1992.

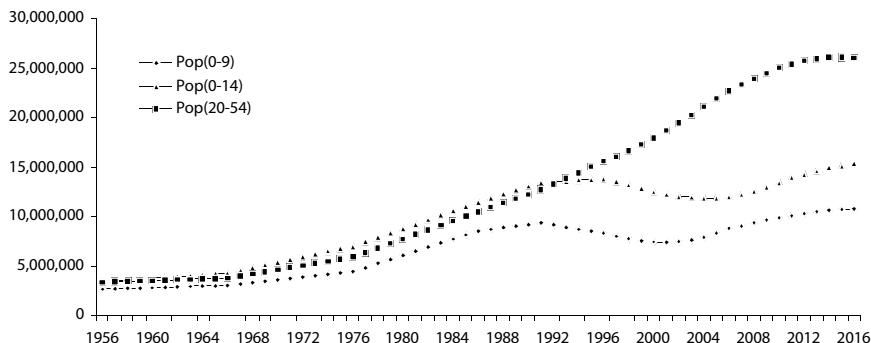
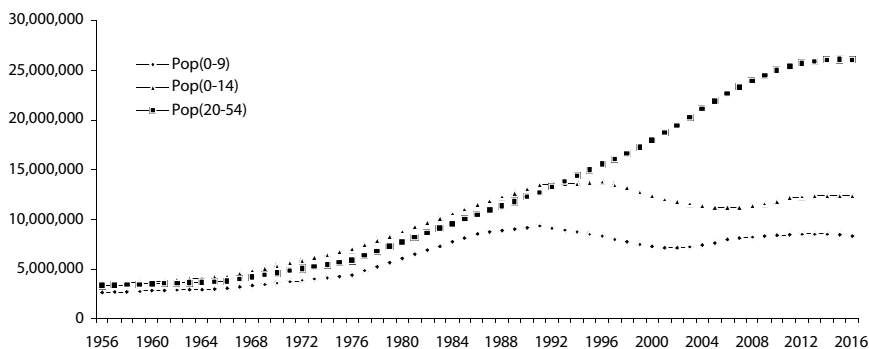
ed via birth timing. In response to the pro-natal atmosphere of the 1980s couples may have increased fertility without desiring larger families. This could happen if for one reason or another they perceived the pro-natal environment to be temporary. In this case, the rise and fall in period fertility would be the result of an intertemporal substitution of births between the 1980s and 1990s. Second, in response to the same set of incentives, couples may have increased their lifetime fertility. In this case, the rise in the period rate reflects increase in lifetime fertility. Policy changes in the late 1980s would have taken these couples by surprise and caused them to cut their fertility sharply as they tried to adjust to a lower desired family size. Such a scenario could explain how the aggregate period rates, such as the TFR, could have fallen beyond what one would expect based on changes in desired family size. If either of these scenarios is correct, the TFR could increase in the near future to a level consistent with lifetime fertility. Salehi-Isfahani and Tandon (1998) present evidence to this effect.

Changes in Age Structure

The rise and fall of fertility induce wide fluctuations in the age structure of population for many decades. The broad outlines of these changes are well known and easily derived from simulations of the age structure. The relatively large cohort born in the early 1980s will first increase the growth rate of the labor force and later that of the elderly population. In terms of the allocation of family time and public resources, the ratio of adults to children is of great importance. This ratio is akin to the more widely used dependency ratio, which includes the elderly in the denominator, and is used in the analysis of savings and social security. In my projections, assuming that urban and rural fertility and mortality rates stay constant at their early 1990s level, the ratio of dependent to working population will fall from 0.48 in 1986 to 0.36 in 2006, and then rise to 0.39 in 2016. The population of working age and dependent groups that during 1966–86 had been growing at 3.5 percent and 3.2 percent, respectively, will grow at 2.6 percent and 1.6 percent only during 1996–2016.

Because the main concern of this chapter is human capital accumulation, I focus on the adult-child ratio. To determine the range of possibilities for this ratio in the next twenty years, I present two scenarios, one assuming that fertility stays the same,³ and the other assuming it will continue to decline. Fertility levels between rural and urban areas are different enough to warrant separate projections. For the base projections, I use age-specific fertility rates that are estimated from the 1992 household survey collected by the Statistical Center of Iran (SCI). These rates yield TFRs of 2.8 and 4.8 for urban and rural areas, respectively, which are slightly higher than those obtained three years later from a Ministry of Health survey (2.7 and 4.2) and reported in Malekafzali (1995). For more optimistic projections, I allow the urban TFR to decline gradually to 2.0 in the year 2016 and rural fertility to 2.8. These are indeed not unreasonable expectations, given the success in fertility reduction in the last 10 years, but they assume that current period rates reflect current desired lifetime fertility. In all projections, I use the age-specific mortality rates estimated for 1991 by Taheripour (1996). I keep mortality rates unchanged throughout the projection period. The projected age structure is much less sensitive to assumptions regarding mortality than fertility.

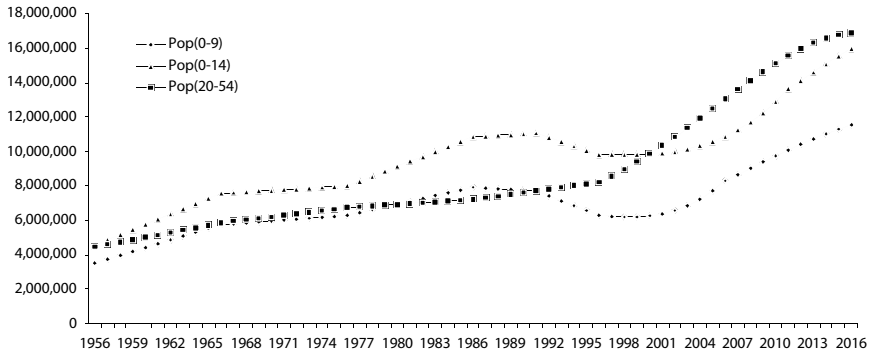
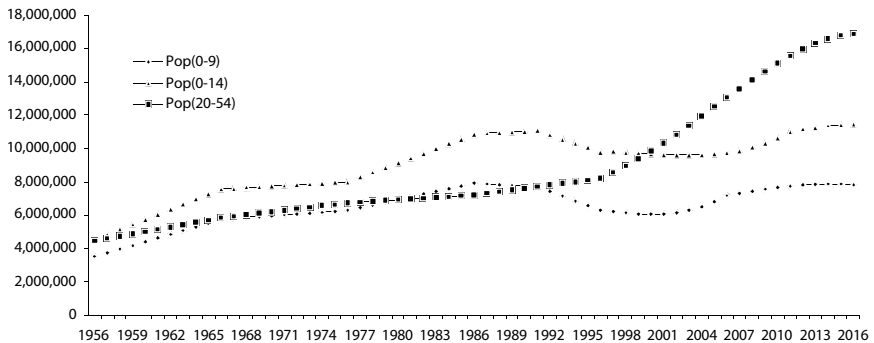
The constant fertility scenario results in an annual (natural) population growth rate of 1.7 percent for the urban and 2.7 percent for rural households.⁴ The reduced fertility sce-

Figure 6.4a: Population Projections, Urban (constant fertility)**Figure 6.4b: Population Projections (urban, reduced fertility)**

Source: Author's projections (both figures).

nario produces growth rates of 1.4 percent for urban and 2.1 percent for rural households. Evidently, there is considerable momentum in the population for growth, so that even when the urban fertility is down to replacement, population continues to increase at the rate of 1.4 percent per year. It will take a long time after families have reached replacement-level fertility for the growth rate to drop to zero.

To begin with urban households, the projection results show a remarkable shift in the adult-child ratio, especially in the reduced fertility scenario (Figures 6.4a and 6.4b).⁵ Having remained constant throughout the last 40 years, the ratio of adults (20–54 years) to children (0–9 years) will rise from 1.0 in 1996 to 2.6 in 2016. If urban fertility declines by 29 percent in 2016 from its 1996 level, from a TFR of 2.8 to 2.0, the adult-child ratio will increase to 3.2! In other words, there will be more than three times as many adults per child in 2016 as there have been in the last 40 years. The implications of such a change for the education of the young in urban areas are immense. Projections for rural areas are less dramatic (Figures 6.5a and 6.5b). If fertility were to stay at its 1996 level (constant fertil-

Figure 6.5a: Population Projections, Rural (constant fertility)**Figure 6.5b: Population Projections, Rural (reduced fertility)**

Source: Author's projections (both figures).

ity scenario), the adult-child ratio would rise to only 1.5, which is less than 60 percent of the projected ratio for the urban households. If fertility were to drop to 2.8, equal to the present urban TFR, the adult-child ratio will climb to over 2.0.

The comparison between rural and urban age structures warns of a possible widening in regional disparities as a result of differential fertility levels. It also underlines the importance of fertility decline for a favorable age structure. Rural youths, already at a disadvantage because of lower school quality and parental education, face a widening gap due to differential fertility. Put together, these factors depict a troubling picture in which the rural-urban gap in education widens rather than disappears in the future.

4. Employment and Participation of Women in the Workforce

As in other countries of the Middle East, the levels of employment and labor force participation of women in Iran are far below those of countries with similar per capita income (Karshenas, 2001). In Iran, after the revolution, employment and participation of women

in the labor force decreased until the mid-1980s, after which it reversed itself. According to census data, the rate of participation fell from 12.9 percent in 1976 to 8.2 percent in 1986 and then increased again to 9.1 percent in 1996 (Table 6.1). However, the fluctuations seen in the overall female activity rate were primarily a rural phenomenon, as the urban rate continued to fall, at a slow pace, from 9.0 percent in 1976 to 8.1 percent in 1996. The urban employment rate decreased from 8.5 percent in 1976 to 5.1 percent in 1986, then went back up to 7.1 percent. The rural activity rate fell by more than half, from 16.6 to 7.9 percent, during the same period. No obvious reason can be found for this drastic decline, but a change in the definition of who is 'active' cannot be ruled out as a possibility (see Tabatai and Salehi-Isfahani, 2001).

Table 6.1: Participation and Employment of Women in Iran, 1976–96 (%)

		1976	1986	1996
Active	Total	12.9	8.2	9.1
	Urban	9.0	8.3	8.1
	Rural	16.6	7.9	10.7
Employed	Total	10.8	6.1	8.7
	Urban	8.5	5.1	7.1
	Rural	13.0	6.3	9.6

Source: Statistical Center of Iran, *Yearbook*, various years.

Can female employment substantially increase to match the full effect of the decline in fertility? The answer is that it is very unlikely, for economic and cultural reasons. A quick look at the balance of supply and demand is not encouraging. According to the constant fertility projections reported above, assuming constant participation rates, the workforce will grow at a rate of nearly 3 percent for the period 1996–2006, and a bit lower during 2006–2016. To accommodate this increase, the economy must create an additional half a million new jobs.⁶ If the response of Iranian women to fertility decline is similar to that of women in Malaysia following their fertility decline, female labor force participation could increase to as much as 40 percent. In this case the rate of job creation would also have to increase by about 40 percent, to about 800,000 jobs per year, which is highly unlikely given the present sluggish state of demand for labor. By most accounts, unemployment has been increasing in the last five years, even without much of an increase in female participation rates, with the new job seekers faring the worst. In 1996, one out of every four people aged 20–24 was unemployed. Furthermore, women do not compete with men for all jobs. After the revolution, market segmentation according to gender increased, and female employment shifted toward the service and public sectors (mainly health and education) and away from industry and the private sector. In 1976, 53 percent of working women were employed in industry and 23 percent in services, compared to 33 percent and 46 percent in 1996. The concentration of women in the public sector is evident from the fact that in 1976 about 30 percent of women worked there, compared to 42 percent in 1996. Future growth is very unlikely to boost labor demand in the already bloated service and public sectors. Added to an adverse economic environment is an unfavorable cultural environment that emphasizes the role of women as mothers and homemakers and does not look favorably on outside work (Karshenas, 2001). This is particu-

larily difficult for women with lower levels of education, who are unlikely to end up with white-collar jobs in the public and service sectors, which are generally more tolerated in Iran's traditional culture. These norms are not permanent; they can change, as they did in Tunisia and Morocco, where an increase in the employment of less-educated women in the export industry was substantial (Shaban et al 2001). However, for at least the next 10 years, the impediments to female employment in Iran are serious enough to suggest that the vast majority of women with reduced fertility will end up using their free time some other way.

Given this constraint, for many women the remaining choices are limited to how this time at home is spent. From a growth perspective, the choice to invest in child human capital is the most productive. In the long run, however, a strategy that relies heavily on women's role at home at the expense of increasing their opportunities to work outside may be economically and socially costly. There are drawbacks to women staying home, even if the time at home is spent on the education and health of children. Women with independent incomes may influence the intrahousehold distribution of resources in favor of girls (Strauss and Thomas, 1995; Behrman, 1997), and they are good role models to encourage younger women to seek education. Furthermore, because women are not paid for home schooling, the benefits of female education may not be obvious to parents, who may therefore underestimate the benefit of female education.⁷

The Role of the Family in Human Capital Accumulation

Before children enter school at age 6, their education depends on what their parents teach them. The accumulation of human capital begins even before they are born. There is strong evidence, from biological to sociological, linking parental investment during the period of early childhood to the ability to learn later in life: "Scientific evidence indicates that 50 percent of the variance in intellectual development is established by age four" (Young 1995). Better nutrition, health, and childrearing raise the child's ability to learn in school and later on the job (World Bank, 1996). Thus human capital accumulation in school depends on the quality of pre-school care a child receives. Even after children enter school, parents continue to play an important role by monitoring the child's activities away from school, supervising homework, and monitoring the quality of school itself.

The level of human capital of parents influences the human capital of their children for two reasons. First, as decision-makers, their education affects the opportunity cost of their time, their desired fertility, and the level of investment in each child as they substitute quality for quantity. Second, as teachers and mentors of their children, their education determines how effective they are in creating the child's human capital at home, and thereby their willingness to do so. Various empirical studies in many different economic and cultural settings have shown that parental characteristics in general, and education in particular, are highly correlated with child education (Strauss and Thomas, 1995). Similar micro evidence for Iran is presented in Salehi-Isfahani (2001a). Regressions of child educational attainment on parents' education, holding other household characteristics constant, show that increasing the average schooling of both parents by one year raises child schooling from 0.5 to 1.5 years depending on rural or urban residence.

If the results from the micro studies are to be believed, the family in Iran can be a particularly positive force in human capital accumulation, because it is an important unit of social organization and because parents' education has been on the rise. About 80 percent

of all women are married by age 25, divorce rates are very low, and having children is at the center of family life. Nearly all marriages result in a child within the first five years. The Islamic revolution promoted this sense of the family by encouraging early marriage and childbearing. In addition, expansion of female education in the last twenty years has created the potential for a more effective parental role. Nearly all women who married in the late 1990s are literate, can read to their children and monitor schoolwork.

Table 6.2: Literacy Rates, 1976–96 (population 6 years and older)

Census year	Urban		Rural	
	Male	Female	Male	Female
1976	74	56	44	17
1986	81	66	60	37
1991	88	78	73	55
1996	90	82	77	62

Source: Statistical Center of Iran, *Yearbook*, various years.

Gender plays an important role in the dynamics of human capital accumulation within the family. Although evidence is far from conclusive, micro studies have shown that in many settings the intergenerational transfer of human capital is not gender-neutral, that mothers have an absolute advantage in the education of their children, while fathers have a comparative advantage in boys' education (Strauss and Thomas, 1995). According to these studies, the transfer of human capital between generations happens primarily through the female. Thus the centrality of the role of female education to long-run growth is due not just to its effect on fertility, but also to its effect on child education. Fortunately, in Iran in the last two decades the educational achievement of women, at least in the urban areas, has grown rapidly and, significantly, faster than for men (Table 6.2). Data from household surveys show that mean educational attainment of males and females has increased, and that urban women's education has accelerated for cohorts born after the 1960s, so that the gender gap in schooling has narrowed in recent years (Salehi-Isfahani, 2001a). The proportion of females among high school graduates has increased rapidly from one-third in the 1970s to 50 percent in 1990s. Women now equal men in number in universities.

The educational attainment of rural women lags well behind urban women. To the extent that families may become more influential as a channel of human capital transfer between generations, in the long run this asymmetry can lead to a deepening of the rural-urban gap in income. The likelihood that rural women will find it optimal to increase their investment of time in their children is lower. Because they are less educated, the returns to their time spent in home production of human capital may be lower than in agriculture and other informal sector activities.⁸ Still, the majority of rural women entering childbearing years in 1996 were literate, and therefore able at least to read to their children, improve child nutrition and health, and follow teacher directions for working with their children at home. Proper incentives and policies to help rural women invest more in their children's human capital may induce them in the direction of greater investment in children.

The market for private tutors that flourished within urban Iran in the last ten years suggests a high level of parental commitment to the success of their children. In 1998 most private tutors charged an hourly fee of \$5–\$10, which is very high compared to their

monthly salaries in their regular jobs of less than \$200.⁹ At the same time, this may be seen as evidence that parents themselves do not want to, or cannot, contribute to the education of their children. The reason for resorting to private teachers may include the highly competitive entrance examinations for universities, a topic to which I will return later.

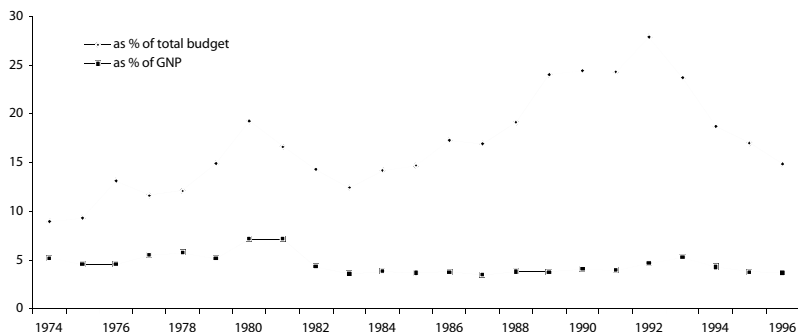
6. The Educational System and Incentives for Human Capital Accumulation

Parents may reap the rewards of investing in their children in terms of support during old age or the child's own welfare. In either case they care about their children's success as adults. The kind of investment they undertake depends largely on what they believe is rewarded by the labor market.¹⁰ But since success in the labor market depends mainly on success in the formal educational system, parental incentives are shaped by the system of formal schooling.

Home production of human capital is influenced by the opportunity cost of parents' time and the signals that the system of formal education and the labor market provide concerning the benefits of parental intervention. If the argument of this chapter regarding the demographic opportunity is correct, taking advantage of it depends crucially on the incentives for human capital accumulation generated by the educational system and the labor market. Historically, the government of Iran has played a dominant role in the provision of formal education. Article 3 of the Constitution of the Islamic Republic of Iran declares education at all levels, from elementary to higher education, free. Budgetary pressures forced the government in 1993 to allow private (non-profit) schools to compete with public schools at the elementary level, but their numbers are still quite small. At the higher education level, Iran's only private university, Azad University, with over 100 campuses across Iran, has nearly as many students as all the public institutions of higher education combined.

The baby boom that followed the revolution (Salehi-Isfahani 2001b) presented the government with a serious shortage of teachers and schools. In the mid-1980s, when the baby boomers started to arrive in schools, the government was not able to increase its expenditures to maintain education quality. The country was in the midst of a costly war with Iraq and oil prices had collapsed. The government responded to the greater needs in education by increasing the share of education expenditures in the budget, but could not prevent a decline in its share relative to GNP (Figure 6.6). Most schools had to go to two and even three shifts, causing a decline in the quality of schooling. However, the drop in fertility that started sometime in the mid-1980s does not seem to have initiated a change in the reverse direction, to increase education quality. The share of expenditures in the budget declined in the 1990s (Figure 6.6), indicating that the government is unwilling to increase quality when enrollments are on the decline.

East Asian economies that started their fertility transition in the 1960s substantially increased the amount of public resources spent per pupil in basic education. For example, Korea increased its per pupil expenditure in primary education from \$51 in 1975 to \$390 in 1985, and \$610 in 1989 (World Bank, 1996). In Iran, at the peak of primary enrollment in 1993–94, government expenditures averaged about 50,000 rials (\$30) per primary student (World Bank, 1996), which is very low. Will the government be able to increase its expenditure per child in the future as the number of students in elementary schools declines, or will it maintain the quality at the same level and use the savings else-

Figure 6.6: Public Expenditures on Education

Source: Statistical Center of Iran, *Yearbook*, various years.

where? The spread of private, non-profit, elementary schools provides the more well-off parents with access to higher school quality, but, given the distribution of income in Iran, only a small percentage of families can take advantage of these schools.

Most parents in Iran have a simple yet ambitious educational objective for their children—to enter university. Since the 1960s, there has been a huge imbalance between the number of high school graduates and those who can enter university (never less than ten to one). Nearly 1.5 million students took part in the entrance examination in 2000, of whom 150,000, or 10 percent, passed the test (60 percent of the successful candidates were women!). The Islamic government expanded public higher education after the revolution, but the real increase in enrollments has come from the private Azad University, which, as noted, now has as many students as all public universities combined. Despite its high tuition fees, those who aspire to enter Azad University must also pass a competitive exam.

Although competitive entrance exams increase student effort, exclusive attention to preparation for the entrance examinations (the dreaded *concour*) can be at the expense of human capital development. As a result, the vast majority of students who do not succeed in passing the exam fail to acquire the basic skills for productive employment. The entire school system has responded to the challenge set by the *concour* by tilting the curriculum in favor of teaching skills that enable students to perform well on a multiple-choice exam once they graduate from high school. The problem with this system is not so much that it has only few winners, but that it concentrates student effort too much on the acquisition of knowledge and too little on the development of other productive skills that are not easily testable, such as creativity, teamwork, and dependability. In doing so, it also ignores the education of the majority of students, who need not go to university in order to be more productive. Under this system, parents, the vast majority of whom have not themselves had a university education, feel that the only effective role they can play is to enforce harsh study habits and pay exorbitant fees to private tutors.¹¹ In the mad rush to prepare their children for the ‘big test,’ parents neglect the teaching of skills that they could best teach, such as instilling confidence and developing teamwork. For the few who pass the exam, the competition comes to an end, and learning slows down. In a pattern that resembles other countries with ‘the big test,’ Iranian students work much harder than their counter-

parts in the west in grade school, but less after entering college. The inevitable result of studying only to pass a test is less effort when the pressure is removed. For the more than one million who fail the test each year, there lies ahead another year of study for yet another attempt at passing the exam or a long shot at landing a job.

Parents and commentators have voiced criticism of this system. According to one critic, the “few thousands who pass the entrance examinations are not the products of the formal educational system; rather they are the products of the harsh response of parents who have realized the gravity of the economic conditions and are convinced that their children must be equipped with a degree.” He goes on to draw distinctions between the institutions of education in Iran and those of the advanced countries, noting that Iran’s consist of “large and small classes for *concour*, highly paid private tutors ... depriving their children of all forms of relaxation, even bathing.” The result “is that they produce real and steady researchers and we produce unsteady and fleeting geniuses” (Hassouri, 1998).

To remedy this situation, in the early 1980s the government embarked on an ambitious program to reform secondary education, which was first introduced in the academic year 1992–93.¹² The program aimed to separate the college-bound, early on, from the rest, so as to allow these others a more appropriate training for productive work. Most observers now agree that this reform has not succeeded (Moazzami, 1998; World Bank, 1996). The most often cited reason is the high cost of vocational training, which limits the scope of the program. Less often noted, but more important in my view, is the fact that labor market signals continue to indicate a low value for such training. Both public and private employment rewards are still based on degrees rather than skills.

7. Labor Market Signals and Incentives for Human Capital Accumulation

In a well-functioning labor market, firms reward productive traits and skills and thereby send signals to schools, families, and individuals that induce investment in those traits and skills. When these signals are distorted, often due to heavy government intervention, the wrong mix of investments in human capital may be produced. In Iran, public intervention in the labor market and in formal education has resulted in greater emphasis on the acquisition of degrees than on productive skills. Both public and private employers face rigid pay scales that are linked not to individual productivity but to formal education. The lack of flexibility in hiring, retention, and compensation of workers creates a specific set of incentives for firms and households which affects human capital accumulation. While lack of labor market flexibility is a problem in any economy, it can be a tragedy for a country facing the demographic window of opportunity.

The labor market is where economic returns to education are realized. Government policies that alter incentives to demand or supply effort affect parental decisions to invest in the human capital of their children. Two types of interventions exist in Iran. First, as the largest employer of trained workers (about 15 percent of all employment), rules governing employment in the public sector influence the decisions of a large proportion of the population to accumulate different types of human capital. Most civil service jobs require a university degree and carry *de facto* tenure. Historically, the security associated with these jobs has raised their value, and encouraged most parents to push their children in the direction of university education in the hope of landing a government job. As a consequence,

the university degree has become more important than the actual skills learned in higher education, and technical and vocational education has become less desirable because it does not qualify one for a public sector job. The only skills worth accumulating in high school are those that increase the chances of passing university entrance examinations. These skills are by and large useful, but fall short of an optimal mix for employment.

Second, the government intervenes in the labor market by inserting itself as a mediator in the employer-employee relation. The Labor Law passed in 1993 has many provisions that make it very difficult for employers to lay off workers, short of closing plants (Tabatabai and Salehi-Isfahani, 2001; Salehi-Isfahani, 1999; World Bank, 1996).¹³ The push to increase job security in both public and private employment has resulted in a situation in which workers regard finding a job as much more important than holding on to it. The former emphasizes external signals such as degrees, whereas the latter depends on the quality of the human capital.

The role of incentives on parental behavior in child education can best be illustrated by contrasting two extremes. At one extreme, jobs are permanent and are therefore assigned on the basis of *ex ante* signals of worker quality. In this case, an effective signal is a university degree because it is the most competitively allocated. If, additionally, the number of new jobs barely exceeds the number of university graduates, which has been the case in Iran, it makes sense for employers to hire only university graduates. In this system, parents will make their investments in such way as to maximize their child's chances of entering the university. Thus in Iran, where most exams, including the national university entrance examination, are based on multiple choice and require speed in answering questions, memorization has dominated learning. Many worker characteristics that would be desirable and productive are not worth accumulating because they are not tested and are therefore difficult to signal. For example, self-confidence, perseverance, teamwork, respect for authority, and the like, which are skills that parents teach well, no longer receive the emphasis they deserve. Indeed, some parents may actively promote certain types of behavior that maybe undesirable in production, such as non-cooperative behavior, but may help the child get ahead in the competitive educational system. A more acute problem arises in promoting self-confidence in children, when the risks of failure in the selection process are so great—more than 90 percent—and fear of failure is therefore an effective tool for motivation. At the other extreme, consider a situation in which employers can, with impunity, lay off unproductive workers and keep those who demonstrate high productivity. In this case, a university degree serves the bearer only if it increases his/her ability to perform on the job. Parents would then be motivated to inculcate in their children skills that would benefit them on the job rather than on the way to it.

In Iran, lack of labor market flexibility has resulted in a situation where hiring, in both public and private enterprise, is based more on diplomas as *ex ante* signals of productivity than on information on other worker characteristics, such as creativity and character, that can best be observed after employment. The inflexibility reveals itself in part in low worker turnover, which prevents employers from signaling the type of worker characteristics that they need for production. At the receiving end of these signals from the labor market, teachers, parents, and students are persuaded to invest in characteristics that do not maximize the productivity of the rising generation of workers, thus preventing the country from taking advantage of its demographic window of opportunity.

8. Concluding Remarks

In this chapter I have examined the implications of the demographic transition in Iran for long-term economic growth. It presents an optimistic scenario for growth in Iran, based on the well-known idea of the demographic window of opportunity, but with emphasis on human capital and its production at home. I have argued that lower fertility provides families with the opportunity to raise the quality of many aspects of their children's upbringing. Today, thanks to increased education, all young parents are at least literate, and are therefore in a position to play a key role in the intergenerational transfer of human capital. I have also argued that lower fertility is unlikely to lead to greater labor force participation in the near future, essentially leaving increased leisure and home production of human capital as the only other options for women with fewer children. The great obstacles that remain in the promotion of human capital are the distorted incentives provided by the system of formal education and the labor market.

Government policy is the chief determinant of how generous Iran's demographic gift will prove to be. The changing age structure poses an opportunity as well as a challenge for the economy. To meet the challenge, the country needs properly functioning labor and financial markets, as well as an effective educational system. Unfortunately, the ideological barriers to creating a competitive labor market are immense. President Khatami's election platforms, which have won him with more than 70 percent of the popular vote in the 1997 and 2001 elections, extended the needs of youth to include political participation but not participation in the economy. Five years after his election to office, he is still unable to articulate the economic base on which to build his promised 'civil society,' in part because of his strong association with the left, which places a much higher value on the protection of existing jobs than on job creation. Failure to enact reforms that can help Iran take advantage of the demographic opportunity may lead to a demographic nightmare of increased unemployment and social discontent. Already one in four young high school graduates is unemployed, which is three times the national average rate of unemployment. Unfortunately, fears of rising unemployment may cause policy makers to take the wrong turn and further intervene in the economy. The temptation to protect jobs in times of high unemployment may prove too strong, causing the government to further tighten, rather than loosen, restrictions in the already inflexible labor market of Iran. On the other hand, once it sees the great potential, it could well be persuaded to take the bold steps necessary for reform.

Notes

- * I wish to thank Ismail Sirageldin and Jeffrey Williamson for helpful comments on the original paper, which was first presented at the ERF conference on "Population Challenges for the Middle East and North Africa," Cairo, November 1998.
- 1 For an evaluation of the role of natural resources in growth, see Sachs and Warner (1995); for the role of human capital in growth, see Lucas (1988) and Barro (1991).
- 2 Although the size of this age group is rarely reported accurately, the phenomenal increase in the later intercensal period shows up in school enrollments.
- 3 This scenario is not the worst case, as I am implicitly assuming that fertility will not rise in the future, but it is consistent with the hypothesis of intertemporal substitution as noted above.
- 4 I assume zero rural-urban migration. Allowing for a certain percentage of rural population to

- move to the urban areas complicates the projections, and it would change the ratios depending on the assumptions made about the fertility of those who move.
- 5 This may not be a good projection for the future parent-child ratio in the urban sector, as these projections ignore rural-urban migration.
 - 6 The 'Plan and Budget Organization' projects a more bleak picture: to maintain unemployment at its current rate, the economy must create 3.6 million new jobs in the next five years, more than it created for the ten-year period 1986–96 (*Hamshahri*, 21 April 1999).
 - 7 Behrman *et al.* (1999) show that in rural India female education is valued in the marriage market, more highly educated women being preferred precisely because they can better educate future sons.
 - 8 Studies of the rate of return to education in Iran are sorely lacking. In particular, we do not know how it varies by rural and urban origin of the child.
 - 9 Personal observations. I use the exchange rate of 3000 rials per dollar.
 - 10 Rewards for human capital are determined mainly in the labor and the marriage markets. But, to the extent that matching in marriage is based on human capital, the markets for marriage and labor produce the same signals.
 - 11 Private tutors, especially those who teach at grades 11 and 12, easily rake in hourly rates in excess of a day's pay at their regular jobs. A World Bank (1999) study estimates that Egyptian parents spend seven billion Egyptian pounds (\$2 billion), or six percent of private expenditures, a year on private tutors.
 - 12 For a review of the planning process, see Moazzami (1998).
 - 13 Article 21 of the Labor Law recognizes quits, deaths, or retirement as reasons for ending a labor contract. All other reasons require government approval. Employers who lay off workers for lack of productivity risk being overruled on appeal to government councils and face penalties.

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