

## Demographic Swings and Early Childhood Education in Iran

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and

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### Abstract

In recent years Iran has greatly expanded its early childhood education program, taking first place in the Middle East in preschool enrolment. In this paper we examine the reasons for the unusual expansion and argue that it is in large part an institutional response to demographic changes in Iran, notably the sharp fertility decline of the 1990s. Fertility declined from more than 6 births per woman in the 1980s to about 2 in 2004, while during the same period kindergarten enrollments increased from less than 10 percent of 5 year old children to nearly one half of the population. Economists usually think of the effect of the reduction in fertility on child schooling in terms of a trade-off between quantity and quality. In their models both fertility decline and rising investment in child education are attributed to choices made by families to substitute quality for quantity of children. In the case of Iran, expansion of pre-school education appears to have an institutional explanation. In the early 1990s, following the decline in primary school enrolments in early 1990s, itself caused by fertility decline a few years earlier, caused a surplus of primary school teachers. In an attempt to preserve primary school teachers' jobs, public schools worked together with parents to set up kindergarten classes in public schools, even though pre-primary education was not part of their official mandate.

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## **1. Introduction**

Family life has gone through fundamental change in post-Revolution Iran, especially in fertility and child education. Fertility has declined from more than 6 births per woman in the 1980s to about 2 in 2004, while at the same time education, especially for girls, expanded to the extent that young men and women born in 1985 now have about 10 years of schooling and women outnumber men in universities. This transformation has brought with it not just more investment in formal schooling, but in early childhood education (ECE) particularly. There has been an explosion of interest in books and educational toys for children, which can now be found in most homes, but is not easily documented.

This combination of changes has been described in the economics literature on family economics as the substitution of quality for quantity of children (Becker 1991), which the modern growth theory considers a precondition for long run economic growth (Becker, Murphy and Tamura, 1990, Lucas 2002). If there is a relation between increase in education and decrease in fertility, then Iranian families have changed strategy from high fertility and low investment in child education to low fertility and high investment in education, which would bode well for Iran's long run growth (Salehi-Isfahani, 2006a and 2006b). Evidence that this may indeed be so can be found in Iran's recent shift of the education portfolio toward ECE, or more specifically, the rapid increase in enrolments in kindergartens and day care centers. In 2004-05 about 48 percent of 5 year olds were in a pre-school programs compared to 7 percent in 1993-94. In this paper, as evidence of the shift in strategy of Iranian families we focus on the expansion of kindergarten, which is not compulsory but has become popular where available. Other types of day care services for children below age 5 account for about 10 percent of the total pre-primary enrollment, so by focusing on kindergarten we capture the most important trend in early childhood education in Iran. We show how the new emphasis in kindergarten education is related to changes in age structure resulting from a demographic swing which has increased the number of adults to children and therefore expanded resources for their

education. We also show that the increased supply of pre-primary education, which at first came in makeshift kindergarten classrooms, was a response to a surplus of primary school teachers as primary enrollments tumbled. The program's popularity since then, however, reflects genuine demand on the part of parents for early childhood education and therefore constitutes classic case of quality-quantity substitution.

In terms of long term economic growth, ECE investment is of particular interest because it is a signal for deepening of human capital. A significant part of the benefits of smaller families that the economic development literature stresses is realized not by greater formal schooling, which can also result from expansion of subsidized public schooling even in the absence of fertility decline, but by greater attention to child education by parents at home. In Iran, as in other Middle Eastern countries, expansion of formal schooling has been less about productive skills than diplomas that help their holders land jobs in a labor market which values formal schooling rather than productive skills (Salehi-Isfahani 2006a). The rise of pre-school education, which is not required as part of formal schooling in Iran, may be a signal that parents in Iran have not just switched from child quantity to child education, but are willing to go beyond formal schooling and invest in productive human capital. Even if parents' interest in pre-school is because it enhances their child's chances of success in formal schooling later, it could still help economic growth because it frees women and young girls to participate in formal education and the labor force, and promotes the early development of such skills as creativity and teamwork which are not taught in grade school (Heckman et al 2004).

The plan of this paper is as follows. The next section reviews the literature on the effect of ECE on human capital development. Section 3 discusses the effect of fertility transition on age structure, school enrollments, and the potential for increase in quality of human capital in Iran. Section 4 offers a brief overview of formal schooling in Iran, and Section 5 reviews the history of preschool education in Iran and shows how its recent rise is related to the changing age structure. Section 6 is the conclusion.

## **2. Early childhood development**

Recent research has identified Early Childhood Development (ECD) as an important factor in economic and social development (Van Der Gaag & Tan, 1997; Van Der Gaag, 2002). Preschool education (ECCE- Early childhood Care and Education) is an important component of ECD and usually includes the education and care of children aged 3-6. Studies have demonstrated that by providing basic health care, adequate nutrition, and nurturing and stimulation in a caring environment, ECD interventions ensure children's progress in primary school, continuation through secondary school, successful entry into the work force, and increased future earning capacity (Young, 2002). Children who have participated in ECD programs show higher intelligence quotients and improvements in practical reasoning, hand and eye coordination, hearing and speech, and reading readiness (Myers 1995).<sup>1</sup> Grade repetition and dropout rates are lower, performance at school is higher, and the probability that a child will progress to higher levels of education increases (Barnett 1995; Grantham- McGregor and others 1997; Karoly et al., 1998). Its contribution to social capital has also been documented (Heckman, 2000), as well as its effects on reducing delinquent and criminal behavior (Schweinhart et al. 1993; Yoshikawa, 1995; Zigler, Taussig, and Black 1992).

By intervening early, studies have shown that ECD programs allow a leveling of the playing field by enabling all children to fully benefit from school and to succeed in the market place, helping to reconcile countries' goals for equity and efficiency (Birdsall, 1999). Evidence on how preschool can improve access to schooling for disadvantaged groups is found in numerous international examples. An evaluation (Barros and Mendoca, 1999) of Brazil conducted by the World Bank and the Institute of Applied Economics Research (IPEA) found that one additional year of preschool increases the schooling ultimately attained by about half a year, and reduces grade repetition by 3-5 percent for each additional year of preschool. The study also found a 2-6 percent

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<sup>1</sup> The 2001 PIRL study examined the effects of preschool education on literacy achievement (Mullis 2002). Iran ranked third from the bottom in literacy competency compared to 24 countries, faring better than only

increase in future earnings with indications of a higher increase for poorer families. The rate of return on investment costs of preschool education was found to be between 12.5 and 15.0 percent. For children whose parents have 4 years of schooling, 1 year of preschool is associated with 0.45 additional years of education. Because it is estimated that 1 additional year of education increases potential earnings by 11 percent, 0.4 years more of education produce an indirect gain of 5 percent in earning power. Children who attend preschool have a direct gain of 2 percent in earning power. The combined indirect and direct gains amount to a 7 percent increase in potential lifetime income. Pre-schooling also increases the participation of females in the labor force. Studies in Brazil, Mexico, and Guatemala found that access to childcare frees older siblings, usually girls, to return to school to complete their own education or to go to work.<sup>2</sup>

### ***3. Demographic swings and ECE in Iran***

In this section we consider the rise of ECE in Iran in the context of the large demographic shift in the last two decades. Rising education would not have been possible without the significant reduction in fertility that started in the mid 1980s (Figure 3). The decline of fertility by one-third in a period of about 15 years, if not motivated by the desire to invest more in children, has certainly made it possible for parents to spend more resources on each child's education. Greater resources available for child education are primarily due to changes in age structure, which follow fertility decline in the form of rise in the number of adults per child. The swing in age structure in Iran has been more exaggerated because fertility rose before falling precipitously. In the early years of the revolution, total fertility (average number of births per woman) rose from about 6 to 7, before falling to about 2 in 2004 (Figure 3). The peculiarity of Iran's fertility transition is demonstrated in Figure 3 which compares the pattern of decline in total fertility (TFR) and child (under 5) mortality rates (CMR) for the three largest countries of the Middle East. Whereas in

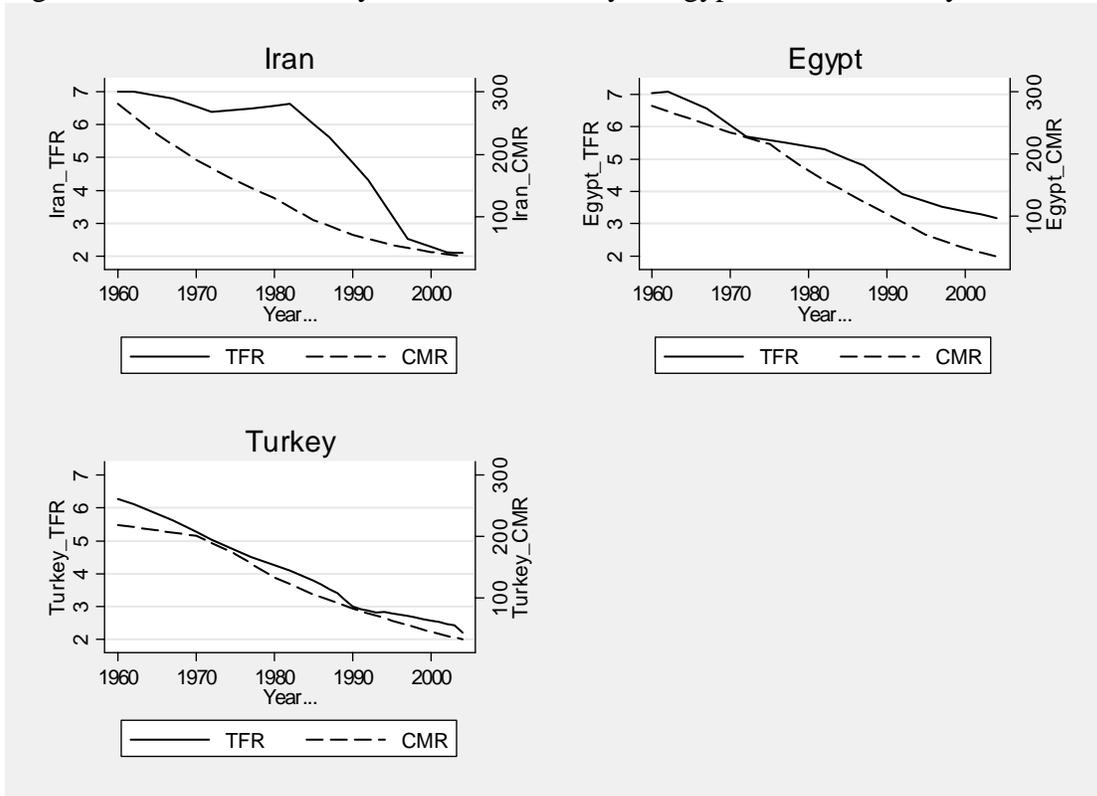
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Argentina and Belize. With only one year of preschool, average achievement on the PIRL literacy score increased by 11%, raising Iran's ranking and placing it on par with Macedonia, Cyprus and Turkey.

<sup>2</sup> Brazil Early Child Development, 2001. World Bank, Human Development Department, Report No. 22841-BR.

Egypt and Turkey we observe a relatively smooth transition, and where decline TFR closely follows decline in CMR, in Iran fertility rises before falling and with a substantial delay. This rise and fall in fertility helps explain the drastic changes in age structure in Iran that we believe help explain the sharp rise in ECE (see Figure 6 and Section 5 below).

Figure 3. Decline of fertility and child mortality in Egypt, Iran and Turkey, 1960- 2004



Source: World Bank Development Indicators, 2005.

The post revolution baby boom quickly resulted in a sharp increase in the number of primary age children. The number of primary school age children accelerated after 1980 (indicated in Figure 4 by the number of 5-9 year olds, assuming 100% enrollment), rising by 60 percent between 1980-90, forcing public schools to use their buildings in two and sometimes even three shifts per day. This was indeed the initial reason why the government reversed its position on family planning and launched its integrated health and family planning program in 1989. The programs success soon alleviated the intense pressure on the education system. Since 1990 the number of 5-9 year olds (and by

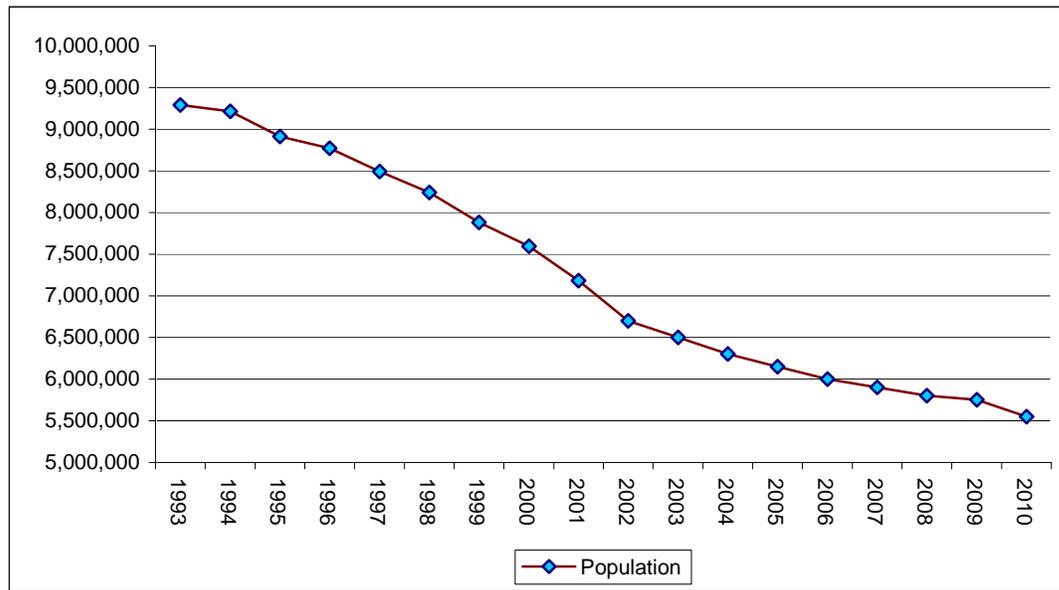
implication primary enrollment) has fallen by one-third. As we show below, the savings from this decline in the primary age population is the key to the increase in preschool enrollment.

Figure 4. The number of 5-9 year olds, 1960-2020.



It took only a few years after the government initiated the family planning program in 1989 for its benefits to show up in enrollment data. The number of children enrolled in primary school dropped by nearly 4 million, from 9.9 million in 1993-94 to 6.2 million in 2004-05. By the year 2010, the population of primary school students is expected to decrease by another 1 million, freeing up additional teachers and educational resources (Figure 5).

Figure 5: Population Projection: 6-10 Year Old Population



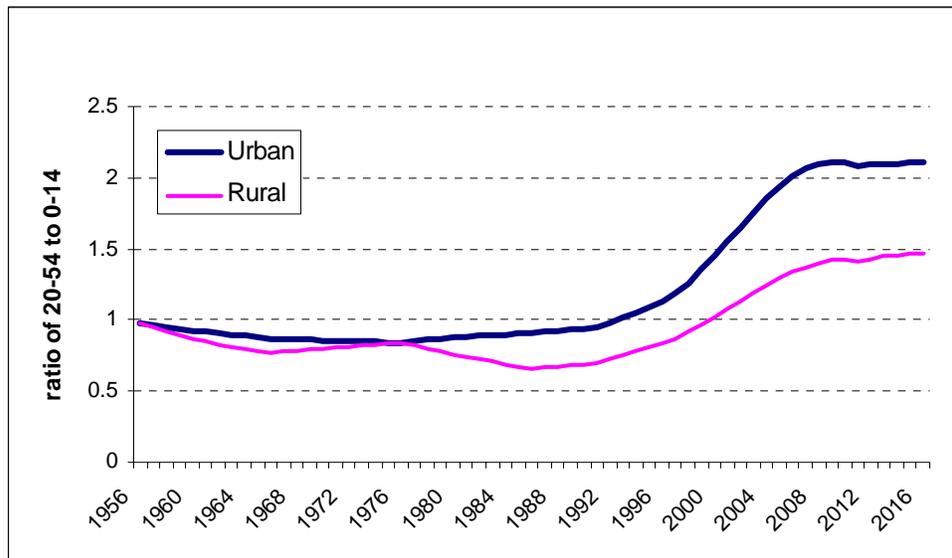
Source: Ministry of Education, Tehran.

The effect of the sharp decline in fertility on age structure is depicted in Figure 6, which shows the historic values of the adult-child ratio since 1956 and its projected values until 2016 using the United Nations population forecasts. The number of adults (20-54 year olds) per child (0-14) has been on the rise since mid 1990s, doubling the ratio in the last ten years in both rural and urban areas. If fertility declines according to the optimistic UN scenario, it may reach as high as 3 by the year 2030 (Salehi-Isfahani 2005).

The rising adult child ratio is a once-and-for-all opportunity for investment in human capital, known in the development literature as the demographic window of opportunity (Barlow 1994, Salehi-Isfahani 2002). The adults in the numerator are parents who, since the late 1990s, have no longer been outnumbered by their children, and therefore can provide them with better health and nutrition and prepare them better for school. They are also teachers who would teach fewer students per class. The fact that the number of adults per child in urban Iran in 2005 was twice what it was in the mid 1990s (see Figure 6) show how dramatically the ability of Iranian families has improved in educating their children in the last ten years. This increase in the societal “teacher-pupil” ratio bodes

well for education of the next generation, especially since new mothers—women aged 20-29—have on average about ten years of schooling (see Table 1 below). The increase in years of schooling and the narrowing of the education gap between boys and girls discussed in the next section is how Iran is taking advantage of its demographic window of opportunity. In this context the rise of early childhood education is interesting because it reveals a new dimension of the response of families to the changing demographic situation, the substitution of child quality for quantity.

Figure 6: Rising adult-child ratio, 1956-2016



Note: The ratio of adults 20-54 years old to children 0-14.

Source: United Nations, World Population Prospects 2002 and author's calculations.

#### **4. Growth of formal schooling**

The rise of formal schooling in Iran is quite impressive, especially because it also entailed a narrowing of the education gap between men and women (Table 1).<sup>3</sup> The average years of schooling rose rapidly: the cohorts born in 1980-84 achieved as adults on average about 8 year of education in rural areas and 11 in urban areas, compared to the 1940s cohorts who achieved less than one year in rural and 4 years in urban areas. The narrowing of the gender gap has been also impressive. Women born during 1940-49 had

<sup>3</sup> For education of women in Iran, see Mehran (1997 and 1999).

only a fraction of schooling of men in rural areas and about half in urban areas. For the 1980-84 cohorts who, by the way, are the parents in charge of educating the next generation of Iranians, the gap has narrowed to about 10% in rural areas and zero in urban areas. The younger cohorts of Iranians born since 1970 have on average at least a basic education (in urban areas about 11 years which since 1996 is a high school diploma).

Table 1: Educational attainment by gender and cohort (average years of schooling)

Cohort	Rural			Urban		
	Male	Female	Total	Male	Female	Total
1940-49	1.40	0.10	0.70	5.80	2.80	4.40
1950-59	3.20	0.70	1.90	7.70	5.10	6.40
1960-64	4.90	1.70	3.30	8.80	6.50	7.70
1965-69	5.50	2.80	4.10	9.10	7.50	8.30
1970-74	6.80	4.20	5.40	9.50	8.40	8.90
1975-79	8.00	5.90	6.90	10.10	10.10	10.10
1980-84	8.60	7.50	8.00	10.70	11.00	10.90

Source: Authors' calculations based on unit record data from Household Expenditure and Income Survey, 2002.

The expansion of education is also reflected in enrollment rates in Table 2. Enrolment ratios in basic primary education are now comparable to countries at similar levels of economic development. The intake for primary education has increased from 78.5 percent in 1988 to 103.4 percent in 2002.

Table 2: Enrollment rates by gender and level of education, 1995-2002

Year	Primary			Lower secondary			Upper secondary		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1995	108.6	101.4	105.1	100.1	81.6	93.1	72.7	66.7	69.8
1998	108.9	102.9	106.0	102.2	85.1	95.9	79.9	81.2	80.5
1999	107.7	102.4	105.1	102.6	85.0	96.0	78.0	81.5	79.7
2000	107.2	102.2	104.8	102.6	85.0	96.1	77.1	81.7	79.3
2001	103.7	99.5	101.6	102.8	85.9	96.6	77.9	83.8	80.8
2002	101.8	98.1	100.0	103.6	87.5	97.8	76.6	82.6	79.5

Note: Enrollment rates for later years are sensitive to population estimates for the relevant age groups.

Source: Ministry of Education, Tehran, Iran.

## 5. Pre-schooling

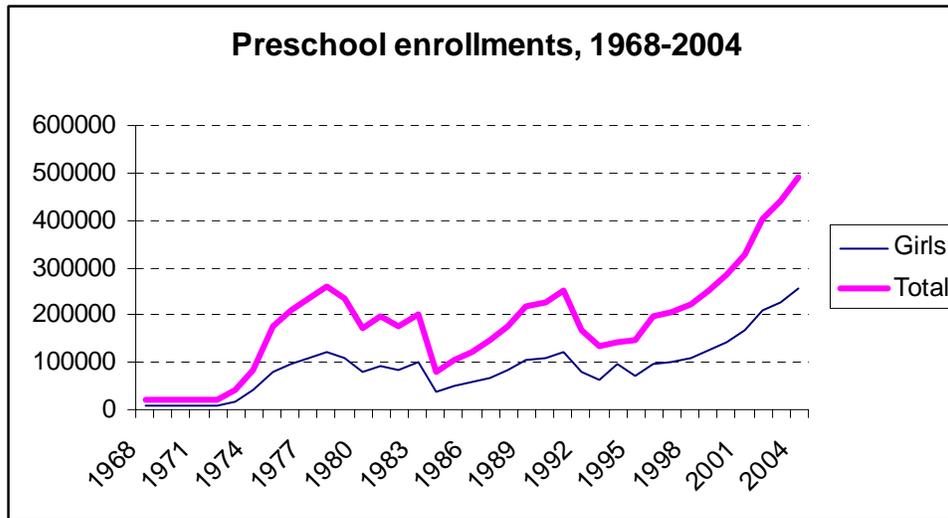
Preschool education in Iran dates back to the early years of the twentieth century,<sup>4</sup> but it accelerated only recently. The first preschools were set up by Christian missionaries in Iran in 1919, which were mostly attended by children from the rich families. In 1924, recognizing the growing importance of pre-school education, the government prepared and ratified the bill to regulate their operations and conferred the first permit to operate a kindergarten in Tehran in 1931. During 1943-53 the government set up centers for training of preschool teachers and enrollments increased from 1874 to 5346. In 1961 the government started to operate its own kindergartens to allow children from middle and lower income classes to attend preschool, but these were mostly set up within its own ministries to help women employees. By 1972, there were 431 such centers. In 1974 the age for attending preschool was raised from 3 to 5. There was a surge of interest in day care and pre-school education during the oil boom years of 1973-78 before the Revolution (Figure 7), most of which were still provided as day care centers attached to places of employment of women. As a result, after the Revolution, as some women left the labor force or were encouraged to retire early, many of these centers were closed down and enrollments fell by one quarter. Shortage of primary teachers as a result of rising primary school population in the mid 1980s reduced the supply of preschool education and contributed to a further decline in primary school enrollments. In 1984 enrollments reached their lowest level of about 78,000, less than one-third its previous high of about 260,000 (see Table A.1 in Appendix). With the end of the war in 1988, enrollments picked up, only to fall again in 1992.<sup>5</sup>

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<sup>4</sup> For the early history of preschool education in Iran see *Encyclopedia Iranica*, “Nursery and pre-school education,” <http://www.iranica.com/newsite/>, under Education.

<sup>5</sup> The time series of preschool enrollments depicted in Figure 7 is problematic because for earlier years, before 1966, the age range is 3-6, some of whom are in day care but in later years it is only the 5 year old children in kindergarten (see “Nursery and kindergarten education,” *Encyclopedia Iranica*). To get a sense of the proportions involved, consider the numbers for 2003-04 (which do separate day care and kindergarten): 492,422 kindergarten (5 year-old) children, compared to 51,385 in the 0-4 category who were in nursery and day care, the latter comprising only about 10 percent of all pre-primary care of any type. Unfortunately, data on growth of the number of children in day care is not available for all years.

Figure 7. Enrollment in preschools



Notes: 1968 refers to school year 1968-69, and preschool refers to children age 5.  
 Source: Ministry of Education 2005 (see also Table A.1).

Table 3: Preschool Enrollments, 1993-2004

Year	Enrolment Ratio	Boys	Girls	Total
1993-94	7.6	69,119	63,534	132,653
1994-95	8.2	73,946	67,782	141,728
1995-96	11.0	94,643	86,948	181,591
1996-97	14.3	99,842	95,339	195,181
1997-98	15.5	104,014	100,308	204,322
1998-99	16.3	110,711	109,723	220,434
1999-00	22.0	125,700	125,856	251,556
2000-01	25.3	142,538	144,365	286,903
2001-02	29.2	160,822	168,240	329,062
2002-03	35.6	195,536	208,176	403,712
2003-04	39.8	212,276	226,503	438,779
2004-05	47.8	238,387	254,035	492,422

Source: Enrolment is Ministry of Education (MOE), population estimates are based on birth registration data from Civil Registration Office (CRO), and under 5 mortality rate of 3.5 percent estimated the Statistical Center of Iran (SCI).

Since 1993 expansion of kindergarten education has increased uninterrupted and at a rapid pace (Figure 7 and Table 3). In 2004-05, 47.8 percent of 5 year olds attended kindergarten, compared to only 7.6 percent 1993-94.<sup>6</sup> The number of kindergartens

<sup>6</sup> Preschool enrollment rates are sensitive to population estimates, which are not available from the same official source in Iran. MOE estimates for enrolment rates are lower than ours after 1996, because estimates of the 5 year old population by MOE are unrealistically high, even though both sets of estimates are derived from the same CRO birth registration data using published SCI under 5 mortality rates. For example, the MOE estimate for the number of 5 year

increased from a few hundred in 1970s to 17,291 in 2004-05. Nearly 4000 of them were added in that year, while the number of primary schools decreased by about 1500.

Will this latest expansion of preschool education continue or stall, as it has in the past?

To answer this question we must first understand how the expansion came about. Was it a part of government-led expansion of formal schooling in Iran, or was it an indication of increasing demand on the part of parents for deepening of formal education by extending it to ECE? The answer appears not to be the first. In Iran ECE is not part of the government's mandate as yet. In fact, as we show below, the Ministry of Education took the responsibility for expansion of ECE rather unwillingly and despite this constraint. The evidence we present shows that ECE growth was related to increased demand by parents but specific institutional reasons were instrumental in making it happen.

Pre-school education is directly related to the decline in fertility and changing number of primary age children depicted in Figure 4. As noted earlier, the population of primary-age children, and with it primary enrollments, declined rapidly in the 1990s. Unlike families who, with a given income, typically invest more in each child when their number is lower, for the government the demographic gift accrues only after all the baby boom children move through the entire system of formal schooling. In the 1990s, even as primary enrollments declined, as far as the government was concerned relief as a result of lower fertility was years away, until the fertility bulge had passed through lower and upper secondary schools as well.

Economists since Becker (1960) have viewed increases in education that follow closely fertility reduction as the main benefit of fertility decline. They often describe the actual mechanism for the quality-quantity substitution is in terms of household resource allocation. However, in most countries where public education is important, a major part of the substitution is done through institutional responses to declines in enrollments which follow a decline in fertility. Institutional responses to fertility decline may not

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olds in 2004 *exceeds* the number of births five years earlier (in 1999) by more than 8 percent, which only makes sense if one assumes undercounting of births by about 13 percent. There is no evidence that CRO data underestimate the

necessarily result in higher quality. There are competing demands for government revenues outside of the education sector, so reduction in enrollment can as easily result in a smaller education budget as in reduced class size and higher quality.

In Iran, the response of Ministry of Education to fertility—and the subsequent primary enrollment—decline, was shaped by institutional constraints and political expediency. A government directive, attached to the Second Five Year Development Plan (1989-93), prohibited the government from shifting its more important resource—manpower—up to higher grades. Surplus primary school teachers were needed in lower secondary level schools but the Ministry was not able to reallocate. Furthermore, the alternative of laying off the surplus primary school teachers was undesirable on grounds of political expediency. As a result, the only two real choices for the government were to lower primary class sizes and to employ the surplus teachers to expand pre-school education. Both would raise education quality, though in different ways. In the event, the government did some of both; it lowered class size at primary level and expanded kindergarten education. Pupil-teacher ratios at primary level fell from a peak of 31 in 1991 to 20 in 2004 (World Bank 2005). Education expenditures per primary student nearly doubled during 1991-2004, from 6 to 11 percent of per capita GDP (World Bank 2001 and 2005). Increased resources at the primary level also resulted in improved efficiency as transition rates from primary to lower secondary level increased from 83 percent in 1993 to 96 percent in 2002 (MOE 2005).

Shifting excess resources down to pre-primary education was not straightforward because yet another institutional constraint prevented the Ministry of Education from engaging in delivery of kindergarten education. Preschool education was (and still is) not part of the Ministry's mandate, so the government could not pay for teacher salaries and other expenses out of the Ministry's annual budget. So, funds to pay preschool teachers and for school supplies had to be raised from parents. To help primary school teachers keep their jobs, the government essentially played the role of a middleman between parents and

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number of births at this rate.

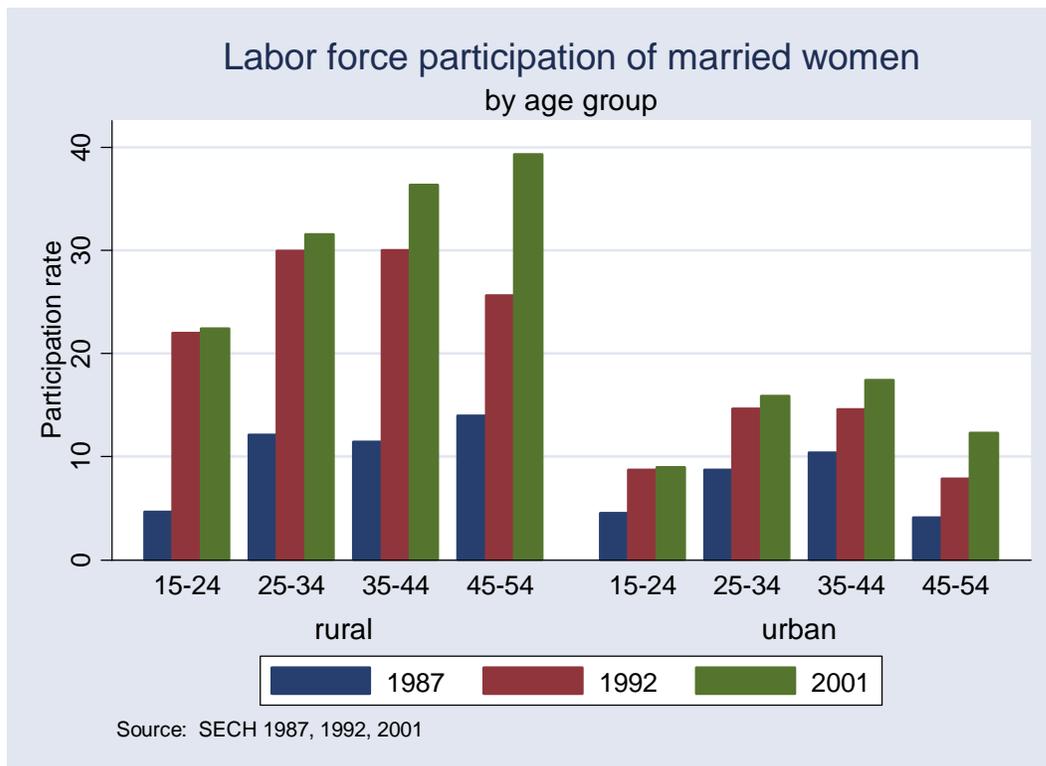
teachers and provided the most important ingredient for their joint enterprise—classroom space. In every school with surplus faculty, school officials set up classroom space and collected tuition from parents, thus creating semi-public kindergartens that would flourish in the following years.

The innovative approach of the Ministry to balancing supply and demand for primary teachers led to a sharp increase in preschool enrollments as noted earlier, from 7.6% in 1993-94 to 47.8% in 2004-05, rising at an annual rate of 12.6 percent (Table 3). The rise of pre-primary education has not only improved primary education in terms of higher efficiency as noted above, it has put Iran in a favourable position internationally. The latest UNESCO (2006) report provides comparative data for 2002/03 showing Iran's gross preschool enrolments in that year is about 30.7 percent, placing it well above the average of Arab countries (17.7 percent), and just below Countries in Transition (34.6 percent) and Developing Countries (34.3 percent), although lagging far behind developed countries (81.1 percent). The government plans to enroll 70 percent of preschool children by 2010, which is realistic because the number of preschools children is expected to remain relatively constant in the near future.

Pressure from the demand side contributed to the success of the program. Parent demand for preschool education was on the increase for two reasons. First, as noted earlier, because of their decision to have fewer children, parents were posed for greater investment in them. Awareness of the importance of early childhood development was at the time increasing and was critical for channeling the new energy for child education away from grades and test scores at high school and the university entrance examinations, which remains the biggest obsession of Iranian parents to this day, to less tangible aspects of education and at younger ages. Discussion of child psychology on public media, notably in widely circulated *Hamshahri* daily and in state television, grew in the 1990s and helped parents become more aware of the benefits of early childhood education.

Second, at the same time more women were entering the labor force and therefore demand more day care and kindergarten services. Figure 8 shows the rise in female participation in market work by married women in both rural and urban areas.<sup>7</sup> The participation rates for both rural and urban increased for all ages. Rural women's participate rate is greater but because of the nature of their work are in a better position to combine work and child care. The group most affected by lack of day care is probably urban women aged 25-34 and married, the group most likely to have children under 6. Participation rates for these women were still under 20 percent in 2001 but have been increasing in the last two decades. Given the low activity rate of Iranian women, say compared to women in North Africa (see World Bank 2004), the high preschool enrollment rates in Iran can be seen as indication of the importance of the investment motive in demand for preschool education.

Figure 8: Participation rates of women in the labor force, 1987-2001



<sup>7</sup> The data are from three rounds of the survey Social and Economic Household Characteristics (SECH), conducted by the Statistical Center of Iran. See also Salehi-Isfahani (2005).

### *Public vs. private supply of preschool education*

If demand for preschool education were high, why did the private sector not step in to satisfy it? Although nearly all schools in Iran are public, since preschool education was not part of the government's mandate it would have made sense for private sector to fill in any gap between supply and demand. In 2004-05, of 218,149 schools at all levels only 12,778, or 6 percent, were private. Nearly all educational institutions in rural areas are public. Private sector played a slightly stronger role at the kindergarten level (see Table 4). The share of private preschools increased during the early 1990s, from 12.0 percent in 1993 to 19.5 percent in 1997, but has fallen below 10 percent since 2001, as the number of public schools offering preschool expanded. During 1993-2002 enrollments in public kindergartens increased by a factor of 4 compared to 2.5 for private institutions. However, since 2003 enrollments in private kindergartens has been increasing faster; in 2004 private enrollment increased by 21 percent compared to 11 for public enrollment. Evidently, for most of this period, the pressure from demand was not sufficient to induce private sector investment in kindergartens, but perhaps that is about to change.

Table 4. The distribution of kindergarten schools and students by ownership

Year	Schools				Students			
	Public	Private	Total	% private	Public	Private	Total	% private
1993	5,292	285	5,577	5.11	116,336	16,317	132,653	12.30
1994	5,592	499	5,877	8.49	117,871	23,857	141,728	16.83
1995	2,201	808	3,009	26.85	147,064	34,527	181,591	19.01
1996	2,400	922	3,322	27.75	157,711	37,470	195,181	19.20
1997	2,462	988	3,450	28.64	164,498	39,824	204,322	19.49
1998	3,285	958	4,243	22.58	185,891	34,543	220,434	15.67
1999	4,812	996	5,808	17.15	219,700	31,856	251,556	12.66
2000	6,331	1,051	7,382	14.24	257,354	29,549	286,903	10.30
2001	8,477	1,104	9,581	11.52	302,074	26,988	329,062	8.20
2002	11,174	1,286	12,460	10.32	372,852	30,860	403,712	7.64
2003	12,099	1,398	13,497	10.36	404,064	34,715	438,779	7.91
2004	15,719	1,572	17,291	9.09	450,351	42,071	492,422	8.54

Source: Ministry of Education (2005).

## **6. Conclusion**

This paper has documented and explained the rapid expansion of pre-primary education in the last ten years in Iran. Nearly half of 5 year old children attended preschool in 2005 compared to about 8 percent in 1993. We argue that the expansion in preschool enrolment took place as a response to Iran's spectacular decline in fertility, and describe the unusual mechanism that linked the two in Iran. Since the pioneering work of Becker (1960), the economic development literature has emphasized the importance of the substitution of quality for quantity of children in the process of economic development. We show that such a substitution appears to have taken place in Iran, though the mechanics of how resources freed from reduced fertility translated into more education is not what models of household decision making typically assume. We show that the quantity-quality substitution occurred in part thanks to an institutional response by the Ministry of Education, which played the role of intermediary helping parental resources finance semi-publicly provided preschool education.

Initially, shortly after the Revolution, the government faced a baby boom which prompted it to expand primary education by hiring additional teachers, building schools and operating most schools with two shifts and some even with three. The pressure on schools was a key factor in the government's decision to reverse its earlier stance against family planning and to adopt an ambitious program which contributed to a rapid decline in fertility. As the size of the primary school age children dropped and a surplus of primary school teachers developed, the government sought ways to respond. Political expediency for the revolutionary government constrained it from laying off thousands of primary school teachers. At the same time, a government directive prohibited the Ministry of Education from re-assigning primary school teacher to lower secondary schools. The government was then left with two options. Reduce class size at the primary level or reassign surplus teachers to teach kindergarten. However, since preschool was not part of its mandate, the government was not able to directly pay these teachers, so in had to adopt an innovative program in which schools acted as

intermediaries between teachers and parents in order to provide preschool education. Public schools were instrumental also in providing the physical space.

This process has not come to an end yet, as the ratio of adults to children continues to climb in the next decade, making additional resources available for even faster accumulation of human capital. The number of primary students will stabilize at about 6 million, while the number of lower secondary students will decline from 4.4 to 3.7 million and that of upper secondary fall slightly from 4.2 to 4.1 million. At the same time, the number of young adults looking for jobs will increase by more than 3 percent per year. The fruits of fertility decline—the demographic gift—will continue to present the families and the government with the opportunity for further improvements in quality of education.

The lesson from the analysis of the rise of preschool education analyzed in this paper is that mere availability of resources does not guarantee that the additional resources will be used properly. Although so far the choice of using additional resources in ECE is in our view quite right, the efficiency of future investment in human capital is not guaranteed. As Salehi-Isfahani (2002, 2005) has argued, the existing institution of education and labor market in Iran are not conducive to effective utilization of the demographic gift. Iran's formal schooling will probably continue to expand, but effective human capital may not. The structure of incentives appear to push parents and students into greater specialization in test taking and rote memorization, rather than promote the variety of skills that producers need but test results fail to reveal. Early childhood education can nevertheless prove a lasting improvement because, by its nature, it promotes a variety of types of skills.

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## Appendix

**Table A.1 Pre-primary enrollments**

Year	Girls	Total	Percent Girls	Population	No. schools
1943	966	1874	51.55		30
1953	1730	5344	32.37		115
1963	5924	13296	44.55		262
1968	8782	19462	45.12		337
1969	9248	20214	45.75		376
1970	8706	19308	45.09		349
1971	9509	21237	44.78		431
1972	10025	21773	46.04		419
1973	18587	40987	45.35		607
1974	40574	82854	48.97		980
1975	79978	175424	45.59		1804
1976	97434	211869	45.99		2342
1977	108298	235136	46.06		2918
1978	119662	259497	46.11		3492
1979	109123	236486	46.14		3696
1980	81163	172003	47.19		2791
1981	92554	195989	47.22		2737
1982	85329	177525	48.07		2410
1983	100960	202899	49.76		2735
1984	36135	77774	46.46		1276
1985	50376	106986	47.09		1732
1986	58451	123437	47.35		1911
1987	69064	146409	47.17		2162
1988	85223	177979	47.88		2547
1989	103345	217496	47.52		3210
1990	108151	227492	47.54		3586
1991	119959	252513	47.51		4114
1992	81307	168864	48.15		3003
1993	63534	132653	47.89		2483
1994	97782	141728	68.99		2715
1995	71299	147064	48.48		2201
1996	95339	195181	48.85	1361581	3322
1997	100308	204322	49.09	1318616	3450
1998	109723	220434	49.78	1355445	4243
1999	125856	251556	50.03	1145103	5808
2000	144365	286903	50.32	1134447	7382
2001	168240	329062	51.13	1126193	9581
2002	208167	403654	51.57	1133259	12456
2003	226503	438779	51.62	1103822	13497
2004	254035	492422	51.59	1029455	

Notes: 1943 refers to school year 1943-44.

Source: Ministry of Education (2005)