

The Effects of Oil Shocks on Poverty and Education in Iran: Evidence from the 1992-95 Panel

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Abstract

Like unemployment, poverty is sensitive to macroeconomic shocks and compounds with their duration. In economies that a large share of export comes from natural resources or commodities such as oil, the global shocks to the price can have drastic effects on household welfare, especially for the poor. This paper uses panel data to throw light on the effects of economic crisis emerging from oil shocks on short and long term poverty in Iran in the early 1990s. We show that the shocks have strong effects on poverty and welfare of the poor and also affect enrollments in school. Although about 20 percent of the population is poor in any given year in that period, only 3 percent are poor for the entire panel period. We show that controlling for household fixed effects, in the crisis years real per capita expenditure fell by 8% for rural areas and 11% to 14% for urban areas. We make a distinction between the long and short term poor and attempt to identify their characteristics. We also look at school enrollments for boys and girls in different regions. Interestingly, enrollment rates increased by 12 to 18 percents for senior female students in high school in all regions while it remained almost flat or in some cases fell for boys . Clarification of reasons behind this interesting phenomenon needs further research in this area.

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1 Introduction

Like unemployment, the welfare costs of poverty compound with its duration. A family that suffers a long spell of poverty may lose its ability to rebound on its own, thus needing assistance to escape from poverty. Long term poverty can also undermine child education and health and thereby transfer poverty from one generation to the next. In other words, whereas short term poverty can be viewed as a welfare problem, long term poverty is a development problem. Empirical studies based on cross section data which offer only snapshots of poverty provide a good picture of social welfare at a point in time, but are of limited use in understanding poverty as a social and development problem because they fail to report on economic mobility. A given level of poverty measured from cross section data can arise from very different social situations. For example, a society in which a quarter of the population forms an underclass of the chronically poor and another in which the same percent move in and out of poverty frequently so that no one family is poor for very long will look the same in snapshot.

Distinguishing short from long term poverty is important for policy because different instruments are needed to deal with each (Baulch and Hoddinott 2000). Short term or transitory poverty is better alleviated by policies that assist with consumption smoothing—better access to credit markets—whereas long term or chronic poverty may call for transfers or programs that increase the poor’s earning capacity (Lipton and Ravallion 1995). For these reasons the use of longitudinal studies of poverty and mobility have increased rapidly (for references see McKay and Lawson 2002, and Fields 2001). In parts of this paper, we analyze the short and long term poverty in Iran in early 1990s when an economic crisis emerged from shocks to oil prices.

Fluctuations in global prices of a commodity largely affect the macroeconomy and the household economic outcome and behavior of countries whose majority of export comes from that commodity. Iran, like most countries, in the Persian gulf, enjoys vast resources

of oil and its economy booms and busts with its prices. There is large literature on the macroeconomic effects of oil shocks on both the oil producing and consuming countries (for a review of the literature see Jones and Leiby 1996 and for some of the recent research see Blanchard and Gali 2007, Balke, Brown, and Yucel 2002, and for developing countries see Cunado and Gracia 2005). However, there is little research on the microeconomic effects of oil shocks specially on poverty, school enrollments, particularly because it is hard to disentangle the effects of oil shocks from other economic factors. Meanwhile, there are studies on the microeconomic effects of economic crisis (see Frankenberg, Smith, and Thomas 2003, Thomas and Teruel 1999, and Friedman and Thomas 2007). Oil prices had large fluctuations since 1970s and Iran's economy suffered from it. There is a large literature on the macroeconomic effects of oil shocks on good understanding of the effect of. In the end of 1993, the economy fell into a severe crisis as the oil prices suddenly dropped substantially. The drop in oil prices led to foreign debt crisis and import compression which paralyzed most industries that were dependent on raw materials. It was pushed harder by bad government policies, such as increasing the money volume, to overcome the crisis which led to high inflation. AS oil prices stayed low during 1994 and 95, the crisis continued during the period. The drop in the oil prices was the main factor in producing this crisis, as more than 80% of the economy directly or semi-directly depends on oil, and most other forces that worsen the crisis were directly related to the oil prices. Interestingly, the crisis happened in the middle of the household panel survey of 1992-95 which gives us an opportunity for this research.

This paper reports on the effects of economic crisis of 1994-95 on poverty, mobility, expenditures and school enrollments in Iran using the household panel survey of 1992-95. We find that there was a substantial drop in expenditure for all families during the crisis years but this pronounced more for families in Tehran, capital, and other urban areas, than rural areas. We observe that poverty increased during this period. Long term poverty

rates were low in this period, around 15 in rural areas to 13 and 12 percent in urban areas and Tehran, while about 44% of the people were poor at least once during the panel. Meanwhile, only 3 to 4 percent of individuals were poor in all four years of the panel. Part of this apparent mobility is due to transitory expenditure shocks and our estimates of mobility may exaggerate the situation. Interestingly, we find that school enrollments did not change in this period for most ages but increased by an average of 12% for age of 17 and 6% for 16 years old. This result needs further attention as what factors may have affected the enrollments.

The rest of this paper is

2 Economic Policy, Oil Shocks, and Poverty in Iran

The Islamic Revolution of 1979 is perhaps unique among modern revolutions in that it identified the poor as its social and political base, in much the same way that the Russian and the Chinese revolutions associated themselves with the working class and the peasantry.¹The revolution was followed quickly by large scale nationalizations of banks and major industrial establishments, which placed about 80 percent of total industrial production under the control of the government. The war of 1980-88 with Iraq intensified the government's role in the economy via a system of rationing of basic goods and extensive price controls. Economic reform starting in 1990 began to gradually dismantle price controls and rationing, increasing the role of markets in distribution, as well as move away from state ownership.

With the passing away of its leader, Ayatollah Khomeini, in 1989 and disappointment with public ownership, the Islamic movement has evolved away from many of its original social aspirations, but public rhetoric still identifies the poor as the main social base of the

¹Ayatollah Khomeini popularized the word *mostazafin*—literally, the disinherited—to refer to the Islamic Revolution's social base. In 1979, he set up the Mostazafin and Janbazan Foundation (Foundation for the Disinherited and War Veterans) to take over the property of the Shah (Pahlavi Foundation) and his allies who fled the country. It is now the largest conglomerate in Iran.

Islamic Republic and proclaims social justice as its key policy objective. More specifically, the key pro-poor policies of the early days, such as food subsidies, direct transfers, and progressive social programs in health and education have continued. Some of these policies have been highly effective in transforming the lives of Iran's poor households. A rural health delivery system is credited with rapid decrease in fertility and child mortality, and the literacy campaign has reduced illiteracy and all but eliminated the gender gap in school enrollments. The government spends about \$2 billion on subsidies for food and medicine, and several semi-public foundations and charities assist the poor with income and credit (Esfahani 2005). The largest such charity, *Komiteh Emdad Emam* (Imam Khomeini's Assistance Committee), which operates under the Supreme Leader's office, has under its direct aid coverage households identified by the community organizations to be in extreme poverty. These households were considered to be about 8 percent of the population or somewhere between one-half to two-thirds of all poor individuals in 2000. The official rhetoric in favor of the poor is yet to translate into a coherent poverty monitoring and reduction program. In 2003 the government decided to create a new ministry of welfare which may offer such a program. Government plans do not cite any specific poverty goals, but policies to increase the targeting of the subsidy program has been debated for several years.

Iran's economy is highly dependent on oil exports, with roughly 50 percent of government revenues and 80 percent of exports coming from oil.² Oil income has proved highly volatile in the past two decades. The economy was rocked particularly hard during the panel years (1992-95) by fluctuations in oil prices, starting with soaring oil revenues in 1990-91 as a result of the Persian Gulf war, followed by heavy external borrowing in 1992-93, and finally a payment's crisis in 1994-95. The heavy borrowing, mainly in short term loans, followed a poorly managed trade liberalization program and precipitated a debt crisis in 1994 which brought the reform program to a halt (Pesaran 2000). Iran's external debt, which had been

²These shares are computed with the oil prices at roughly \$20 per barrel in 2000 prices.

negligible up to that point, climbed to nearly \$23 billion in 1994, or 50 percent of the GDP, 76 percent of which was of short maturity (World Bank 2003). The crisis started by a drastic devaluation in March 1993, which helped inflation soar to 50% in 1995.

The combined effect of these factors on the economy is best seen in the level of imports, which averaged about \$27 billion during 1992-93 and fell to about \$15 billion during 1994-95, and the rate of growth of GDP which fell from about 8 percent in 1990-93 to less than 3 percent in 1994-95 (Figure 1). Private per capita consumption also fell, though by less than indicated by survey data (presented below in Figure 4).

[Figure 1]

The macroeconomic effects of these shocks on the economy were understood by policy makers. But only since this crisis, a debate was formed in the circle of policy advisors on how the government should tackle the fluctuations in the international oil prices. Some policy advisors suggested that the amount of oil revenues injected into the economy each year should be kept constant, say at \$12 billion in real prices of 1994, irrespective of the price of oil, and the rest of the revenues should be kept in a fund for crisis years when the oil revenues are lower than \$12 billion. In crisis years the government can use the fund to keep the amount of injected dollars at the same rate. This way there would be no macroeconomic shock and everything would be under control. Although the 94-95 crisis provided a ground for this policy and it was implemented for a few years in the late 1990s, but policy makers has not been eager to follow this suggestion as it would keep the government from using oil revenues in years when the price of oil is sky-rocketing.

Policy advisors supported their proposal for this fund by providing evidence on the effects of oil shocks on macroeconomy, macroeconomic indicators and economic stability. But little has been done to understand how oil shocks affect household welfare, economic behavior and poverty. In this paper, we intend to study the effect of these shocks on poverty,

consumption behavior and school enrollment. This research may depict more clearly the urgent need for policies that try to regulate oil shocks.

3 The Household Panel Survey of 1992–95

The base survey of the panel, taken in 1992 by the Statistical Center of Iran, is a self-weighted, nationally representative sample of 5090 households who reside in 172 sampling clusters (63 rural and 109 urban), with an average of about 30 families in each cluster. Because of attrition, the size of the balanced sample, those interviewed in all four year, is only 3371 households, or 66 percent of the base survey. The survey includes all the basic demographic and economic characteristics of the households. Income and expenditure data are self reported (the person interviewed is usually the household head) and are based, depending on an item's frequency of purchase, on a 30 or 365 day recall period. Food, fuel and clothing, for example, are reported for the last 30 days. Households were interviewed each year in November of each year which is after the fall harvest and could give more accurate estimates of income and expenditure in rural areas. Evidence from experimentation with the length of the recall period in India suggests that a shorter recall period results in higher levels of reported expenditures (Deaton 2001).

The data is collected from 24 provinces and is classified by rural and urban areas. We divide the households into three regions, Tehran, other urban and rural. Tehran (including its surrounding urban areas) is treated as a distinct urban area because it accounts for more than 15% of Iran's population and attracts migrants from all over the country. Cost of living is higher in Tehran than smaller urban areas, so we will assign it its own poverty line. We use CPI (different for the three mentioned regions) for deflating income and expenditure. Changes in the CPI in the three regions are highly correlated.

3.1 Attrition and Sample Selection

As it would become more clear later for our analysis, we need households who were interviewed at least in two years of the panel. We call this sample, ‘used sample’ which is different from the ‘whole sample’. The use of the used sample raises important concerns regarding selection (Wooldridge 2002). If households drop out of the panel for reasons related to the characteristics we are analyzing here, the balanced sample would suffer from selection and our conclusions would be wrong. Attrition is higher in the first year, 17.5 percent, and falls to about 10 percent per year in the remaining two years, a common feature of panel datasets. Comparison of means for the variables used in this study are presented in Table 1. Households that drop out after their first interview appear to be more in urban areas, especially Tehran. They are smaller in size and the heads are about a year younger and have slightly higher educational levels (see Table 1). The gender of the head, his/her marital status, job type, economic activity, and interestingly income and expenditure per capita, are not significantly different between the used sample and the whole sample.

[Table 1]

Fortunately, as seen in Table 2, the rates at which the poor and non-poor left the panel after their first interview, 15.43 and 14.03 percents, were quite close and the difference is statistically insignificant. Thus selection does not appear to play a major role in changes in poverty rates to be discussed below. Selection was important in the rural-urban distribution of population, however. As shown in Table 3, while 80 percent of the rural households interviewed in 1992 stayed with the survey for all four years, only 63 percent of urban residents and 52 percent of Tehran residents did. The distribution of years in panel is very similar for individuals and households. Higher attrition in Tehran is probably caused by the greater mobility of its residents between neighborhoods, itself a result of higher rates of tenancy in larger urban centers. The percentage of households who were tenants (average

rent rate in Table ?? in the whole sample is twice that of the used sample and the difference in (highly) significant.

[Table 2]

[Table 3]

Figure 2 compares the distributions of per capita expenditure (pce) across these two samples, by the three regions of residence. The distributions for pce are quite similar in the two samples and the Kolmogorov-Smirnov test rejects the null hypothesis that these distributions are different across the two samples.

[Figure 2]

To correct for attrition in the ‘used sample’, for the analysis used in this paper, we used the ‘inverse response probability’ method. We weighted each household in the by the inverse probability of response for that household. The response is defined as a dummy variable equal to one if the household were in the panel for more than a year, i.e. interviewed at least twice (observations in the ‘used sample’) and zero otherwise. A regression of the response variable on some arguably exogenous variables were used to find the probability of response for each household. In all the analysis in this paper, each household is weighted by the response probability of that household to correct for the attrition problem. The results with or without using ‘inverse response probability’ method differ by at most 2% and most results are quite similar. We do not report the results without correcting for attrition in this paper as they are very similar.

[Table 4]

The probit regression of response is depicted in Table 4. As it was expected, being in Tehran and other urban areas decreased the probability of response (increases the attrition

probability). More importantly, if the household has rented their residence, either for a fee or free, the probability of response would increase largely. If the household had moved in 1991, a year prior to survey, the probability of attrition increases. All these variables, are highly significant and rent variables coefficients are larger than other coefficients.

4 Income, Expenditure, and Poverty in 1992-95 Period

4.1 Income and Expenditure

The data exhibit a fair amount of disparity in per capita incomes (pci) and expenditures (pce) between the three regions in Iran. Average per capita rural incomes and expenditures were about half the amount in urban areas and as low as one-third of those in Tehran. The trends observed in the panel data in per capita expenditure and income are not uniform for all regions but broadly reflect the macroeconomic situation discussed earlier. The oil shock and the import compression of 1994-95 appears to have affected individuals in Tehran more harshly than in other urban or rural areas. Average per capita expenditure in Tehran was down 18 percent in 1994-95 from 1992-93, compared to a 10 percent decline in rural expenditures, indicating that the provincial areas were less strongly linked to foreign exchange inflows than Tehran.

Income data show a different pattern, which is likely the result of measurement error. The table also shows that on average reported expenditures exceed incomes, which is a common feature of many household surveys in developing countries (Deaton 1997). Rural incomes fall short of expenditures by as much as 15% while urban incomes and expenditures are closer to each other. Rural income reporting is probably even worse than reporting of urban incomes because most rural incomes are from owner operated farms, and interviewers rely on self reporting of incomes rather than attempt to compute net incomes from data on farm operations.

Figure 3 shows the cumulative distributions of per capita expenditures for rural, urban, and Tehran residents using the balanced sample. The distribution for Tehran dominates the other two, and urban dominates rural.

Comparing cumulative distributions of real pce across panel years shows that decline in expenditures occurred across income levels. Figure 4 and the Kolmogorov-Smirnov tests show that the distribution of real pce in 1992 stochastically dominates 1994 and 1995 distributions.

[Figure 3, and 4]

4.2 Poverty Rates

To measure poverty, we use the simplest measure of poverty which is the proportion of individuals whose income is below the poverty line, or the head count ratio. The choice of poverty line is not critical in this study because our focus is on change in poverty over time and real pce distributions do not cross each other in ways that would make poverty rates sensitive to the choice of poverty line (see Figure 4). The relative rates of poverty between the regions under study is affected by the levels of poverty line chosen, but not the change over time in each region. We adopt the poverty line calculated by Pajouyan (2000) based on cost-of-basic-needs approach and used extensively in poverty studies in Iran (Salehi-Isfahani 2003). Pajouyan uses 2200 calories as the basis for his calculations and finds for each region the average level of total household expenditures for those households whose food intake corresponds to this calorie level.

Table 5 lists the cost of basic needs poverty lines by region and compares them with one-half of median, which is also popular in studies of poverty in Iran.³ There is considerable difference between the two lines for Tehran, mainly because the calorie base line takes into account the higher cost of living in Tehran. According to the cost-of-basic-needs estimates,

³Although rural Tehran and other rural areas are given their own slightly separate poverty lines, we combine the two regions for the remainder of the paper.

a rural person with less than \$2 per day in 1994 would be classified as poor, compared to \$3 in urban and \$5 in Tehran.

[Table 5]

Tables 6 report on poverty rates for the whole and used samples. Several important points are worth noting. First, poverty rates are highest in Tehran followed by rural and urban areas. Second, the oil shock of 1994-95 appears to have affected poverty in Tehran more seriously than in other areas. This may be due to the nature of the shock, which affected urban consumers, especially in Tehran, more severely than rural consumers. The poverty rate increased by seven percentage points in Tehran between 1993-94, whereas in rural areas it increased by one point in 1994 and then declined in 1995. This drop in poverty in rural areas is also noted by Pajouyan (2000) which uses the income and expenditure survey data and attributes it to an increase in agricultural support prices in 1995.

[Table 6]

These rates are comparable in magnitude with those estimated in other studies for Iran, though there is a wide variation in estimates in the (mostly Persian) literature (Tabibian 2000; Pajouyan 1999). Previous studies of poverty rates for Iran are based exclusively on income and expenditure surveys (HEIS), which are larger surveys and are collected annually.⁴ The comparison of the two data sets is not easy because of differences in methods of collection. Both data sets rely on a 30 day recall period to measure most items of expenditure; the HEIS visits different households at different times of the year whereas the panel data is collected from the same households at the same time every year.

One possibility for explaining the rise in poverty during 1992-95 is the increase in inequality. Table 7 shows that inequality as measured by the Gini index decreased for all regions, especially in Tehran, between 1992-93 and stayed the same during 1993-95. This

⁴For a detailed account of poverty measurement in Iran, see Salehi-Isfahani (2003).

implies that increase in poverty after 1993 was not likely caused by the result of worsening of the overall distribution. The overall decline in real incomes may have been so severe as to increase poverty even though the poor may have fared better than the rest in the downturn. Improvement in inequality may be also due to reshuffling of the non-poor income groups.

[Table 7]

4.3 Mobility

In this section, we consider the concept of mobility into and out of poverty. It is well known that the use of expenditure data is likely to result in overestimation of mobility (Luttmer 2001). Transitory shocks to expenditures, such as purchase of durable goods and bulk purchase of grains, a common practice in rural Iran, can create an impression of mobility where there is none. We tried to refine the analysis of mobility measures in order to take into account these factors.

Table 8 shows a high degree of mobility into and out of poverty. Those with multiple spells of poverty are about one half of all the individuals counted as poor in any given year. Only 4.3 percent of the population are poor in all four years of the panel, which shows serious long term poverty (those found poor all four years of the panel) is low, but, on the other hand, almost 47 percent are poor at least once in the four years. The low rate of long term poverty is similar to the proportion who are poor in a five year panel from Pakistan (McCulloch and Baulch 2000), 7 percent in four and 3 percent in five years, but much lower than the 20 percent found for a three year panel in Egypt (Haddad and Ahmed 2002) and 40 percent reported for a ten year period for the ICRISAT panel from India (Morduch 1994) and nearly all households experience poverty at some time (Baulch and Hoddinott 2000). The latter is quite a contrast to rural Iran where only 52.3 percent of households are poor at some point. The range of findings for those who are “always poor” is quite wide in the studies surveyed by Baulch and Hoddinott (2000), from 25% in Ethiopia and Zimbabwe to

3% for Pakistan. As they note, much of this may reflect differences in methodology in data collection and definition of “always poor”. Nevertheless, it is interesting to note that Iran falls into the lower part of this range.

[*Table 8*]

About 3.3 to 3.8 percents of households were poor in all years of the panel and more than half of the population in rural areas were poor at least once, compared to less than 40 percent in all urban areas. The comparison of Tehran with rural and other urban areas shows that percentage of households who were poor for all number of years (1 to 4) were highest in the rural areas while they were lowest in Tehran. Nevertheless, the percentages are only differ by almost 5% and they are very similar for the number of households that were poor every year.

4.4 Short and Long Term Poverty

Panel data can help us not only measure the extent of mobility but also understand if those who suffer from long term and short term poverty differ in important respects. There are many different ways in which the information in the panel can be used to define long vs. short term poverty; for example, based on the number of years in poverty or on how the individual does on average during the panel. Jalan and Ravallion (2000) offer a particular definition which is widely used in the empirical literature because of its appealing additive property: that is, the measures of chronic and transient poverty in a given year add up to the same measure of total poverty.

Because my primary aim is not to decompose poverty, I do not need the additivity property and can therefore use a simpler distinction of short and long term poverty. I define as long term or chronically poor those individuals whose mean real expenditures for the panel years falls below the poverty line. To avoid confusion with the Jalan-Ravallion concept I will call these people long term poor. Short term poor (akin to transient poor in

Jalan and Ravallion) are those who are *not* long term poor—that is, their mean consumption exceeds the poverty line—but who fall into poverty at least one year in the panel period. These measures have intuitive appeal and allow probit analysis of their determinants.

Long term poverty for 1992-95 is measured at 13.8 percent nationwide; highest in rural areas, 15.3 percent, and lowest in Tehran, 12.1 percent (Table 9). Short term poverty rates are unsurprisingly much higher (because being poor in any one year of the panel qualifies a person as short term poor) and range from 37.1 percent in rural areas to 24.1 percent in Tehran. Residents of Tehran and rural areas face different situations, with the former facing higher long term poverty and the latter higher short term poverty. Other urban areas have the lowest long and short term poverty rates.

We can also consider short term poverty by the year in which the person was poor. The last four rows of Table 9 present this modified notion of short term poverty. Again the rates are highest in rural areas, but we are also able to see that for those who are not long term poor (that is, their mean expenditure is above the poverty line), all four years were not equally likely to bring misfortune. For example, in 1993, just before the macroeconomic shock, only 6.5 percent of Tehran residents who were not long term poor fell into poverty, whereas 15.2 percent of such individuals were poor in rural areas. The yearly short term poverty rate increase in 1994-95, after the shock, while the rural rates were actually lower in 1995. Showing a slight recovery for rural areas and continuation of effects for urban areas.

[Table 9]

5 Expenditures and the Oil Shocks

In this section, we analyze the effect of oil shocks on expenditure of households. If the shocks could affect the expenditure of household, more households would have fallen to poverty. The regression of log of per capita expenditures on the shocks is used and trusted more in

the literature than the probit regression of being below poverty line on the shocks. Here, we adopted the former method and regress log of pce on a dummy variable for years that the economy was experiencing shocks, i.e. 1994 and 95 and characteristics of household. The dummy for the crisis years would capture everything that on average was happening to households for that period and is not a good measure of shocks. Nevertheless, as the shocks were very large in magnitude and paralyzed the government which is controlling 80% of the economy, it would be plausible to assume that the largest force affecting all households in these two years would be the oil shocks.

[Table 10]

The result of this regression is shown in Table 10 in two panels. The ‘shock years’ is a variable equal to 1 for 1994 and 1995 and 0 otherwise. All other variables are the characteristics of head of household. The dependent variable is the log of per capita expenditure in the household. The left panel is the simple regression without using the fixed-effects for head and the right panel contains head fixed-effects. The coefficients for shock years are negative and similar whether we use fixed-effects or not and are larger for Tehran and smaller for rural areas. This particularly shows the forces that all households felt in those years dropped their expenditures on average.

If the head of the household were female, that would affected the expenditures differently in rural vs. urban areas. This is because most households in urban areas whose head were female lost the husband in the war and now are supported by the government. This would be less of the case in rural areas. As expected, households with younger heads would have less earnings and expenditure. The education coefficients have the usual significance and magnitudes. The magnitude of education for urban and Tehran are larger than rural areas which could be because of a combination of sorting and more opportunities in urban areas.

6 Enrollments and the Oil Shocks

The other interesting question is how the oil shocks affect enrollment of children of school age in schools. Public schools in Iran are either totally free or highly subsidized, in most cases more than 95% of the school fee is subsidies. Therefore, the most important reason for school drop-out is the opportunity cost. This makes the question even more interesting as how the shocks might affect the school enrollment in this particular case. On the other hand, there might be many other factors that could affect schooling in addition to the oil shocks that were changing during the same period. Disentangling the effect of oil shocks would be a cumbersome or rather impossible in this case. Nevertheless looking at enrollment rates would be interesting.

Table 11 depicts the total enrollment for children aged between 7 and 18 during the 1992-95 period. Interestingly, for Tehran, which seems to be hit hard with the economic shock, the total enrollments are increasing each year, although it remains almost flat in 1995. The difference in enrollments between 1992-93 and 1994-95 periods is statistically significant. For the other urban areas, the enrollment increases from 1992 to 93 and almost remains the same in 1994 but drops by 1.3 percentage points in 1995. In the rural areas, enrollments drops slightly in 1994 and 95 after an increase in 1993. It seems that rural areas respond earlier to the shocks than other areas. Nevertheless, enrollment rates in 1995 in all regions are higher than what they were the beginning of the survey.

[*Table 11*]

To Analyze this phenomenon more, we look at the gender and age differences in changes in school enrollments across different regions. Table 12 depicts the change in average of school enrollment rates between 1992-93 and 1994-95 periods for each age group, gender, and region. Looking at change in rates for the whole country (the second through fourth columns), we could not find a statistically significant change in enrollments rates for boys

between the two periods while most changes are positive. Meanwhile, there are significant large changes in the total enrollment rates for the ages of 16 and 17 and both are derived from significant and sharp increases in girls enrollments. In addition, enrollment rates increased significantly for girls of age 7 and 14 between these two periods. This is while the economy is experiencing a downturn in 1994-95 period and the enrollments for boys remained essentially flat.

Columns five through seven of Table 12 show the results for the rural areas. Although there is no significant changes in enrollments for the all rural students and similarly boys, there are significant and large increases in enrollments for girls ages 7 and 17 (the ages representing the start and end of schooling).

[Table 12]

Results for urban areas, columns eight through ten of Table 12, depict similar interesting pattern for girls. Enrollment for girls of age 14 and 16 increased by 8.39% and 19.4%, while girls of age 9 are dropping about 2.6% more out of school. For boys on the other hand, there is no significant difference in enrollment between the two periods but for boys of 11 years old for whom the enrollment increased by 2.35%. Ages 11 and 14 are the end of primary and secondary schools in Iran. at the end of these schools a license would be given to the student. It seems that parents prefer their children to end the schools and get the license instead of dropping out to increase their labor market outcome.

For Tehran, we see very large increases in the enrollment rates for girls of age 16 and 17 (18.2% and 15.7% respectively) while for boys of age 14, enrollments increased by 7.2%.

7 Concluding remarks

This paper has tried to evaluate the information contained in the 1992-95 panel data to might shed light on the effect of oil shocks on the economic mobility, school enrollments,

the extent and persistence of poverty in Iran. Clearly, a lot more can be learned from these data than I have been able to report here. Several interesting results emerge from the study. First, Poverty rates were high during the 1992-95 period. Second, long term poverty rates are much lower, but both long and short term poverty rates are comparable to those observed in other countries with very different economic and political goals. Third, per capita expenditures in households dropped when the economy experienced the crisis in the 1994 and 95. The drop in expenditures happened in all areas, but more in Tehran, the capital, and the least drop was in the rural areas.

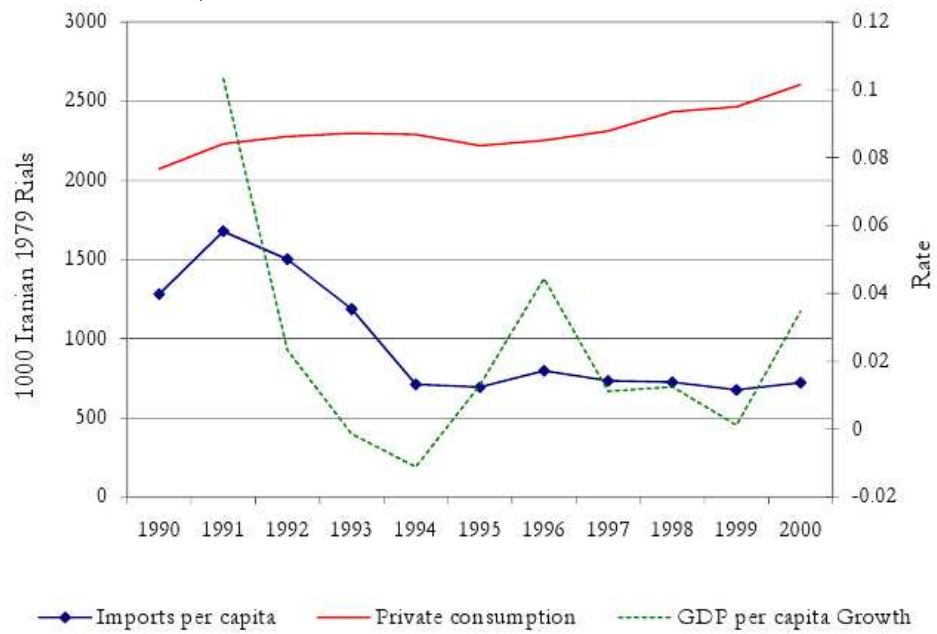
On the other hand, the school enrollments in crisis years had no or positive change. Whenever there was a change in enrollment it was an increase and it was specially more pronounced for girls. enrollments in all regions for girls of 16 and 17 increased sharply. While it remained flat for similar boys. These results need much further attention as what has derived them.

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Figure 1: Imports as percentage of GDP, GDP growth, and per capita private consumption (1000 Iranian 1979 rials), 1990-2000



Source: Central Bank of Iran, *Annual Reports*, various years.

Figure 2: Comparing the distribution of log expenditure per capita in the balanced sample with the sample of drop-outs by region of residence

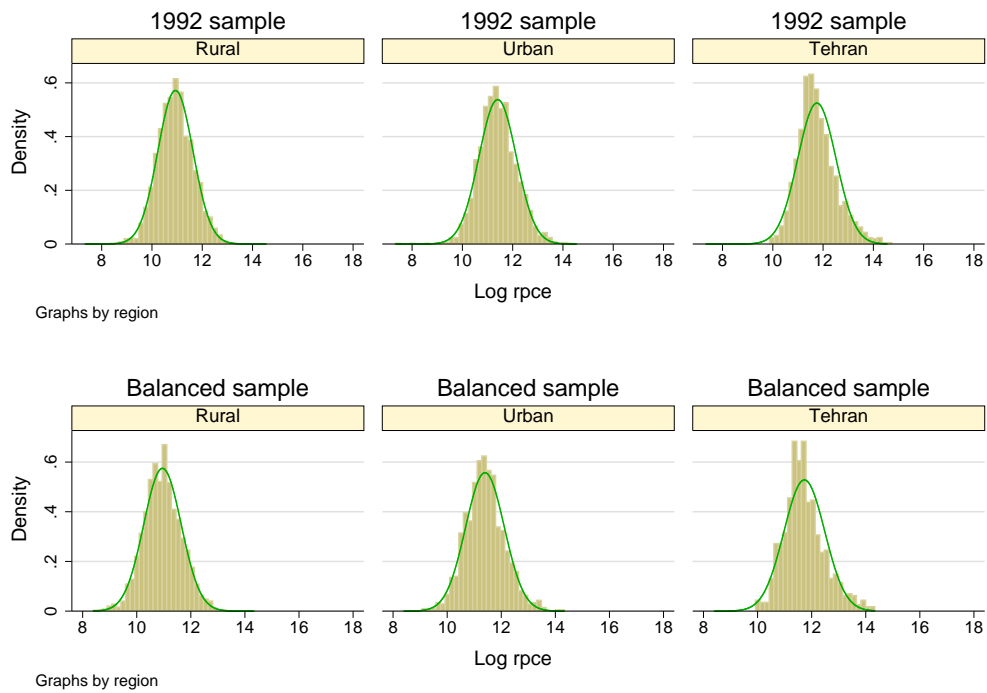
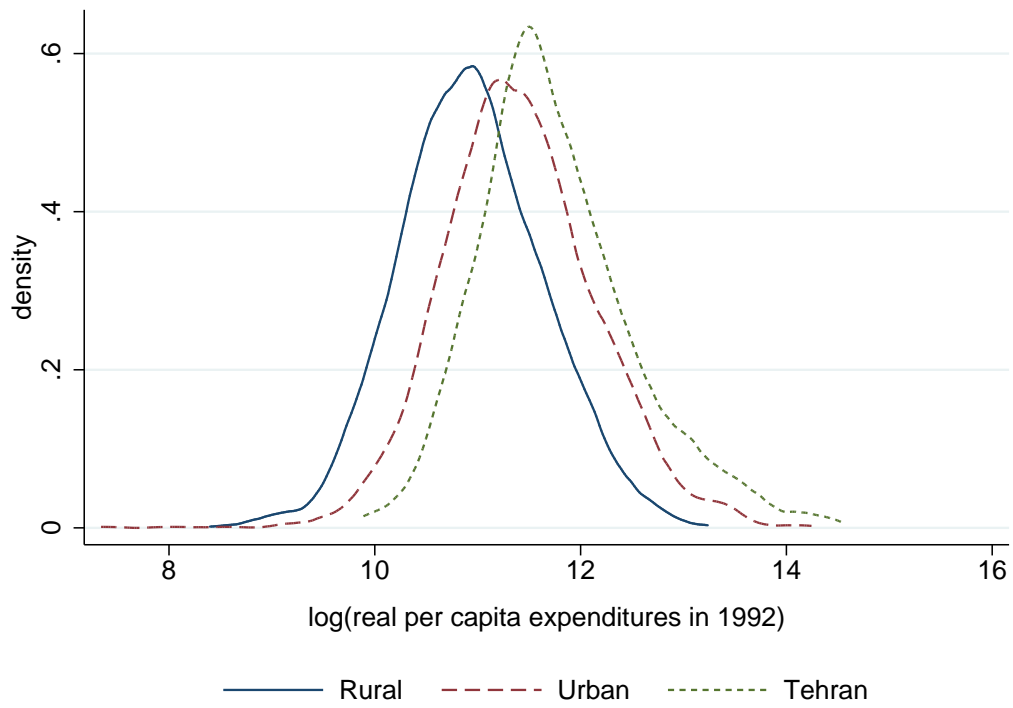
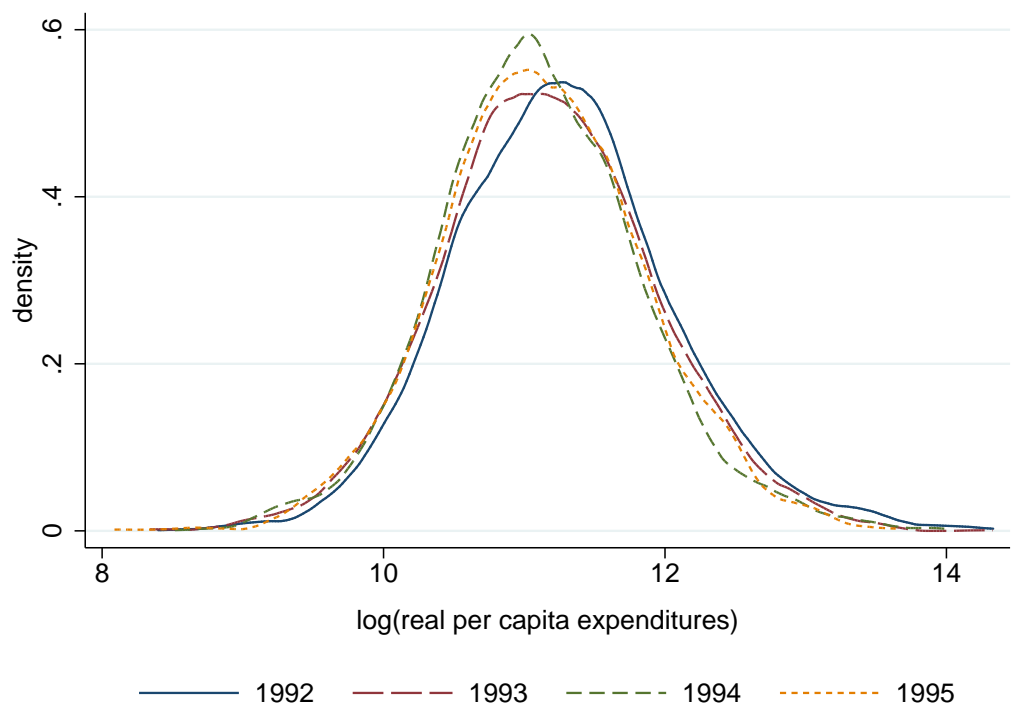


Figure 3: Cumulative distributions of real per capita expenditures by region



Source: Statistical Center of Iran, 1992-95 panel data, used sample.

Figure 4: Cumulative distributions of real per capita expenditures by panel year



Source: Statistical Center of Iran, 1992-95 panel data, used sample.

Table 1: Summary Statistics for the Whole and Used Samples
(1992 values)

Variable	Comparison of Samples		
	Whole Sample	Used Sample	Difference
<i>Region</i>			
Rural (%)	36.28 (0.67)	43.71 (0.85)	-7.43*** (1.08)
Urban (%)	38.17 (6.81)	36.29 (8.03)	1.88* (1.08)
Tehran (%)	25.55 (0.61)	23.53 (0.64)	2.02** (0.89)
Household size	5.10 (0.03)	5.24 (0.04)	-0.15*** (0.05)
<i>Education of head</i>			
Illiterate (%)	33.77 (0.66)	35.84 (0.73)	-2.07** (0.98)
Read/Write only (%)	20.3 (0.56)	21.14 (0.62)	-0.84 (0.84)
Primary (%)	20.38 (0.56)	19.58 (0.60)	0.80 (0.82)
Middle School (%)	10.32 (0.43)	9.54 (0.44)	0.78 (0.62)
High School (%)	9.98 (0.42)	8.92 (0.45)	1.06* (0.60)
University (%)	5.25 (0.31)	4.98 (0.33)	0.27 (0.45)
Age of Head	44.35 (0.21)	45.42 (0.23)	-1.07*** (0.31)
Female Head (%)	7.82 (0.38)	7.68 (0.40)	0.14 (0.55)
<i>Marital Status</i>			
Married (%)	88.92 (0.44)	89.13 (0.47)	-0.22 (0.65)
Widowed (%)	8.16 (0.38)	8.28 (0.42)	-0.12 (0.57)
Divorced (%)	0.71 (0.12)	0.66 (0.12)	0.04 (0.17)
Never Married (%)	1.71	1.42	0.29

Continued on next page

Table 1 – continued from previous page

Variable	Comparison of Samples		
	Whole Sample	Used Sample	Difference
	(0.18)	(0.18)	(0.26)
<i>Job Type of Head</i>			
Employer (%)	11.44 (0.45)	12.29 (0.50)	-0.85 (0.67)
Self-Employed (%)	31.31 (0.65)	32.65 (0.71)	-1.34 (0.96)
Public (%)	22.05 (0.58)	21.21 (0.62)	0.84 (0.85)
Private (%)	18.55 (0.55)	17.11 (0.57)	1.45 (0.79)
Unpaid Family (%)	0.12 (0.05)	0.14 (0.06)	-0.02 (0.07)
<i>Economic Activity</i>			
Employed (%)	83.47 (0.52)	83.40 (0.56)	0.07 (0.77)
Unemployed (%)	1.85 (0.19)	1.72 (0.20)	0.13 (0.27)
Retired (%)	9.67 (4.14)	10.16 (0.46)	-0.49 (0.62)
Student (%)	0.43 (0.09)	0.28 (0.08)	0.16 (0.12)
Homemaker (%)	2.00 (0.20)	1.88 (0.21)	0.12 (0.29)
Other (%)	2.57 (0.22)	2.57 (0.24)	0.01 (0.33)
PCE, Rials per Month	70228.2 (1195.26)	69216.4 (1276.36)	1011.80 (1750.18)
PCI, Rials per Month	60724.62 (1101.37)	59905.74 (1181.91)	818.87 (1616.37)
Rent (%)	14.11 (0.49)	7.77 (0.41)	6.34*** (0.65)
Free Rent (%)	12.05 (0.46)	11.05 (0.47)	1.00 (0.66)
Car (%)	15.98	16.37	-0.39

Continued on next page

Table 1 – continued from previous page

Variable	Comparison of Samples		
	Whole Sample	Used Sample	Difference
Migrant (%)	(0.51)	(0.56)	(0.76)
	1.97	1.17	0.80***
	(0.20)	(0.16)	(0.26)

The data is from the yearly household panel survey of 1992-95 in Iran. The ‘whole sample’ consisted of 5090 households that were interviewed in 1992 but left the sample in later interviews, i.e. in 1993, 94, or 95. The ‘used sample’ consists of only those households who were at least interviewed twice during the 1992-95 period, i.e. two, three, or four times. The used sample consists of households. Mean value for each variable is calculated and standard errors of the means are in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Attrition of Poor and Non-poor households

	<i>poor</i>	<i>Non-poor</i>	<i>Difference</i>
households left after first interview (%)	15.43 (1.18)	14.03 (0.54)	1.40 (1.27)

This table shows the percentage of poor and non-poor household leaving the panel after their first interview. Poverty lines used are explained in Table 5.

Table 3: Distribution of Households By the Number of Years in Panel and Region

Years in panel	Region			Total %
	Rural %	Urban %	Tehran %	
1	7.3	16.4	21.1	14.3
2	5.4	9.5	11.7	8.6
3	7.7	11.2	15.5	11.0
4	79.7	62.9	51.8	66.1
Total	100.0	100.0	100.0	100.0

Pearson Chi-squared test of equality across columns reject the the null hypotheses that the columns are equal with value, 287.86 and p-value, 0.00. Source: 1992-95 panel data; whole sample.

Table 4: Probit Regression of Household Response on Some Characteristics of Households

	Response
Urban	-0.37** (0.12)
Tehran	-0.44*** (0.13)
Female head	-0.09 (0.19)
Employed	0.08 (0.16)
Unemployed	-0.03 (0.34)
Rented residence	-2.73*** (0.11)
Free-rent residence	-1.41*** (0.12)
Moved in past year	-1.04*** (0.25)
Constant	2.98*** (0.18)
Observations	5068

This table is the probit regression of response, a dummy equal to 1 if the household were interviewed more than once and 0 otherwise. Tehran is a dummy equal to 1 if the household is in Tehran. Urban is equal to 1 if household is in other urban areas. Female head is 1 if head is female. Employed and unemployed are 1 if head is employed or unemployed respectively (self-employed, student, homemaker, and others have dropped.) Rented residence and moved in past year are dummies equal to 1 if true. Free-rent residence is 1 if the household residence is rented for free.

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Poverty Lines: Cost of Basic Needs Approach

Group	1994 Rials Per Month	PPP \$
Rural	31954	66.97
Urban	42468	89.00
Rural Tehran	31407	65.82
Urban Tehran	59978	125.36

poverty line calculated by Pajouyan (2000) based on cost-of-basic-needs approach. Pajouyan used 2200 calories as the basis for his calculations and finds for each region the average level of total household expenditures for those households whose food intake corresponds to this calorie level. Purchasing Power Parity (PPP) rates are from the World Bank, *World Development Indicators, 2003*.

Table 6: Percentage of Individuals in Poverty by Region , 1992-95

Year	Region			Total
	Rural	Urban	Tehran	
1992	20.8 (0.4)	17.7 (0.4)	18.2 (0.7)	19.0 (0.3)
1993	27.6 (0.5)	19.6 (0.5)	16.0 (0.7)	22.0 (0.3)
1994	28.8 (0.5)	20.3 (0.5)	18.9 (0.8)	23.5 (0.3)
1995	24.7 (0.5)	21.5 (0.5)	20.3 (0.8)	22.6 (0.3)
Total	25.5 (0.2)	19.6 (0.2)	27.6 (0.4)	

Standard errors are in parentheses.

Table 7: Gini Index for Real Per Capita Expenditure and Income, 1992-95

Year	Expenditure			Income		
	Rural	Urban	Tehran	Rural	Urban	Tehran
1992	0.37	0.41	0.43	0.40	0.41	0.42
1993	0.36	0.36	0.37	0.37	0.38	0.40
1994	0.34	0.37	0.36	0.40	0.38	0.37
1995	0.36	0.36	0.35	0.37	0.38	0.33

Source: 'used sample'

Jackknife standard errors are all below 0.01.

Table 8: Distribution of Individuals by Number of Years in Poverty and Region

Years poor	region			Total
	Rural	Urban	Tehran	
	%	%	%	
0	47.7 (0.3)	61.7 (0.3)	63.8 (0.4)	56.4 (0.2)
1	23.7 (0.2)	17.1 (0.2)	18.1 (0.3)	20.1 (0.1)
2	15.0 (0.2)	10.6 (0.2)	9.8 (0.2)	12.2 (0.1)
3	10.0 (0.2)	6.8 (0.2)	4.9 (0.2)	7.7 (0.1)
4	3.7 (0.1)	3.8 (0.1)	3.3 (0.1)	3.6 (0.1)
Total	100.0	100.0	100.0	100.0

Pearson Chi-squared test of equality across columns
 rejects the null hypothesis that the columns are equal
 with value,192.55 and p-value, 0.00.

Standard errors in Parentheses

Table 9: Proportion of Individuals in Short and Long Term Poverty by Region, 1992-95

Year	Rural	Urban	Tehran	Total
Long term poor	15.3 (0.2)	13.1 (0.2)	12.1 (0.03)	13.8 (0.1)
Short term poor	37.1 (0.3)	25.2 (0.3)	24.1 (0.4)	29.9 (0.2)
Not long term poor but poor in:				
1992	10.8 (0.3)	7.4 (0.3)	8.8 (0.5)	9.5 (0.4)
1993	15.2 (0.4)	8.7 (0.3)	6.5 (0.4)	10.8 (0.4)
1994	16.1 (0.4)	10.4 (0.4)	9.2 (0.6)	13.6 (0.5)
1995	13.1 (0.4)	11.2 (0.4)	11.1 (0.6)	12.8 (0.6)

Standard errors in parentheses

Table 10: The Effect of Shocks on Log of Real Per Capita Expenditures Across Regions

	No Fixed Effects			With Fixed Effects		
	Rural	Urban	Tehran	Rural	Urban	Tehran
Shock Years	-0.08*** (0.02)	-0.11*** (0.02)	-0.14*** (0.02)	-0.08*** (0.01)	-0.10*** (0.01)	-0.13*** (0.02)
Female head	-0.13** (0.04)	0.18*** (0.04)	0.28*** (0.05)	-0.09 (0.09)	0.14 (0.08)	0.05 (0.09)
Age of head	0.01* (0.00)	0.01** (0.00)	0.02** (0.01)	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
$Age^2 * 10000$	-0.52 (0.36)	-0.44 (0.46)	-0.78 (0.63)	0.97 (0.99)	-0.60 (1.09)	-1.69 (1.14)
Number of adult members	-0.02** (0.01)	-0.05*** (0.01)	-0.08*** (0.01)	-0.03* (0.01)	-0.08*** (0.02)	-0.06** (0.02)
<i>Education of Head</i>						
Read/write	0.12*** (0.02)	0.15*** (0.03)	0.13*** (0.03)	0.02 (0.04)	0.00 (0.04)	-0.09 (0.05)
Primary school	0.23*** (0.02)	0.36*** (0.02)	0.33*** (0.03)	0.10 (0.06)	0.07 (0.05)	-0.10 (0.05)
High school	0.31*** (0.05)	0.68*** (0.03)	0.69*** (0.04)	0.12 (0.15)	0.06 (0.07)	-0.01 (0.09)
University	0.59*** (0.08)	0.92*** (0.04)	0.89*** (0.05)	-0.16 (0.27)	0.23* (0.10)	0.04 (0.12)
<i>Activity of Head</i>						
Unemployed	-0.23** (0.08)	-0.05 (0.06)	0.04 (0.07)	0.07 (0.09)	-0.11 (0.08)	-0.07 (0.08)
Retired	-0.35*** (0.05)	0.14*** (0.03)	0.22*** (0.04)	-0.05 (0.08)	0.04 (0.05)	0.00 (0.06)
Other(not employed)	-0.23*** (0.06)	-0.09 (0.06)	0.14* (0.06)	-0.05 (0.08)	-0.02 (0.07)	-0.04 (0.07)
<i>Job Type of Head</i>						
Self employed	-0.08* (0.03)	0.19*** (0.02)	0.23*** (0.03)	0.03 (0.06)	0.14** (0.04)	-0.02 (0.05)
Employer	0.10** (0.04)	0.48*** (0.04)	0.53*** (0.05)	0.07 (0.06)	0.23*** (0.05)	0.17* (0.07)

Continued on next page

Table 10 – continued from previous page

	No Fixed Effects			With Fixed Effects		
	Rural	Urban	Tehran	Rural	Urban	Tehran
In private sector	-0.07 (0.03)	-0.05 (0.03)	0.07 (0.04)	0.00 (0.05)	0.05 (0.04)	0.02 (0.05)
Constant	10.59*** (0.09)	10.51*** (0.11)	10.77*** (0.14)	11.30*** (0.26)	11.20*** (0.32)	11.72*** (0.34)
Observations	6461	5876	3591	6461	5876	3591

This table depicts the regression of log of real per capita expenditures on shock years, a dummy that is equal to 1 for 1994 and 95, and on characteristics of head of household. The second set of regressions (columns 5 through 7) have included the head fixed effects. Standard errors are in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11: Percentage of children enrolled in school between ages of 7 and 18, 1992-95

Year	Region			Total
	Rural	Urban	Tehran	
1992	72.9 (0.8)	87.6 (0.7)	88.5 (0.9)	81.8 (0.5)
1993	74.7 (0.8)	89.9 (0.6)	90.5 (0.8)	83.8 (0.4)
1994	74.3 (0.8)	90.1 (0.6)	92.0 (0.7)	83.9 (0.4)
1995	74.0 (0.8)	88.8 (0.7)	92.2 (0.8)	83.1 (0.5)

Standard errors in parentheses

Table 12: Change in School Enrollment Rates Between 1992-93 and 1994-95 Periods for Children Aged 7 to 17

Age	All			Rural			Urban			Tehran		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
7	1.29 (0.85)	-0.19 (1.00)	3.01* (1.39)	2.92 (1.63)	0.02 (1.85)	5.93* (2.68)	-0.25 (1.00)	-1.52 (1.26)	1.12 (1.46)	2.46 (1.28)	3.29 (1.76)	1.50 (1.87)
8	-0.64 (0.67)	-0.79 (0.64)	-0.41 (1.18)	-1.79 (1.35)	-1.35 (1.15)	-1.68 (2.43)	0.65 (0.62)	-0.08 (0.79)	1.37 (0.96)	-0.14 (0.80)	-0.96 (1.31)	0.79 (0.85)
9	0.00 (0.67)	0.32 (0.72)	-0.23 (1.17)	1.12 (1.38)	0.68 (1.37)	1.97 (2.47)	-1.33* (0.66)	-0.13 (0.74)	-2.59** (1.09)	0.57 (0.79)	0.42 (1.35)	0.70 (0.80)
10	0.64 (0.69)	0.54 (0.69)	0.9 (1.22)	0.78 (1.43)	-0.67 (1.18)	3.08 (2.71)	0.89 (0.65)	1.75 (1.02)	-0.02 (0.80)	0.95 (0.84)	1.19 (1.43)	0.71 (0.80)
11	0.38 (0.88)	0.89 (0.78)	-0.13 (1.63)	-1.03 (1.88)	-0.04 (1.56)	-2.05 (3.51)	1.83** (0.66)	2.35** (0.93)	1.25 (0.93)	1.35 (0.72)	0.62 (0.70)	2.19 (1.30)
12	0.25 (1.10)	1.57 (1.04)	-1.21 (1.98)	-0.05 (2.25)	3.81 (2.12)	-4.91 (3.96)	-0.09 (1.05)	-1.29 (1.05)	1.31 (1.87)	0.23 (1.19)	1.38 (0.99)	-1.04 (2.19)
13	0.76 (1.37)	0.91 (1.47)	0.13 (2.31)	0.86 (2.58)	0.39 (2.64)	1.23 (4.27)	2.35 (1.63)	0.71 (2.03)	4.11 (2.57)	0.32 (1.75)	2.81 (2.06)	-2.26 (2.37)
14	3.47 (1.63)	1.07 (1.98)	5.32* (2.56)	1.42 (2.88)	-3.31 (3.45)	4.09 (4.35)	5.94** (2.16)	3.54 (2.86)	8.39** (3.26)	3.73 (2.26)	7.23* (3.27)	0.15 (3.12)
15	1.40 (1.91)	1.06 (2.48)	2.22 (2.90)	0.85 (3.15)	-0.44 (4.12)	0.98 (4.52)	1.67 (2.78)	2.86 (3.71)	0.39 (4.20)	5.01 (3.24)	5.27 (4.95)	3.76 (4.15)
16	6.32** (2.12)	1.03 (2.88)	12.27*** (3.10)	4.64 (3.30)	4.49 (4.62)	5.69 (4.54)	8.54** (3.23)	-0.85 (4.42)	19.42*** (4.69)	7.03 (3.88)	-3.02 (5.95)	18.18*** (4.59)
17	4.61* (2.25)	-1.57 (3.09)	11.23*** (3.27)	6.16 (3.30)	-0.47 (4.81)	12.22** (4.40)	2.89 (3.67)	1.76 (5.00)	4.28 (5.42)	0.90 (0.84)	-11.21 (6.24)	15.73** (6.13)

The values depicted in this table are the changes in school enrollment rates between 1992-93 and 1994-95 periods. Standard errors of the means are in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$