Understanding Mobility and Dynamics of Poverty in Iran

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Abstract

Like unemployment, the welfare costs of poverty compound with its duration. This paper uses a four-year panel data to throw light on the extent of true mobility and dynamics of poverty in Iran. Incorporating three methods, we try to overcome the problem of measurement error and find the true mobility. We find that there is only about 25% chance that someone in the lowest (highest) quintile moves up (down) the welfare ladder while someone in the three middle quinitles moves up and down with fairly the same chance. We also find that the chance of getting out of poverty in one year is only about 15%. Discussing poverty dynamics by looking at some of its measures, including Jalan and Ravallion (2000)'s, we conclude that a new measure of poverty dynamics is needed that not only consider the poverty gap over time but also the pattern of falling into or getting out of poverty. Following Jalan and Ravallion (2000), we examine the differences in household characteristics who are chronic and transient poor. Chronic poverty is a more serious problem in Tehran than rural and other urban areas, whereas transient poverty is more in rural areas. Chronic poverty declines with age and education faster than transient poverty.

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1 Introduction

Like unemployment, the welfare costs of poverty compound with its duration. Families that fall into poverty for a short period of time may be able to bounce back using their own resources, but those who remain in poverty for a long spell may lose their ability to rebound on their own, and thus be in greater need of assistance to escape from poverty compared to the short term poor. Long term poverty can undermine child education and health and thereby affect economic growth by transferring poverty from one generation to the next. Whereas short term poverty can be viewed as a welfare problem, long term poverty is a problem of economic development. 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 development problem because they are silent on economic mobility. There are also obvious political and social implications of economic mobility understating of which requires distinguishing between short and long term poverty. 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 proportion move in and out of poverty frequently will look the same in snapshot, but quite different from a social and political viewpoint.

Distinguishing short from long term poverty is also 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).

This paper reports on persistence of poverty and the degree of economic mobility in Iran using household panel data for 1992-95. We find a fair degree of mobility across expenditure quintiles and, correspondingly, low rates of long term poverty. Whereas about half of the people are poor at least once during the panel, only about five

percent are poor all four years. We show that a good part of this apparent mobility is due to transitory expenditure shocks by correcting for bulk purchases (such as grain at the time of harvest) that the poor are more likely to engage in. and our estimates of mobility may exaggerate the situation. The panel period encompasses a large macroeconomic shock caused by a foreign exchange crisis and followed by a severe import compression in 1994-95. We ask if poverty and mobility change in significant ways as a result of this shock. I analyze the determinants of short and long term poverty using a distinction similar to that introduced by Jalan and Ravallion (2000). We show that their determinants differ, implying that policies that target the poor need to be cognizant of the dynamics of poverty.

2 Economic policy 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.[1] The 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 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

[1] Ayatollah Khomeini popularized the word *mostazafin*–literally, the disinherited–to refer to the Islamic Revolution's social base. In 1979 he set up the Mostazafan 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.

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 (**?**). 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 number about 8 percent of the population or somewhere between one-half to two-thirds of all poor individuals. 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. 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 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).

[*Figure 1*]

3 SECH 1992-95

For technical reasons that will become apparent in section 4.1, to get as close as possible to the true measures of mobility, we need to have a panel data that has at least four successive years. In addition, to analyze poverty dynamics it is profitable to have a long enough panel data set that could encompass both good and bad economic times. The only data set that fulfills our purpose in understanding the true mobility and poverty dynamics in Iran is the Socio-Economic Characteristics of Household (SECH) panel data of 1992-95. It is the only panel in Iran that has more than three years of data and is surveyed during a period which has both boom and bust cycles[2].

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 resided in 172 sampling clusters (63 rural and 109 urban), with an average of about 30 families in each cluster. The survey includes all the basic demographic and economic characteristics of the households including self reported income and (disaggregated) expenditure.Similar to most household surveys, expenditure items are based, on a 30 or 365 day recall period, depending on the frequency of purchase. Food, fuel and clothing, for example, are reported for the last 30 days. The interviewees are usually the household head and were interviewed during November of each year which is after the fall harvest. 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 (Scott and Amenuvegbe 1990; Deaton 2001).

The household location can be identified up to the province level – 24 provinces at the time of survey – and whether it resides in an urban or rural area. We divide the residing region of household into three groups: 1) urban areas in Tehran province, called Tehran for simplicity in this paper, 2) other urban areas, called urban from here after, and 3) rural areas. The first group, Tehran, is composed of the capital and its surrounding cities and is treated as a distinct region since it accounts for more than 15% of Iran's population, attracts migrants from all over the country and its cost of living is significantly higher than other urban areas; hence needs its own

[2]There are two other panels gathered until the time this paper was written: SECH 1987-89, and SECH 2001-03. Both have three years of data and were gathered during boom cycles.

poverty line. We use CPI (by region) for deflating income and expenditure. Changes in the CPI in the three regions are highly correlated.

3.1 Attrition

SECH 1992-95 is a rotating panel, with new households added every year while some others left the survey. Like most panel data sets, attrition is a major problem with the size of the balanced sample, those interviewed in all four years, being only 3371 households, or 66 percent of the base survey in 1992. Table 17 presents the summary statistics for the base year and for the base (1992) and balanced samples. As depicted in table 1, attrition follows the usual pattern of most household surveys, namely it happened more in urban areas, especially the capital, Tehran, and its surrounding cities (45% drop in Tehran relative to 21% in rural areas) and it mainly occured in the second round of the survey, i.e. 1993 with almost 14% drop.

[*Table 1*]

There are three main sources of attrition in the data: 1) household moved, 2) household was not present at the time of interview, despite living in the same place as before, and 3) household was not willing to continue participating in the survey. Since no attempt was made to follow households even when they moved within a neighborhood, the first factor could have a strong effect on attrition. Therefore, one can expect that, for example, households living in a rented residence could be more likely to leave the sample. Fortunately, this hypothesis is testable by looking at the attrition rate among renters and non renters from the sample of households who were interviewed in the first round. Showing these rates across regions, table 2 provides strong evidence for this hypothesis. Renters in rural areas are 52% more likely to leave the survey (70% for renters vs. 18% for non renters), while in urban areas there is almost 60% higher chance for a renter not to be in the balanced sample (87% relative to 27%). In Tehran, the difference in attrition rate among these groups is 47% (83% for renters vs. 36% for non renters.) All differences are also quite significant.But it is not obvious how the fact that renters (movers) who are more likely to leave the sample may affect our results on mobility, since those who moved may have done that because they became richer, poorer, or simply their situation did not change.

[*Table 2*]

The second source of attrition could also play an important role here since little effort was made to come on hours or days when household was present. We are also not sure how this may affect the analysis of mobility. The third source of attrition may have several different underlying reasons which range from the opportunity cost of time to lack of trust to interviewer or government. It is not clear how trust in interviewer or government for example could play a role in our analysis. On the other hand, cost of time is clearly correlated with income (wage) and may affect the results. Fortunately, we can also (partially) test this hypothesis by observing how attrition was different among the rich and poor. Table 3 depicts the attrition rate for those who participated in the first round of interview (i.e. 1992) among poor and non-poor parts of the population[3]. There is virtually no difference between the attrition rates of poor and non-poor (32.6 to 34.1 per cents respectively while difference is statisticall insignificant.)

[*Table 3*]

In addition, one can look at the attrition rates across different quintiles of each region (since attrition is different across regions, it is better to analyze both attrition and mobility separately for each region.) Looking at table 4, one can see that differences in attrition rate across quintiles are not significant, except for the first quintile in rural areas and the third quintile in the urban areas. In Tehran, there is virtually no difference in attrition rates.

[*Table 4*]

Although all these tests may provides more understanding of attrition in this data set, and some evidence on its indifference towards mobility, but we can never be completely sure about the role it may play in the analysis. Hence, we try to tackle attrition by incorporating inverse response probabilities. Among households who were interviewed in the first round (i.e. 1992), we try to predict the probability of a household remaining the survey in the successive rounds (i.e. 1993 through 1995)

[3]Poor is defined as being below an absolute poverty line that is defined later in section 5

using variables that ideally are both very likely to predict attrition but not variable of interest, mobility. For example, table 2 suggests that a dummy variable that shows 'rent' could be a suitable candidate. As discussed, the effect of renting a house and moving is ambiguous on mobility (those who rent and move may do so as they become richer, poorer or simply because of non-economic reasons).

Suppose 'response' is a dummy variable equal to one if household, which was interviewed in the first round, remained in the survey in all the remaining rounds. Table 5 is the result of the logit regression of 'response' on some household characteristics. The sample includes household heads who were interviewed in 1992 and the values of variables are for 1992. As it can be seen some variables in the regression are arguable whether they can fully satisfy the requirements. For example, table 1 shows that region of residence ,dummies for urban and Tehran (rural was dropped), can explain part of attrition but may also be correlated with mobility. To mitigate this problem, we analyze mobility separately for each region. This can solve the problem as long as households who attrited did not change their region of residence. But assuming that those who left their region of residence are improving their welfare (since the reason for their migration, from rural to urban or vice versa, is to improve their lives), the predicted mobility and poverty dynamics provide lower bounds for mobility and therefore are conservative estimates. Employment status is a set of three dummy variables, 'employed', 'unemployed', and 'others' (such as home maker). 'Employed' and 'unemployed' were included in the regression and both are insignificant. On the other hand, dummy variables, 'rent' and 'free rent', are both significant and reflect the results depicted in table 2.

[*Table 5*]

The next step is to estimate the predicted probabilities for each household using this model and then take the inverse of that. The result, the inverse of the response probability of a household (i.e. probability of a household to be in the sample, all four years), can be used as a weight for the household to augment its effect in our analysis. But each household should augment the results relative to its size as well, therefore, we multiply the inverse response probability by household size to get the household weight. For the rest of this paper and in all the proceeding analysis, we

use these weights as probability weights of observations (households).

4 Measuring Mobility

Mobility is a hard concept to measure since it is the change in income (or expenditure) over time, the first difference of variables that are measured with errors themselves. Therefore, the difference would have larger measurement error and less precise. In this case, even classical measurement error gives upward bias estimates of mobility. Baulch and Hoddinott (2000) explain that in the studies of income or expenditure dynamcis, observed mobility is partly the result of measurement error not the actual movement of welfare. Lee (2008) shows that measures of income and consumption persistence over time are estimatd with 65 to 55 percent bias. It is fairly difficult if not impossible to at least partially solve the problem in these studies, mainly due to data limitation (Luttmer 2002).

Since we use the disaggregated expenditure data in SECH 92-95 to estimate mobility, we face less measurement error than income data. As consumption was asked retrospectively, measurement error is heavily due to the recall ability of the interviewee and the poor efforts/ability of interviewer to gather data. Respondents' recall errors can be because of forgetting what they consumed (omission error), or forgetting the time they consumed it (telescoping error)[4]. Sudman and Bradburn (1973) provides a theoretical model for these two recall errors. It is also observed that recall error decreases as the number of consumption categories and their details increases (Deaton 1997). However, as Martin Browning (2003) show there is a trade-off in reducing measurement error through asking more (detailed) questions as the respondents become tired and therefore less precise. They provide suggestions for an optimal questionaire.

In our study, we tackle the problem of measurement error in three ways. But first, we look at the mobility matrices in table 6 using the observed expenditure data. We divided households into five equally spread expenditure quintiles using the weights explained in section 3.1 in 1993 and 1994 (1 stands for the poorest quintile and 5 for the richest) and then tabulated mobility (again by accounting for the weights)

[4]For a nice discussion of income and consumption measurement errors, please refer to Lee (2008).

matrices over these two years. Observed mobility in rural areas is higher than urban areas and Tehran and it is specifically higher for the poorest quintile.

[*Table 6*]

The substantial size of mobility specially in the lower quintiles increases the suspicion of existence of a fair size of measurement errors. Our first approach towards finding the true mobility is to construct a transition matrix for *average* expenditures of 1992-93 and 1994-95 (Table 7) thinking that some of the transitory element would be averaged out. The effect on the mobility of the poorest quintile is shown to be significant for all regions, lower by between 10-15 percentage points. In rural areas nearly half of the sample, instead of one-third (as in Table 6), are found in the first quintile both in 1992-93 and 1994-95. The drop in mobility for urban areas and Tehran, where income variability is lower, is also significant, by about 10-13 percentage points.

[*Table 7*]

We also calculated the transition matrices by not counting movements due to expenditure changes of less than 20%. The rationale behind this is that we can reduce the effect of transitory shocks and time-varying measurement errors that account for movements less than 20%. By ignoring smaller movements, we may lose some real movements in household welfare, in addition that we are not sure how much of the measurement error effect has been mitigated. These frailties comes from the fact that the choice of 20% is rather arbitrary and the results are quite sensitive to it. In other words, we geThe reason that But this did not produce a significant change, only about a 4 percent increase in the proportion of rural individuals who were in the lowest quintile in both years. The results are depicted in table 8.

[*Table 8*]

A more serious source of bias may arise from the way expenditures data are collected, based on expenditures in the last month rather than actual daily consumption. Large purchases made in the month of reference (November) can push the person one or more quintiles up without any change having occurred in the person's actual economic status. Many items are collected on an annual basis, such as certain educational

expenditures and durable goods, and are therefore immune to this particular problem. But expenditures on items reported on a monthly basis can cause error. The most important source of such error for poverty analysis is from bulk purchase of grains, which affect poorer rural households more. Using the more detailed Expenditure and Income Survey (HEIS), Salehi-Isfahani (2003) has shown that this problem is more acute for rural households and it can cause substantial distortion in the estimation of their poverty rates. For panel data, too, large purchases are more prevalent among rural households, presumably because large purchases in rural areas may coincide with harvest times. Table 9 describs that, in 1992, 13% of rural households reported grain purchases of greater than 250 kilograms compared to 4 percent for households in urban areas and Tehran. For example, those who made their 'purchase' during the month of interview in one panel year but not the next would appear, without justification, to have dropped into a lower quintile. Average share of expenditures on grain in 1992 was 9% in rural areas and 5% in urban areas and Tehran. In rural areas the share of those who purchased more than 250 kg was about 11 percent, about 20 percent above the average for rural households.

[*Table 9*]

The error created by bulk purchases for mearement of mobility appears particularly acute for lower income households. About 24% of households who moved up from the poorest quintile in 1992 to a higher quintile in 1993 were those who also moved down from grain quintiles 4-5 in the same period. While we cannot be sure if the change in the amount of grain purchased reflects a change in actual consumption, or if it is due to a change in the timing of the bulk purchase, we do know that it can be a source of spurious mobility.

To correct for this potential bias, we assume that the four year average of grain purchases better reflects monthly grain consumption than the actual purchase and replace expenditure on grains in each year with with its average for 1992-95. The results for adjusting expenditures for only those with high grain purchases (250 kg or more per month) are presented in Table 10. The change in the proportion of rural individuals who remain in the lowest quintile is quite noticeable, from 33% to 45%. The change for the corresponding quintile in urban areas and Tehran is

comparatively very small, reflecting the smaller proportion with high grain purchases. These adjustments are similar to those when using two year averages of pce.

[*Table 10*]

4.1 Disentangling Measurement Error

Here, we review and follow Luttmer (2002) methodology as one way to tackle the problem of measurement error. Luttmer (2002) defines transitory shocks to consumption (or income) as those that last only one period (one year in our case) and proposes a novel method to separate them from the observed consumption (income). By his definition, transitory shocks not only include actual shocks that happen at the household, community, or country level, but also non-serially correlated (time varying) measurement error over time. Separating these shocks from observed consumption, we end up with a more persistent consumption that is not deluded with classical measurement error and is a better index of the real welfare of the household. Looking at this persistent consumption over time, we can find a closer index to the true mobility of households. The main advantage of Luttmer's novel methodology as unlike many other studies in the literature is that it does not assume any functional form for measurement error, transitory, and persistent shocks and with minimum assumptions (only 3) tries to disentangle them from the persistent expenditure. Using Luttmer (2002) notations, suppose C_{it}, the log per capita consumption of household i in period t, can be written as

$$C_{it} = C_{it}^{P} + \epsilon_{it} \tag{1}$$

in which ϵ_{it} is the transitory shock that lasts one period, and C_{it}^{P} is the persistent part of consumption. Conditional on persistent expenditure, ϵ_{it} has mean zero and variance $\sigma_{\epsilon_t}^2$ which can vary over time. In addition, we can specify the change in persistent consumption as

$$C_{it}^{P} = C_{it-1}^{P} + \alpha_t + \eta_{it} \tag{2}$$

in which α_t is the growth in persistent consumption for all households at time t, and eta_{it} is the persistent shock at time t which has mean zero and variance $\sigma_{\eta t}^2$. By

definition, transitory shocks are uncorrelated with past and future shocks (transitory or persistent), therefore one can write

$$E[\epsilon_{it}, \epsilon_{it-j}] = 0 \ , \ \forall j \neq 0 \tag{3a}$$

$$E[\epsilon_{it}, \eta_{it-j}] = 0 \ , \ \forall j \neq 0 \tag{3b}$$

Writing equation (2) for C^P_{it-1} and plugging it into equation (2) and repeating this process recursively, one finds that C^P_{it} can be written as the sum of all past persistent shocks. Therefore, as (3b) holds, one can infer that current and future transitory shocks are independent of past persistent consumption. In order to have independence of current temporary shocks from current persistent expenditure, we need to assume

$$E[\eta_{it}, \epsilon_{it}] = 0 \tag{asmp.1}$$

This assumption cannot be verified but Luttmer (2002) explains the bias in the results if it does not hold. The second identifying assumption is that the successive persistent shocks are not correlated with each other.

$$E[\eta_{it}, \eta_{it-1}] = 0 \tag{asmp.2}$$

This assumption also needs not to hold and Luttmer (2002) discusses that as well. We will review them below. But, we do not need to impose any restriction on correlation between persistent shocks that are more than one period apart. If we take the first difference of log per capita expenditure of the household, we will have:

$$\Delta C_{it} = C_{it} - C_{it-1} = \alpha_t + \eta_{it} + \epsilon_{it} - \epsilon_{it-1}$$

The expectation of ΔC_{it} is α_t. Therefore,

$$Cov[\Delta C_{it}, \Delta C_{it+1}] = E[(\eta_{it} + \epsilon_{it} - \epsilon_{it-1})(\eta_{it+1} + \epsilon_{it+1} - \epsilon_{it})] \tag{4}$$

Using definition of transitory shocks which implies equations (3a) and (3b) and also

assumptions (asmp.1) and (asmp.2), we can simplify (4) to find

$$Cov[\Delta C_{it}, \Delta C_{it+1}] = E[-\epsilon_{it}^2] = -\sigma_{\epsilon_t}^2 \tag{5}$$

Having a four-period panel data, similar to Luttmer (2002), we can only identify the variance of transitory shocks in periods 2 and 3, i.e.

$$Cov[C_2 - C_1, C_2 - C_3] = \hat{\sigma}_{\epsilon_2}^2 \tag{6a}$$
$$Cov[C_3 - C_2, C_3 - C_4] = \hat{\sigma}_{\epsilon_3}^2 \tag{6b}$$

If assumptions (asmp.1) and (asmp.2) does not hold then the bias in the estimated variances can be written as

$$Bias(\hat{\sigma}_{\epsilon_2}^2) = E(\epsilon_2\eta_2) - E(\eta_2\eta_3)$$
$$Bias(\hat{\sigma}_{\epsilon_3}^2) = E(\epsilon_3\eta_3) - E(\eta_3\eta_4)$$

A positive correlation between current ϵ_t and ηt leads to an upward bias in the estimated variances, while a positive correlation between successive persistent shocks biases the estimated variances downward.

Now that we estimated the variance of transitory shocks, we can simulate transitory shocks assuming that they are following a log normal distribution

$$\epsilon_t \sim LogN(0, \sigma_{\epsilon_2}^2) \tag{asmp.3}$$

We saw that current transitory shock are orthogonal to current persistent expenditure, therefore they should be correlated with current observed consumption. Hence, we can simulate them using

$$\tilde{\epsilon_2} = a_1\tilde{\psi}_2 + a_2\tilde{\psi}_3 + a_3\tilde{\zeta}_2 \tag{8a}$$
$$\tilde{\epsilon_3} = b_1\tilde{\psi}_2 + b_2\tilde{\psi}_3 + b_3\tilde{\zeta}_3 \tag{8b}$$

in which $\tilde{\psi}_t$ is a standard normal variable with a perfect rank correlation with observed log expenditure in period t, ($t \in \{2, 3\}$), and $(\tilde{\zeta}_2, \tilde{\zeta}_3)$ is a bivariate standard normal

distribution with correlation coefficient r. We first make $\tilde{\psi}_t$ by generating standard normal random variables with equivalent percentile tanking of log per capita expenditures of households. Then we compute parameters a_1 to a_3, b_1 to b_3, and r by solving the following system of equations which reflects the implications of the model

$$Cov[\tilde{\epsilon_2}, C_2] = a_1 Cov[\tilde{\psi}_2, C_2] + a_2 Cov[\tilde{\psi}_3, C_2] = \hat{\sigma}^2_{\epsilon_2} \tag{9a}$$

$$Cov[\tilde{\epsilon_2}, C_3] = a_1 Cov[\tilde{\psi}_2, C_3] + a_2 Cov[\tilde{\psi}_3, C_3] = 0 \tag{9b}$$

$$Cov[\tilde{\epsilon_3}, C_3] = b_1 Cov[\tilde{\psi}_3, C_3] + b_2 Cov[\tilde{\psi}_3, C_3] = \hat{\sigma}^2_{\epsilon_3} \tag{9c}$$

$$Cov[\tilde{\epsilon_3}, C_2] = b_1 Cov[\tilde{\psi}_3, C_2] + b_2 Cov[\tilde{\psi}_3, C_2] = 0 \tag{9d}$$

$$Var[\tilde{\epsilon_2}] = a_1^2 + a_2^2 + 2a_1 a_2 Cov[\tilde{\psi}_2, \tilde{\psi}_3] + a_3^2 = \hat{\sigma}^2_{\epsilon_2} \tag{9e}$$

$$Var[\tilde{\epsilon_3}] = b_1^2 + b a_2^2 + 2b_1 b_2 Cov[\tilde{\psi}_2, \tilde{\psi}_3] + b_3^2 = \hat{\sigma}^2_{\epsilon_3} \tag{9f}$$

$$Cov[\tilde{\epsilon_2}, \tilde{\epsilon_2}] = a_1 b_1 + a_2 b_2 + (a_1 b_2 + a_2 b_1) Cov[\tilde{\epsilon_2}, \tilde{\epsilon_3}] + a_3 b_3 r = 0 \tag{9g}$$

Equations (9a) through (9d) makes simulated transitory shocks independent of persistent consumption (implications of equations (3a) and (3b), and assumption (asmp.1)) and equations (9e) and (9f) would give the right variances to the simulated transitory shocks (equations (6a) and (6b)), and the last equation confirms that there would be no correlation between transitory shocks (equation (3a)). a_1, a_2, b_1, and b_2 can always be computed from the first four equations, but a_3 and b_3 computed from equations (9e) and (9f) may be complex values (not real numbers) and solutions to r may be outside $[-1, 1]$ range. This happens when data do not follow assumption (asmp.3). Luttmer (2002) provides a solution to this problem that depending on the data it may work or not and that is to replace $\tilde{\psi}_t$ with a combination of itself and the z-score of log of measured expenditure at time t in the above simulation model. This new variable is defined as

$$\tilde{\psi}^*_t = \frac{\theta \tilde{\psi}_t + (1-\theta) z_{C_t}}{\theta^2 + (1-\theta)^2 + 2\theta(1-\theta) Cov[\tilde{\psi}_t, z_{C_t}]}$$

in which θ is a parameter that takes values between zero and one, and z_{C_t} is z-score of C_t, the log expenditure at time t, $t \in \{2, 3\}$. One may find values of θ between zero and one for which consistent values of a_3, b_3, and r exists.

After finding a_3, b_3, and r, we can simulate $(\tilde{\zeta_2}, \tilde{\zeta_3})$, N times for each household to get rid of stochastic variation introduced by simulation[5]. Now, we can easily simulate the transitory shocks for each household and find N transitory shocks for each household. By subtracting observed household log per capita expenditure from each of these transitory shocks we can compute N persistent log per capita expenditures for each household. Therefore, we will have N times as many observations as we had before. Computing quintiles of persistent expenditure using weights computed in the attrition section ($household\ size \times inverse\ response\ probability$) and cross-tabulating persistent expenditures quintiles of periods 2 and 3 using the same weights, one can get quite close to the true mobility.

Table 11 shows the result of this analysis for each region. As before, quintiles are computed separately for each region. Unlike tables , there is almost no chance of a household in the first quintile to jump all over to the fifth quintile in one year. Conversely, someone in the richest quintile is unlikely to fall into the first quintile in 12 months. About 75% of households who were in the first or last quintiles in 1992 did not move in 1993.

[*Table 11*]

5 Dynamics of Poverty

Analyzing mobility, one may wonder how poverty status for a household change over time, i.e. what is the mobility into and out of poverty. In particular, questions like how many households are persistently poor over time, how many drop into and out of poverty termporarily, and how long is the duration of poverty for various households are of special interest. 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.

[5]Following Luttmer (2002), we simulated $(\tilde{\zeta_2}, \tilde{\zeta_3})$ 20 times.

Distinguishing short from long term poverty is important for policy since 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).

5.1 Measures of Chronic and Transient Poverty

The first question is how to define and measure long and short term poverty. Various ways devised to measure these concepts[6]. But before using each of these measures we need to set a poverty line to identify the poor. We adopt cost-of-basic-needs poverty lines computed by Salehi-Isfahani (2007) for each region. They correspond to the average per capita expenditure of households whose food intake is 2200 calories per adult.?????

Table 12 provides one of these measures which is to look at the percentage of people who were poor for a specific period of time. There is a fair amount of mobility as large size of poor fell into and out of poverty. only 5% of population who were poor all four years and 6% were in poverty three years, while 25% fell into and out of poverty. This can be due to measurement error. Consider a household close to poverty line (above or below). A small measurement error can make this households poor or non-poor and since measurement error changes over time, we may observe that the household is moving into or out of poverty while its status may have never changeed. describe table .The other problem with this measure is that it treats every poor similarly that is it does not distinguish between the poor and the poorest of the poor (one near the poverty line and one far below the poverty line).

[*Table 12*]

We can also define long term poor as people whose four year average expenditure is below the poverty line. Individuals who were poor in any given year but their average expenditure was above poverty line are considered short-term poor. Table

[6]cite reviews and compares some of the popular measures.

13 describes percents of population who were long-term poor or short term poor separately for each region. The advantage of using this method is that time varying classical measurement error tends to diminish for the long-term poor (as we take the average of expenditure over time), but not for the short-term poor, since we still observe short term poverty by looking at expenditure in each year. This measure also does not distinguish between individuals close to poverty line and those far from it.

[*Table 13*]

Jalan and Ravallion (2000) offer a particular definition which is widely used in the empirical literature because of its many appealing features like accounting for the difference between being poor and being the poorest of the poor (Haddad and Ahmed 2002; McKay and Lawson 2002, for examples see). It can also mitigate the problem of measurement error to some extent by having smaller values [7] for individuals close to the poverty line. They define an aggregate intertemporal poverty function for household i as

$$P_i = P(y_{it}, y_{it+1}, y_{it+2}, \ldots, y_{it+k}) \tag{10}$$

in which y_{it+j} are real expenditure for houeshold i at time $t+j$, $j = 0, \ldots, k$ (in our case, $k = 3$). They divide this poverty function into two parts, transient and chronic. Chronic component, has the same functional form while its arguments are averaged expenditure of household i over all periods, that is

$$C_i = P(Ey_i, Ey_i, Ey_i, \ldots, Ey_i) \tag{11}$$

and transient part is the difference between the total poverty function (equation (10)) and the chronic poverty (equation (11)), i.e.

$$T_i = P(y_{it}, y_{it+1}, y_{it+2}, \ldots, y_{it+k}) - P(Ey_i, Ey_i, Ey_i, \ldots, Ey_i) \tag{12}$$

Jalan and Ravallion (2000) impose three assumptions on P, 1) additivity of measure across time and household, 2) similarity of individual poverty function over time,

[7] This is not a weight in technical terms, like sample weight.

and 3) convexity of the measure. These will leave us with P defined as

$$P_i = P(y_{it}, y_{it+1}, y_{it+2}, \ldots, y_{it+k}) = p(y_{it}) + p(y_{it+1}) + p(y_{it+2}) + \ldots + p(y_{it+k})$$

in which individual poverty measures, $p(y_{it+j})$, are squared poverty gap at time $t+j$ for $j = 0, \ldots, k$, i.e.

$$p(y_{it+j}) = \begin{cases} (1 - y_{it+j})^2 & \text{if } y_{it+j} < 1 \\ 0 & \text{otherwise} \end{cases}$$

in which, y_{it+j}s are normalized at poverty line, i.e. it is per capita expenditure is divided by poverty line. This measure of poverty is one when per capita expenditure is zero and gets smaller as we approach poverty line. As ithis is a convex function the speed of getting to zero becomes smaller as get closer to poverty line. One can easily see that this measure does not treat the poor and the poorest similarly. In addition as it converges to zero around poverty line, it partially solves problem of measurement error. Using equations (11) and (12), we can compute chronic and transitory measures for each household and take the weighted average of these measure to find chronic and transitory poveryt in each region. Table 14 shows the result.

[*Table 14*]

As shown, chronic poverty is about 70 percents of total poverty in the country. Although the share of chronic and transitory poverty are almost similar across Tehran and rural areas (about 65 percents for chronic poverty and 35 percent for transient poverty), but interestingly chronic poverty is about 80% in other urban areas. This is a bit of surprise that in Tehran, chronic poverty is smaller than other urban areas while transient poverty is larger.

5.2 Accounting for Dynamics

Consider two households who are poor the same number of years, for instance 2 years, but one of them is poor in successive years while the other is not. The interesting question would be whether there is a difference between these two and if different

policies should be targeted towards them. For a better understanding of the question consider this analogy: A person whose head is under the water in one period but have the eopportunity to come out and breath for the next period before going back under the water again, has a quite different circumstance relative to one whose head is under the water for successive periods. Thinking of the poverty line as the water level in that analogy, one may suppose that someone who is poor in successive periods may be more likely to take her children our of school or suffer from poor health.

Here, if there would be a difference between the two households mentioned above, one may think of two different aspects of this difference. The first is, whether the two households behave differently due to the fact that they experience different patterns of poverty and the second is whether they have different characteristics that made them to experience different patterns and therefore behave differently. Disentangling these two hypotheses and analyzing them separately is difficult since behavior can make characteristics and characteristics make behavior. Nevertheless, we can test whether there is a difference (in behavior or characteristics) between these two groups.

Table 15 is an effort to test the existence of these differences. It depicts the average value of several variables for 5 distinct groups in the years that they were poor. The groups are 'never poor', 'one year poor', 'two years poor in intermittent periods','two years poor but in successive periods', 'three years poor in intermittent years', 'three years poor in successive years', and 'Four years poor'. Each cell in a row provides the (weighted) average of the variable only in the years the household was in poverty. For the 'never poor' group, the average of the variable over all four years of the panel is taken. Since many of the variables are dummy variabels equal to one if they are true and zero otherwise, multiplying them by 100 gives the percentage of people in that group for whom the variable was true. For example, 2.8% of people who were poor in two intermittent years only lived in a female headed household while 5.6% of people who were poor in two successive years only had similar situations and the difference between these two is statistically significant. The star signs in columns 5 and 7 of the table show the significant level of the test whether intermittent poverty is different from successive poverty, i.e. it tests the difference of columns 5 vs. 4, and columns 7 vs. 6.

[*Table 15*]

As it is shown, there are significant difference between the two groups. Households who were poor in successive years were more likely to live in rural areas (least likely to live in Tehran) relative to households who were poor in intermittent periods. This liklihood is more pronounced for households who were three years in poverty.Real per capita expenditure for households who were poor in successive periods is lower that those who were poor in intermittent periods, although the difference is only significant for three years poor. Interestingly, enrollment of kids in school is lower in poverty years for households who were poor in successive periods and the difference is significant. The difference in children's enrollment comes only from girls, since share of boys in school is virtually equal for people who were poor in successive periods vs. those who were poor intermittently.

Looking at the 'female headed' dummy variable, we can see that although it is more likely for an individual who is poor in only two successive years to live in a female headed household relative to one who is poor in two intermittent years, the opposite is true for three years in poverty. This difference between two years and three years is true for some other variables such as 'head being literate', 'education category', and 'wife(ves) employed.' Explaining these differences is beyond the scope of this paper but a promising road for future research.

'Employed' is a dummy variable equal to one if the head is employed, and for those who are poor in only two years of the panel, employment is higher for people who were poor in successive periods, the difference vanishes for people three years in poverty. One interesting policy implication of the result is that employment status is almost similar across different groups of poor and non-poor (except for those who were poor in all four years.) This shows that these people are not poor because they do not have a job, rather their living wage is lower than providing the basic necessities of living in some years.

We can conclude that in understanding chronic vs. transitory poverty not only the poverty gap and its duration matter but also the dynamic pattern of falling into and out of poverty, i.e. being poor in successive periods vs. intermittent ones may play a role. Although Jalan and Ravallion's measure is a powerful index of poverty dynamics and has many advantages, it does not account for the pattern of falling into and out of poverty over time. We argue that it would be fruitful to improve their

measure or look for new measures that account for the poverty dynamics as well.

5.3 Determinants of Chronic and Transient Poverty

After measuring chronic and transient poverty, the next interesting question is what distinguishes households suffering chronic poverty vs. those who experience transient poverty. Here, we follow the well-estalished methodology of Jalan and Ravallion (2000) to answer this question. Assuming X is a vector of explanatory variables, we look at the following models

$$C_i = X_i\beta_C + \epsilon_{Ci} \tag{13}$$

$$T_i = X_i\beta_T + \epsilon_{Ti} \tag{14}$$

in which C_i and T_i are computed from equations (11) and (12) respectively. Both dependent variables are censored, that is they take value of zero for non-poor while have positive values for the poor. Therefore, OLS estimations are inconsistent. On the other hand, although tobit regression gives consistent estimates, it assumes that the errors are normally distributed. Arabmazar and Schmidt (1982) provide evidence that tobit, when errors are non-normal and/or heteroskedastic, gives inefficient and inconsistent estimates. Following Jalan and Ravallion (2000), we use censored quintile regression (CQR) to get consistent estimates, since it has less stringent assumptions about the error term[8]. CQR estimates of (13) and (14) are obtained by minimizing (15) and (16) over parameters β_C and β_T respectively.

$$\min_{\beta_C} \frac{1}{N}\sum_{i=1}^{N} \rho_\theta \left| C_i - \max(0, X_i\beta_C) \right| \tag{15}$$

$$\min_{\beta_T} \frac{1}{N}\sum_{i=1}^{N} \rho_\theta \left| T_i - \max(0, X_i\beta_T) \right| \tag{16}$$

in which θ represents the quintile and ρ_θ is a weighting function that centers the data based on quintile, i.e.

[8]It only assumes that errors are i.i.d. and continuously differentiable with positive density at the chosen quintile.

$$\rho_\theta(\lambda) = [\theta I(\lambda \geq 0) + (1-\theta)(\lambda < 0)]\,|\lambda|$$

We used *qcenreg* developed by Robert Vigfusson in Stata to compute CQR estimates. The results are shown in table 16. Since the coefficients were too small, especially for transient poverty, we divided each regressor by 1000 to get a comparable result. As depicted, coefficients of chronic poverty are larger than transient poverty, while almost all coefficients are highly significant. This is quite interesting, since unlike **?**), we did not increased poverty line to make the coefficients significant[9]. The results are not surprising. More education is correlated with less chronic and transient poverty. Meanwhile older people are less likely to have both types of poverty [10]. Speaking and understanding Persian is also improve the chance of not being of any type of poor, its effect on transient poverty is also quite strong comparable to the other regressors. Being in larger families and having a female as the head of the household is positively correlated with being in chronic and transient poverty.

Interestingly, it is more likely to be a chronic poor if one lives in an urban area (Tehran or other urban areas) while it is less probable to be in transient poverty if one lives in these areas relative to rural areas. This can be partially explained by the fact that agriculture, the major activity in rural areas, is a precarious business and depends on many unpredictable factors such as weather and therefore is more volatile.

[*Table 16*]

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[9] Jalan and Ravallion (2000) had to multiply poverty lines by 1.5 to get significant coefficients.

[10] unlike what some policy makers in the country think.

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Table 1: Attrition by Region of Residence

When left the panel	Region			
	Rural %	Urban %	Tehran %	Total %
2nd year	7.3	16.4	21.1	14.3
3rd year	4.7	8.3	10.2	7.5
4th year	5.3	9.1	9.4	7.8
Never left	79.7	62.9	51.8	66.1
Left but returned	3.1	3.3	7.5	4.3
Total	100.0	100.0	100.0	100.0

Note: Households who left the balanced sample are those who are in the first round(i.e. 1992) but are not in all four years of the survey. Standard errors are in parentheses. 'Difference' is the difference in percents attrited between poor and non-poor.
Pearson chi2(6) = 287.8567 Pr = 0.000 Households

Table 2: Attrition among the Renters and Non-renters

	Renters	*Non-renters*	*Difference*
Rural	70.6	18.4	-52.2***
	(5.6)	(0.9)	(5.8)
Urban	86.9	27.2	-59.7***
	(1.9)	(1.1)	(2.6)
Tehran	83.6	36.3	-47.3***
	(2.0)	(1.5)	(2.9)

Note: Each cell shows the percentage of households who were interviewed in the first round (i.e. 1992), but left the balanced sample later. Standard errors are in parentheses. 'Difference' is the difference in percents attrited between renters and non-renters.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Attrition among the Poor and Non-poor

	poor	*Non-poor*	*Difference*
Percents left the balanced sample	32.6	34.1	1.50
	(1.6)	(0.7)	(1.79)

Note: Households who left the balanced sample are those who are in the first round (i.e. 1992) but are not in all four years of the survey. Standard errors are in parentheses. 'Difference' is the difference in percents attrited between poor and non-poor.

Table 4: Attrition among Quintiles by Region of Residence

	PCE Quintiles*				
	1	2	3	4	5
Rural	25.7†	18.7	19.8	19.8	17.6
	(2.3)	(2.0)	(2.1)	(2.1)	(2.0)
Urban	35.6	41.9	29.5‡	38.2	40.1
	(2.4)	(2.5)	(2.3)	(2.5)	(2.5)
Tehran	46.9	48.8	44.2	51.2	50.0
	(3.1)	(3.1)	(3.1)	(3.1)	(3.1)

Note: Each cell shows the percentage of households who were interviewed in the first round (i.e. 1992), but left the balanced sample later. Standard errors are in parentheses.

* Per capita expenditure quintiles are categorized as 1 indicates the poorest and 5 the richest households.

Table 5: Response Probability Logit Regression

	(1) Response
Living in Urban	-0.46***
	(0.08)
Living in Tehran	-0.80***
	(0.09)
Rent	-2.77***
	(0.11)
Free Rent	-1.33***
	(0.09)
Constant	1.67***
	(0.06)
Observations	5081
Psuedo R-squared	0.19

Standard errors in parentheses

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

Table 6: Observed Mobility between 1993 and 1994

	1994					
1993	1	2	3	4	5	Total
Rural	%	%	%	%	%	
1	45.2	22.2	13.3	13.1	6.3	100.0
	(3.4)	(2.8)	(2.1)	(2.2)	(1.6)	
2	29.0	26.9	19.7	16.0	8.3	100.0
	(3.1)	(3.0)	(2.6)	(2.4)	(1.7)	
3	13.5	24.5	24.2	20.3	17.5	100.0
	(2.2)	(2.8)	(2.8)	(2.7)	(2.6)	
4	8.4	19.4	24.9	25.6	21.7	100.0
	(1.8)	(2.7)	(2.7)	(2.8)	(2.7)	
5	4.1	6.8	18.2	24.8	46.2	100.0
	(1.2)	(1.5)	(2.5)	(2.5)	(3.0)	
Total	20.0	20.0	20.1	19.9	20.0	100.0
	(1.2)	(1.2)	(1.1)	(1.1)	(1.1)	
Urban						
1	55.9	23.3	12.6	3.3	4.9	100.0
	(4.1)	(3.4)	(2.5)	(1.2)	(2.5)	
2	27.0	36.4	15.0	13.1	8.6	100.0
	(3.4)	(4.0)	(2.6)	(2.5)	(2.3)	
3	11.0	24.8	29.3	22.7	12.2	100.0
	(2.3)	(3.8)	(3.4)	(3.2)	(2.4)	
4	3.9	9.7	27.7	40.0	18.6	100.0
	(1.3)	(2.2)	(3.4)	(3.5)	(2.7)	
5	3.0	5.3	14.6	20.8	56.2	100.0
	(1.1)	(1.5)	(2.6)	(2.6)	(3.3)	
Total	20.2	19.9	19.9	20.0	20.0	100.0
	(1.4)	(1.5)	(1.3)	(1.3)	(1.3)	
Tehran						
1	48.5	26.8	15.0	5.1	4.7	100.0
	(4.8)	(4.1)	(3.3)	(1.7)	(1.9)	
2	24.1	27.5	17.9	24.3	6.2	100.0
	(5.3)	(5.3)	(3.4)	(4.4)	(1.9)	
3	12.9	19.9	30.4	16.9	19.9	100.0
	(4.5)	(4.3)	(6.2)	(4.0)	(5.7)	
4	9.5	14.7	22.4	28.5	24.9	100.0
	(3.4)	(5.2)	(3.7)	(4.9)	(4.3)	
5	5.1	10.9	14.2	25.8	44.0	100.0
	(3.1)	(3.2)	(3.9)	(4.7)	(5.2)	
Total	20.1	20.0	20.0	20.1	19.9	100.0
	(2.1)	(2.0)	(1.9)	(1.9)	(1.9)	

Pearson: Uncorrected chi2(16) = 3997.8743
Design-based F(14.14, 190038.55) = 7.6674 Pr = 0.000

Table 7: Mobility between Averaged Expenditure of 92-93 and 94-95

	1994-95					
1992-93	1	2	3	4	5	Total
Rural	%	%	%	%	%	
1	48.2	27.0	15.4	6.4	3.0	100.0
	(3.4)	(3.1)	(2.4)	(1.7)	(1.1)	
2	20.7	30.2	23.3	16.0	9.8	100.0
	(2.6)	(3.1)	(2.9)	(2.5)	(1.9)	
3	15.4	21.1	24.4	24.0	15.2	100.0
	(2.4)	(2.6)	(2.7)	(2.9)	(2.4)	
4	10.8	14.1	20.2	29.0	25.8	100.0
	(2.0)	(2.2)	(2.7)	(2.9)	(2.8)	
5	5.3	7.3	16.7	25.1	45.7	100.0
	(1.6)	(1.6)	(2.3)	(2.6)	(3.0)	
Total	20.1	20.0	20.0	20.1	19.9	100.0
	(1.2)	(1.2)	(1.2)	(1.2)	(1.1)	
Urban						
1	54.6	29.1	8.9	5.3	2.1	100.0
	(4.0)	(3.7)	(2.1)	(1.7)	(1.1)	
2	27.3	32.5	23.4	11.8	4.9	100.0
	(3.5)	(4.2)	(3.4)	(2.4)	(1.6)	
3	9.9	23.3	28.8	24.5	13.5	100.0
	(2.0)	(3.4)	(3.2)	(3.5)	(2.7)	
4	6.3	10.4	25.4	32.3	25.6	100.0
	(2.3)	(2.2)	(3.0)	(3.4)	(3.1)	
5	2.0	4.6	13.7	25.9	53.8	100.0
	(0.9)	(1.3)	(2.4)	(3.3)	(3.4)	
Total	20.0	20.0	20.0	20.0	20.0	100.0
	(1.4)	(1.5)	(1.3)	(1.4)	(1.2)	
Tehran						
1	53.7	32.1	11.4	2.2	0.6	100.0
	(5.5)	(5.0)	(2.9)	(1.2)	(0.6)	
2	26.0	28.7	22.9	19.5	2.9	100.0
	(5.0)	(4.7)	(4.5)	(4.1)	(1.3)	
3	11.9	26.3	29.4	19.4	13.0	100.0
	(4.1)	(5.0)	(4.3)	(4.2)	(3.1)	
4	8.0	10.2	25.2	29.6	27.0	100.0
	(4.6)	(2.7)	(5.2)	(5.3)	(5.5)	
5	0.8	2.5	10.7	30.0	56.0	100.0
	(0.8)	(1.2)	(3.1)	(5.0)	(5.3)	
Total	20.1	20.0	19.9	20.1	19.9	100.0
	(2.2)	(1.9)	(1.9)	(1.9)	(2.0)	

Pearson: Uncorrected chi2(16) = 7089.5038
Design-based F(13.30, 178827.74) = 15.3667 Pr = 0.000

Table 8: Mobility Ignoring Movements More than 20% 1993 and 1994

	1994					
1993	1	2	3	4	5	Total
Rural	%	%	%	%	%	
1	50.2	17.1	13.3	13.1	6.3	100.0
	(3.4)	(2.4)	(2.1)	(2.2)	(1.6)	
2	25.6	37.5	12.6	16.0	8.3	100.0
	(3.0)	(3.3)	(2.2)	(2.4)	(1.7)	
3	13.5	17.2	37.2	14.6	17.5	100.0
	(2.2)	(2.5)	(3.2)	(2.3)	(2.6)	
4	8.4	19.4	18.5	35.4	18.3	100.0
	(1.8)	(2.7)	(2.4)	(3.1)	(2.5)	
5	4.1	6.8	18.2	22.0	48.9	100.0
	(1.2)	(1.5)	(2.5)	(2.4)	(3.0)	
Total	20.4	19.6	20.0	20.2	19.9	100.0
	(1.2)	(1.2)	(1.1)	(1.1)	(1.1)	
Urban						
1	63.1	16.2	12.6	3.3	4.9	100.0
	(4.0)	(3.0)	(2.5)	(1.2)	(2.5)	
2	21.0	48.3	9.1	13.1	8.6	100.0
	(3.2)	(4.0)	(2.0)	(2.5)	(2.3)	
3	11.0	19.4	46.9	10.6	12.2	100.0
	(2.3)	(3.7)	(3.9)	(2.3)	(2.4)	
4	3.9	9.7	25.9	45.1	15.4	100.0
	(1.3)	(2.2)	(3.4)	(3.6)	(2.6)	
5	3.0	5.3	14.6	17.5	59.5	100.0
	(1.1)	(1.5)	(2.6)	(2.4)	(3.2)	
Total	20.4	19.8	21.8	17.9	20.0	100.0
	(1.4)	(1.5)	(1.4)	(1.2)	(1.3)	
Tehran						
1	60.4	14.8	15.0	5.1	4.7	100.0
	(4.6)	(3.1)	(3.3)	(1.7)	(1.9)	
2	24.1	39.9	6.5	23.3	6.2	100.0
	(5.3)	(5.4)	(2.1)	(4.4)	(1.9)	
3	12.9	19.9	35.9	11.4	19.9	100.0
	(4.5)	(4.3)	(6.2)	(3.6)	(5.7)	
4	9.5	14.7	22.4	34.7	18.6	100.0
	(3.4)	(5.2)	(3.7)	(5.1)	(3.8)	
5	5.1	10.9	14.2	21.8	48.0	100.0
	(3.1)	(3.2)	(3.9)	(4.1)	(5.3)	
Total	22.5	20.0	18.8	19.3	19.4	100.0
	(2.1)	(2.0)	(1.9)	(1.8)	(2.0)	

Pearson: Uncorrected chi2(16) = 6214.9608
Design-based F(14.07, 189191.29) = 12.2091 Pr = 0.000

Table 9: Distribution of Reported Size of Grain Purchase (Kilograms Per Month) in 1992

	Rural		Urban		Tehran	
Weight Category	Number	%	Number	%	Number	%
0 – 10	102	6.9	50	4.1	8	1.2
10 – 50	303	20.5	309	25.3	209	31.1
50 – 100	384	26.0	439	35.9	267	39.7
100 – 250	489	33.1	373	30.5	166	24.7
250 – 500	129	8.7	41	3.4	17	2.5
500+	69	4.7	10	0.8	6	0.9
Total	1,476	100.00	1,222	100.00	673	100.00

Table 10: Mobility Corrected for Grains>250kg between 1993 and 1994

	1994					
1993	1	2	3	4	5	Total
Rural	%	%	%	%	%	
1	52.7	24.0	10.3	10.0	3.1	100.0
	(3.4)	(2.8)	(1.9)	(1.9)	(1.0)	
2	25.6	29.1	23.1	15.0	7.0	100.0
	(3.0)	(3.1)	(2.7)	(2.4)	(1.5)	
3	12.1	25.2	25.9	20.9	15.9	100.0
	(2.1)	(2.8)	(2.9)	(2.7)	(2.6)	
4	6.5	15.2	25.2	27.3	25.9	100.0
	(1.6)	(2.3)	(2.9)	(2.8)	(2.8)	
5	3.2	6.4	15.8	26.7	47.9	100.0
	(1.1)	(1.4)	(2.3)	(2.7)	(3.0)	
Total	20.0	20.0	20.0	20.0	20.0	100.0
	(1.2)	(1.2)	(1.2)	(1.1)	(1.1)	
Urban						
1	54.8	25.6	10.7	4.0	4.9	100.0
	(4.3)	(3.9)	(2.2)	(1.4)	(2.5)	
2	28.0	34.6	17.5	12.5	7.4	100.0
	(3.4)	(3.7)	(2.8)	(2.5)	(2.2)	
3	10.8	23.5	31.8	21.7	12.2	100.0
	(2.2)	(3.7)	(3.4)	(3.1)	(2.4)	
4	3.6	11.4	26.8	38.6	19.6	100.0
	(1.2)	(2.4)	(3.5)	(3.5)	(2.8)	
5	2.9	5.2	12.5	23.6	55.9	100.0
	(1.1)	(1.5)	(2.4)	(2.9)	(3.3)	
Total	20.1	20.1	19.8	20.1	20.0	100.0
	(1.4)	(1.5)	(1.3)	(1.3)	(1.3)	
Tehran						
1	49.6	25.5	15.1	5.1	4.8	100.0
	(4.8)	(4.0)	(3.3)	(1.7)	(2.0)	
2	23.2	27.8	19.1	22.0	7.9	100.0
	(5.2)	(5.3)	(3.5)	(4.2)	(2.2)	
3	12.9	22.0	28.6	18.2	18.3	100.0
	(4.5)	(4.5)	(6.2)	(4.2)	(5.7)	
4	8.8	14.2	22.9	29.3	24.8	100.0
	(3.3)	(5.2)	(3.8)	(4.9)	(4.3)	
5	6.1	9.9	14.3	25.7	44.0	100.0
	(3.2)	(3.1)	(3.9)	(4.7)	(5.2)	
Total	20.1	19.9	20.0	20.1	19.9	100.0
	(2.1)	(2.0)	(1.9)	(1.9)	(1.9)	

Pearson: Uncorrected chi2(16) = 3959.5288
Design-based F(14.19, 190780.59) = 7.5041 Pr = 0.000

Table 11: Mobility After Correction for Measurement Error Using Luttmer Analysis

	1994					
1993	1	2	3	4	5	Total
Rural	%	%	%	%	%	
1	84.0	15.6	0.4	0.0	0.0	100.0
	(0.6)	(0.6)	(0.1)	(0.0)	(0.0)	
2	15.6	62.4	21.1	0.8	0.0	100.0
	(0.5)	(0.7)	(0.6)	(0.1)	(0.0)	
3	0.3	21.2	56.8	21.4	0.4	100.0
	(0.1)	(0.6)	(0.7)	(0.6)	(0.1)	
4	0.0	0.9	21.4	62.2	15.5	100.0
	(0.0)	(0.1)	(0.6)	(0.7)	(0.5)	
5	0.0	0.0	0.3	15.6	84.1	100.0
	(0.0)	(0.0)	(0.1)	(0.5)	(0.5)	
Total	20.0	20.0	20.0	20.0	20.0	100.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	
Urban						
1	84.9	14.8	0.4	0.0	0.0	100.0
	(0.7)	(0.7)	(0.1)	(0.0)	(0.0)	
2	14.9	64.0	20.3	0.7	0.0	100.0
	(0.6)	(0.8)	(0.7)	(0.1)	(0.0)	
3	0.2	20.4	58.8	20.3	0.2	100.0
	(0.1)	(0.7)	(0.8)	(0.7)	(0.1)	
4	0.0	0.8	20.4	64.0	14.8	100.0
	(0.0)	(0.2)	(0.7)	(0.8)	(0.6)	
5	0.0	0.0	0.2	14.8	85.0	100.0
	(0.0)	(0.0)	(0.1)	(0.6)	(0.6)	
Total	20.0	20.0	20.0	20.0	20.0	100.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	
Tehran						
1	84.2	15.5	0.2	0.0	0.0	100.0
	(0.9)	(0.9)	(0.1)	(0.0)	(0.0)	
2	15.2	63.2	20.9	0.7	0.1	100.0
	(0.9)	(1.2)	(1.0)	(0.2)	(0.1)	
3	0.6	20.3	56.3	22.1	0.6	100.0
	(0.3)	(1.0)	(1.2)	(1.0)	(0.2)	
4	0.0	0.9	22.1	60.3	16.8	100.0
	(0.0)	(0.3)	(1.0)	(1.2)	(0.9)	
5	0.0	0.0	0.5	17.0	82.5	100.0
	(0.0)	(0.0)	(0.2)	(0.9)	(0.9)	
Total	20.0	20.0	20.0	20.0	20.0	100.0
	(0.5)	(0.4)	(0.4)	(0.4)	(0.4)	

Pearson: Uncorrected chi2(16) = 1.18e+05
Design-based F(14.42, 968555.60) = 898.0458 Pr = 0.000

Table 12: Distribution of Individuals by Number of Years in Poverty by Region

	region			
Years Poor	Rural %	Urban %	Tehran %	Total %
0	50.8	60.7	62.9	57.4
	(0.7)	(0.8)	(1.2)	(0.5)
1	23.1	17.6	18.5	20.0
	(0.6)	(0.7)	(1.0)	(0.4)
2	14.2	10.1	9.7	11.6
	(0.5)	(0.5)	(0.8)	(0.3)
3	8.6	7.3	5.2	7.3
	(0.4)	(0.5)	(0.6)	(0.3)
4	3.3	4.3	3.8	3.8
	(0.3)	(0.4)	(0.4)	(0.2)
Total	100.0	100.0	100.0	100.0

Pearson: Uncorrected chi2(8) = 202.2834
Design-based F(7.66, 103005.99) = 14.7136 Pr = 0.000

Table 13: Proportion of individuals in short and long term poverty by region (balanced panel), 1992-95

	Region			
	Rural %	Urban %	Tehran %	Total %
Long term poor	12.8	12.1	11.4	12.2
	(1.0)	(1.2)	(1.7)	(0.7)
Short term poor	36.4	27.2	25.7	30.5
	(0.7)	(0.8)	(1.1)	(0.5)
Not long term poor but poor in:				
1992	10.6	8.4	9.2	9.5
	(0.9)	(0.9)	(1.4)	(0.6)
1993	14.0	8.9	4.8	9.9
	(1.0)	(1.0)	(0.8)	(0.6)
1994	15.3	10.5	9.0	12.0
	(1.1)	(1.1)	(1.5)	(0.7)
1995	12.2	11.2	11.5	11.7
	(0.9)	(1.1)	(1.8)	(0.7)

Source:

Table 14: Total, Chronic, and Transient Poverty by Region

	Total		Chronic		Transient	
Region	Absolute	Share(%)	Absolute	Share(%)	Absolute	Share(%)
Rural	0.1072	100	0.0719	67	0.0353	33
Urban	0.0758	100	0.0590	78	0.0168	22
Tehran	0.0649	100	0.0414	64	0.0236	36
Total	0.0855	100	0.0598	70	0.0257	30

Table 15: Poverty Dynamics

	Years Poor						
	Never	One year	Two Years		Three Years		Four Years
			intermittently	successively	intermittently	successively	
Female headed	0.070	0.042	0.028	0.056***	0.058	0.032***	0.084
	(0.004)	(0.004)	(0.005)	(0.008)	(0.010)	(0.006)	(0.013)
Living in Rural	0.329	0.460	0.450	0.529***	0.334	0.603***	0.410
	(0.006)	(0.012)	(0.024)	(0.019)	(0.028)	(0.025)	(0.025)
Living in Urban	0.399	0.318	0.337	0.289*	0.357	0.328	0.374
	(0.007)	(0.011)	(0.023)	(0.016)	(0.030)	(0.025)	(0.025)
Living in Tehran	0.272	0.222	0.213	0.182	0.309	0.069***	0.216
	(0.007)	(0.012)	(0.025)	(0.016)	(0.036)	(0.012)	(0.022)
Literate	0.704	0.585	0.620	0.538***	0.447	0.527**	0.467
	(0.006)	(0.011)	(0.022)	(0.018)	(0.031)	(0.023)	(0.025)
Education category †	1.744	1.140	1.215	1.048*	0.818	0.965	0.721
	(0.021)	(0.034)	(0.076)	(0.046)	(0.073)	(0.067)	(0.055)
Employed	0.844	0.850	0.850	0.903***	0.864	0.866	0.816
	(0.005)	(0.008)	(0.014)	(0.009)	(0.016)	(0.014)	(0.015)
Real PCE	121,038	32,792	31,380	30,390	32,148	26,543***	26,938
	(977)	(275)	(552)	(362)	(628)	(397)	(513)
Wife(ves) employed	0.150	0.099	0.190	0.116***	0.119	0.165**	0.124
	(0.004)	(0.007)	(0.015)	(0.012)	(0.015)	(0.013)	(0.013)
Share of kids ‡ in school	0.876	0.833	0.847	0.816**	0.861	0.781***	0.808
	(0.004)	(0.009)	(0.011)	(0.012)	(0.013)	(0.013)	(0.012)
Share of girls ‡ in school	0.851	0.773	0.817	0.745***	0.846	0.708***	0.804
	(0.006)	(0.014)	(0.017)	(0.019)	(0.023)	(0.019)	(0.016)
Share of boys ‡ in school	0.908	0.902	0.874	0.896	0.892	0.870	0.823
	(0.005)	(0.008)	(0.016)	(0.012)	(0.014)	(0.012)	(0.015)
No. of households	2,009	627	151	222	84	151	115

All variables are averages for households across those years that household was poor. If household were never poor, average over all four years were computed. Each cell in the table represents the weighted average, in which the weight is inverse resp. probability multiplied by the HH size. Standard errors of mean estimation in parentheses. Averages for households who were poor for only two successive years (three successive years) were compared to those who were poor for two years (three years) but were poor intermittently. The significance level of the difference is depicted with the following symbols: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

† Education category takes values of 1 through 6: 1 = illiterate, 2 = read/write, 3 = primary, 4 = middle school, 5 = high school, and 6 = university.

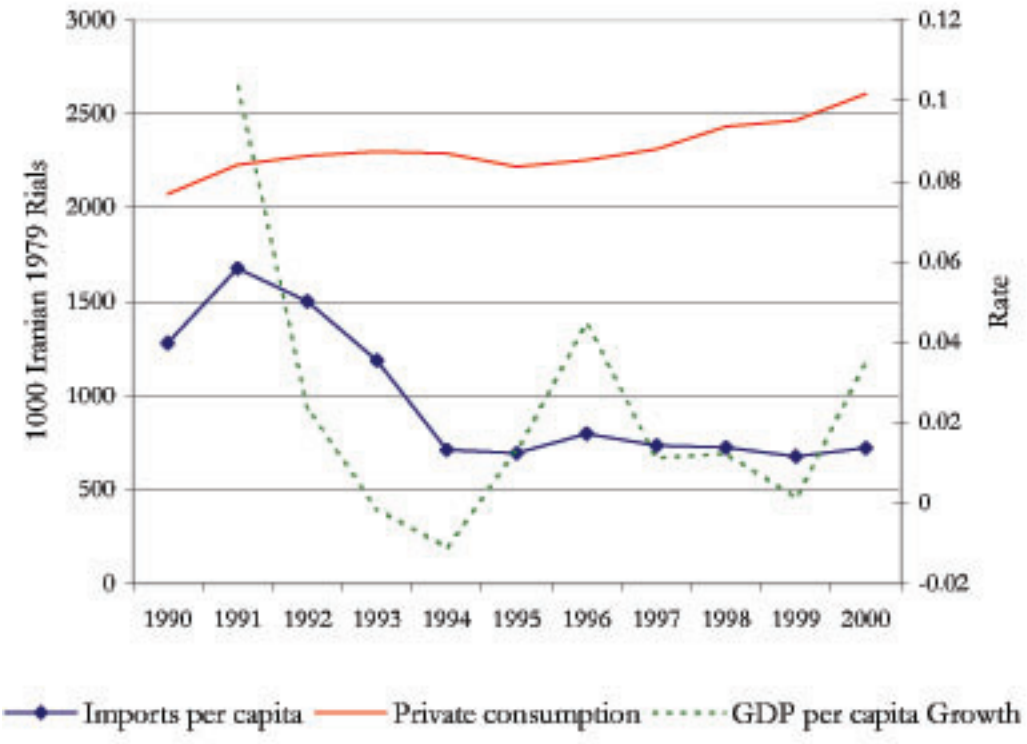
‡ Kids, girls, and boys, are considered children between ages 6 and 17 (6 and 17 included.) Households who had no child in these age groups in any given year were dropped fom the sample.

Table 16: Determinants of Chronic and Transitory poverty

	Chronic	Transient
HH Size†	16.86***	0.09***
	(0.52)	(0.00)
Living in Urban	21.37***	-0.57***
	(2.55)	(0.01)
Living in Tehran	21.76***	-0.52***
	(3.34)	(0.02)
Female Headed	12.82*	0.10***
	(4.98)	(0.02)
Age	-2.21***	-0.02***
	(0.67)	(0.00)
Age^2	-0.00	0.0002***
	(0.01)	(0.00002)
Speak Persian	-21.11***	-13.81***
	(3.63)	(0.02)
Head's Education		
Primary School	-34.61***	-0.18***
	(2.81)	(0.02)
Mid School	-37.64***	-0.18***
	(3.93)	(0.02)
High School	-62.39***	-0.21***
	(7.49)	(0.02)
University	-72.52***	-0.19***
	(20.08)	(0.03)
Migrant in 1991	38.04**	-0.14
	(12.24)	(0.09)
Constant	0.05***	0.01***
	(0.01)	(0.00)
Observations	7419	13370

This table depicts the censored quintile regression of chronic and transient poverty at quintile = 0.7 following Jalan and Ravallion (2000). The regressions are done as described by equations (15) and (16).
Chronic and transient poverty are defined according to equations (11) and (12).
†All regressors are divided by 1000 not to get too small coefficients. They also take the 1992 values.
Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1: Imports as percentage of GDP, GDP growth, and per capita private consumption (1000 Iranian 1997 rials), 1990-2000



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

Table 17: Summary statistics for the base and balanced samples (1992 values)

Variable	Comparison of Samples		
	Whole Sample	Balanced	Difference
Region			
Rural (%)	36.28	43.71	-7.43***
	(0.67)	(0.85)	(1.08)
Urban (%)	38.17	36.29	1.88*
	(6.81)	(8.03)	(1.08)
Tehran (%)	25.55	23.53	2.02**
	(0.61)	(0.64)	(0.89)
Household size	5.10	5.24	-0.15***
	(0.03)	(0.04)	(0.05)
Education of head			
Illiterate (%)	33.77	35.84	-2.07**
	(0.66)	(0.73)	(0.98)
Read/Write only (%)	20.3	21.14	-0.84
	(0.56)	(0.62)	(0.84)
Primary (%)	20.38	19.58	0.80
	(0.56)	(0.60)	(0.82)
Middle School (%)	10.32	9.54	0.78
	(0.43)	(0.44)	(0.62)
High School (%)	9.98	8.92	1.06*
	(0.42)	(0.45)	(0.60)
University (%)	5.25	4.98	0.27
	(0.31)	(0.33)	(0.45)
Age of Head	44.35	45.42	-1.07***
	(0.21)	(0.23)	(0.31)
Female Head (%)	7.82	7.68	0.14
	(0.38)	(0.40)	(0.55)
Marital Status			
Married (%)	88.92	89.13	-0.22
	(0.44)	(0.47)	(0.65)
Widowed (%)	8.16	8.28	-0.12
	(0.38)	(0.42)	(0.57)
Divorced (%)	0.71	0.66	0.04
	(0.12)	(0.12)	(0.17)
Never Married (%)	1.71	1.42	0.29
	(0.18)	(0.18)	(0.26)

Table 18: Summary statistics for the base and balanced samples (1992 values) - Continued

Variable	Comparison of Samples		
	Whole Sample	Balanced	Difference
Job Type of Head			
Employer (%)	11.44	12.29	-0.85
	(0.45)	(0.50)	(0.67)
Self-Employed (%)	31.31	32.65	-1.34
	(0.65)	(0.71)	(0.96)
Public (%)	22.05	21.21	0.84
	(0.58)	(0.62)	(0.85)
Private (%)	18.55	17.11	1.45
	(0.55)	(0.57)	(0.79)
Unpaid Family (%)	0.12	0.14	-0.02
	(0.05)	(0.06)	(0.07)
Economic Activity			
Employed (%)	83.47	83.40	0.07
	(0.52)	(0.56)	(0.77)
Unemployed (%)	1.85	1.72	0.13
	(0.19)	(0.20)	(0.27)
Retired (%)	9.67	10.16	-0.49
	(4.14)	(0.46)	(0.62)
Student (%)	0.43	0.28	0.16
	(0.09)	(0.08)	(0.12)
Homemaker (%)	2.00	1.88	0.12
	(0.20)	(0.21)	(0.29)
Other (%)	2.57	2.57	0.01
	(0.22)	(0.24)	(0.33)
PCE, Rials per Month	70228.2	69216.4	1011.80
	(1195.26)	(1276.36)	(1750.18)
PCI, Rials per Month	60724.62	59905.74	818.87
	(1101.37)	(1181.91)	(1616.37)
Rent (%)	14.11	7.77	6.34***
	(0.49)	(0.41)	(0.65)
Free Rent (%)	12.05	11.05	1.00
	(0.46)	(0.47)	(0.66)
Car (%)	15.98	16.37	-0.39
	(0.51)	(0.56)	(0.76)
Migrant (%)	1.97	1.17	0.80***
	(0.20)	(0.16)	(0.26)