

**Earnings Inequality and Earning Levels in Iran:  
An Analysis of 1986-2004 Trends and Events**

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Abstract

In the past decades Iran economy has experienced a diverse set of dramatic events including drastic changes in government policies, an unchecked increase in the population followed by a sharp decline in fertility rate and a continuous structural evolution within its economic sectors. How these events have influenced Iran's labor market is an open question. This paper is the first to investigate the issue of earnings inequality in contemporary Iran. Using Household Budget Surveys from last two decades it summarizes the trends in earnings levels and inequality levels in Iranian society and analyzes them with respect to gender, education, region, and experience. It finds out a persistent increase in real and relative earnings and an increasing then decreasing trend in earning inequality since early 1990's. Although within group inequality explains part of the overall inequality trend, the main factor to blame is earning polarization between urban and rural regions and between education groups. A supply and demand analysis shows that during the first half of the period under study demand for labor was consistently less than supply of it. Only after mid 1990's, after a considerable improvement in economy, job creation outnumbered labor supply and increased the relative earnings. Women, college graduates, and young job seekers did not enjoy the virtues of this improvement due to vast supply of labor in these groups.

*JEL Codes:* J21, J31, O15

**Keywords:** Earnings Levels, Earnings Inequality, Iran, Labor Market Institutions.

## 1. Introduction

In the past three decades Iran's economy has experienced a diverse set of drastic events. Its infrastructure went through the destruction of an eight year long war, after which it was reconstructed. It has been exposed to vacillating government policies from extensive nationalization of industries to privatizing public monopolies in telecommunication and aviation. Meanwhile its sectors went through an evolution of their own. In 1970's agriculture sector employed close to 50% of Iran's labor force by 1990 its share of employment was well below 35%<sup>1</sup>. In the same time service sector share of employment rise from 20% in 1970's to more than 50% by 1990's. Urbanization process that had begun in 1970's continued during 1980's and 1990's; when the new millennium began 63% of Iran's population were living in urban areas (Mehryar, Aghajanian, Tabibian and Tajdini 2002). These evolutionary changes altered Iran's population pattern permanently.

After a modest decline in fertility rate in urban areas in 1970's, the population growth continued unchecked during 1980's and total fertility rate increased to 7. However Iranians reacted most enthusiastically when government introduced a pragmatic population control policy in 1988 (Abbasi, Mehryar, Jones, McDonald 2002) and the fertility rate dropped sharply to 2.6 by 1996 (Aghajanian and Mehryar 1999) and by 2000 it dropped to 2.26 (Abbasi-Shavazi, McDonald and Chavoshi 2003)<sup>2</sup>. Today 70% of Iran's population is less than 30 years old.

While the fertility rate was declining in Iran, country's student population was growing exponentially. At the beginning of 1980's most universities and colleges were

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<sup>1</sup> Authors' calculations based on Statistical Center of Iran Annual Reports.

<sup>2</sup> Hoodfar and Assadpour (2000) contribute the success of these population policies to urbanization and increased educational opportunities for girls.

public and female students constituted only one-third of college student population.

Establishing a network of universities and community colleges known as Islamic Azad University in late 1980's multiplied the opportunities for high school graduates, male and female, to continue their studies to receive a college degree. The importance of obtaining a college diploma (Salehi-Isfahani 2002) encouraged an increasing female participation in national universities' entrance exams that facilitated an increase in female enrollment in colleges. By 2007 Iranian women share of college student population reached 65%, giving them the majority in colleges across the country.

The changes in population and education structural shifts have altered labor force structure in Iran. Female participation rate that had stayed flat for most of 1980's started to increase modestly during 1990's and reached 30% by 2000<sup>3</sup>. We also can detect a soft decline in male labor force participation rate during this period that is diverged in late 1990's and begins to increase. Male participation rate stands at 73% in 2000.<sup>4</sup> The increase in female participation rate and the temporary decline of male participation rate have not altered the direction of overall participation rate in Iran. It has been increasing continuously during past decades.

In the past years motivated by the success of Iran population policies a number of authors (Aghajanian and Mehryar 1999, Hoodfar and Assadpour 2000, Mehryar, Aghajanian, Tabibian and Tajdini 2002, Abbasi-Shavazi, McDonald and Chavoshi 2003, Salehi-Isfahani 2005) have studied the dynamics of population growth, fertility and labor participation in Iran. However there is little known about the effects of the dramatic

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<sup>3</sup> International Labor Organization report on Iran. Mehryar, Aghajanian, Tabibian and Tajdini (2002) estimate that in 1986 8.2% of female population was economically active, this ratio doubled by 2000 reaching 17.3%.

<sup>4</sup> Mehryar, Aghajanian, Tabibian and Tajdini (2002) estimate 68.4% of male population was economically active in 1986. This rate declined to 60.8% in 1991 and then increased to 67.8% in 2000.

changes of the past three decades on the dynamics of labor markets in Iran and country's economy (Nomani and Behdad 2006). This has motivated some authors to take a closer look at Iranian society and inequality within it.

Early studies point out that 1970's oil boom increased inequality in Iran (Pesaran 1976). Soon authors focus on measuring and analyzing the effect of Iran's Islamic revolution of 1978 on inequality and poverty. Their findings are most intriguing. Salehi-Isfahani (2003) studies poverty measurement in Iran using Household Survey Data collected by Statistical Center of Iran. Later he observes (Salehi-Isfahani 2007) that despite the success of these policies and improvements in education<sup>5</sup> the inequality remains unchanged in post revolutionary Iran. Studying poverty in Iran he concludes that poverty has been declining continuously in Iran and is now "considerably lower" than it was in 1970's and during the war. However he notices that while poverty has been falling, inequality has been "relatively constant" in recent decades. The existing literature is silent on the dynamics and evolution of inequality in Iran in recent years. This paper fills the void by addressing inequality in post war Iran.

The present study is the first to investigate the earnings levels and the inequality trends in Iran to draw an accurate picture of inequality between and within different groups and regions of country. To accomplish this task the present article benefits from the analytical tools introduced and modified by Katz and Murphy (1992), Levy and Murnane (1992) and Autor, Katz and Kearney (2005). Thus it creates a framework to compare the inequality in Iran with other developing countries in Middle East and North Africa while avoiding any deviation that might bias the analysis of inequality trends.

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<sup>5</sup> Salehi-Isfahani (2005) shows that rural population access to schooling has been increasing in 1980's and 1990's to the level that nearly all rural students were able to attend schools.

To investigate the inequality trends in Iran this paper uses Household Budget Survey (HBS) of Iran for urban and rural areas, recorded annually from 1986 to 2004. This data includes an employee's net annual earnings, which is considered to be his/her income. Using this measure we study the inequality between and within different social groups in Iran and investigate their income trends. These groups are defined across age, education, gender and geographical regions. We also consider age to be correlated with experience. To draw a general picture of economic conditions in the country we use the per-capita GDP after some modifications to include a macroeconomic background to the analysis of earnings and inequality.

We notice that that the overall trend of per capita income-earnings has been increasing between 1986 and 2004<sup>6</sup>. Thus earning levels change for all groups however the magnitudes of these variations are not the same. This study highlights the fact that the earnings inequality increases in Iran when the overall economic situation improves and it decreases when overall economic situation depreciates, with the exception of late 1990's when economic conditions improved enough to reduce inequality in Iran. It also provides a detailed analysis of its trends and changes across different social groups marking the effects of experience and education.

This article includes six sections. After introduction, the second section reviews and summarizes the data. It is followed by a brief introduction of analytical framework used to study income patterns. The fourth section summarizes our findings and interprets the changes in inequality trends and income patterns. The fifth section offers a brief

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<sup>6</sup> Although the macroeconomic conditions in this period have not been stable and economy experienced at least one balance of payment crisis for further information see Pesaran (2000) and Salehi-Isfahani (2007)

demand and supply analysis. Finally the sixth section ends the article by summarizing the analysis and highlighting our major findings.

## **2. Data Review**

The data used in this study come from Household Budget Survey (HBS) of Iran for urban and rural areas, recorded annually from 1986 to 2004. It covers all contemporary economic cycles in Iran including war, economic reconstruction and reform in the post war years. This article includes only those who are employed either in private or in public sector and exclude those who claimed to be self-employed. An employee is an individual whose earnings are positive and nonzero during last 12 months. The data have recorded self-employed individuals separately, thus allowing us to make this exclusion without presumption. We also exclude the observations for 1992, due to many missing observations in this year.

The number of observations varies annually however data includes at least a sample of about 0.7 per 1000 for 1987, translating into 3889 observations. At its best data includes a sample of about 3.2 per 1000 or 23,780 observations for 1995, Table 2.1 summarizes this information.

The samples are not randomly selected and the numbers of observations in the rural and urban areas and in different provinces across the country are not proportional. To address this issue we implemented different weights for the rural and urban areas in each province. This weight is calculated by dividing the population of a particular area in a province by the number of observations in the data taken from that particular area. For instance the 2004 HBS contains 6487 observation from urban areas of Tehran. The

population of urban areas of Tehran was approximately 11.5 million at that time. Thus we allocated 1773.2 as the weight for urban areas of Tehran. To estimate weights for other areas we use the number of observations in each area and province in the HBS samples. The data for the population of each area is taken from reports of the Statistical Center of Iran.<sup>7</sup> It must be noted that due to the administration decisions new provinces have been created since 1986 increasing the number provinces from 24 in 1986 to 28 in 2004.<sup>8</sup> The new provinces were created from existing ones; necessary adjustments have been made to address these changes and their effects on the data.

**Table 2.1 Summary of Observations**

<b>Year</b>	<b>Number of Observation</b>	<b>Per 1000</b>
1986	3912	0.73
1987	3889	0.70
1988	5457	0.93
1989	7459	1.22
1990	12261	1.92
1991	12330	1.84
1992	NA	NA
1993	8322	1.19
1994	13992	1.95
1995	23780	3.23
1996	15596	2.07
1997	15859	2.04
1998	12797	1.59
1999	20170	2.42
2000	19515	2.27
2001	19372	2.18
2002	23210	2.52
2003	17059	1.79
2004	18313	1.86

<sup>7</sup> These reports are available online at [http://www.sci.org.ir/portal/faces/public/sci\\_en](http://www.sci.org.ir/portal/faces/public/sci_en).

<sup>8</sup> Ardabil province was created in 1994, followed by Qom in 1997 and by Ghazvin and Golestan Provinces in 1998. Recently Khorasan province was divided into 3 new provinces, these new additions are beyond the scope of current study.

In this study the definitions of urban versus rural areas, province, sex, and age are based on the codes and numbers described in HBS. We consider the net annual earning of an individual employee as his or her earning. This includes all regular and occasional payments minus all taxes, social security deductions and all other deductions permitted under Iran's labor code during last 12 months. An employee might have other earnings from a second or even a third job, where he or she could be employed or self employed. This extra income is not added to an individual's earnings, since each observation is defined at individual-job level and not at individual level.<sup>9</sup> This allows us to analyze the trends of wages and individual earnings without distortion. To deflate these earnings we use the Consumer Price Index (CPI) of Central Bank of Iran.<sup>10</sup>

Education groups are defined based on two variables in HBS. The first one is the literacy situation and the second is the code that the Statistical Center of Iran has assigned to each level of educational accomplishment. We use these codes to divide the population into four education groups: illiterate; those who have no formal education, without a high school diploma; those who didn't finish 12 years of customary schooling, equivalent of high school drop outs in other studies, high school graduates, those who have finish 12 years of formal education and received their diploma and college graduates, including those who have received any sort of higher education including 2-years post diploma programs, 4 years of college education and any post graduate programs. We also define five age groups based on the variable age provided in HBS. These groups include 16 to 25 years old, 26 to 35 years old, 36 to 45 years old, 46 to 55 years old and 56 to 65 years old.

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<sup>9</sup> It must be taken into account that many second and third job holders do not reveal the information regarding these other employments and are usually self employed and beyond the scope of our study.

<sup>10</sup> The data is available online at CBI website: [http://www.cbi.ir/default\\_en.aspx](http://www.cbi.ir/default_en.aspx)



### 3. Framework

This paper utilizes an analytical framework introduced by Katz and Murphy (1992) in their ground breaking study of relative wages in the United States and modified by Levy and Murnane (1992).

Assuming that there is an aggregate production function for  $K$  types of labor input. The associated factor demands can be written as:

$$X_t = D(W_t, Z_t) \quad (3.1)$$

Where

$X_t = K * 1$  vector of labor inputs employed in the market in year  $t$

$W_t = K * 1$  vector of market wages in year  $t$

$Z_t = K * 1$  vector of demand shift variables in year  $t$

$Z_t$  captures the effect of exogenous non labor related events on the factor demand on.

Assuming that the aggregate production function is concave the differentiation of aggregate demand function (3.1) can be derived as:<sup>11</sup>

$$dX_t = D_w dW_t + D_z dZ_t \quad (3.2)$$

Where  $D_w$  is negative semi-definite, thus the following can be derived:

$$dW_t' (dX_t - D_z dZ_t) = dW_t' D_w dW_t \leq 0 \quad (3.3)$$

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<sup>11</sup> According to Levy and Murnane (1992) a system of equations can be derived to map the wages of  $K$  different kinds of labor in period  $t$ :

$$W_t = BX_t + CZ_t + U_t$$

Where  $B$  is a  $K * K$  matrix of coefficients that maps  $Q_t$  into  $W_t$ .  $C$  is a  $K * K$  vector that maps demand shifter  $Z_t$  into  $W_t$ .  $U_t$  is the vector for error terms.

This implies that the net of demand shifts changes in the opposite direction of wages. It has been always open to speculation that if changes in relative supplies cause the changes in wages. Levy and Murnane (1992) argue that across a short period of time it can be assumed that factor demand is stable and the wages are determined only by the quantity supplied, ignoring  $Z_t$ . However Katz and Murphy (1991) consider factor demand to be stable when  $Z_t$  is present and constant. When factor demand is stable an increase in the relative supply of a social subgroup reduces the relative wage of that social group. Thus it is necessary to test for stability of factor demand between year  $t$  and year  $\tau$  by determining whether:

$$(W_t - W_\tau)'(X_t - X_\tau) \leq 0 \quad (3.4)$$

For the periods of time that this inequality holds the changes in wages can be explained by the changes in supply. However when this inequality does not hold and the inner product of changes in wages and changes in factor supplies is positive the changes in wages must be explained by relative demand shifters and relative changes in supplies. Without doing so no analysis would be consistent with the data.

This article explains relative wage changes as a function of relative factor demand shifts and relative supply changes. By doing so it incorporates the demographic changes in Iran, the consequences of developments in education and the features of different social groups in its analysis of inequality trends and earning levels. The next section summarizes this analysis.

#### **4. Earnings Trends and Earnings Inequality**

This section is divided into two subsections; first we review the trends in relative and real earnings and inequality.

##### *4.1. Trends in real and relative earnings and earnings inequality*

Per-capita GDP is commonly used measure of general well-being of people in different economies. This measure provides an almost reliable picture of production in most countries, but it needs some qualification in Iran's economy since Iran is an oil producing country. Oil revenues are accounted for 25% of Iran's GDP, but they are produced by a negligible fraction of labor force. As a result, per-capita non-oil GDP provides a more reliable picture of general labor force production. Graph 4.1 provides an insight into the economic conditions of Iran by presenting the trends for per capita GDP, per-capita non-oil GDP, and productivity<sup>12</sup> as well as median (log) earnings, all normalized to be one in 1987. It is noticeable that all these variables follow the same patterns, with median income demonstrating high variations across time.

The overall trend of per capita GDP has been increasing between 1986 and 2004, allowing us to presume that average earnings-income has been increasing in this period. However the pattern is not continuous. We can identify three periods of economic slowdowns in income and production across these years.

The first slowdown, a considerable downturn in economic production, occurred in last years of 1980's when the war with Iraq was approaching its end and the destruction caused by it was approaching its peak. Thus the downturn was the result of enormous destruction of economic infrastructures. The second slowdown, which was much slighter

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<sup>12</sup> Productivity is estimated by dividing non-oil production by the number of workers.

than the first one, occurred at the end of the first five year development plan. After five years government changed its policies and altered the path of economic reforms it had been following. The deviation stalled economic growth. Unlike these slow downs, when the direction of economic growth was either reversed or stalled, the third slow down period is a very short and moderate one. It happened around 1998 caused by the decline in global oil prices and the widespread draught in Iran.

The effects of these slowdowns on labor force's earnings were intensified by a rigid payment system and high inflation rate. Particularly during the second slowdown period the decline in earnings was accompanied by a high inflation rate that reached 50% in 1995. The high inflation reduced the purchasing power of rigid earnings considerably. This is more noticeable when we consider the median of real earnings, presented in Graph 4.2. It follows a u-shape curve where the decreasing section is shorter than the increasing section.

Several inequality indexes measure different aspects of earnings dispersion in Iran. Graph 4.3 provides an image of earnings inequality using two commonly used measures; Gini coefficient and 90-10 log wage differential<sup>13</sup>. These two show almost the same trends. The general trend of inequality follows the general trend of earnings at the beginning, but reverses near the end. It must be pointed out that the first economic downturn in late 1980's is associated with a decline in inequality according to these measures. The economic reforms of first five years development plan increased labor force's real earnings, but at the same time they amplified the earnings inequality until

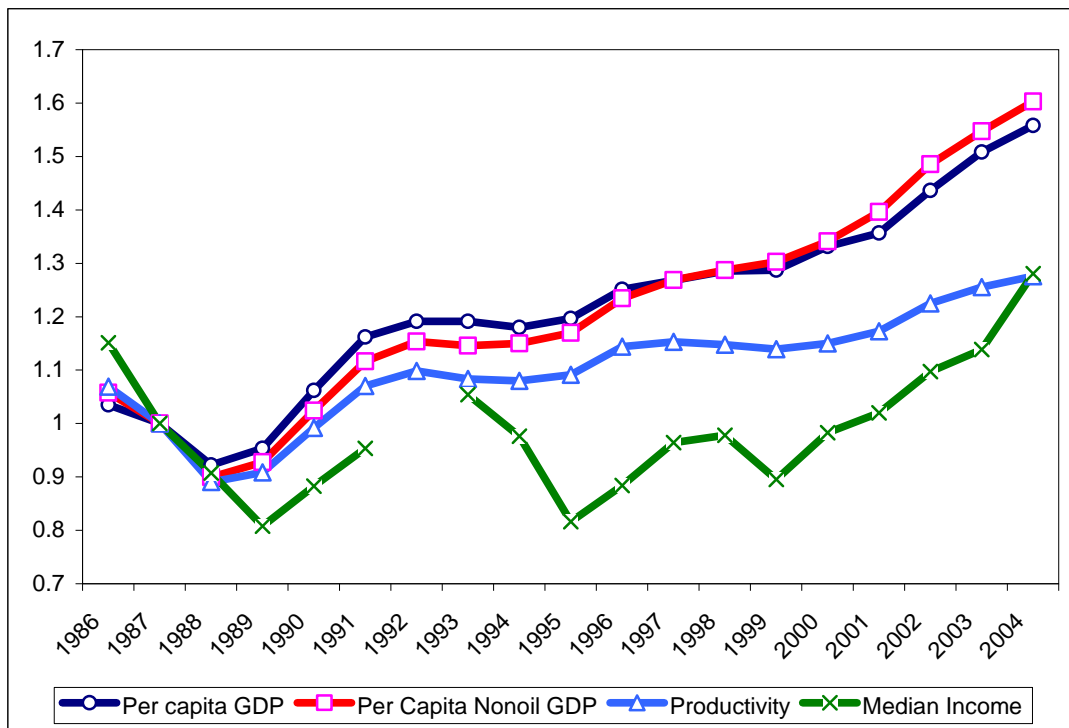
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<sup>13</sup> Two other proposed indexes are coefficient of variation of income and variance of natural log of income. We examined the trend in earning inequalities based on there two indexes. Neither of these two shows significant difference with our indexes. For a brief note on virtue of each index see:

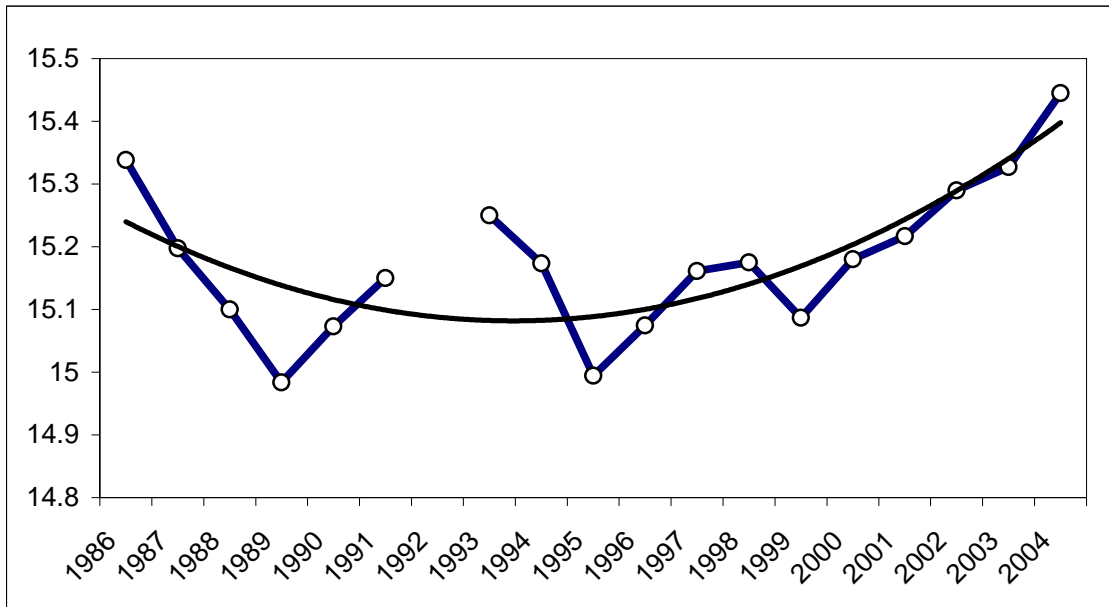
1999. However after this year inequality began to decline while real earning were still increasing trend.

This is a significant observation. An increase in inequality is usually associated with increasing earnings in Iran. Decreasing earnings often are accompanied by declining inequality in the society as well. This observation contradicts these interpretations by suggesting that if earnings increase continuously for an extended period of time, inequality begins to decline after a preliminary increase. In other words for economic reforms to succeed they must be carried out long enough. Drawing the inequality trend against a background of productivity, as presented in Graph 4.4, confirms this interpretation by showing that the decline in inequality in late 1990's was also associated with an improved productivity in non oil sector.

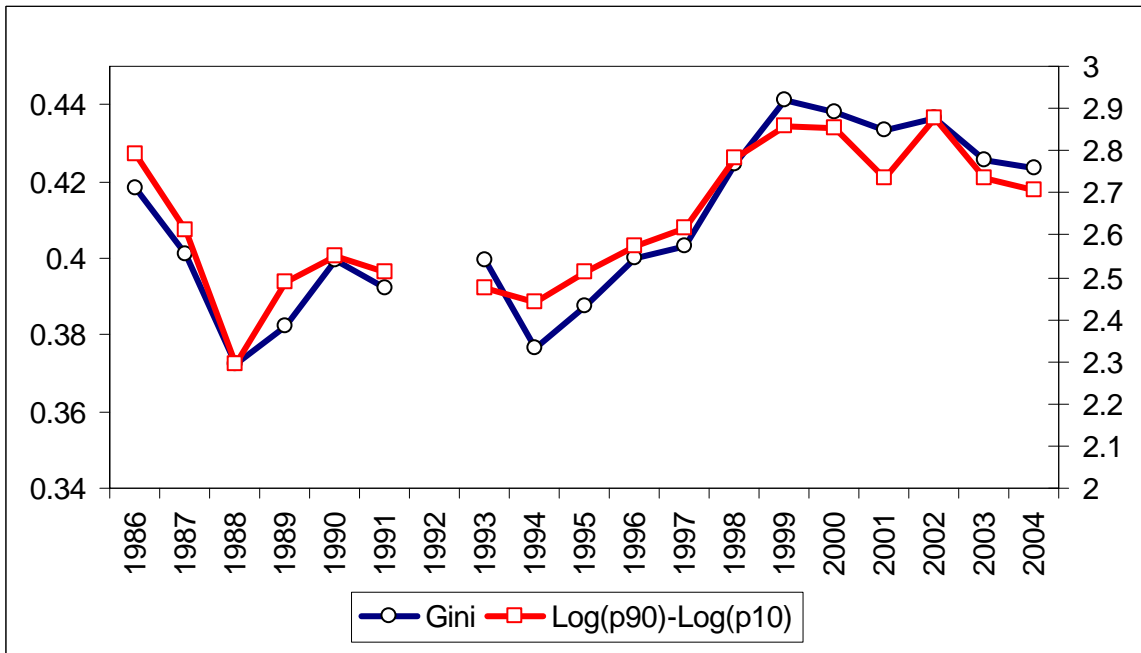
**Graph 4.1 Normalized Measures of per-Capita Production**



**Graph 4.2 Median (log) Income (1997 Rials)**



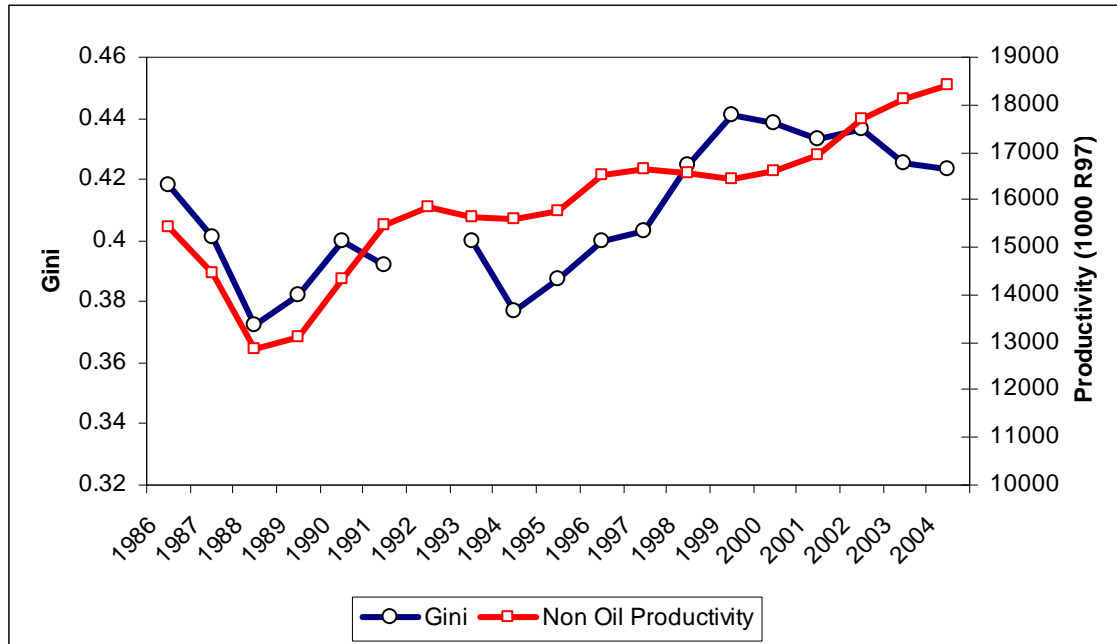
**Graph 4.3 Gini and log(p90)-log(p10) in Iran: 1986-2004**



The results presented above show the trends in overall real earnings. However they fail to capture some of the crucial aspects of earnings and inequality, particularly the exogenous ones. As discussed in the introduction in the recent decades, many labor related factors changed exogenously in Iran. These have altered the structure of labor

force by changing the composition of different types of labor. We categorized these exogenous changes in two main dimensions: age and education.

**Graph 4.4. Inequality and Labor Productivity Trends**



During 1976-86 the population of Iran grew with an annual average rate of 3.9%. As a result, a considerable number of young workers have entered the market since mid 1990's, increasing the share of young and inexperienced workers in the labor force. As discussed in introduction, the enrollment in all levels of education, particularly colleges, increased exponentially after 1989. As a result, the numbers of educated workers and job seekers have increased tremendously since mid 1990's. Given the increase in female college student population in the past years, a large number of these recent college graduates are female. In these years migration of rural workers to urban areas continued and intensified the urbanization process in Iran. By the end of 1990's these changes have created a younger, more educated and more urban oriented labor force, which includes an increasing number of economically active female workers. To have a realistic and

reliable picture of earning trends in Iran, any analysis should take into account these changes.

To accomplish this we calculate the relative earnings as the weighted average of 80 age-education-region-gender groups. The weights are the 1986-2004 average shares of workers in each group. In the next subsection we review these groups and inequality within and among them.

#### *4.2. Within- and Between-Group Earning Inequality*

The overall trend of earning levels and inequality is the result of changes in earning levels both within and between age, region, education and gender groups. Earning levels changed for all subgroups, but the magnitude of the change varied. In this section we investigate between and within group inequality among groups.

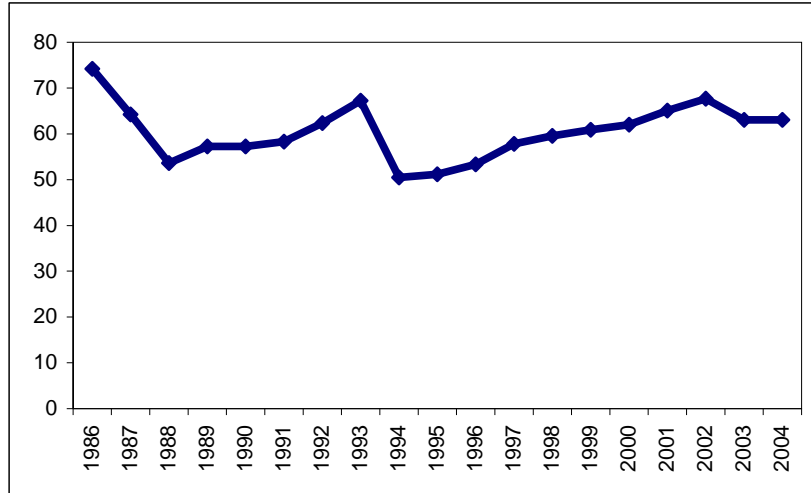
The differences in earnings between workers in subgroups are calculated based on log percentage points. This measure is defined as the difference in log of earnings multiplied by 100. An increase of 10 log percentage points is equivalent to a multiplier of about 1.105. We refer to these differences as between-group earning differences. The differences between groups are potential sources of inequality. For instance, if there is an increasing differences between earnings of male and female workers, it finally will polarize the earning distribution and increase the inequality. If, on the other hand, the difference is diminishing, the overall inequality will decline. The Graphs 4.5.a through 4.8.a show the trends for the premium earnings, estimated using log percentage points.

We use Gini coefficient to measure and to quantify the within-group inequality. Graphs 4.5.b through 4.8.b demonstrate the within-group inequality measured in each

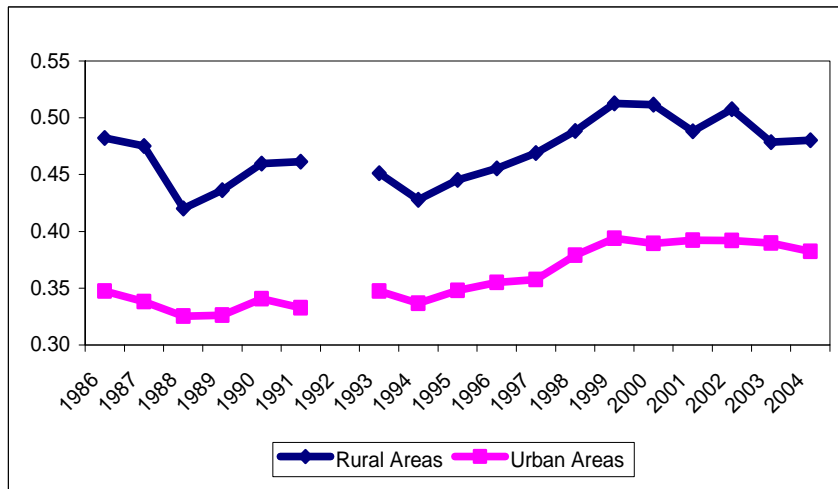


subgroup. Within-group inequality is the second explanation for overall inequality. An increase in within-group inequality, even in the absence of polarized earning levels, boosts the overall inequality.

**Graph 4.5.a Premium Earnings in Urban Areas**



**Graph 4.5.b Within-Group Inequality (Gini): Rural/Urban**



Graph 4.5.a shows that workers in urban areas earn considerably more than, about 60 log percentage points, or about 1.8 times, the workers in rural areas. For the time period of interest, 1994 onward, the difference was increasing. As a result, the difference in earning level increased by about 20 log percentage points. This excess earning was one

of the reasons of increasing inequality after 1994. The slight fall in urban-rural earning difference near the end of the period under study is also consistent with final improvement in inequality. In other words, from a regional perspective the inequality between rural areas and urban areas has increased the inequality in last decade.

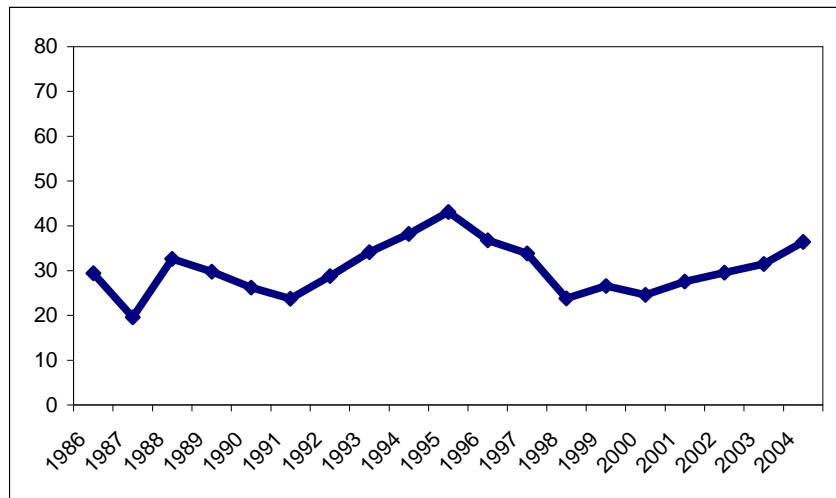
Since Graph 4.5.b presents the trends of Gini coefficient as well it also shows that the inequality within workers in urban areas always was much less than that in rural areas, although these two followed the same pattern. Earning inequality in both areas rose from 1994 to 1999, and decreased afterward. These trends perfectly match with the overall trend in inequality. Along with the between-region difference in earnings, the within-region inequality explains the overall trend of inequality. Inequality in earnings was the result of both the widening gap between earnings of urban-rural workers and increasing wage disparity in each region.

The earning and inequality between male and female workers are showed in Graph 4.6.a shows that male workers consistently earned more than female workers. This excess earning was in its highest point in mid 1990's, estimated to be more than 40 log percentage points. Following the overall improvement in earning levels, this difference decreased by a magnitude of about 20 log percentage points. Near the end of this period the male-female gap widened during 2000's. The trend of gender inequality is in the opposite direction of the overall inequality trend during 1990's. Thus, unlike urban-rural earning gap, the male-female earning gap can not be responsible for the inequality in the second half of 1990s.

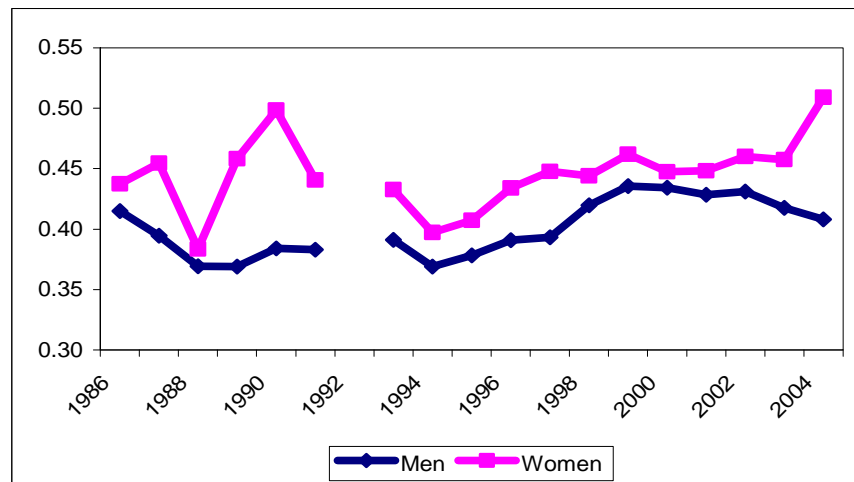
Within-gender wage disparity is represented in Graph 4.6.b and it is a potential candidate to explain the overall inequality. Earnings among both male and female

workers followed an increasingly dispersed level from 1994 onward. The trend reversed among men after 1999. However dispersion among female workers, after a short slowdown, increased considerably. This could be caused by the limited number of jobs available to female workers or by the small market for female labor force.

**Graph 4.6.a Premium Earnings of Men**



**Graph 4.6.b Within-Group Inequality (Gini): Gender**



Higher education has always been associated with higher earning levels and social prestige in Iran (Salehi-Isfahani 2002). High school graduates earned more than high school drop outs and university graduates earned more than high school graduates during

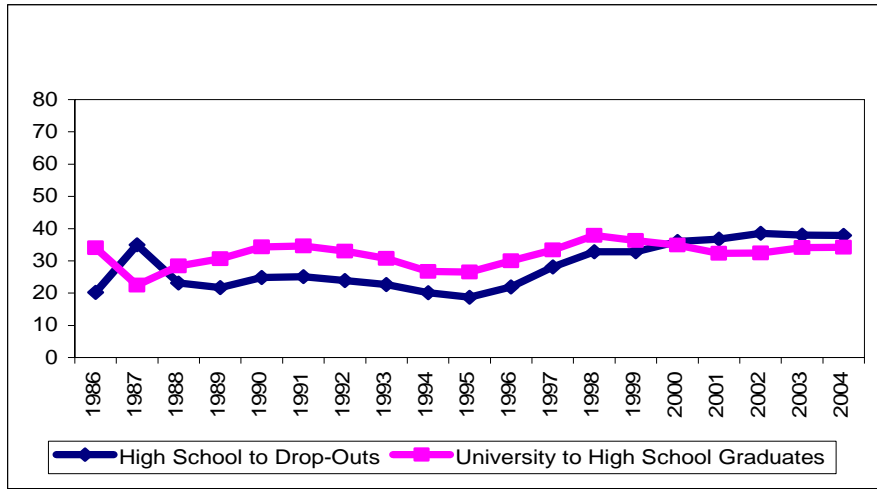
the entire period. From the mid 1990s onward, the education premium increased for both high school graduates relative to drop outs and university graduates relative to high school graduates. The upward trend reversed for university graduates but not for high school graduates. In other words, the earning polarized into more educated and less educated groups. This within-education group divergence was part of the reasons for increase in inequality after mid 1990s. The other part was the increasing dispersion in earning in each subgroup. Except for university graduates who did not experience a rise in earning dispersion, earning inequality in the other subgroups increased considerably after 1994 and caused the overall inequality to rise.

It the last group, defined based on age or experience, although there is a difference of earnings among its subgroups, a clear trend is not detectable. Middle age workers, 36 to 55 years cluster, earned almost equally. The most diverse group was young workers. This group earned much less than the next group for entire period. However the trend did not change significantly. The earning did not polarize among age groups over time, therefore, age can not cause any increase in inequality. Although earning was increasingly dispersed after mid 1990s in all age groups, particularly for the older workers.

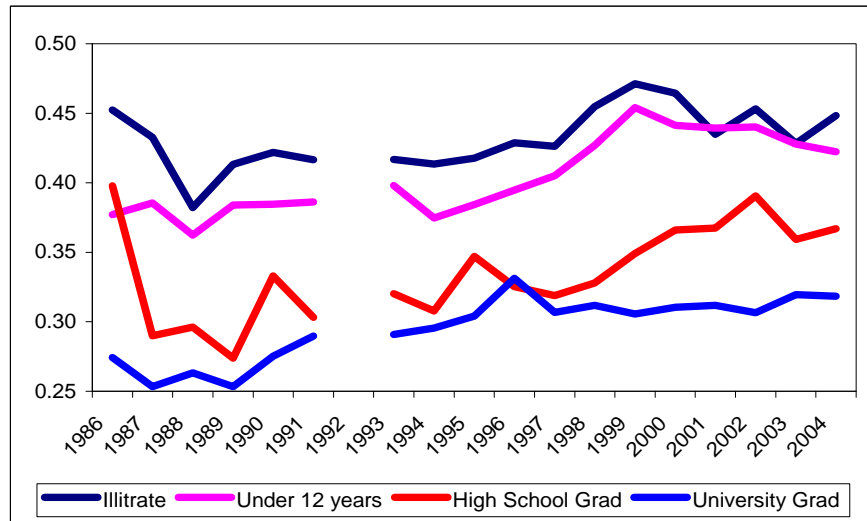
To summarize, regional and educational differences in earnings increase after mid 1990s and cause a polarization of income distribution in Iranian economy. These within-group factors were major contributing factors to the increasing trend in inequality. Workers in rural areas and less educated workers suffered continuously from a relative decline of their earnings. In particular this explains the constant flow of emigration to urban areas. The other part of the increasing inequality after mid 1990s can be explained

by between group inequalities. Between groups inequality existed in almost all subgroups the variations of earnings increase in each subgroup of the labor force, causing the inequality to increase.

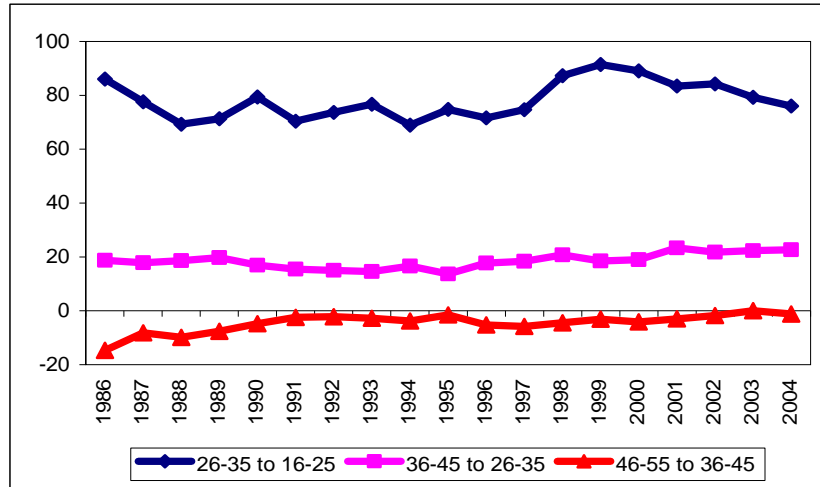
**Graph 4.7.a. Premium Earnings of Education**



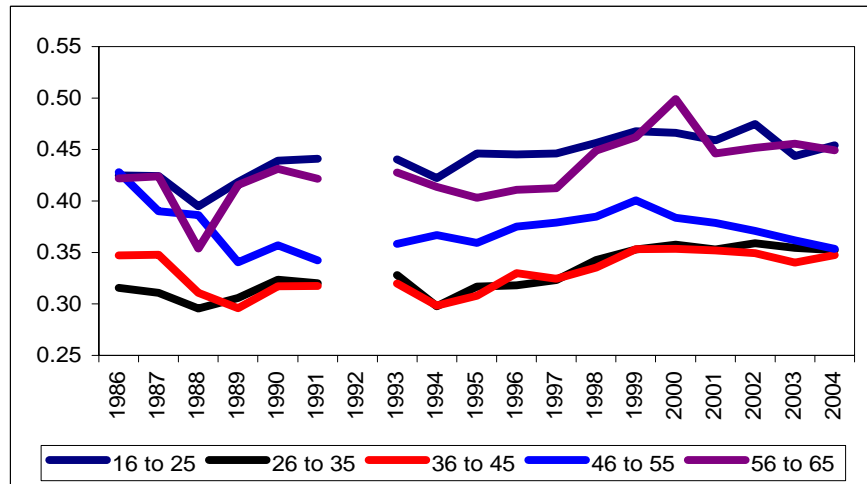
**Graph 4.7.b Within-Group Inequality (Gini): Education**



**Graph 4.8.a Premium Earnings of Age (=Experience)**



**Graph 4.8.b Within-Group Inequality (Gini): Age**



## 5. Demand and Supply Analysis

To have an accurate picture of labor market dynamics necessitates an analysis of factor demand and labor supply. The changes in earnings from 1986 to 2004 in Iran were accompanied by massive changes in supply of workers and structural shifts in the composition of workers. These changes were intensified in the second decade of this

period. Factors in supply side, demand side, or institutions of job market, such as type of the employment contracts, could be responsible for these deviations.

We use a simple labor supply and factor demand analysis, as explained in section 3, to address the question of whether supply of new workers or demand for new workers had a stronger effect in determining the earnings. In other word if factor demand were stable during this period for different types of labor. We use three-year averages of earnings and supplies (except the last period for which we used four-year average of 2001 to 2004). Table 5-1 shows the inner product of changes in relative supply and relative earnings. For example, the number -0.65 in the first cell of the table is the inner product of two vectors: first, a vector of differences between the 1986-88 average relative earnings and 1989-91 average relative earnings, second, a vector of differences between the 1986-88 average relative supply to 1989-91 average relative supply.

**Table 5.1 Supply & Demand Analysis for Labor in Iran**

	<b>1990</b>	<b>1993</b>	<b>1996</b>	<b>1999</b>	<b>2002</b>
<b>1987</b>	-0.65	-1.32	-2.63	-0.33	0.37
<b>1990</b>		-0.07	-0.54	1.12	1.81
<b>1993</b>			-0.06	1.04	2.02
<b>1996</b>				0.55	1.57
<b>1999</b>					0.16

A negative number confirms that the changes in supply and earning move in opposite directions, thus the relative factor demand is not constant. In other words, a negative number shows that the increase in supply was not accompanied by enough increase in demand. And the changes in the earnings are due to both relative supply changes and *relative demand shifters*. We observe that in late 1980s there was a huge gap between job creation and supply of workers. The situation improved in early to mid 1990's, yet the demand for workers was not growing fast enough to compensate the extra

supply. The inner products are quite small for this period and make it difficult for use to accept or reject the hypothesis concerning the stability of factor demand.

Second half of 1990s was the period when demand increased faster than supply, thus elevated the earnings despite the increase in supply. The increase in real and relative earnings in second half of 1990s was mainly driven by the increase in demand for workers. However the pace of job creation was slowed down in early 2000s. Still it was large enough to meet the growth in labor supply. Thus the earning levels continue elevation. To draw a detailed picture of these changes and following the classification of previous section, we also analyze the changes in labor supply across region, gender, education and experience. Table 5.2 presents the supply and demand analysis for each group in labor force.

Labor supply was increasing in both urban and rural areas, though at different rates. The supply in urban areas increased even more because of ongoing immigration from rural areas to urban areas. It must be noticed that creating larger number of jobs in urban areas than rural ones raise the earnings in urban areas despite the increases in supply of labor. However the evolution of employment structure and service sector expansion changed the requirements for employment in urban areas and increased the demand for a certain type of worker, who was very different from rural one.

Reviewing Table 5.2 we notice that during 1993 to 1996 the relative increase in labor supply in rural areas became larger than job creating rate in these areas, while factor demand in the urban areas was stable. It must be noticed when stagnation is present in the labor market, rural markets are exposed to more dramatic effects than urban ones.



A different pattern presents itself between male and female workers. Demand for both male and female workers was increasing during late 1980's and early 1990's. However during later 1990's and 2000's demand for female workers did increase as fast as supply of female labor force. At the same time an increasing number of jobs became available to male workers. Between 1999 and 2002 the relative supply of female workers grew much faster than relative demand for it. The inner product of change in relative supply and relative wage for female workers is -0.84, compared with 0.38 for male workers. It suggests that while male workers enjoy an improvement in overall job creation process since 1999, female workers struggle with a significant increase in competition. The gap between job market situation for male and female workers imply a separation of job market for men and women. It appears that a considerable part of employees target male workers and hesitate to offer their jobs to female workers. This phenomenon is an intriguing one and further research is needed to explain its causes and consequences.

Looking at education based groups it seems that an increase in relative supply of college graduates in labor market has not been matched by an increase in the number of jobs available in recent years. After an increase in demand for college graduates during most of 1990's, since mid 1990's Iranian college graduate is facing a more competitive markets, where the number of jobs is increasing at a pace slower than college graduate population. This is confirmed by a shockingly high negative number for inner product of change in labor supply and earnings of university graduates (-0.29). Compared with positive numbers for most other groups this confirms that Iran's job market has failed to provide enough jobs for its skilled workers. In the same time demand for high school

graduates has been increasing (inner product of 0.27). One possible explanation can be the state control of college education. The college education is determined by government, almost fully independent of job market situation –or at most under short-run considerations. Thus the qualifications of a college graduate are not optimized with respect to labor market signals. As a result, the supply of educated workers does not follow market conditions or alter in response to their variations. The realities of labor market might influence college students' incentives to complete their studies.

It seems when the supply of college graduates has been increasing in Iran, the experience was gaining significance. The demand for 56-65 years old workers has been increasing since mid 1990's, while demand for inexperienced workers was falling down. Also demand for the age group 46-55 years old has dropped slightly, given the fact they receive the same wage as 36-45 years old, it seems that it would be better to combine these two groups for further studies of labor dynamics in Iran. It is also noticeable that job market situation is against younger workers. This inexperienced group, aged 16-25, has suffered continuously from loss of factor demand. Even after late 1990's, when all other groups enjoyed the increasing demand in market, the relative increase in youth labor supply depressed their earning levels. These new entrants constitute nearly 32% of supply of workers<sup>14</sup>. The unkind job market situation for them has many social and economic consequences that recently have attracted researchers' attentions.

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<sup>14</sup> The percentage is calculated from HBS survey of 2004.

**Table 5.2 Supply & Demand Analysis for Social Labor Groups in Iran**

	<b>1989-1990</b>	<b>1990-1993</b>	<b>1993-1996</b>	<b>1996-1999</b>	<b>1999-2002</b>
<b>Rural Areas</b>	-0.50	-0.22	-0.34	0.47	0.00
<b>Urban Areas</b>	-0.69	-0.07	0.09	0.46	0.12
<b>Male</b>	-0.71	0.03	-0.03	0.43	0.38
<b>Female</b>	0.20	0.19	0.11	1.47	-0.84
<b>Illiterate</b>	-0.21	0.19	-0.08	0.31	0.23
<b>No High School</b>	0.33	-0.21	-0.06	0.04	0.06
<b>High School</b>	0.84	-0.23	0.28	-0.24	0.27
<b>University</b>	1.21	0.01	0.16	-0.07	-0.29
<b>16-25 Years</b>	-0.15	0.41	-0.15	-0.07	-0.25
<b>26-35 Years</b>	-0.75	-0.26	-0.17	0.80	0.61
<b>36-45 Years</b>	-0.99	0.10	-0.39	0.56	2.72
<b>46-55 Years</b>	-1.47	0.41	0.40	0.40	-0.05
<b>56-65 Years</b>	1.04	-0.24	-0.73	1.02	1.41

## 6. Conclusion

This study fills the void in existing literature regarding Iran's economy by investigating the crucial issue of earnings levels and inequality in this country. It finds out that inequality and earnings trends in Iran have been influenced by several socio-economic events. Despite the volatility of circumstances this study shows that improving economic conditions and economic reforms cause inequality to decline, if they are implemented for a continuous period of time. Otherwise short term improvement of economic conditions causes inequality to increase.

This study highlights the existing regional inequality in Iran that continues to fuel the domestic immigration from rural areas to urban areas. It also shows that despite this continuous migration rural and urban areas continue to be polarized. Factor demand in rural areas is different from urban regions of country and this difference is intensified by the fact that rural labor market is a shrinking market. In the past decades urban labor force qualifications have changed, while rural labor force has maintained the same

qualities. The polarization confirms that even immigrating to urban areas does not increase the earnings of rural workers.

It demonstrates that the inequality trend is not explained by polarization between male and female workers in country; since there is little of it. We noticed that the gap between male and female workers has begun to increase during 2000's after falling during the second part of 1990's. However the overall inequality between male and female workers has declined from its peak values in the past. Given the remarkable increase in female labor supply this recent increase could be caused by declines in female earnings caused by the shifts in supply. This study suggest that supply of female workers has been increasing in Iran faster than factor demand, thus the changes in market equilibrium can be contributed to relative supply increases and not market shifters. Although we notice that markets for male workers and female workers seem to be separated. It seems men and women do not compete for the same positions in Iran.

We believe further research is needed to explain this phenomenon. It must be noticed that inequality within male workers has been increasing dramatically in 2000's, while it has been declining for female workers. A number of events and factors could cause this. However it could be because of male workers' access to more high income positions than female workers. Further research is needed to clarify the causes.

The same can be said for educated workers. The supply of college graduates has been increasing much faster than job creation rate. It is noticeable that premium of a college degree with respect to high school education has been declining in early 2000's, while premium for high school graduates has been increasing. We believe a sharp increase in the number of college graduates and public control of higher education, which

separates it from factor demand in market, are the cause. For both women and educated workers factor demand has been constant and the relative increases in labor supply have influenced the changes in their wages dominantly.

Overall we notice that polarization process has continued among education groups and between urban and rural areas. This process can influence inequality and its trends in Iran, however to quantify its effects and to measure them accurately further studies are needed. Short term economic reforms, which were abandoned after a few years, also contribute to increases in inequality in Iran. We must highlight the fact that at the beginning of any economic reform inequality was increasing in Iran; however when they were implemented for a number of years, inequality began to decline. At the end of the day the declining premiums also can be caused by slow growth and slow pace in creating jobs. To employ Iran's young and educated workers simply more jobs are needed.

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