1.1 Introduction

The fundamental question of economic development - why some countries are so rich and others are so poor - has occupied the main discussion point for the economists since its exist. Adam Smith claimed that growth was related to division of labor, but he did not link them in a clear way. After Thomas Malthus developed a formal model of a dynamic economic growth process in which each country converge toward stationary per capita income. The Neoclassical growth model of Solow (1956)\(^1\), which has been for the past thirty years the central framework to account for economic growth, focuses on exogenous technical population factors that determine output-input ratios, responded to the failure of Malthusian model. Recent models of economic growth such as, Romer (1986)\(^2\) and Lucas (1988)\(^3\) emphasizes that investment in human capital is an important factor contribution to economic growth. These models generate persistent growth endogenously from the actions of the individuals in the economy. An additional role for human capital may be as an engine for attracting other factors such as, physical investment, which also contribute largely to per capita income growth.

Yet the evidence is quite strong to indicate close link between investments in human capital and economic growth. Since human capital embodied knowledge and skills, and economic development depends on advances in technological and scientific knowledge, development presumably depends on the accumulation of human capital. Investment in human capital has been a major source of economic growth in advanced countries. The negligible amount of investments in human capital in developing countries leads to have low capacity of people to meet the challenge of accelerated

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development. Schultz (1961)⁴ noted that the growth rate of output exceeded the growth rate of relevant input measures (employment and physical capital) suggesting that investment in human capital is probably the major explanation for this difference. Nelson and Phelps (1966)⁵ said that the ability of nation to adopt and implement new technology from abroad is function of its domestic human capital stock.

From studies of the development of the American economy, and the sources of growth of many countries around the world, it has become recognized that human capital—the skill of the population—plays a major role in explaining differences in productivity and inequality among nations (Becker 1964⁶, Schultz 1981⁷). Human capital is another very valuable kind of capital which is costly to acquire like physical capital, but with pays in the long-run for the economy. While considering the importance of human capital for the economy, first we have to consider how human capital improves productivity.

First, human capital is productive because it has the still to raise the effect of investment made in them. Human capital also improves adaptability and allocative efficiency. More skilled workers allocate resources more effectively across tasks and are more able to adapt to change and to respond to new opportunities (Nelson and Phelps 1966⁸, Schultz 1975⁹). These benefits of human capital investment are especially relevant today. Numerous empirical studies demonstrate that more educated and skilled people adapt better to change. They are able to benefit from opportunities that become available and create new opportunities of their own. They enhance

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productivity in the workplace. Greater skill also facilitates worker mobility across occupations, industries, and regions in response to new opportunities. It helps people reallocate resources, both human and physical, toward more productive opportunities, and even to realize that those opportunities exist. A more educated workforce is a more flexible workforce. Educated labor is able to absorb new ideas, adopt foreign technologies, to improve local technologies, and understand how apply to knowledge from outside to local situations.

In recent times, education has been recognized as a very important growth factor. Lucas (1988)\textsuperscript{10}, Becker, Murphy, and Tomura (1990)\textsuperscript{11}, Mulligan and Sala-i-Martin (1992)\textsuperscript{12} and Mankiew, Romer, and Weil (1992)\textsuperscript{13}, have provided a conceptual framework that links education and growth.

Psacharopoulos (1989\textsuperscript{14}, 1994\textsuperscript{15}), Mincer (1988)\textsuperscript{16}, Cohn and Geske (1990)\textsuperscript{17}, Cohn and Addison (1998)\textsuperscript{18} have concentrated their efforts in the alternative direction of calculating and comparing educational rates of return for different countries.

In contrast to classic contributors (Schultz 1961\textsuperscript{19}, Denison 1985\textsuperscript{20} etc.) that tried to explain the impact of education on growth by technological change, modern

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theorists such as, Romer (1986\textsuperscript{21}, 1990\textsuperscript{22}) and Lucas (1988)\textsuperscript{23} attempted to provide satisfactory answers to the so-called “convergence controversy”. They re-emphasized the role of human capital by stressing the impact of education in the context of formal schooling and on-the-job training. Lucas (1990)\textsuperscript{24} explained that technology fails to flow to poor countries because of their poor endowment in complementary human capital, a claim which is consistent with aggregate cross-sectional studies conducted by Benhabib and Spiegel (1994)\textsuperscript{25}.

Overall, most of the growth literature and the empirical work about human capital leads to two facts of great interest: (a) economies with a greater stock of human capital which is used properly experience faster growth; and (b) investing in schooling is a pre-requisite for the creation of human capital which, in turn, generates ideas and promotes the development of new products (Romer, 1990)\textsuperscript{26}.

In an attempt to understand the growth miracle of East Asia, Kim and Lau (1996)\textsuperscript{27} and McMahon (1998)\textsuperscript{28} produced empirical evidence to the effect that, if political stability was assumed, investment in education was a key factor in the rapid growth rates. Barro’s (1991)\textsuperscript{29} crosssectional study involving 98 countries found a positive relationship between enrolment rates and growth, while the role of initial GDP

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per capita was negligible for flexible enrolment rates. On the other hand, when enrolment rates were held constant, the correlation between per capital growth and initial GDP became negative. Romer (1990)\textsuperscript{30} stressed the importance of human capital as a key input in research, while Nelson and Phelps (1966)\textsuperscript{31} claimed that a high level of initial human capital improved an economy’s ability to utilize new ideas discovered elsewhere.

### 1.2 Importance of Study

In the process of scientific and technological development of societies, the economic activities become more and more knowledgeable and the economic system is constructed on the basis of "Knowledge Economy". Higher educated manpower is one of the characteristics of the knowledge economy, which deals with scientific instrument.

The power of knowledge workers by which the main body of the human capital of the economic systems is constituted, is the most important capital of the societies. In knowledge economy the human capital is very significantly preferred to the physical and financial capitals. In these systems knowledge, knowing and creating the knowledge become the main factors of survival in the situation of competition.

Now regarding the above discourse, the very basic question, which arises, is that, why the Higher Educated Manpower (HEM), which is so vital in the process of the economic development, is so much ignored and the existent human capital is not properly employed?


In this study the researcher tends to analyze the relationship between HEM (human capital) and economic growth in Iran, on the other hand, finding causes of unemployment of HEM in Iran.

1.3 **Objectives**

The aim of this thesis is “An analytical study of educated manpower and economic development of Iran (1971 – 1996)”. Specific objectives of this thesis are as following:

I. Finding relationship between HEM (human capital) and economic growth in Iran.

II. Finding economic and noneconomic causes of non-utilization of (HEM) for economic development in Iran.

III. To suggest policy for better use of available HEM in Iran.

1.4 **Hypothesis**

The hypotheses of this study are as follows:

I. There is a positive relationship between HEM (human capital) and economic growth in Iran.

II. There are some economical factors which we are not in a position to utilize available HEM for faster economic development in Iran.

III. There are some educational factors which we are not in a position to utilize available HEM for faster economic development in Iran.
IV. There are some Socio-cultural factors which we are not in a position to utilize available HEM for faster economic development in Iran.

V. There are some administrative factors which we are not in a position to utilize available HEM for faster economic development in Iran.

1.5 Scope of Study

The study was confined to:

1) The statistical data on the period 1971 – 1996.

2) The Iranian masters and Ph.D. students in Pune, contributors in the seminar of employment and higher education in Tarbiyat e modarres university Tehran, Iran, and experts of management and programming organization of Islamic republic of Iran.

1.6 Methodology

1.6.1 Conceptual Framework


2. The estimated method is based on the standard growth accounting methodology with human capital specifies an aggregate production function, according to Cobb – Douglas technology and taking log differences.

3. Model is Raymo’s (1995)\(^{38}\) \(Y = f(K, L, HC)\) has been used.

4. Question bank filled by Iranian researchers, thinkers and policymakers.

5. For gathering data in primary source the researcher used questionnaire. For gathering data in secondary source the researcher used different census, surveys, books, journals, etc., related to the study.

### 1.6.2 Variables

The growth accounting function with human capital is dependent upon three input factors: labor, physical capital, and human capital. According to Reymo’s model, human capital have influence on the growth accounting function with two indices: number of higher educated employee and education expenditure. According to above, physical capital (K), labor (L), higher educated manpower (EL) and higher education and research expenditure (RC) are dependent variables and Gross Domestic Product (GDP) is independent variable.

Unemployment of higher educated manpower is dependent on economical, educational, socio-cultural, and administrative factors. Then, for finding causes of unutilized higher educated manpower, independent variables are economical, educational, cultural and social, and administrative factors.

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1.6.3 Instrument

In chapter four, according to the literature, many studies emphasize on relationship between higher educated manpower (human capital) and economic growth. The researcher for finding this relation used econometrics methods as follows:

1) Unit root test for stationary.
2) Two step Engle – Granger method.
3) Auto Regressive Distributed Lag (ARDL) method.

In chapter five the researcher created a questionnaire regarding demographic data and variables related to unemployment of higher educated manpower. Also, many of variables found in the literature review were formed into questions and added to the survey. The researcher has developed questionnaire in three parts namely about:

1) Personal information (demographic data) including gender, marital status, age, etc.
2) Variables in four sections:
   a) Economical factors include 14 questions.
   b) Educational factors include 10 questions.
   c) Socio-cultural factors include 10 questions.
   d) Administrative factors include 17 questions.

Data were collected using a 5-point Likert scale, with response to categories used to measure each of the items in the various dimension from “very low” (1) to “very high” (5). Then, for analysis we used 3-point scale (low, medium, and high).

The questionnaire was validated using the content validity technique. A total of four experts holding in economic, education, cultural and social, and administrative reviewed this questionnaire for appropriateness, usages of words, and item structure.
experts also examined whether each item was assigned to appropriate scale. The questionnaire was modified, incorporating the experts’ comments. The parallel forms technique was used for the stability reliability analyses. A total of 40 participators participated in this reliability test. The parallel forms correlation coefficient was 0.916. In this way the questionnaire was valid and reliable for this study.

### 1.6.5 Data Analysis

Data were analyzed using econometric software Microfit (4.0) in chapter four and Statistical Program for the Social Science (SPSS 13.0) in chapter five.

In chapter four, data entered into personal computer for analysis. Unit root test was used for checking stationary. Two steps Engle – Granger and Auto Regressive Distributed Lag (ARDL) methods were used for finding relationship between higher educated manpower and economic growth in Iran.

In chapter five, data were coded and entered into personal computer for analysis. Descriptive statistics were used for data checking and correction. Frequency distribution and measures of central tendency and variances were assessed for the relevant continuous variables. Demographic variables were examined for relationship with values about study’s independent variable (age group) and dependents variable. Pearson’s chi-square, parametric and non-parametric analysis were used in this study. Alpha was set at $p \leq 0.05$ for all data analyses unless otherwise indicated.

### 1.6.6 Limitation of the Research

Every researcher, while doing his Ph.D. thesis, has to face several limitations. Some limitations can be controlled and some limitations are out of control. In this particular study the researcher had some limitations as follows:
1) The researcher chose HEM as a human capital index among various indices and non-educated manpower is not taken in to consideration.

2) The researcher selected only three groups (higher educated students, researchers and policy makers) for collecting primary data for finding causes of unutilized higher educated manpower in Iran.

3) The results were highlighted during the research period.