# Impact of Social Capital and Human Capital

# On

# Economic Growth

## (A Comparative Study of SAARC and OECD Countries)

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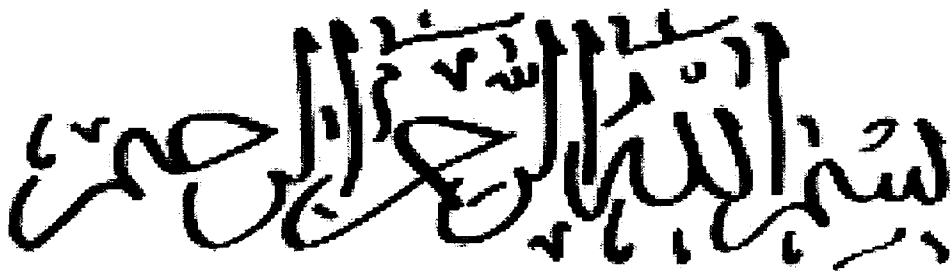M.Phil (Economics)
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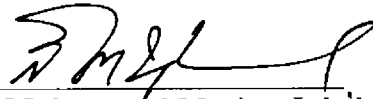
بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

**In the Name of Allah, the Most Gracious, the Most Merciful**

That Allah may reward them according to the best of their deeds, and add even more for
them out of His Grace: for Allah doth provide for those whom He will, without measure.
Al-Qura'an (24:38)

# CERTIFICATE

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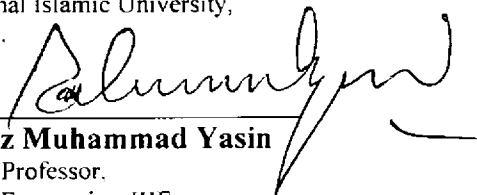
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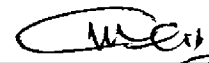
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TO

MY MOST LOVING AND CARING

PARENTS

# ACKNOWLEDGEMENTS

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# Abstract

It has been a matter of prime importance for the economists to explore the factors responsible for long run and sustainable growth. With the passage of time, the researchers have suggested different factors that determine economic growth and development such as physical capital, technology, labour, natural capital and human capital etc. From the dawn of $21^{st}$ century, a new field of research has emerged that consider the norms of the society, entitled as social capital, to be an important determinant of growth besides other usual factors. The objective of present study is to examine the relationships that exist between human and social capital and to see their impact on economic growth in SAARC and OECD countries. The study intends to compare the results so obtained in order to find the gap between the two regions in respect of factors of economic growth. The analysis follows a panel data model for 12 economically and socially developed countries (OEDC) and 4 developing countries (SAARC) and uses a time series data from 1995–2004. The findings indicate that while both social and human capitals are the crucial determinants of economic growth, a crucial difference in factors capabilities across the two regions does exist and prevail. The study concludes with some policy recommendations that may improve the situation of factors.

# Chapter 1

## Introduction

The theory of economic growth has been an area of concern and significant interest for the researchers since the end of World War II. The major challenge has been to identify the factors responsible for long term sustained growth. Harrod (1939) and Domar (1946) were the preliminary attempts to pinpoint the ingredients of growth. This was followed by Solow (1956) to elaborate further the theory of economic growth, which is commonly known as the neoclassical model. Romer (1989) incorporated the concept of human capital as an important ingredient of growth, which changed the entire scenario. Coleman (1988) and Putnam (1993) added another dimension to the theory of growth by highlighting the role of social capital.

The impact of human and social capital is now widely recognized in the growth literature. Both the factors make significant contributions to economic development and thus considered as supporting factors to the primary factors of production (capital and labour). Social capital provides a common platform for interaction to masses. Where the human capital concerns the ability or competence of the workers, the social capital comprises the scope for interaction and cooperation among the people when they work together. The individuals not only use their networks to solve their private problems but also to find effective solutions for the welfare of the society at large. Thus more competent individuals need substantial social support to contribute to the productivity, which promotes economic growth in the long run.

The accumulation of social and human capital has cumulative impacts on economic growth. According to Glaeser et al. (2002), there exists a strong positive relationship between the stock of human capital in the society and association of the individuals to social organizations.

## 1.1 Social and Human Capital - Conceptual underpinnings

According to Woolcock (2001), the social capital concept goes back to Hanifan (1916). During the late 1980's and 1990's, the concept became popular with the works of Coleman (1988) and Putnam (1993). According to Putnam "social capital refers to features of social organization. such as trust. norms, and networks that can improve the efficiency of society by facilitating coordinated actions". Putnam (1993) conducted a research in Italy and found that the measures of civic engagement are strongly associated with governance quality. A concise definition by the World Bank (2003) considers social capital to constitute the institutions. social relationships, networks, and norms shaping the quality and quantity of interaction within a society. However, the definition focuses only on horizontal social networks associated with norms that affect economic performance.

Further research on the topic suggests that the concept of social capital is much wider and can be defined, taking into consideration other aspects. Social capital can be differentiated at micro, macro and meso level. At the micro level, relationships between individuals and households are emphasized whereas the focus of macro level is on the institutional and political structure. The components of this structure include the quality of contract enforcement, rule of law, judicial system, and all other aspects that are normally the subject of institutional economics. The meso perspective targets interaction

among regions, communities and even clusters of companies. It encompasses both the relationships (micro and macro) as well as the overarching social structure, which includes vertical and hierarchical institutions and explores the possibility of negative as well as positive impacts on performance, (Coleman, 1990).

Human capital is defined as the compendium of skills, knowledge and information embodied in the labour force. The workers need know-how which is acquired through training and experience. Thus the highly skilled labour is the asset of a nation, which can effectively be employed in production process and in income generation. Thus, Kokkinen (2000) suggested that human capital should be treated appropriately in the national accounts along with other variables, such as GDP, investment and accumulation of physical capital.

The growing evidence in the area suggests that there are numerous measures of social capital whereas almost all studies find some degree of linkage between these measures and human capital. Social coherence increases the ability of an individual to improve his/her economic welfare and thus turns out to be a resource for the society. In other words, a higher level of social capital is associated with higher level of GDP per capita and consequently a vehicle to push forward economic growth. The social capital then comprises all the characteristics, inculcated within an individual or group by virtue of possessing a long-lasting institutional relationships and acknowledgments. As discussed above, both social and human capital are mutually related and reinforcing each other. The line of demarcation between the two can be drawn: social capital emanates from social relations while human capital resides within the individuals.

Baron et al (2000) summarize the difference between human and social capital in terms of their points of reference. The former focuses on individual characteristics and is therefore measured by formal education, intellect, physique and work experience; while the later emphasizes on relationships across the individuals and measured by their membership to some organization or their participation in social programs. Both the concepts may resemble the inter-muscular and intra-muscular characteristics, to borrow from medical terminology. Human capital results directly into increase in productivity, income and civic activity while social capital serves as a medium (dialectic) conducive for such achievements. For analytical purposes, human capital is measured directly through linear models whereas certain interactive models are needed to deal with social capital. In other words, human capital is enhanced via improvement in health, education and skills, while social capital gets nourishment from social activities, mutual interactions and participation in community services.

There exist strong complementarities between both kinds of capitals. On one hand, social capital emphasizes the role of communities, family structure and learning institutions. These institutions help in the improvement of skills, values, norms and behaviours, which are components of human capital. Due to these complementarities, education acts both as the seed as well as the flower of economic progress (Schaller, 2001).

To sum up, social capital incorporates all such features of societies like trust, norms, laws, regulations, governance, justice, reciprocity in behaviour, cooperation among individuals and societies etc. In recent studies, researchers have incorporated another very important factor, namely religion, which provides basis for all the above-mentioned characteristics. It is impossible to sustain these features without the inspiration from

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religion, although the Western theories have kicked it out from explanation of economic and social behaviour. With the inclusion of religion in this scenario. the amount of social capital may vary across individuals, organizations and societies, depending upon the specific beliefs and the extent to which the religion is practiced.

## 1.2 The Economic Impact of Social and Human Capital

A number of studies have shown that social and human capitals are the primary sources of economic growth. Temple et al (1998) suggest that the relationship of social development and real economic growth stems from the idea that society matters for growth, which is almost as old as economics itself. Social capital depends positively on the existing networks among the individuals and also on the human capital, accumulated overtime by these individuals. It uses the network together with shared norms, values and understanding that facilitates cooperation within or among societies (OECD, 2001).

Social capital has a robust positive effect on income generation. The economic development is positively influenced by the interaction of social capital with those of institutional quality and human capital. Social capital may reduce the probability of individuals to engage in opportunistic behaviour, which in turn saves resources devoted to monitoring performance of employees and increases the available resources to be allocated for productive purpose (Beugelsdijk and Smulders, 2004).

The existence of effective social institutions strengthens the market activity and incentives. In the absence of such institutions, the opportunistic behaviour (cheating, deceiving etc.) is likely to increase in the society that adversely affects production and investment (Bardhan, 2000). Rodrick, (2000) describes five types of institutions, which

can help and support the country at different stages of development and economic growth. These include (i) proper arrangement for protection of private property and enforcement of contracts, (ii) control and monitoring of business activities, (iii) efficient mechanism for macro-economic stability, (iv) proper provision for social protection and (v) vigilant resolution of social conflicts. The role of social capital in facilitating the efficient use of skills, proper information sharing and skilful mediation in resolving the conflicts cannot be ignored.

The effect of human capital on economic growth is two dimensional. First, there is the direct impact on growth since human capital is now considered as a factor of production (and frequently used in growth models). In simple words, an increase in human capital (sound physique and higher levels of education and skills) is followed by an increase in growth rate in the long run. Second, there is an indirect impact, which can be visualized in terms of development of other factors (like physical capital and technical progress) leading to enhanced productivity. In other words, educated and skilled people are more inventive and innovative. Higher levels of human capital encourage investment and enhance the rate of technical know how.

Good governance (an indicator of social capital) is now considered to be an important prerequisite for medium and long-term economic growth. Government intervention in the components of state apparatus (process, structure, institutions, etc) is mandatory for the attainment of higher level and long term sustainable growth (Gora, 2003). Without good

governance, it is not possible to achieve sustainable development or to materialize the dream of nation building[1].

## 1.3 Rationale of the Study

A number of studies have been carried out in the post war period, highlighting the factors that lead to sustainable and long term growth. During the last quarter of 20th century, the economists mainly focused on the role of factors like natural resources, physical capital, human capital and technology in the process of economic growth. However, since the dawn of 21st century, some researchers have come up with the idea of social capital. This has opened a new arena of research leading to evaluation of the role of both social and human capital as the primary source of economic growth.

Many researchers have used cross country data of both developed and developing countries for investigation while other researchers have analyzed the case of economically advanced countries like OECD. In addition to this, some other researchers have used regional data to see the impact of social and human capital on growth.

The present study intends to investigate and compare the importance of social and human capital among different regions of OECD viz-a-viz SAARC etc. which could be helpful to find the gap between the economically developed and developing countries. This kind of research in regional comparison seems to be useful and need of the time if we consider the fact that policy implications need prior and up-to-date information about the socio-economic conditions prevailing in different regions. The investigation of regional disparities and understanding their causes and impacts is an essential pre-requisite for

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[1]    Statement of the Chief Justice of Pakistan, Iftikhar Muhammad Chaudhary dated 7/2009 "The News".

designing appropriate policies so as to promote co-operations at institutional level and to achieve maximum benefits of long-term economic growth within and across countries.

The present study is first of its kind in comparing the differences in factors responsible for economic growth within the two regions, one economically developed (OECD regions) and other developing (SAARC regions). The main purpose of the endeavour is to explore and empirically investigate the importance of social capital and human capital for long-term economic growth within the regions that are homogeneous in a number of socio-economic indicators such as life expectancy, literacy rate, rule of law, social and family structure etc, and to compare the results with technically advanced countries.

## 1.4    Objectives

The main objectives of this study may be enumerated as under:

- To appraise the impact of social and human capital on economic growth in the context of developed and developing countries.

- To facilitate inter-regional comparison of growth process in terms of human and social capital.

- To highlight the role of human capital towards the accumulation of physical and social capital.

## 1.5    Methodology of Research

There has been increasing interest in analyzing trends in regional disparities within the context of an augmented neoclassical growth model. The objective is to understand the reasons behind differences in growth rates across regions over time. The present study is an endeavour to analyze empirically the impact of newly emerging factors in growth

theories along with conventional factors using the panel data and dynamic growth framework. To account for the determinants of economic growth, we have used gross fixed capital formation, population growth rate, social capital and three proxies of human capital as important variables in our analysis. The dynamic growth framework provides natural specification to control for unobserved region-specific effects, like initial level of technology, in growth regression. We review the alternative growth models since different models are based on different assumptions and specific propositions for income disparities and economic growth across regions.

We start with the familiar Augmented Neoclassical Growth Models as the basis of analysis and employ GLS estimation technique for the purpose. We undertake this research despite certain limitations in availability of data for some variables. However, it is expected that this work will be useful in improving our general understanding of the complex problem of disparities in different regions and may provide some insights in getting the situation improved.

## 1.6   Organization and Set-up

The study is organized as under. The second chapter is devoted to a brief review of the concerned literature. The third chapter provides a brief background of the growth model. In the fourth chapter we discuss the model used in the analysis and deal with the available data and their sources. The fifth chapter is vital in to this effort that provides the analysis and discusses the results. The last chapter is devoted to conclusions and proposals for policy making. Finally we provide graphs in appendix followed by references.

# CHAPTER 2

## Literature Review

There is a vast body of empirical and theoretical literature that explains the impact of social and human capital on economic growth and their mutual correlation. Most of these studies have focused on macroeconomics interactions based on cross country survey data, while a few studies have tried to analyze the microeconomic impact of both the factors on productivity and growth. We consider some of the important studies with respect to human and social capital separately.

## 2.1    Human capital

Jones (1996) analyzed the impact of human capital on economic growth by taking the cross country data of 78 countries from 1960 to 1985 and found that human capital has a positive and significant impact on economic growth.

Appleton et al (1998) analyzed both health and education as the ingredients of human capital in 29 African countries, which contribute to human welfare through economic growth. In this comparative study, the authors examined the school enrolment rate and health in African and Asian countries and found that the level of both education and health in Africa are at the lowest level than other developing countries. This factor is not only responsible for the slower economic growth in the countries concerned but has also severely restricted the ability of the governments and households to investment further in health and education sectors.

Robert J. Barro (1998) analyzed economic growth, investment and their determinants in 100 developed and developing countries. Author took the data from 1960-1995 and applied panel data estimation techniques. It was revealed that economic growth was positively related to the average number of years spent in attainment of secondary and higher education in case of male but insignificantly related in case of female school attainment. The author also utilized the score data on international comparable examination, quantity of schooling, score on scientific test, and found a significant relationship of these indicators of human capital with economic growth.

Michael et al (1998) examined the relationship of human capital and physical capital with economic growth by including different theories on endogenous growth in one model, in which physical capital, human capital, knowledge accumulation and R&D based technological progress, drives economic growth. The results indicated that if educational productivity increases by 20%, the long-run economic growth increases by 35%. The Uzawa (1965) and Lucas model (1988) is considered best for the economies where development is knowledge based, and Grossman and Helpman model (1991) is appropriate for the economies where increase in the productivity occurs due to technological progress. The paper focused on the importance of education and training since the physical capital contributed about 50% to economic growth whereas the educational quality and technical progress contributed the remaining.

Kokkinen (2000) analyzed the possible long-run relationship of the accumulation of human capital in Finland over the period from 1960 to 2000. The study explored the impacts of investment in human capital (through attainment of formal education) on GDP

growth. The annual investments on education contributed directly to GDP growth in Finland between 2% - 6% per year during 1960–2000.

Maria (2001) analyzed the data of 65 countries from 1960 to 1990 with five year intervals to determine the relationship between human capital and economic growth. She estimated the twofold impact of education investment on economic growth. First, as a productive factor. it can enhance growth in output directly. Second, highly educated people can contribute more effectively to technological progress. The results showed the two-way causality between human capital and economic growth, since accumulation of human capital leads to enhancement in workers productivity and hence to economic growth. and the level of income in turn has a positive and significant impact on the process of human capital accumulation.

Aurora et al (2003) examined the effect of human capital on economic growth in Portugal from 1960-2001 by using VAR and Co-integration techniques. The authors found that 1 percent increase in human capital and innovation increases economic growth by 0.42% and 0.30% respectively. The results were statistically significant, which showed that both standard education and native innovation efforts are very important in growth process.

Mohsin Khan (2005) examined the growth performance of Pakistan economy over the past twenty years and found that it grew faster than many other low and middle income countries. on the average. In addition to the traditional factors determining growth. the study focussed particularly on the role of differences in the quality of human capital across countries. The results suggested that in order to achieve higher economic growth both physical capital accumulation and improvements in the quality of institutions have

the largest pay-offs, whereas better education and health facilities also have significant impacts. It is concluded that Pakistan can improve the living condition if its masses by making investment in the areas concerned that will increase its probability for Pakistan to enter a virtuous cycle of high growth.

Garett et al (2006) conducted a survey on cross cultural IQ test as a measure of human capital. He used 21 variables, employed data from 1960 to 1992 on GDP per capita and applied robust regression techniques for analysis. They borrowed the methodology of Sala-i-Martin and Doppler Hofer and Miller (2004). It was concluded that IQ shows statistically significant results in growth regression in that 1% increase in IQ was responsible for 0.11% increase in GDP per capita and 7.8% increase in living standards. The IQ level has 13 points strong bi-variate association with both level and growth rate of GDP per capita. The primary school enrolment rate showed 11.5% significant impact on economic growth.

Abbas et al (2007) examined the relationship between human capital and economic growth in Pakistan. They used data from 1960-2003, and applied Phillips-Perron and Augmented Dicky Fuller (ADF) test statistics and used co-integration regression ala the Engle-Granger approach (OLS and IV). As proxy for human capital, the authors used the number of workers with secondary education (net of drop outs). They analyzed different political eras and used dummies for four regimes, i.e.1960s (Ayub), 1970s (Bhutto), 1980s (Zia), 1990s (democratic) and 2000 to 2003 (Musharraf) regimes. The results revealed that human capital accounted for 40% increase in GDP per capita, which could be downward biased, due to other unmeasured dimensions of human capital.

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Wei Chi (2007) examined the relation of human capital on economic growth indirectly by means of investment in physical capital. Author took the provincial data of GDP per capita, labour force, population, fixed asset investment, education, government revenue, government expenditure on education and total social expenditure of 31 provinces from 1996 to 2004. He used both cross sectional and panel estimation techniques for analysis. The result showed significant impact of investment in physical capital and growth, however no direct relationship was found between human capital and economic growth. The workers having tertiary education played more significant role in physical capital formation than others having primary and secondary education. The results suggested that physical capital is the important determinant of economic growth, which improves more quickly in the Eastern provinces where human capital stock is larger.

Belton et al (2007) examined the impacts of human capital, FDI, physical capital, new technology, infrastructure, regional spread and market reforms on economic growth and total factor productivity in China by taking the provincial level data from 1966-2003. They used OLS, 2-way FE and cost benefit analysis techniques. Human capital was found to have significant and positive impact on economic growth and total factor productivity (TFP), while FDI showed larger effect on growth before 1994 than afterwards. The human capital spillover effect on economic growth also showed positive and significant impact on TFP. It was concluded that investment in human capital will be an effective policy to reduce regional inequality in China and an efficient way to encourage economic growth.

Feisher et al (2007) used the provincial data of China and analyzed the dispersion in the provincial economic growth rate and total factor productivity. They found that human

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capital has positive affect on per worker output and growth of GDP, while marginal productivity of educated labour was higher than others. It was concluded that investment in human capital was responsible for growth efficiency and reduction in regional gaps and inequalities.

Leeuwen (2007) analyzed the impact of human capital on economic growth by taking the data from 1980s to 1990s for three countries of South Asia (Japan, Indonesia. India) and found a positive correlation between human capital and growth.

Baldacci et al (2008), analyzed the data of 118 developing countries from 1971–2000 to explore the link between social spending. human capital and growth. They used nonlinear models for education and health and explicitly controlled for governance. The results showed that investment in education and health sectors have positive impacts on economic growth. Various policy interventions like improving the quality of governance and taming inflation can have meaningful implications. The study concluded that higher spending alone (in the social sector) may not be sufficient to achieve the targets of higher growth and Millennium Development Goals (poverty reduction).

Ahmed et al (2008) have examined the credibility of Pakistan's integration with the South-East Asian economies (ASEAN). They are of the opinion that such an attempt of economic integration may not be sustainable, obviously for two important factors; the short-term macroeconomic instability and unsustainable long-term growth pattern. It is therefore crucial to develop long-term strategies, which would emphasize on the accumulation of human capital before effective integration could be considered.

## 2.2 Social Capital

Tolbert et al (1998) analyzed the research design of newly emerging body of social stratification in the civil societies, which are economically woven together through global market forces. The authors tested the hypothesis that local capitalism and civic engagement variables are associated with positive socioeconomic outcomes. To this end, they used data on more than 3,000 US counties. The control variables comprised three measures of local civic society; namely small manufacturing establishments, family farms and civically engaged religious denominations. The results suggested a robust positive association of the measures of local civic society and socio economic outcomes.

Brayan et al (2002) defined and characterized the social capital in the context of an endogenous growth model to see how individuals in a society maximize growth. They postulated that technological shock has effects both on efficiency and social networks of labours. Labour mobility also affects the structure of society and efficiency of mutual trade. A fewer mobile labour force is favourable for transitional economies, while highly mobile labour force is favourable for stable or rapidly changing economies. The theoretical model so presented concluded that social capital affects economic growth by facilitating co-operative trade.

Jonathan (2001) conducted a survey to find the evidence, if any, of the impact of social and human capital on economic growth in developed countries. For empirical investigation, the author consulted the literature related to world value survey on the economies concerned. The survey showed a significant relation between social capital, human capital and economic growth. The survey concluded that there is a comprehensive

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need of research on both sorts of capital for sustainable economic growth and policy implications.

Reino (2003) analyzed the previous studies conducted on the cross country data on social capital and economic growth. In this study, author explained the interaction of various measurements of social capital and economic growth, and also the problem involved in the measurement of the concerned factor. The studies found that the factor concerned had a positive impact on growth. The results of the studies revealed that about 40-60 percent of economic growth was left unexplained by changes in the so called 'factors of growth'.

Gora (2003) analyzed the relationship between social capital, economic growth and corruption in Slovenia. The results showed that regulatory quality in Slovenia is quite poor as compared to developed societies. Although the researcher argued that there exists strong positive relation between higher per capita income and quality of governance, however it does not automatically lead to the improvement of governance.

Sjoerd et al (2004) developed a model of social capital and economic growth and empirically tested the relationship by using the data on trust (an indicator of social capital) for 54 European regions. They analyzed the Putnam's distinction in different dimensions of social capital, first closed networks of family and friends, secondly open networks in different communities and found a positive relationship between social capital and economic growth.

World Bank (2005) in a study conducted on the impact of intangible capital (raw labour, human capital, social capital, quality of institutions etc) and tangible capital (natural and produced capital) on the economic growth. The empirical findings, based on data from

120 countries, reveal that the productive share of social and human capital is more than 5 times as compared with the other factors of production.

Helje et al (2005) analyzed the impact of social capital on economic development in 34 European countries from Central and Eastern Europe by using panel data estimation method. They divided the countries into three groups according to HDI values. The components of social determinants i.e. human capital, social capital, income equality and redistribution were included for analysis purpose. The result shows significant for all variables. The sign of variable was positive for developed countries and negative for others. The impact of social capital and human capital was 0.8% for first group, -0.06% for second group and -1.48% for third group.

Marijana (2005) explained the importance of the quality of governance (i.e. rule of law and public administration) on economic growth in Croatia. Author used the data of 14 EU countries and Croatia from 1990 to 2005. The results found that if the value of the rule of law and quality of the public administration increases by 1, than real GDP will rise by 0.69% and after controlling corruption it raises to 7%. This shows that corruption has negative effect on GDP growth. While institutional reforms such as, rapid justice, good administration and controlling corruption have positive impact on economic growth.

Andrew (2006) examined the impact of social capital on economic development in two towns of Australia between 2001 and 2002. The research hypothesis tested was simple: that a town with high level of social capital will have a high economic development and that with low level of social capital will be lagging behind. He selected the towns which were identical in geographic and political factors so as to minimize the influence of these

factors. The data comprised of randomly selected 250 people from each town. Qualitative data on social capital was collected from local news papers in a six month period. The results supported the hypothesis that the town with high level of social capital also has high level of economic development. The author recommended that since social capital is an important determinant of economic development, policy intervention should be directed towards enhancement of social capital.

Senaj Daut (2006) analyzed the concept of social capital on economic growth and in various government institutions. Social trust increases communal pressure for competent and efficient government which in turn significantly increases economic growth. Author suggested that for social capital accumulations in Macedonia, government should have to create such environment which encourages positive social capital and discourages negative social capital i.e. corruption. Data (in percentage) provided the level of people satisfaction from government institutions as, Education [66], Health System [62], Police [54], Municipality [52], Tax Office [49] and the Court [39]. The result shows that trust in institutions ranges from 0.7 for court and o.23 for the Tax office. This efficient performance of institutions will influence the social capital, which in turn positively increases the economic growth.

Yuan K. (2006) emphasized on the role of social capital and its importance for generating future benefits i.e. information sharing and harmonizing to economic opportunities, mutual aid and insurance, and collective action. Author adopted a logical approach for the representative individuals. Author proposed three models of social capital, (i) micro level bonding by human capital accumulation, (ii) macro level bridging by effective financial development and (iii) meso level linking by networking and collaborative

activities. These models resolved the best possible steady-state allocation of human resources to the creation and maintenance of social capital.

Semih et al (2006) takes the data of European countries from 1990-2002 to investigated the relation between social capital, innovation and economic growth, by using 2SLS and 3SLS models. Their results shows social capital has much higher impacts on economic growth than the innovation and education.

Isabel et al (2008) examined the relationship between social capital, human capital and economic growth for 14 economically developed countries of OECD. He employed data from 1980-2000 and used panel data technique (fixed effect) and F-tests to evaluate the significance of cross-sectional effects. The result obtained showed significant impacts of all the key variables. The author also used Bartlet test to check for heterosckedasticity and showed significant difference between the countries. The result indicated that a 1% increase in physical capital, human capital and social capital raised GDP per capita by 0.02%, 0.001% and 0.002% respectively.

Pelle et al (2008) examined the impact of social capital on economic growth in Nigeria and Canada by drawing an investment game between a producer and a lender. Author takes the data from 1995 to 2000, and applied OLS, TSLS and LIML techniques for analysis. Author used the measures of distance from equator and a navigable river as social capital instrument. Author found that 1% increase in social capital increases economic growth by 1.8 percent in Nigeria and 0.3 percent in Canada. Author also analyzed the impact of social capital on investment and urged that efforts should have to be made to create social capital.

Oguzhan et al (2008) used the data of 43 contiguous US States and Alaska from 1990-1994 and 1995-1999 to examine the relationship between trust and economic growth. Author applied seemingly unrelated regression (SUR) and random effect for their analysis. The result shows that trust has significant impact on economic growth.

## 2.3 Interaction of Social and Human Capital

Jihannes et al (1998) examined the impact of social capital and human capital on productivity of 1851 firms by taking the data from Dutch industries for the period 1880 to 1990. They employed discrete-event-history analysis to remove biased-ness in the data due to time aggregation and right censoring. The results of human capital and social capital were significant in firms' dissolution or productivity. The data of firm tenure, industrial experience and graduate education were taken as proxies for human capital, while the proxy data of professional relationship with potential client were used for social capital. Both the variables have strongly affected the productivity of firms.

Honig (1998) takes the data of 215 small business firms in Jamica to analyze the impact of human capital. social capital and financial capital on business profitability. He used OLS regression technique for analysis. Data shows positive relation between these variables and business profitability, which reveals their importance for the success of a business.

Wool cock et al (2001) theoretically discussed about the origin of social capital and its importance in the development process of economic growth and various other aspects of life. Author differentiated the bonding and bridging of social capital i.e. family institutions work as an example of bonding, while file of addresses work as bridging.

Parents' involvement in children schooling produces better outcome for both students and community. Social capital also has an interaction with the health of the people i.e. higher social capital is correlated with low murder and suicide rates, low mortality rates and high level of health status. Innovation which enhances economic development disperses much faster in the economies where there is rich stock of bridging social capital. Author suggested that ideas and ideals of social capital to understand the subject of economic development are very important.

Pichaud (2002) analyzed theoretically the effect of social and human capital on economic growth, poverty reduction and empowerment of individuals, communities and nations. The study highlighted the determinants of poverty and social exclusion and explained the possibility of economic development and reduction in poverty at individual, community and national level by using the broad framework of social and human capital along with other factors.

Dirk at al (2003) examined the effect of social and human capital on innovation in 59 countries by taking the data from 1981 to 1998. They used Human Development Index as proxy measure of human capital, and data on trust, associational activity and 'norms' as indicators of social capital. The countries were selected from all the five continents. Europe (30), America (12), Africa (3), Asia (13) and Australia (whole). The results show a positive relationship between human capital and innovation and a partial positive relationship between social capital and innovation. The results of all the measure of social capital show positive and significant impact at 1% level of significance. The positive effect of human capital supports the theoretical prolong of countries including economic growth, productivity and innovation.

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Tiago Neves et al (2009) examined the relationship between social capital and human capital and their contribution to economic growth within the context of endogenous growth model. The study is theoretical in nature. It is argued that human capital is relatively more important for the process of economic development than social capital. The developed economies with more human capital also have more social capital. The market value of human capital increases with more investment in social sectors (education and health in particular).

Tom Healy (2005) analyzed the hypothesis that the impact of social capital and human capital is positively related with subjective well-being. He used NESF data of Ireland for 2002 on (i) happiness and (ii) life satisfaction from EVS to examine the structural factors i.e. age, gender, location and employment status as a measure of human capital and social capital by using bivariate and multivariate regression models. The results were statistically significant at 5% level. The result also shows that human capital is correlated with socio-economic factors and age, where as social capital is correlated with demographic factors. High income and more satisfying employment during economic success have expended the opportunities for life satisfaction.

Mina (2005) analyzed the data of 39 African countries from 1975-2000 to see the relationship among institutions, social capital and economic development. Author used panel estimation method (fixed effect and random effect) for analysis purpose, and used the following model.

Income = f (human capital, openness, institutions, social capital)

The results show that social capital has positive effect on income. Moreover, the interaction of social capital with institutional quality as well as with human capital has a positive impact on economic development.

## 2.4   Concluding Remarks

The literature shows that almost all the studies have been conducted either for developed countries i.e. Europe and United States or Italian regions, while some of the studies have combined both developed and developing countries, whose main objective is to investigate and show the importance of social capital and human capital in the field of economic growth. So far as our information is concerned, no study is available that investigates and compares the importance of social and human capital among developed and developing regions like OECD and SAARC. Such an attempt is not only the need of present worse situation of the developing countries, but it can also be helpful in finding ways and means to fill up the gap between the developed and developing regions.

We incorporate human and social capital to see their impact on economic growth for lower middle income (SAARC) countries and to compare the results with high income (OECD) countries. The objective is to explore the factors responsible for slow growth in SAARC countries and to suggest some remedial measures.

## Chapter 3

## Growth Theory

## (A Brief Overview)

Modern growth theory emerged with the writings of R.F. Harrod (1939) and Domar (1946). This was followed by the pioneering work of Robert Solow (1956) and Swan (1956). Solow's model is simple and straight forward. However one of its results that sustained economic growth can not be maintained by mere capital accumulation is confronted to subsequent debate. Here we discuss some of the problems.

## 3.1   The Neoclassical Model

In Solow model, the technical progress was assumed to be exogenous and costless, some thing like Mana from Heavens, which increased the productivity of factors over time. However the model did not explain as to how technology improves overtime. This led to the natural conclusion that without technological progress, the effects of diminishing returns to factors would ultimately result into secular stagnation or that at some point in time, the process of economic growth will cease. The basic neoclassical model employs an aggregate production function exhibiting constant returns to scales but diminishing return to labour and reproducible capital. The aggregate production function can be written as a function of capital intensity alone:

$$Y = F(K, L) \Rightarrow y = \frac{Y}{L} = f(\frac{K}{L}) = f(k)$$

Assuming an aggregate saving function $S=sY$ and that savings are effectively transformed into investment and capital formation, we get the fundamental equation of

motion as $\frac{dk}{dt}$=s.f(k)-nk . At equilibrium, the capital labour ratio assumes a stable value

and the above relation reduces to: $\frac{dk}{dt} = 0 \Rightarrow$ s.f(k) = nk or $\frac{s}{\upsilon} = n$

The LHS represents the warranted growth rate $g = \frac{s}{\upsilon}$, where "$\upsilon$" is the incremental capital output ratio and the RHS shows the natural growth rate of labour force (n). The equation of motion may slightly modified to take care of capital depreciation and technical progress: $dk/dt = s. f(k) - (n+\lambda+\delta) k.$. The steady state condition implies that all the key variables like the output level, capital stock and labour force grow at the same rate, which is an ideal situation. The equilibrium is shown to be stable due to the flexibility of the capital output ratio (endogeneity).

Although, the Neoclassical (Solow) model was significant improvement over the conclusions of Harrod and Domar, yet there were certain problems. Due to the assumption of diminishing returns to capital accumulation, if the same kind of capital is progressively added to the production process (without creating new uses or innovations), a point is likely to reach where extra capital goods become outmoded, and where the marginal product of capital is insignificant. This expected but logical outcome is referred to as 'the stage of secular stagnation' which emanates from the assumption that both population growth and technological progress are exogenous and the only driving force behind the growth process is capital stock, which is accumulated through saving. However, there is a second line of reasoning as well. The economic reason to analyze growth lies behind the fact that scarcity of capital makes it more productive. When capital stock is small in proportion to national output (capital-output ratio), the

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deterioration in capital stock can be compensated with saving and some extra capital added, which in turn increases the national output. If the process continues, then due to the property of diminishing returns, output will not grow at a pace at which capital stock is depreciated. As a result saving rate will not catch up with the fast depreciation rate and further increase in capital stock will not be possible. Eventually the growth rate of output will choke off in the absence of technological progress and population growth.

Next we see the impact of population growth and technological change on long run economic growth within the context of neoclassical growth model. Suppose the economy works under the constant returns to scales. Since the absolute size of the economy is irrelevant under this assumption, a faster growth in population will reduce the capital intensity or the amount of capital per worker. The steady state equilibrium implies that output and capital stock grow at the rate of population growth which will not be feasible if capital formation or investment rate is low. Thus a higher growth rate of population also predicts a discouraging conclusion.

It is claimed that long-run growth in per capita output can be explained only with technological change that continually compensates for the dampening effects of diminishing returns to capital. In the context of Solow-Swan model, the aggregate P.F. may be written as: $Y = A.f(K, L)$ where "A" is a scale parameter that reflects the current state of technical know how. The growth rate of output is then the weighted sum of many factors, including technical progress: $\hat{y} = \hat{A} + \eta_{y,k}\hat{k} + \eta_{y,L}\hat{L}$, where $\eta_{y,k}$ and $\eta_{y,L}$ are the partial elasticises of output with respect to capital and labour respectively. This reduces to the condensed form $\hat{y} = \hat{A} + \eta\hat{k}$

As the growth process goes on, the capital-output ratio tends to fall primarily due to diminishing returns to capital. However, this effect is likely to be offset by technical progress for some time. Although the point of steady-state is determined by saving rate, depreciation rate and the rate of population growth, however, the only factor that promotes the long run growth is the exogenous rate of technical progress. The growth accounting research carried out in 1960's also posed similar problems. The increase in GDP per capita, that was over and above the increase in stock of labour or capital, was attributed to a third factor, referred to as 'Solow residual' in growth literature. This factor was supposed to be responsible for about 50% of the historical growth in industrialized countries; obviously this unexplained component of growth was due to technical progress. This, in turns, requires massive investment, not only to cover depreciation but also for renovations and innovations.

The controversy during 1970's revolved around the question whether technology could be considered as exogenous or endogenous as also embodied or disembodied. The proponents of endogenous growth theory argued that the original Solow model suffered from two insurmountable drawbacks. First, it could not analyze the determinants of technological advancement because of the contention that it was completely independent of the decisions of economic agents. Second, the theory failed to explain the differences in residuals across countries.

## 3.2 Returns to Physical Capital

In this section, we briefly discuss the debate on diminishing returns to capital and convergence. An extensive empirical literature has grown overtime to provide evidence

on convergence in per capita income in different countries to a common steady state level even with different starting points. The per capita income is said to converge to steady state only if there is decreasing returns to capital, which would generate higher growth rate. Due to disparity in per capita income levels of different countries, the researchers must control for the determinants of steady state equilibria. In this case the Solow model provides more clear idea about convergence in that different countries will converge to their own steady state levels of per capita income not necessarily the same level.

Barro and Sala-i-Martin (1995) have given evidence of convergence on the basis of cross country regression. They covered 90 countries and took the data from 1965 to 1985. Their results indicated that educational attainment, life expectancy, investment to GDP ratio and terms of trade are positively related with average growth rate of per capita GDP and negatively related with government spending to GDP ratio. Their results favour the AK model and the strong influence of these variables over the long run GDP growth rate. However, it is shown that a large fraction of GDP goes to physical capital formation and education. which indicates casual relationship between these variables and GDP growth.

King and Levine (1992) argue that financial sectors also have positive impact on economic growth. Alesina and Rodrick (1994) consider political instability while Benhabib and Spiegel (1994) highlight human capital as determinants of growth. Although their empirical results support the endogenous growth theory but they do not provide any support to convergence hypothesis and dynamic return to capital.

Some researcher also used elasticities of output with respect to capital to find returns to capital. Romer (1987) used Cobb-Douglas P.F with the assumption of CRS and labour-

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augmenting technology: $Y=K^\alpha(AL)^{1-\alpha}$ and showed that the coefficients of both capital

($\alpha$) and labour (1- $\alpha$). should be equal to 1/3 and 2/3 respectively. He estimated that

elasticity of physical capital was in the range of 0.7-0.8, which indicates the presence of

externalities that increases the share of physical capital in out put. However, in measuring

input elasticises, some problems like as technical shock may exist, which increases

investment and accumulation of physical capital. In this case the error terms would be

correlated and the measured elasticises would be biased. Benhabib et al (1991) studied

the case in which technical progress was recognized differently, while Spiegel (1994)

studied the case in which technical progress was considered same. They found that in

both the cases the elasticities of output with respect capital were biased upward. King et

al (1994) also support the idea of decreasing returns to capital in growth empirics.

## 3.3    Different Approaches to Endogenous Growth

Following the pioneering work of Robert Solow (1956), numerous models that

endogenized technical progress have been proposed, although none of them was as

simple and well-designed as the basic one. Solow himself revised his model and stressed

that technology is always embodied in the new capital equipment. In the following lines

we discuss some important attempts that have tackled the question of incorporating

technical progress in growth models.

Mankiw (1995) proposed that if we include both the physical as well as human capital in

the neoclassical model, then it is capable to explain the international differences in

growth path. The main problem with the simple neoclassical model is that it measured

technical progress exogenously, which is exclusively responsible for growth performance

in each country but incapable to capture the persistent differences in growth rate across countries. The main problem to endogenize technology is the crucial CRS assumption about aggregate P.F. If technology is incorporated explicitly, then the P.F. would exhibit increasing returns to scale in three factors i.e. capital, labour and technology. Kenneth Arrow (1962) demonstrated that technical progress is an unintended result of producing new capital goods keeping in view the past experience, a phenomenon named as "learning by doing". Kaldor (1957) proposed the idea of aggregate production function. which may shift overtime both due to capital formation and technological change. Hence the stock of capital was the only determinant of the steady state growth rate. Nordaus (1969) and Shell (1973) built the growth models in which technical progress occurred as a result of intentional economic preferences. The models emphasized that research is provoked by the prospects of monopoly rents. Nordhaus argued that without population growth, there is no enough long run sustained economic growth while Shell assumed that without T.P. sustained per capita growth is not possible. Uzawa (1965) argued that technical progress requires educated labour and analyzed optimal growth[2].

The simplest approach. generally termed as the AK model. incorporates human capital explicitly. Frankel (1962) observed that due to similarity between knowledge (human capital) and physical capital, there is no need of assuming fixed co-efficient P.F. He invited attention to the fact that capital increases in proportion to output even with full employment of labour and constant returns to scales. With the path-breaking work of Romer (1986). the attention of researchers shifted to endogenous models. He developed

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[2]    Optimal growth path is one in which all the investment is specified to each physical or human capital, until a steady state path is reached A and K with equal exponential growth in A and K. The model was limited to the accumulation of optimal path and could not grasp the problem of compensating the growth in technology in the economies which facing increasing return.

an alternative view of long run growth in that the growth process originates from within the firm or industry. Like the Solow model, it was assumed that each industry separately produced under constant returns to scales; however the economy-wide human capital stock and know-how (available to all firms) positively affects the output level of each firm and therefore the production function exhibits increasing return to scales. The stock of knowledge acquired by each firm is a public good, which has a spill-over effect on growth process. Assuming homogeneity in capital and labour, the production function of a typical firm is given by: $Y = A K^{\alpha} L^{1-\alpha}$. After incorporating human capital, the production function assumes the shape: $Y = A K^{\alpha} H^{\beta} L^{1-\alpha} \Rightarrow AK^{\alpha+\beta}L^{1-\alpha}$, where "H" stands for human capital and B>0. Obviously, such a production function exhibits increasing return to scales and the aggregate growth rate is given by

$$dY=[A(\alpha+\beta)K^{(\alpha+\beta-1)}L^{1-\alpha}]dK+[A(1-\alpha)K^{(\alpha+\beta)}L^{(1-\alpha)-1}]dL \rightarrow Y^{\wedge} = (\alpha + \beta)K^{\wedge} + (1-\alpha)L^{\wedge}$$

Now the growth rate of per capita income is given by the relation:

$$y^{\wedge} = \left[\frac{Y}{L}\right]^{\wedge} = Y^{\wedge} - L^{\wedge} = g - n$$

It can be seen that in the absence of spill-over effects of human capital, we have the following position: $Y^{\wedge} = K^{\wedge} = \dfrac{s}{v} = g \; and \; L^{\wedge} = n \Rightarrow g - n = 0$, since the warranted growth rate equals the natural growth rate at steady state equilibrium or the per capita income remains constant. However, in the presence of spill-over effects. the final result is different: $g = (\alpha + \beta)g + (1 - \alpha)n \Rightarrow [1 - (\alpha + \beta)] g = (1 - \alpha)n$ and

$$g = \left[\frac{(1 - \alpha)n}{1 - (\alpha + \beta)}\right] \Rightarrow g - n = \frac{\beta n}{1 - (\alpha + \beta)} > 0 \quad \text{since } \beta>0$$

In other words, the per capita income grows faster than the population growth.

The interesting result of Romer model is that with investment in human capital (a form of technical progress), there are increasing returns to scales and per capita growth will continue indefinitely. In other words, there is no steady state.

## 3.4  The Role of Human and Social Capital

Keeping in view the above discussion, the theorists are now suggesting that the term capital does not merely comprise physical capital but also other factors such as human and social capital that play significant role in long run growth. Mankiw et al (1992) found that the rate of convergence in developing countries to their steady state was slower than that forecasted earlier, which led them to augment the Solow (1956) model. They proposed a new version of the model given by: $Y = K^\alpha H^\beta (AL)^{1-\alpha-\beta}$, where as "H" is the proxy for human capital measured by investment in human capital. They used the cross-country data over 121 economies from 1960-85 and found that the share of both physical capital ($\alpha$) and human capital ($\beta$) is approximately 1/3 each. They estimated elasticities indicate that accumulation of human capital increases the impact of physical capital on output at steady state level, which is consistent with the evidence given by Barro and Sala-i-Martin (1995). Mankiw et al (1992) therefore emphasized that the neoclassical model provided correct results provided human capital is properly incorporated under both the assumptions of decreasing returns to capital and technical progress.

By the mid of 1980s, a new term social capital came to the forefront and frequently recognized in social science research. The work of Putnam (1993) in Italy declared that social capital could explain the long-run growth while Knack and Keefers (1997) showed that mutual trust in the society is strongly associated with economic growth. Many

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researchers have tested this hypothesis empirically in the late 20th century and showed that growth rate in economies with higher level of trust overweighs their counterparts. The literature on social capital has pointed out a number of transmission methods to show that trust is an important determinant of economic growth.

There is a general agreement among the researchers that cooperative behaviour amog the agents is an important part of modern economic life. The concept makes an innate sense and common incidents in the world of social sciences have attracted attention of the researchers. Significant empirical literature has affirmed that social capital certainly determines various political and economic characteristics. Recently, the researchers have distinguished among the constituent elements of Putnam's concept of social capital. The results are mainly in favour of the elements of trust, while other elements have shown weak results (Stolle, 1998; Uslaner, 2002; Bjørnskov, 2006). The overall implication has been in the form of a strong empirical support (for trust as proxy of social capital) in both cross-country and cross-state studies in the US (Rice and Sumberg, 1997; La Porta et al., 1997; Knack, 2002).

After emergence of this concept, a thorough debate took a start that success of economic growth could not merely be attributed to physical capital, industrial labour, investment in the infrastructure and technical progress etc; rather some other important factors like human capital and social capital (in particular) are also vital. This research has shifted the paradigm from material to non-material factors since the beginning of the 21st century.

In view of the foregoing discussion, it can be argued that social capital, along with other sources of economic growth, is equally important for developing countries, where the

pace of progress is much slower when compared to the developed world. This fact constitutes a solid rationale for a thorough regional analysis in order to have a deeper insight into the ingredients of growth that may improve our understanding of the process of growth on the one hand and also help the policy-makers in designing appropriate policies for achieving the target of long awaited sustainable economic growth.

# Chapter 4

# Analytical Framework and Data Description

The objective of the present study is to evaluate the impact of social and human capital (besides the physical capital, of course) on economic growth using the dynamic panel framework within the context of endogenous growth model. The conventional method is to estimate growth equation in which real per capita GDP growth is regressed on physical capital and human capital. The human capital comprises two components, namely education attainment and social interaction. The physical capital accumulation is denoted by investment, both public and private. The framework for analysis is as under:

## 4.1 The Model

Keeping in view the theoretical background discussed in chapter-3, we develop the model for the purpose of our analysis as under:

Let the P.F. be given by the standard Cobb-Douglas specification with familiar neoclassical assumptions i.e. diminishing returns to individual factors but constant returns to scales and labour augmenting technology.

$$Y_{(t)} = K_{(t)}^{\alpha} \left[ A_{(t)} L_{(t)} \right]^{(1-\alpha)} \qquad \text{----------------------- [1]}$$

The familiar equation of motion is given as:

$$\frac{dk}{dt} = s.f(k) - nk \implies \frac{dk}{dt} = sk^{\alpha} - nk \qquad \text{------------ [2]}$$

The symbols carry their usual meaning. i.e. 'y' is the per capita income/output in real terms and 'k' is the capital-labour ratio, 's' is the saving rate, 'n' is the growth rate of

labour force and 'A' stands for technical progress. The time path of GDP per capita is given by the following relation (via Bernoulli method):

$$y(t) = [A\, e^{-(1-\alpha)nt} + \frac{s}{n}]^{\frac{\alpha}{1-\alpha}} \qquad \text{------------- [3]}$$

This may be expressed in the logarithmic form as

$$\ln y_{(t)} = \frac{\alpha}{1-\alpha}[\ln A + \ln s - \ln n] - \alpha nt \qquad \text{------------ [4]}$$

Keeping in view the above, the growth rate of GDP per capita may be written in the general format as

$$\overset{\wedge}{y} = f(A, s, n) \qquad \text{------------ [5]}$$

The Endogenous growth model due to Mankiw et al (1992) and Barro and Sala-i-Martin (2004) incorporate human capital explicitly in the relationship while retaining rest of the assumptions:

$$Y(t) = K_{(t)}^{\alpha} H_{(t)}^{\beta} [A_{(t)} L_{(t)}]^{1-\alpha-\beta} \qquad \text{------------ [6]}$$

The equations of motion then assume the following configuration:

$$\frac{dk}{dt} = s_k k^{\alpha} h^{\beta} - (n+g+\lambda)k \quad \text{and} \quad \frac{dh}{dt} = s_h k^{\alpha} h^{\beta} - (n+g+\lambda)h \qquad \text{------------ [7]}$$

The variables 'k' and 'h' in the above refer to the per capita values of physical and human capital, whereas $s_k$ and $s_h$ are the fractions of total investment devoted to physical and human capital formation respectively such that $s_k + s_h = s = \dfrac{S}{Y} = \dfrac{I}{Y}$ . Other parameters carry their usual meaning, i.e. 'n' stands for the growth rates of labour force, 'g' for technical progress and '$\lambda$' for the rate of capital depreciation.

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Keeping in view these considerations, Baldacci et al (2008) have suggested the following growth equation in general format. However, human capital is bifurcated into health and knowledge components and some control variables included:

$$\hat{y} = f(s, He, Ed, \Delta He, \Delta Ed, \Omega) \qquad \text{------------ [8]}$$

As usual, the dependent variable is the growth rate of GDP per capita. The saving/investment rate (indicated by 's') is measured in terms of gross capital formation as percentage of GDP. 'He' refers to the physique/health status (measured in terms of infant mortality rate with sign reversed), and 'Ed' stands for education/ knowledge and the gross primary and secondary level enrolments rates are used as proxies. The composite variable ' $\Omega$ ' comprises the set of control variables like trade openness, fiscal balance, inflation and the lagged value of GDP per capita etc. They also incorporate changes in the stock of health and education capital as control variables.

However, human capital is a complex factor that cannot be restricted to health and education levels. It also comprises factors and values like spending for social cause, status of the individuals in the society and mutual relationships. For the sake of convenience, we may restrict human capital to health and knowledge and introduce another variable as social capital, which is subsidiary of human capital and complementary to it. This variable may be proxied by indicators like mutual relationships and social coherence, cooperation and coordination, honesty in dealing and trustworthiness. Fortunately, the data on "trust" is available for the countries concerned and over the period 1995-2004 through the World Value Survey, which will be discussed in detail under data description.

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Therefore, we may consider 'trustworthiness' as appropriate proxy for social capital, keeping in view the data constraints on other possible indicators. We also include the multiplicative term of Hc and Sc in the model to highlight the mutual interaction between human and social capital. The growth equation may be written in the revised format as:

$$\hat{y} = f[s_t, E_d, H_e, S_c, n, (H_c * S_c), y_{t-1}]  \text{-------------------- [9]}$$

This general equation assumes the econometric form as under:  -------------------- [10]

$$\hat{y}_{i,t} = \beta_0 + \beta_1 \ln y_{i,t-1} + \beta_2 Inv_{i,t} + \beta_3 n_{i,t} + \beta_4 Hc_{i,t} + \beta_5 Sc_{i,t} + \beta_6 (Hc * Sc)_{i,t} + u_{i,t}$$

- In the above relation, the subscript 'i' stands for ith country and 't' for time.

- $y^\wedge$ is the growth rate of real GDP per capita, measured in \$ppp.

- $\ln y_{it-1}$ is the log of lagged per capita income, measured in \$ppp.

- $Inv_{it}$ denotes the investment rate/saving rate: gross investment to GDP ratio.

- $n_{it}$ denotes population growth rate.

- $Hc_{it}$ refers to Human capital that comprises

  - Ed, gross enrolments rate at secondary school level and

  - He, health standard proxied by Adult survival rate.

- $Sc_{it}$ refers to social capital proxied by the generalized trust value.

- $(Hc * Sc)_{it}$ denotes the interaction between human capital and social capital.

- $u_{it}$ is the error term as usual.

We discuss the variables in detail under the section on data.

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## 4.2 Methodology

For the purpose of this study, we employ a panel data framework over a cross section of two sets of countries for the period of 1995-2004. The panel data has various advantages over cross-section and time series data. It enables us to overcome the problems of diversity in technological changes and dynamic effects in growth regression that cannot be simply handled by employing either cross-section or time series data. Another econometric problem is the possibility of endogeniety bias (some of the explanatory variables at the right side of the equation may be endogenous to the model), which is minimized by using the panel data. The panel framework minimizes the collinearity among the variables. Same is case of omitted variable bias. It also helps in facilitating identification of certain parameters without making any restrictive assumptions. It is an efficient way to control for the error term and increases the degree of freedom due to large sample size, which is particularly useful for the present study. In brief, panel data estimation makes better the empirical analysis.

However, there are certain shortcomings of pooling the cross section and time series data. First, some of the assumptions associated with the usual linear model may be violated. Second, the errors (u') in the pooled model may be heterosckedastic, auto-correlated and may exhibit contemporaneous covariance across countries, which makes simple ordinary least square (OLS) estimators inappropriate. Under these situations, the choice of Generalized Least square (GLS) is an appropriate framework that ensures robust results. In order to cope with the problem of heterosckedasticity and auto-correlation in the error term, we may use the 'White' heterosckedasticity corrected standard error for the former

problem and seemingly unrelated regression (SUR) model for the later during estimation to get meaningful result.

## 4.3    Description of the Variables and Data Sources

**Dependent Variable: Growth Rate of per capita GDP (Sppp)**

Data on the growth rate of real per capita GDP is available in World Development Index (WDI 2007) for all countries. It measures the change in a country's production from year to year, measured as: $g = (y_t - y_{t-1})/y_{t-1}$. We use a uniform scale for all countries and express the per capita GDP in terms of purchasing power parity, which uses the international unanimous set of prices for all goods and services.

**Explanatory Variables**

**i.    Lagged per capita income ( $\ln y_{t-1}$ )**

This variable is used in growth models to control for the expected changes in growth rate. We use the natural log of per capita real income for the purpose. As discussed above, the data is available at WDI (2007).

**ii.    Gross fixed capital formation (Inv/GDP)**

Gross fixed Capital formation includes both public and private investment, as percent of GDP. It is calculated by taking the ratio of investment (net of depreciation) to GDP at factor cost during an accounting period. It consists of expenditures on addition to the fixed assets of the economy plus net change in the level of inventories. The components of fixed assets include land improvements, construction of roads, railways, schools offices, hospital, commercial and industrial buildings, plants, machinery, and equipment purchases; and the stocks of inventories and work in progress. Again, the data on this variable is derived from WDI (2007).

### iii. Population growth rate

Population growth rate is measured as the annual percentage change in population and the data is derived from WDI (2007). The population growth rate can be conveniently used as proxy for the growth rate of labour force. Theoretically speaking, there is a negative relationship between growth rate of population and growth rate of output.

### iv. Human capital

As discussed above, human capital is one of the most important determinants of economic growth and development. It is inculcated by both education and health. However, it is very difficult to measure human capital precisely since the concept is very vast. Several indicators, both for health and education, may be used for the purpose like enrolment rates in primary/ secondary/ tertiary education, student teacher ratio, technical training, occupational experience, life expectancy, morbidity and mortality rates, and adult survival rate etc. Even though, these indicators are useful for analysis purpose, but in case of small sample, the problem of degrees of freedom becomes crucial to get meaningful estimates. Further, there is a considerable degree of correlation between health and education. Health is a prerequisite for increase in productivity while successful education depends on adequate health. Similarly, the early childhood school-level relations create social network and strong ties with other families.

In view of these issues, it is suggestive to construct a composite index for human capital that combines the effect of both health and education. This methodology has been used by prominent researchers like Casey B. Mulligan and Sala-i-Martin (1995), Elbert, C. and Lanjouw J. (2001) and Savitra Abeyaseka and P. Ward (2002) in their analyses.

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In order to construct the requisite index, we use two main indicators namely, the gross enrolment at secondary level and the adult survival rate, as proxies for education and health respectively. The data on these indicators are available from WDI (2007) and other sources like UNESCO, UNHDR, MHDR, MICS. For this purpose, we follow the ordinary regression method. First we estimate the proposed equation (10) modified slightly as shown below, for both sets of countries:

$$y_{i,t}^{\wedge} = \beta_0 + \beta_1 \ln y_{i,t-1} + \beta_2 Inv_{i,t} + \beta_3 n_{i,t} + \beta_4 Ed_{i,t} + \beta_5 He_{i,t} + \beta_6 Sc_{i,t} + u_{i,t}$$

### Table 4.1 Growth Equation (10A)
### Dependent Variable: GDP per capita growth rate

| Independent Variable | SAARC Countries | OECD Countries |
|---|---|---|
| Constant | -0.191* <br> (-4.922) | 3.408* <br> (11.997) |
| ln $(Y_{t-1})$ | 0.987* <br> (155.07) | 0.73* <br> (38.154) |
| Investment Rate (Public and Private) | 0.00049 <br> (0.889) | 0.003*** <br> (1.800) |
| Population Growth Rate | -0.0013 <br> (-1.06) | -0.022** <br> (-2.403) |
| **Gross Secondary Enrolment rate** | **-0.00027*** <br> (-1.98)** | **-0.0001 <br> (-0.707)** |
| **Adult Survival Rate** | **0.0047* <br> (9.615)** | **-0.009* <br> (-4.285)** |
| Social Capital | 0.00077* <br> (3.026) | 0.00062** <br> (2.336) |
| Adjusted $R^2$ | 0.99 | 0.95 |

White heteroskedasticity corrected standard error has been used. Absolute values of t-statistics are in parenthesis.
*  Significant at 1 percent
** Significant at 5  percent
*** Significant at 10  percent

The coefficients of secondary school enrolment and adult survival rate so obtained (as shown in Table-4.1) are then multiplied with their respective series. We finally add the results year-wise to obtain a composite index for human capital. The indices for SAARC and OECD countries are given as:

**Human Capital Index Equation (SAARC Countries)**

$$Hc_{it} = [(-0.00027) \, Ed_{it} + (0.0047) \, He_{it}]$$

**Human Capital Index Equation (OECD Countries)**

$$Hc_{it} = [(-0.0001) \, Ed_{it} + (-0.009) \, He_{it}]$$

### v.    Social capital

As discussed earlier, social capital is also a very complicated concept and different virtues like mutual cooperation and interaction among members of the society, honesty, reliability and trustworthiness may be considered as its indicators. In most of studies, 'trust' has been used as proxy for social capital, for instance Helliwell (1996), Knack and Keefer (2007), Whitely (2000), Beauglesdijk and Schaik (2001), Temple (1998-2000), Helliwell and Putnam (1999, 2000), and Neira et al (2002) etc. The very reason of using 'trust' as a potential proxy for this variable can be easily understood since trustworthiness reduces transaction costs and facilitates the flow of information. Data on trust is available from World Value Survey (WVS)[3] and Asia Barometer. The WVS measures the generalized trust on the basis of the ideas developed by Rosenberg (1956). It encompasses several areas including social, cultural and political characteristics. The survey is conducted by the International Network of Social Sciences, which covers 80 economies since 1981 under the auspices of the Institute of Social Research, University

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[3]    Details are given in the appendix-1. The questionnaire is available on www. wvs.org

of Michigan. The main aim of the survey is to analyze the confidence of individuals in the society by asking a variety of questions as per the questionnaire (given in the appendix). The data on 'Trust' for SAARC and OECD countries is reproduced for ready reference.

## Table 4.2 Social Capital Data of Selected Countries

| SAARC Countries | Social Capital | OECD Countries | Social Capital |
|---|---|---|---|
| Pakistan | 37.78 | Finland | 57.2 |
| India | 34.3 | Sweden | 57.1 |
| Sri-Lanka | 11.06 | Denmark | 56 |
| Bangladesh | 30.78 | Nether land | 46.2 |
| | | United Kingdom | 44.4 |
| | | Ireland | 40.2 |
| | | Spain | 34.5 |
| | | Belgium | 30.2 |
| | | Germany | 29.8 |
| | | Italy | 26.3 |
| | | France | 24.8 |
| | | Norway | 61.2 |

**Source: World Value Survey (1995)**

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## 4.4 Descriptive Statistics

The summary statistics of dataset used for four SAARC countries (Table 4.2) and twelve OECD countries (Table 4.3) from 1995 to 2004 show an overview of the mean values and standard deviations of the variables that are included in the model. The inter relationship of the dependent variable (GDP growth rate) with human capita (education and health) and social capital (trust indicator) overtime is shown in Appendix-2 for both sets of countries.

| Table 4.2 | | | | | |
|---|---|---|---|---|---|
| Summary Statistics (SAARC Countries) | | | | | |
| Variables | Mean | S.D. | Min | Max | Observations |
| Real Per Capita GDP Growth rate | 7.68 | 0.31 | 7.19 | 8.27 | 40 |
| Per capita GDP (lagged) | 7.65 | 0.31 | 7.16 | 8.23 | 40 |
| Gross Capital Formation | 22.33 | 3.71 | 15.56 | 30.98 | 40 |
| Population growth rate | 1.85 | 0.42 | 1.09 | 2.46 | 40 |
| Human capital* | 49.14 | 18.74 | 19.00 | 82.50 | 40 |
| Health** | 65.24 | 5.10 | 54.47 | 74.20 | 40 |
| Social Capital*** | 28.48 | 10.489 | 11.06 | 37.78 | 40 |

\*      Secondary School gross enrolment rate
\*\*    Adult Survival rate
\*\*\*  Indicated by trust statistics

| | | Table 4.3 | | | |
|---|---|---|---|---|---|
| | Summary Statistics (OECD Countries) | | | | |
| Variables | Mean | S.D. | Min- | Max | Observations |
| Real GDP Growth rate | 2.51 | 1.92 | -0.74 | 10.56 | 120 |
| Per.capita GDP (lagged) | 10.16 | 0.165 | 9.75 | 10.59 | 120 |
| Gross Capital Formation | 20.28 | 2.61 | 16.07 | 28.28 | 120 |
| Population growth rate | 0.427 | 0.381 | -0.407 | 1.82 | 120 |
| Human capital* | 116.77 | 16.66 | 77.50 | 160.15 | 120 |
| Health** | 82.058 | 2.12 | 75.74 | 85.94 | 120 |
| Social Capital*** | 42.33 | 12.75 | 24.80 | 61.20 | 120 |

\*    Secondary School gross enrolment rate
\*\*   Adult Survival rate
\*\*\*  Indicated by trust statistics

## 4.5  Normality Tests

We have used Jarque-Bera statistical test 'for normality in distribution' in our data for both regions before estimation. The results indicate that the value of coefficient is 1.387 (with P-value 0.4997) for OECD countries and 0.172 (P-value 0.917) for SAARC countries. In both the cases, the results are insignificant, which means that the data for both regions is normal, in other words, no serious abnormality is detected in the data. The graphical representation of JB test is given below.
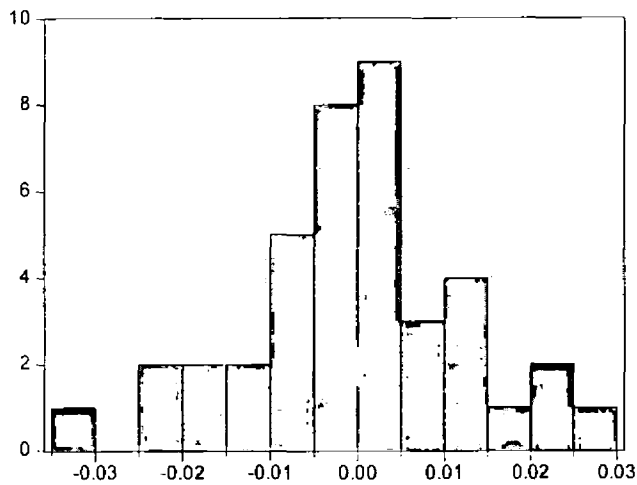
## OECD Countries
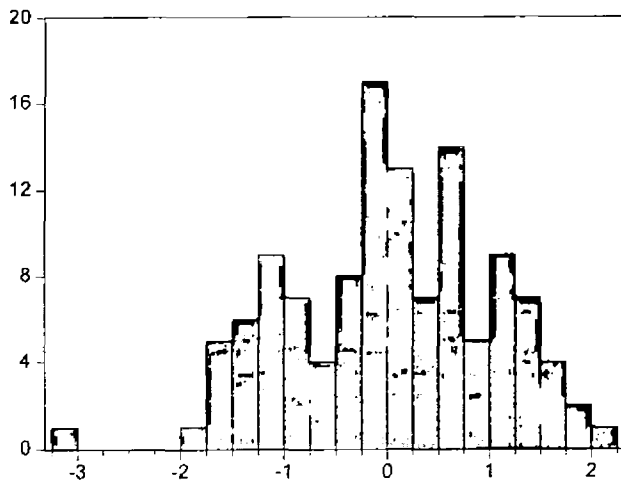


| | |
|---|---|
| Series: Standardized Residuals | |
| Sample 1995 2004 | |
| Observations 120 | |
| | |
| Mean | 0.030673 |
| Median | 0.048647 |
| Maximum | 2.194209 |
| Minimum | -3.216690 |
| Std. Dev. | 0.982874 |
| Skewness | -0.258601 |
| Kurtosis | 2.900075 |
| | |
| Jarque-Bera | 1.387414 |
| Probability | 0.499720 |

## SAARC Countries



| | |
|---|---|
| Series: Standardized Residuals | |
| Sample 1995 2004 | |
| Observations 40 | |
| | |
| Mean | -1.23e-15 |
| Median | -6.71e-05 |
| Maximum | 0.025912 |
| Minimum | -0.031139 |
| Std. Dev. | 0.012350 |
| Skewness | -0.159836 |
| Kurtosis | 2.969091 |
| | |
| Jarque-Bera | 0.171909 |
| Probability | 0.917636 |

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# World Values Survey[4]

World Values Survey is a global research project that explores people's values and beliefs, how they change over time and what socio-cultural and political impact they have.

It is carried out by a worldwide network of social scientists who, since 1981, have conducted representative national surveys in almost 100 countries. It is the only source of empirical data on attitudes covering a majority of the world's population (almost 90%).

The data is collected through a series of surveys carried out in 1981, 1990-1991, 1995-1996, 1999-2001, and 2005-2007. The surveys provide a more complete coverage of the world's societies and as the time series that has grown longer. It provides a broader range of variation than has ever before been available for analyzing the impact of the values and belief of masses on political and social life. The data also makes it possible to examine cross-level linkages, such as that between public values and economic growth, between environmental pollution and mass attitudes towards environmental protection and between political culture and democratic institutions.

The WVS measures, monitors and analyzes: support for democracy, tolerance of foreigners and ethnic minorities, support for gender equality, the role of religion and changing levels of religiosity, the impact of globalization, attitudes toward the

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[4] Reference the website: www.wvs.org

environment, work, family, politics, national identity, culture, diversity, insecurity, and subjective well-being.

The findings are valuable for policy makers seeking to build civil society and democratic institutions in developing countries. The work is also frequently used by governments around the world, scholars, students, journalists and international organizations and institutions such as the World Bank and the United Nations (UNDP and UN-Habitat). Data from the World Values Survey have for example been used to better understand the motivations behind events, such as civil unrest and political upheaval and also the changes taking place in basic values relating to politics, economic life, religion, gender roles, family norms and sexual norms. The values of younger generations differed consistently from those prevailing among older generations, particularly in societies that had experienced rapid economic growth.

The WVS has over the years demonstrated that people's beliefs play a key role in economic development, the emergence and flourishing of democratic institutions, the rise of gender equality, and the extent to which societies have effective government.

The WVS network has produced over 1,000 publications in 20 languages and secondary users have produced several thousand additional publications. The database of the WVS has been published on the internet with free access.

**Methodology**

The World Values Survey uses the sample survey as its mode of data collection, a systematic and standardized approach to collect information through interviewing

representative national samples of individuals. The basic stages of a sample survey are Questionnaire design, Sampling; Data collection and Analysis.

The questionnaire is translated into the various national languages and in many cases independently translated back to English to check the accuracy of the translation. In most countries, the translated questionnaire is pre-tested to help identify questions for which the translation is problematic.

Samples are drawn from the entire population of 18 years and older. The minimum sample is 1000 is used to obtain representative national samples. The sample is made based on the given society statistical regions, districts, census units, election sections, electoral registers or voting stations and central population registers. In most countries the population size and/or degree of urbanization of these Primary Sampling Units are taken into account, while in some countries, individuals are drawn from national registers.

The sampling in each country is left with a representative national sample of its public. These persons are then interviewed during a limited time frame decided by the Executive Committee of the World Values Survey using the uniformly structured questionnaires. The survey is carried out by professional organizations using face-to-face interviews or phone interviews for remote areas. Each country has a Principal Investigator (social scientists working in academic institutions) who is responsible for conducting the survey in accordance with the fixed rules and procedures. During the field work, the agency has to report in writing according to a specific check-list. Internal consistency checks are made between the sampling design and the outcome and rigorous data cleaning

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procedures are followed at the WVS data archive. No country is included in a wave before full documentation has been delivered. This means a data set with the completed methodological questionnaire, and a report of country-specific information (for example important political events during the fieldwork, problems particular to the country). Once the surveys are completed, the Principal Investigator has access to all surveys and data.

Each research team, which has contributed to the survey, analyses the findings according to its hypotheses. Because all researchers obtain data from all of the participating societies, they are also able to compare the values and beliefs of the people of their own society with those from scores of other societies and to test alternative hypotheses. In addition, the participants are invited to international meetings at which they can compare findings and interpretations with other members of the WVS network.

It is organized as a network of social scientists coordinated by a central body - the World Values Survey Association. It is established as a non-profit organization seated in Stockholm, Sweden, with a constitution and mission statement. The project is guided by an Executive Committee representing all regions of the world, which raises funds for central functions and assists member groups in their fundraising.

Mainly, it is funded by the Bank of Sweden Tercentenary Foundation. Other funding has been obtained from the U.S. National Science Foundation, the Swedish International Development Cooperation Agency (SIDA), the Volkswagen Foundation and the Dutch Ministry of Foreign Affairs.

## FIGURE: Behaviour of Countries

Annual change in per capita GDP growth rate VS human capital (secondary gross enrolment rate and adult survival rate) and social capital (generalized trust)

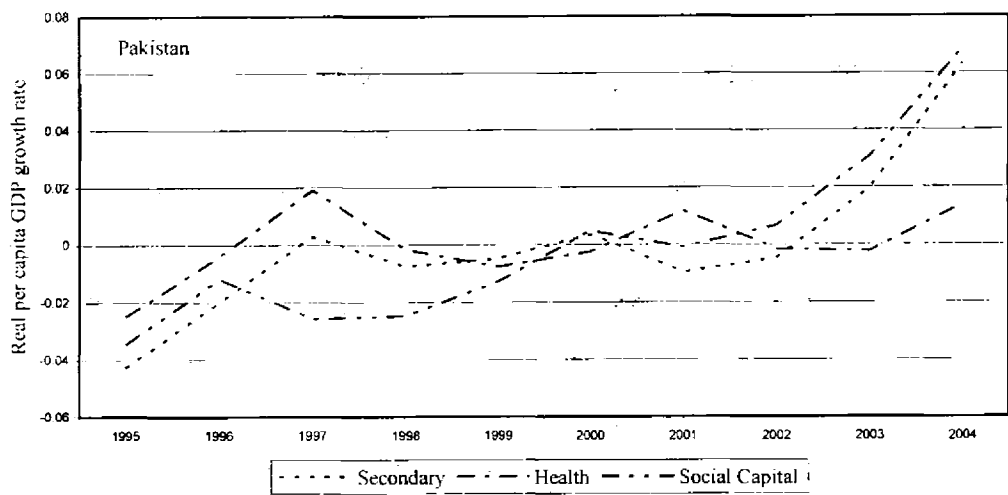## Behaviour of SAARC Countries

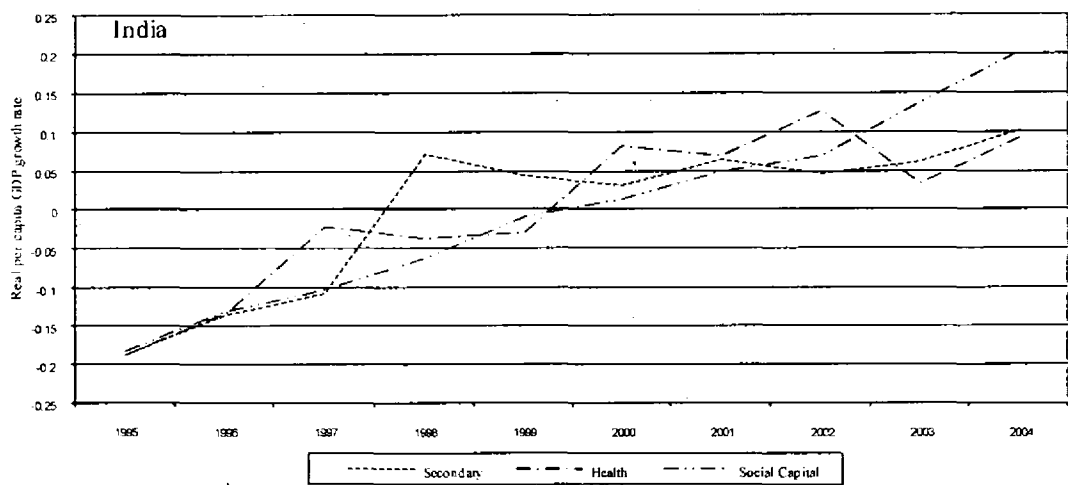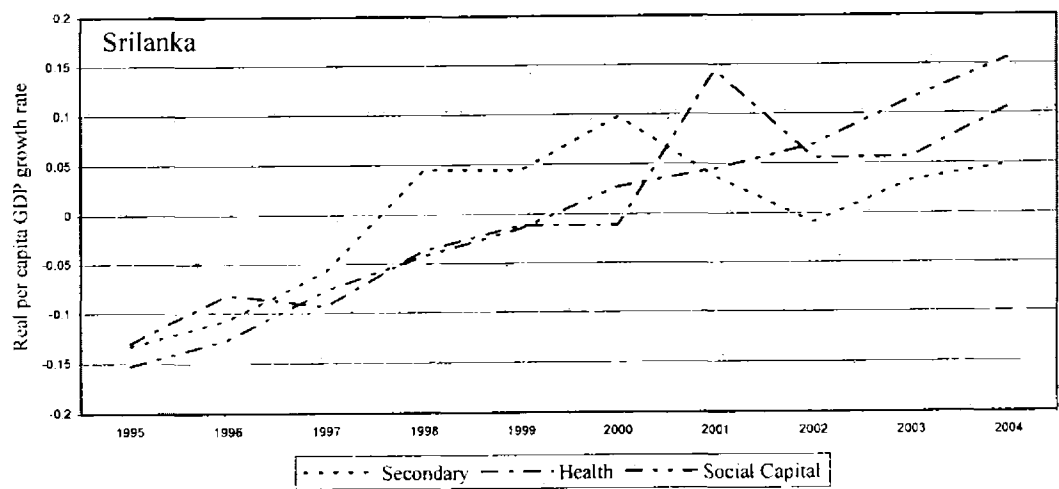### Fig 1 Pakistan (SAARC)



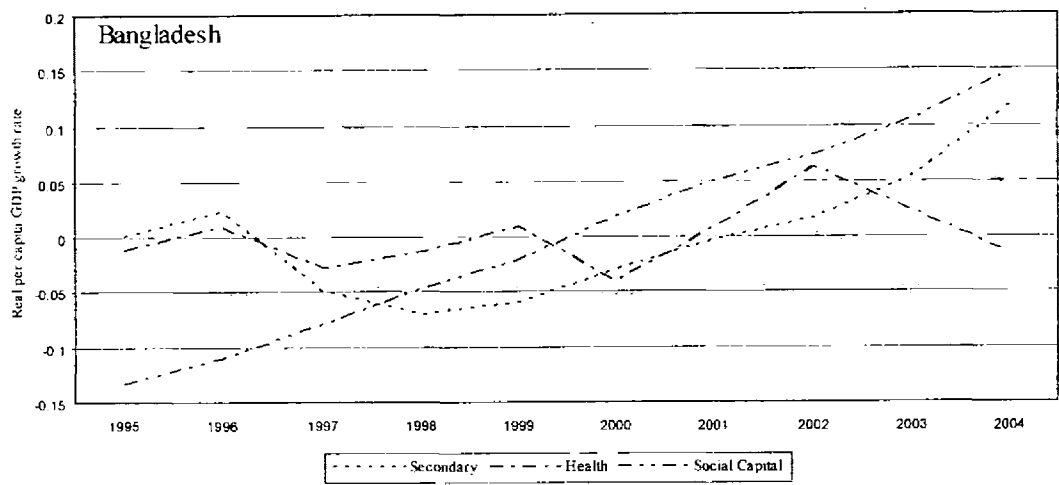### Fig 2 India (SAARC)

**Fig 3 Srilanka (SAARC)**



**Fig 4 Bangladesh (SAARC)**
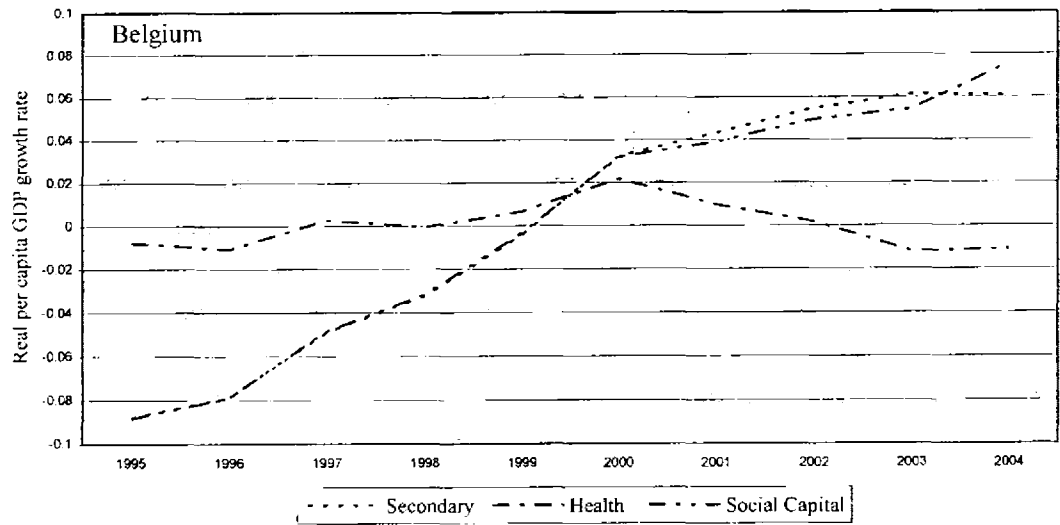
# Behaviour of OECD Countries
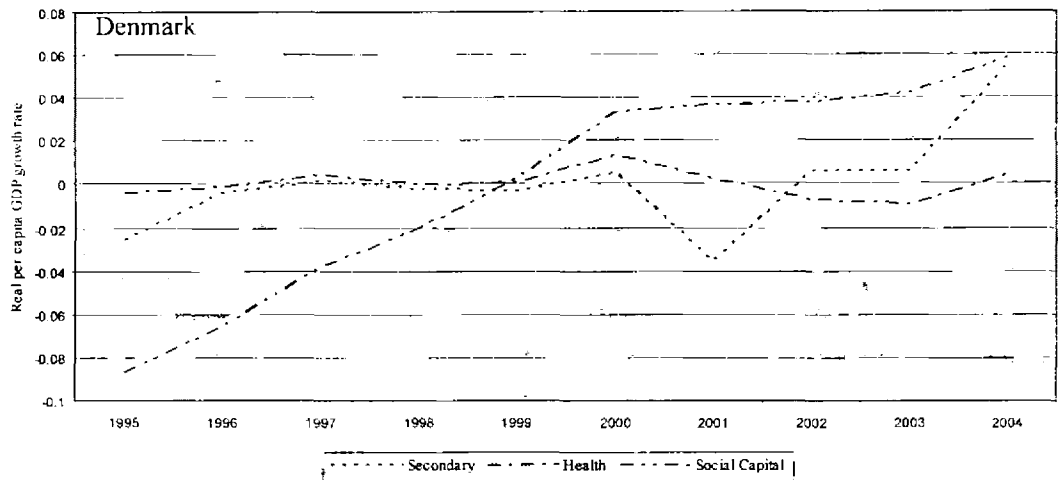
## Fig 1 Belgium (OECD)



## Fig 2 Denmark (OECD)

## Fig 3 Finland (OECD)



Finland

Real per capita GDP growth rate

Legend: ····· Secondary — · — Health — — — Social Capital

## Fig 4 France (OECD)



France

Real per capita GDP growth rate

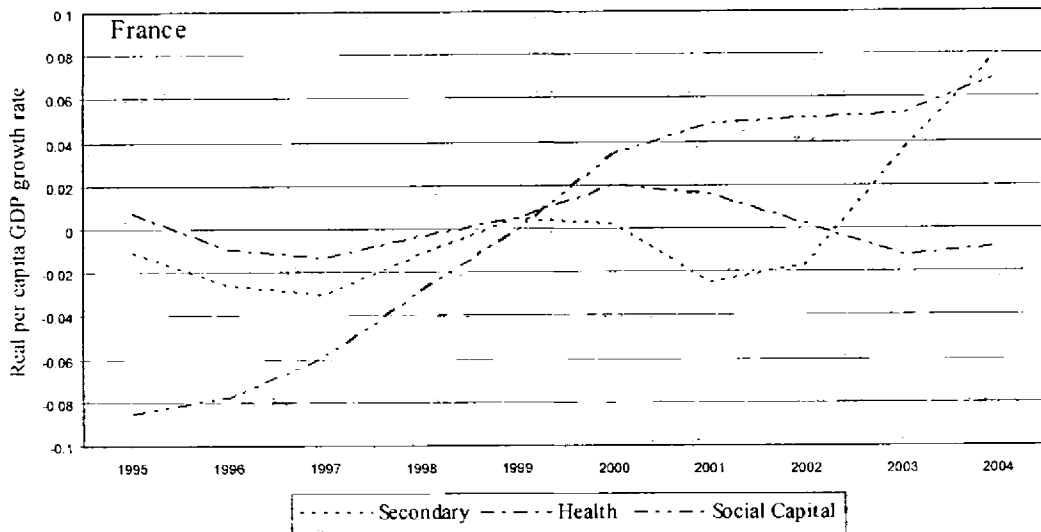Legend: ····· Secondary — · — Health — — — Social Capital
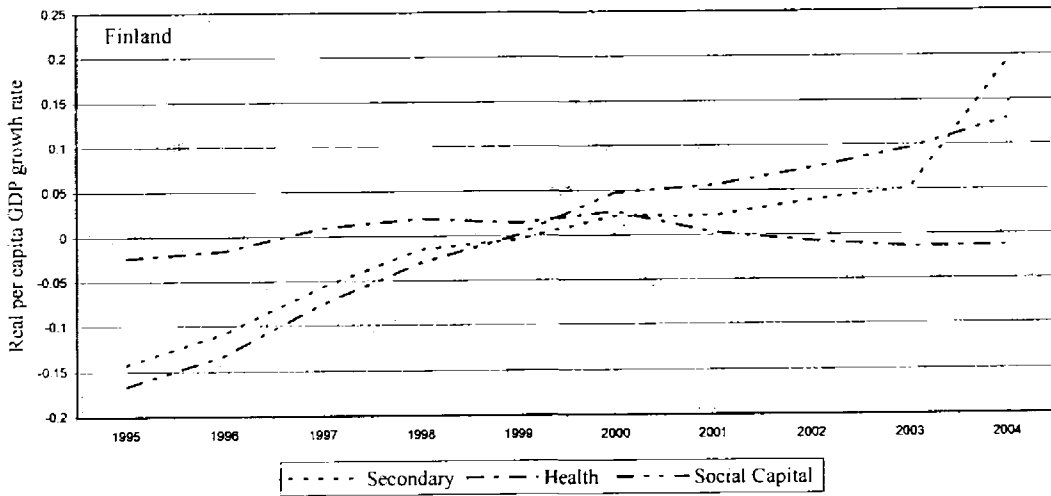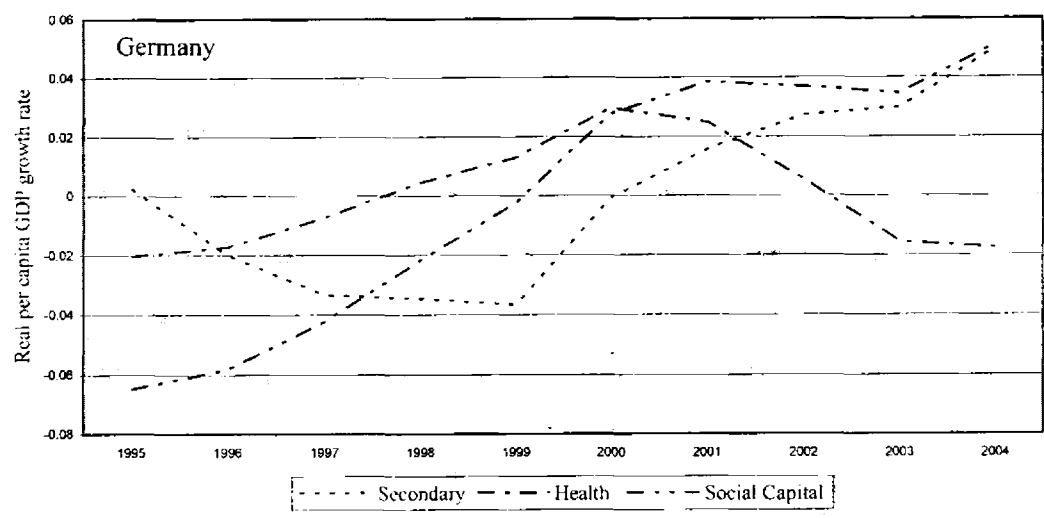
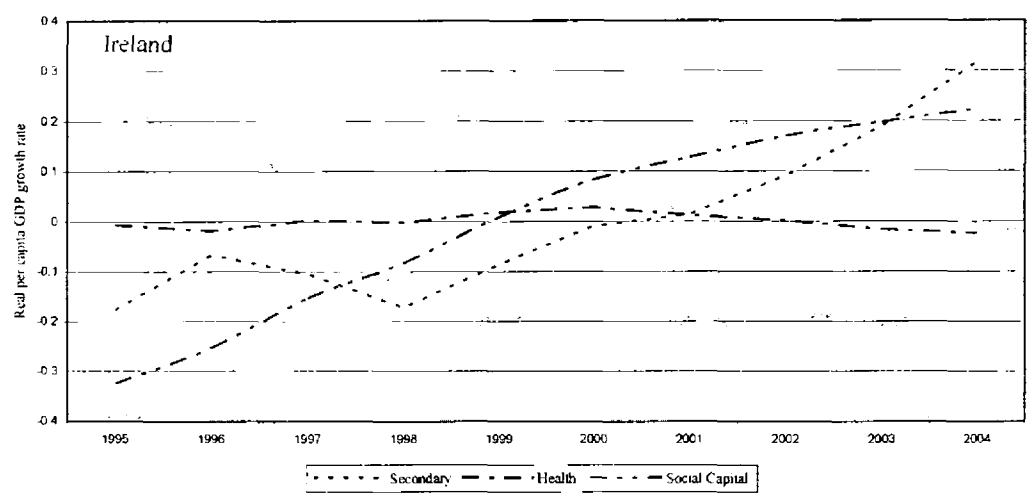## Fig 5 Germany (OECD)



## Fig 6 Ireland (OECD)
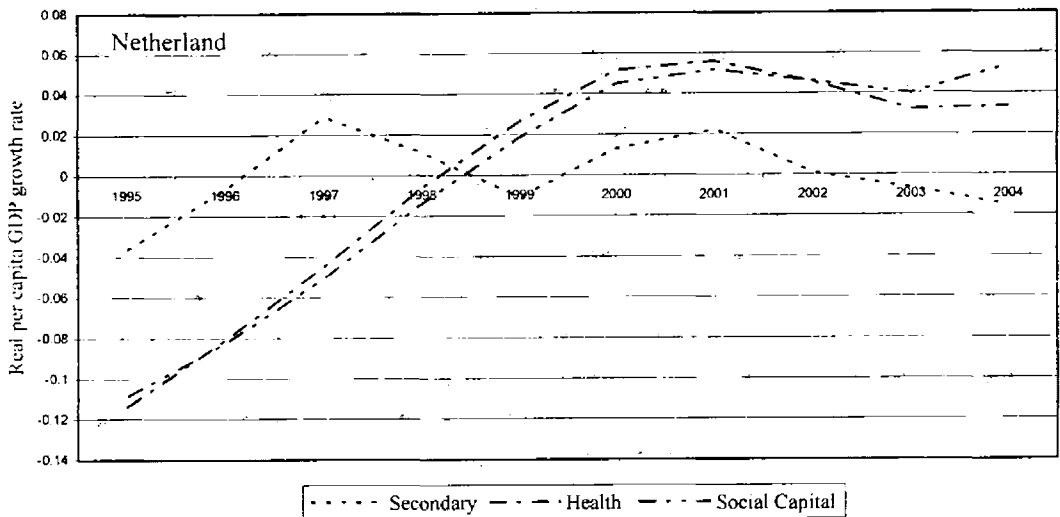
## Fig 7 Italy (OECD)
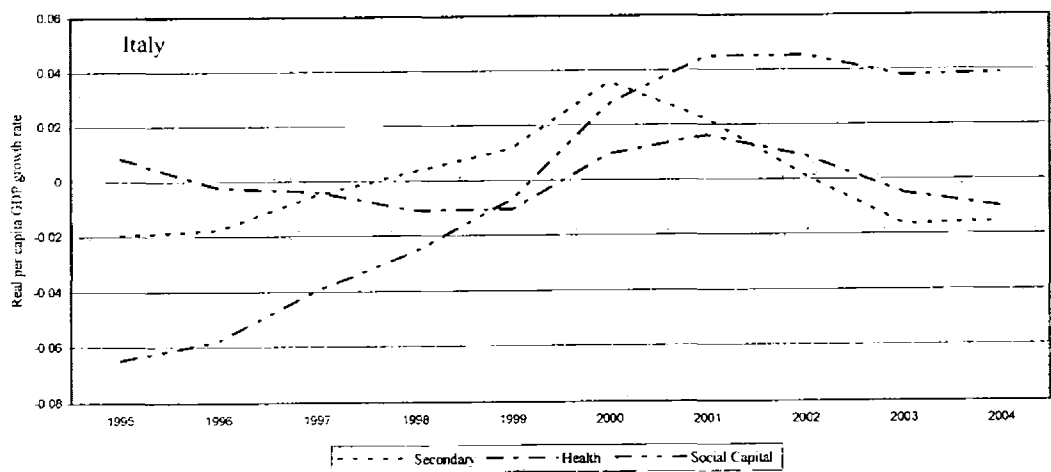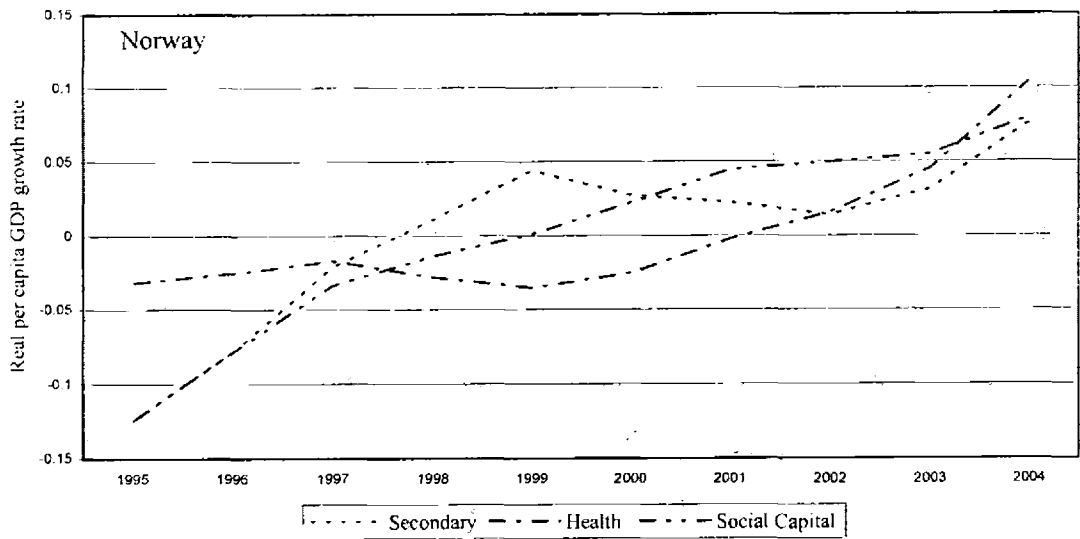


## Fig 8 Netherlands (OECD)



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**Fig 9 Norway (OECD)**
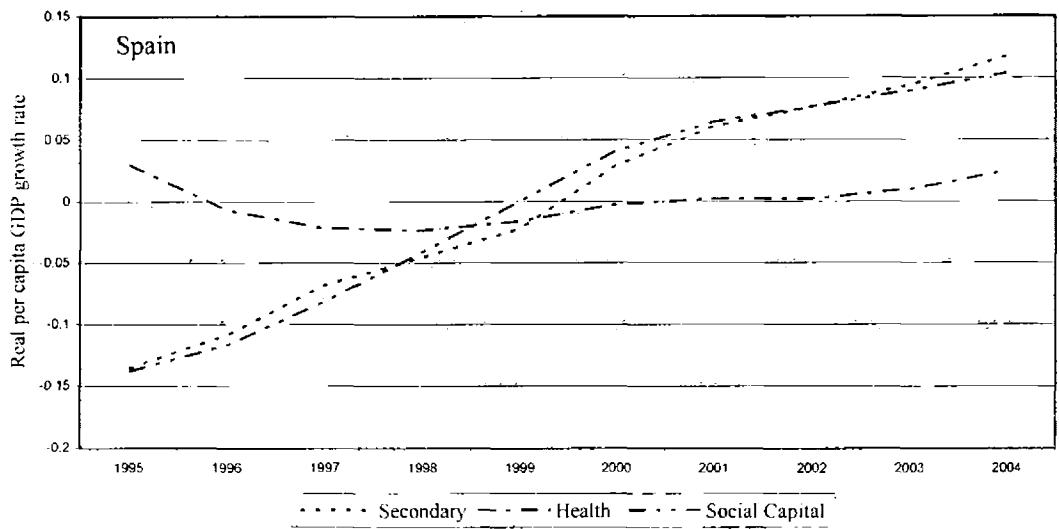


**Fig 10 Spain (OECD)**
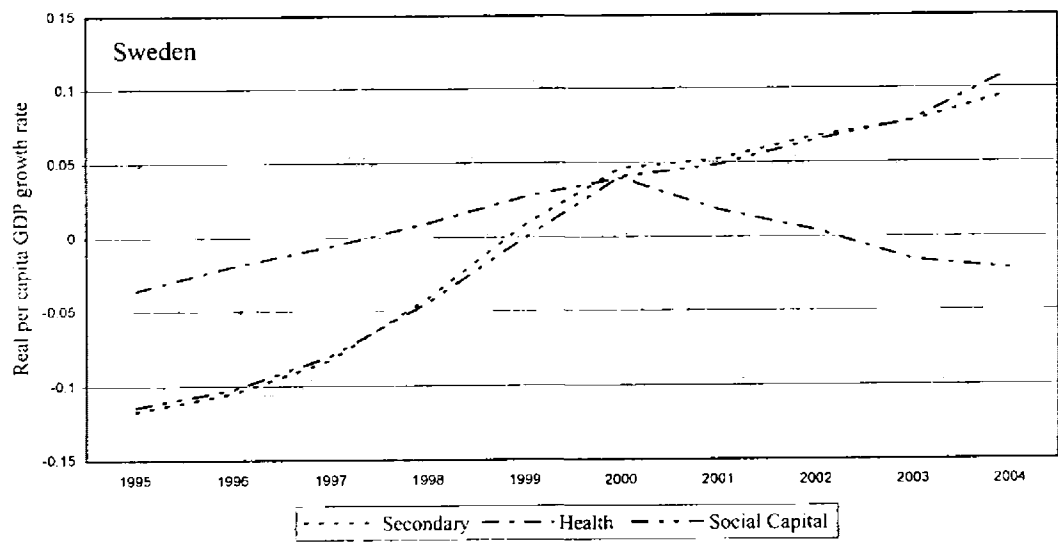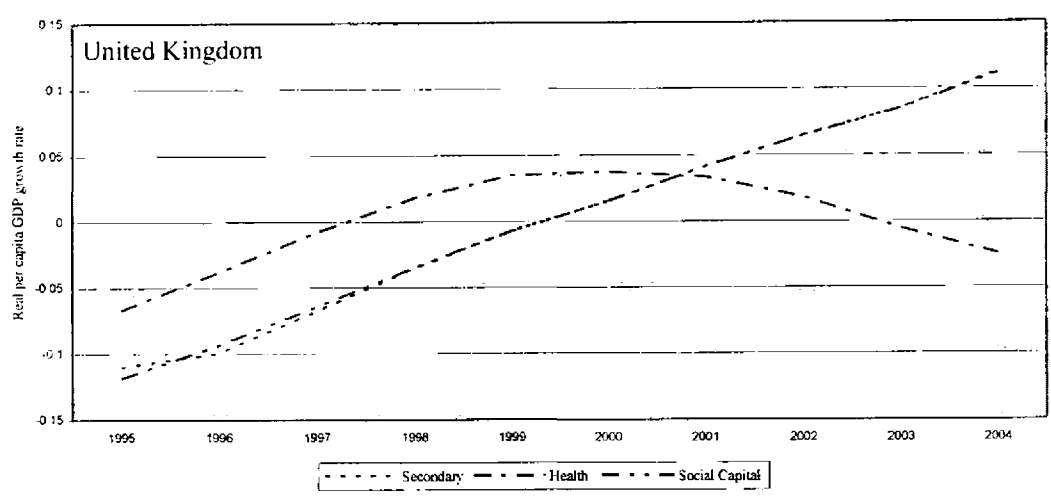
## Fig 11 Sweden (OECD)



## Fig 12 United Kingdom (OECD)



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# Chapter 5

## Empirical Results & Analysis

This study is devoted to highlight the importance of social and human capital for economic growth by focusing on the information available in two important regions of the world, i.e. the SAARC region, which is representative of low income developing countries, and the OECD region, which comprises the technologically advanced high income developed countries. The OECD may be taken as a standard point to which other nations may be referred for comparison in economic growth and material prosperity. These countries have demonstrated impressive rates of economic growth and maintained high standards of living over time along with social cohesion. The levels of absolute poverty and deprivation have significantly declined, which may be considered as the most preferred goal of every nation.

We have estimated the growth equation (No. 10: reproduced below for ready reference) for the two sets of countries (SAARC and OECD), using the panel data over the period 1995 to 2004 (separately for each block). We included the interaction term for human and social capital in one regression. however the results were insignificant. Therefore. we excluded the interaction term from final analysis.

$$y_{i,t} = \beta_0 + \beta_1 \ln y_{i,t-1} + \beta_2 Inv_{i,t} + \beta_3 n_{i,t} + \beta_4 Hc_{i,t} + \beta_5 Sc_{i,t} + u_{i,t} \text{-------- [10A]}$$

The estimations provide deep insights into the relationships among social and human capital and their impact on economic growth, which facilitates comparison between the two regions. First we discuss the results separately for the regions concerned and then pay attention to comparisons.

## 5.1 SAARC Countries Analysis

As discussed earlier, we have included four countries in the set (i.e. Pakistan, India, Bangladesh, and Sri Lanka) for which the data on social capital and other variables were available. As discussed in the previous chapter, we constructed a composite index of human capital that incorporated the school enrolment rate at secondary level as proxy for education and the adult survival rate as proxy for health indicators. Likewise, we derived data on 'trust' as indicator of social capital from the World Value Survey (2007) and on all other variables from WDI (2007). The estimated results are depicted in Table-5.1.

### Table 5.1 Growth Equation (SAARC Region)
### Dependent Variable: GDP per capita growth rate

| Variables | Coefficients | t-values | P-values |
|---|---|---|---|
| Constant | -0.288885* | (-5.017092) | 0.0000 |
| Log of per Capita income Lagged (PPP dollars) | 0.992024* | (234.0880) | 0.0000 |
| Gross Capital Formation rate (Public and Private) | 0.000838** | (2.703557) | 0.0106 |
| Population growth rate | 0.013755** | 2.249811) | 0.0310 |
| Human Capital Index | 0.004775* | (11.85969) | 0.0000 |
| Social Capital Index | 0.000858* | (4.943653) | 0.0000 |
| Adjusted $R^2$ | 0.99 | | |
| Mean. D. V. | 0.0000 | | |
| D.W. statistics | 1.774781 | | |
| Observations | 40 | | |
| White heteroskedasticity consisted standard error has been used. <br> *    Significant at 1 percent <br> **  Significant at 5  percent | | | |

It can be easily seen that almost all the variables included in the model strongly support the theory of economic growth. The empirical results show that the coefficients of lagged per capita income and investment (physical capital formation) are positive and significant. In particular, the population growth rate is not only significant but carries a positive sign, which indicates that labour force is the main ingredient of economic growth in developing countries like SAARC.

Likewise, the coefficient of human capital has the expected positive sign and is highly significant. According to the estimation, an increase by 1 percent in human capital increases the dependent variable by 0.47 percent. The coefficient of social capital is also positive and significant as shown above. The estimated results indicate that an increase of 1 percent in social capital increases the growth rate in per capita GDP by 0.08 percent. This reveals the importance of social capital in the growth process.

The overall results may be summarised: both human and social capital play a vital role in the process of economic growth for SAARC countries. Therefore, the governments concerned ought to adopt appropriate policies that would support and improve education. health and mutual trust and confidence within the societies.

## 5.2    OECD Countries Analysis

Next we look at the case of twelve OECD countries. The results of panel data GLS estimation for the period concerned 1995-2004 are reported in Table-5.2.

As expected, the coefficient of lagged per capita income and investment rate have the usual signs and significant. So far as the population growth rate is concerned, it carries a negative sign, although it is statistically significant. A plausible explanation for this

outcome may be the sub-optimal growth of population in OECD countries in general and

therefore, the growth rate in these countries is mainly explained by investment in physical

capital, human capital and technical progress. Other explanations can be found in

International Adult Literacy Survey (2004)[5].

## Table 5.2 Growth Equation (OECD Region)

### Dependent Variable: GDP per capita Growth rate

| Alternative Regressions | Coefficients | t-values | p-values |
|---|---|---|---|
| Constant | 2.878* | (13.1) | 0.0000 |
| Lagged logarithm of per Capita income (PPP dollars) | 0.775* | (45.93) | 0.0000 |
| Gross Capital Formation (Public and Private) | 0.00203* | (9.348) | 0.0000 |
| Population growth rate | -0.01347* | (-8.2002) | 0.0000 |
| Human Capital | 0.8586* | (9.936) | 0.0000 |
| Social Capital | 0.000363* | (3.4699) | 0.0007 |
| Adjusted $R^2$ | 0.99 | | |
| Mean. D. V. | 202.8461 | | |
| D.W. Statistics | 1.80 | | |
| Observations | 120 | | |
| White heterosckedasticity corrected standard error has been used. * Significant at 1 percent ** Significant at 5 percent | | | |

However, we are more interested in the impact of two variables, namely the human and

social capital. The co-efficient of human capital is positive and highly significant. This

result is quite consistent with that arrived at by other researchers like Englander and

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[5] Published by Minister of Industry, 2004 – Statistics Canada, Ontario KIAOT6

Gurney (1994) for OECD countries, Gemmel (1996) and Mankiw et al (1992) for the developed and developing countries. The result indicates that an increase by 1 percent in human capital will increase economic growth by 0.86 percent.

So far as the case of social capital is concerned, we observe that the coefficient is positive and significant. The results indicate that an increase by 1 percent in trust among the individuals will increase the economic growth by 0.036 percent. The overall results may be summarised: iIn addition to the traditional factors, both the human and social capitals play a vital role in the process of economic growth in OECD countries.

## 5.3    Comparative Position of SAARC and OECD Regions

We are now in a position to compare the two groups of countries in terms of the determinants of growth, specifically human and social capital. The results are reproduced and presented in Table-5.3 to facilitate comparison.

**Table 5.3: Comparative Position of SAARC and OECD Countries**
**Dependent Variable: GDP per capita Growth rate**

| Independent Variable | SAARC | OECD |
|---|---|---|
| Human Capital | 0.004775*<br>(11.859) | 0.8586*<br>(9.936) |
| Social Capital (Trust) | 0.000858*<br>(4.944) | 0.000363*<br>(3.470) |
| Observations , | 40 | 120 |

White heteroskedasticity corrected standard error has been used.
Absolute values of t-statistics are in parenthesis.
*    Significant at 1 percent
**   Significant at 5   percent

As explained in the relevant sections, the impacts of conventional factors like the lagged value of per capita income and the investment rate on growth rate are significant and carry the correct signs for both sets of countries. The case of population growth rate is however converse for both sets, it is positive for SAARC but negative for OECD bloc; for which the explanation is already given. However, our focus has been on human and social capital to see the difference between the developing and developed world in these areas. The human capital, measured by a weighted index of education and health has significant impact on growth rate for both sets of countries. The results show that the overall impact of human capital on economic growth is high in OECD countries as compared to that in SAARC countries. This outcome seems to be natural since the level of human capital is very low in the SAARC regions as compared to developed countries.

Despite the fact that SAARC countries have performed well in improving their literacy rate over the past decade (1995-2004), yet the gross enrolment rate at primary school level is far below the comparative position in OECD countries. While India. Sri Lanka and Bangladesh have achieved appreciable improvement in this respect during the past decade, Pakistan is still lagging behind. Same is the case with secondary level education. The overall gross enrolment rate at secondary level has shown only little improvement from 43 to 53 percent in SAARC region during the last ten years. This is because the governments in this region are spending only less than 3% of their GDP on basic education, which is far below the standards in OECD countries[6].

So far as public health is concerned, the SAARC countries have made significant efforts towards improvement over the past decade as evident from the key health indicator,

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[6] Source of this information

namely life expectancy at birth, which has increased from 62 to 64 percent during the period under reference[7]. However, these countries could spend hardly 1% of their GDP. on the average, on health sector due to scarcity of resources. As such, the SAARC countries are still lagging behind in HDI ranking when compared to OECD countries (MHHDC 2007). It can therefore be concluded that SAARC countries can embark speedily on the rout to sustained growth provided they continue and accelerate their efforts in improving the conditions of health and education.

Next we look at the position of social capital as proxied by "trust" indicator. Although the results are positive and significant for both groups, these are much stronger in OECD countries in favour of economic growth than in SAARC countries. The reasons are obvious. The SAARC countries are facing a number of socio-economic problems and challenges, like wars and conflicts, political disturbance, crimes, ignorance, poverty and inequality, focus on group interests and the general neglect of the broader public interest etc. All these factors are responsible for encouraging the socially destructive activities like selfishness, cheating and rent seeking that lead to reduce mutual confidence and trust in the societies as also pointed out by Olson (1982) and knack (1999).

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[7] Source of this information

# Chapter 6

## Conclusions

### 6.1    Summary

We have attempted to evaluate the impact of human capital and social capital on economic growth for developing countries; of course in combination with other determinants like physical capital formation and labour force etc. We have carried out this analysis in a comparative fashion by involving two groups of countries with vast difference in their stages of economic development. The economically advanced countries are represented by twelve OECD members and the developing countries by four members from within SAARC. The growth rate of real per capita income is regressed upon the determinants concerned. using the generalized least square (GLS) technique while drawing the data from standard sources for the period 1995-2004.

We have used two alternative proxies for human capital index, namely the level of education is represented by the gross enrolment rate in secondary schools and the condition of health is indicated by the adult survival rate. Although both the proxies for human capital are questionable. but due to data constraints, we could find no alternative. Further, many researchers have also used these indicators in analysis as evident from the study of literature. We have tried to minimize the inadequacies by constructing a weighted index of human capital with the help of the two components. The case of social capital was more complex as it was not easy to find appropriate indicator for this variable. As discussed earlier, social capital involves honesty of economic agents, seriousness and devotion of workers, national spirit and sense of responsibility, mutual trust and reliability of individual, both employers and employees. The use of this variable

*in* studies on growth and development is rather naïve and appropriate data on different indicators is very scarce. Fortunately, the data on 'trust' is now available and we have utilized the indicator (World Value Survey) in our analysis.

We have followed a panel data approach and utilized the latest available and efficient technique of estimation (GLS). We have confined our analysis to the regions which are relatively intra-homogeneous in certain characteristics like the level of income, ethnicity, culture, socio-economic status etc but with crucial inter-regional differences as evident in terms of these characteristics. We have employed the appropriate statistical tests for evaluation of the results and drawing conclusions. The inclusion of social capital in the augmented growth model has confirmed its importance along with other conventional determinants.

In general, the results indicated that both human and social capital have positive influence on economic growth in both regions/sets of countries. In particular both the variables are more significant and have stronger impact on growth in the developed countries (OECD), which means that developing countries (SAARC) have yet to cover a long distance to reach the highly desirable goals of human and social capital; and only then these countries can expect a respectable and sustained pace of economic growth. If the availability of physical factors like capital stock and the labour force etc are the necessary conditions for sustainable growth, it is doubtless to say that appropriate levels of human capital (appropriate education, technical know how and good health) and social capital (honesty, strong will, devotion, sincerity and mutual trust among members in the society) are the sufficient conditions for the said objective. Both the human and social capitals

have an indirect effect, i.e. they reinforce the physical determinants in the growth process and help in solving the socio-economic issues with much ease.

## 6.2 Policy Implications

For the policy purpose, the government and society must have to focus on the development of both social and human capital and give them priority so as to enable the individuals, families, societies and nation as a whole to cope with the demands of social and economic challenges, which are coming forth very rapidly.

First, human and social capital should be promoted formally and informally at the work place as well as at the family and community levels and the government must have to support these endeavours. Second, as the two variables are mutually reinforcing, so the provision of compulsory minimum education should be the prime responsibility of the government for the development of trust and reliability among the individuals (Sabatini 2006, Dowla 2006). Social capital is an important component of means and ends of development. The importance of education and health needs not any explanation; therefore investment in human capital is an effective policy for reducing regional gaps and poverty and for elevating the level of GDP and economic growth (Belton et al. 2007).

The education policy should be targeted towards creation of cooperation, among other objectives, so that people should solve problems themselves rather than looking towards the government. Awareness about social capital helps in doing the following three things. (i) to diverge from the assumption of homo-economics and to extend our analysis by taking into consideration unselfish and cooperative behaviour as well as non-wage incentives to improve productivity, (ii) to facilitate an integrated approach of interaction

among economic, social and technological factors and (iii) to face the issues of growing importance of social interactions in the global framework (Takashi, 2003). Social capital is very important for the areas where education level is low and law enforcement is weak.

However, all these measures need availability and proper allocation of resources. The present level of public expenditure on education, health and other social sectors in the developing countries is discouraging. In fact, nothing is left for social sector after allocating to defence, debt servicing, law and order and administration. It is evident from the structure of annual budgets in developing countries that governments are continuously in the process of shedding off the responsibility of health, education and other social services over time. These areas are being transferred progressively to the private sector over the past decade and now considered to be good for business and profit making. Higher education and adequate health facility is now beyond the reach of huge majority of population. Keeping in view the prevailing situation, the society has to come forward in building suitable institutions for providing quality education and adequate health services to poor masses at lowest possible cost. The educational institutions have to focus on character building to inspire mutual trust and sense of responsibility among the individuals, which have been badly shaken by the severe issues of unemployment, inflation, poverty, increasing gulf between rich and poor, political instability, fear and frustration due to terrorist activities, wars and conflicts, and deteriorating law and order situation. Both the governments as well as the societies at large have to think seriously on the prevailing issues.

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