Resource Allocation among Consumption, Labour Supply, Human Capital, Social Capital and Religious Human Capital:
Theory and Empirical Analysis

Dissertation
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by;
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2007
In The Name of Allah, the Most Kind, the Most Merciful
Countless Salutations
and Dedication
To The Holly Prophet Muhammad
Peace Be Upon Him and His Progeny,
Whose Prime Objectives (Based on Divine Principles) and Deeds
Were To Promote the Interests of Humanity
Even Sacrificing Themselves
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This long endeavor taught me a number of observable lessons that it is frequency and effective time allocation on the occasions of needs that develops and strengthens co-feelings, indebtedness and reciprocity, thereby, accumulate social capital between teacher and student,
friends, brothers, close kin and affine, group and community. This social capital is owned throughout their life. It draws its roots from old proverb ‘a friend in need is a friend in deed’.
Abstract

This study is an attempt to find more and diversified areas of resource allocation and the factors affecting decision making of individuals in this regard. An individual’s allocation of resources (time and money) depends on economics, social, demographic, religious and environmental variables. Study extends some earlier work to the analysis of individual’s utility maximization out of available budget of money and time by allocation into five activities namely; consumption, labor supply, human capital, social capital and religious human capital. The cost (marginal cost) of investment in human capital, social capital and religious human capital is incurred in one and the same period and returns from human capital, social capital and religious human capital are accrued in next period. All types of capital are relational to each other. The path of wage rate is determined by the variables human capital, social capital and religious human capital. Similarly behavior of time allocation to labor supply also depends on time allocation to social capital and religious activities in addition to its complementarity with time allocated to consumption.

Our mathematical results imply that in equilibrium marginal returns in future from investment of time in human capital, social capital and religious human are equal. So equilibrating process imply that allocation of time between human capital, social capital and religious human capital will be readjusted until the returns from all types of capital are equalized.

The study presents a social capital matrix to explain that social capital accumulates in one or more than one dimension and in different forms. Such a matrix can show how a variety of reciprocal relations, mutual exchanges and social infrastructure exists and interacts. Some of our empirical results are contrary to studies pertaining to conventional economics or the economics of religion and others support newly developed Divine Economics Framework. While some results are exclusively innovative with regards the role of religious stock as an externality to determine resource allocation. The stock of religious human capital in a household affects individual to make decision regarding resource (time and money) allocation to make investment in consumption, labor supply, human capital, social capital, and religious human capital.
Chapter 1

INTRODUCTION

1.1 Background

An Individual allocates time and money in different activities such as consumption, labor, human capital and social interaction. Recently, faith based activities of individuals have also been recognized as one of the areas in which individuals can allocate their resources. These activities are inter-related to one another. The nature of this inter-relationship may be influenced by factors such as value of time and money to the individual, preferences of individual, age of individual and other factors affecting preferences’ structure of individuals. The decision making of the individual is also influenced by returns from various activities. Individual makes investment to accumulate human capital that in turn enables him/her to get returns [see Becker 1965, 1975 Barro, and Sala-i-Martin 1995, 2004, Ben-Porath 1967 Rangazas 2002, and 2005]. The level and pattern of investment determine returns from human capital [Becker 1965, 1975, Ben-Porath 1967 and Mincer 1974]. An individual invests in human capital and other complementing or substituting activities that directly or indirectly affect such returns. Individual’s time allocation decision has a set of benefits and opportunity costs. Time allocation in human capital and labor supply is related to each other in a systematic manner [Becker 1965, 1975 and Ben-Porath 1967]. Resource allocation\(^1\) by individual in labor supply and social capital is interrelated; [see Putnam, 1995, and Costa and Kahn 2003]. Investment decision of an individual in human capital is influenced by investment in social capital only. A number of other studies are also available that discuss resource allocation in the above mentioned activities.

\(^1\)Throughout the document Resource allocation by individual’s mean; allocation from ones’ time and money resources, if specified otherwise.
Significance of social aspect of human life is recognised and incorporated in systematic economics research by studies such as Grootaert and Bastelaer (2002), Temple (2001), Coleman (1990) Putnam (1995, 1997 and 2000) and Woolcock (1998). Schmid (2003) noticed that physical capital, measured in dollars and person-hours of work in the aggregate production function, did not explain growth in output very well. Therefore, role of social capital has to be included in overall economic analysis of time allocation in economic growth. The time is allocated by individuals in various social activities to accumulate social capital in different dimensions that enable to get private and societal return [for example Putnam 1995, 1998, 2000, and Woolcock, 1998].

The resource allocation to attain human well-being through social capital is widely discussed in the literature. Helliwell (2003 and 2004), along the lines of Aristotle and Durkheim highlighted the significance of social capital in well being of human life. Kahneman et al; (1997); Kahneman et al. (2004) and Kahneman and Riis (2005), have discussed human well-being through integrals of experienced utility and compared with ‘unremembered utility’. King et al. (2003) worked out the measures of life satisfaction in line with social capital. Different models of incomplete information help to explain how bonds strengthen trust with use of social capital [for more discussion, see Blonski, and Probst, 2000, and Sobel, 1985]. James (2000) noted that many times, firms in different societies make economic decisions dominated by their social system and even discriminate labor force despite their potential level. Social aspects of human beings are also associated with their religiosity. Schiller and Garang (2002) observe “Incident reminds us that there is much to learn about religion’s role in strategic agendas for change by examining group’s internal
religious issues even when investigating its members’ tactics for settling apparently non-religious inter-ethnic disputes”.

Role of religion in economic decision making has been recognized by economists like Iannaconne (1990) and Hamdani (2004). The concept that faith in life hereafter may systematically affect economic behavior, is getting rapid recognition. The introduction of home production model by Becker (1965) was another breakthrough which paved the way for inclusion of non-conventional variables in economic models. This model assumes that household is a mini firm that maximizes its output by combining market-purchased inputs with own time. Consequently, many economists included religion variables in theoretical and empirical studies [Azzy and Ehrenberg 1975, Iannaconne 1990, 1992, 1998, and 2000, Pollak and Watcher, 1975]. Allocation of resources and its investment pattern have been studied during different times in various parts of the world, for example works of Becker (1965, 1975, 1993), Gronaue (1977), Long and Settle (1977) and Zaman (1992). Azi and Ehrenberg (1975) studied allocation of time in religion as well as economic activities. Iannaconne, (1990, 1992, and 2000) made significant pioneering contributions in economics of religion and explored many new dimensions. He pointed out that an individual’s time allocation in market and religious activities is made jointly. However, these studies remained confined in perspective of one religion i.e. Christianity. Need was felt for a model which might represent religious view of all divine religions in economic analysis. Realizing this deficiency [Hamdani and Ahmad, 2002 Hamdani, and Khalid, 2003, and Hamdani, 2004] introduced time allocation in a much general manner under the title of Divine Economics framework. These studies point out that investment decision by an individual is jointly made in view of current utility of consumption in this life and expected utility due to current allocations in life-hereafter. These
studies also documented that individuals across different religiosity levels reflect relatively distinct resource allocation plan in volunteering, donation, labor supply, religious activities and self care. As Hamdani (2004) proposes:

“Time is valuable whether it is used for paid work, leisure, voluntary activity or worship, the hours of wage work can be regarded as a measure of human capital, which together with non-human capital assets can be used for generating income, leisure, voluntary work or worship”. (P-114)

Although this model paved the way for deeper investigation in economic behaviors, yet it did not explicitly deal with human capital, and religious human capital. It is inferred from findings of different economists that investment of time and money in human capital and labor supply is inter-related. The investment of resources by individuals in human capital and social capital is also influenced by each other. Hence, there is a need to explore how deeply and in what direction these activities are inter-related.

In present study, we attempt to review works pertaining to allocation of resources and investment patterns along with their returns to human capital, social capital and religious human capital.

1.2 Need and Importance.

To know about human beings and their different aspects of life, such as social, religious and economic aspects, are persistent phenomena over the ages. Historically, human beings evolving from different societal and social organizational stages, have recognized the role of religion, social inter-action and investment in self. The urge to know in depth about human behavior in a particular society or time period, has most oftenly been contextualized in isolation. Economists have worked on different economic dimensions of human behavior with different means either in classical way or Ricardian or Keynesian way. These efforts brought
them closer to know about economic aspects and processes and role of human beings in the whole scenario. Simultaneously, isolated efforts were also continued by other disciplines of knowledge to know about different aspects of human being such as social, religious, political, psychological etc. The emerging trend of interdisciplinary research and studies also opened vistas of religious aspects of human life for economists, so eminent works in this regard were made by Barro and Mc Cleary (2003), Azzy and Ehrenberg (1975), Iannaccone (1990, 1992, 1998, and 2000) and Hamdani (2004). Further extensions and improvements in intra-disciplinary research and understanding of humanbeings invoked urge to know about its other aspects. Understanding of a human being is rather a complex phenomenon which can better be studied in holistic framework, so conventional economic interpretation of an individual seems an incomplete reflection of humanbeing [Lucas 1988, Romer 1986, Coleman 1990, and Schmid 2003].

Realizing significance of the matter that a human being needs to be studied with respect to its social, behavioral and other aspects, different economists such as Lucas (1988), Bowles and Gentis (2001), Heckman (1998, 1999, 2000, 2001, and 2003), Becker (1964, 1965, 1975, 1976, 1991) and Coleman (1990 and 1988) have provided strong insights in this regard that need further enquiry.

There is no dearth of analytical work on time allocation on such grounds. Both static and dynamic models of time allocation have been developed and empirically tested. However, no formal and integrated study, pertaining to social capital, human capital, and religious human capital in a holistic perspective has yet been carried out, which is essential for a comprehensive understanding of economic systems. Whatever work is available, it is mostly scattered. Therefore, there is a need to study humanbeings in multidimensional areas of social,
relational and economic life in a more holistic perspective, by observing this nature of relationship with other conventional economic issues. For comprehensive understanding of the mechanism of resource allocation, it is imperative to know the areas in which resources are allocated and to identify determinants of resource allocation. More specifically, one needs to answer the following questions;

- Where are the resources allocated?
- What are determinants of resource allocation?
- What is the process of resource allocation?
- What are the implications of resource allocation?

Although Becker’s work is a significant contribution in the literature on time allocation with respect to investment in human capital and earning, however, there is still a room to know about allocation of time and its investment in other areas. These areas of investment complement or substitute accumulation of human capital that directly or indirectly affect returns from it. In addition to labor force participation, consumption and human capital, time and money are also invested in social capital and religious human capital. This investment pattern and its impact on returns to human capital, social capital, and religious human capital will be modeled and analyzed in this study.

The present work attempts to extend Becker’s (1975), human capital model along the lines recently introduced by Hamdani (2004) in faith-based life cycle time allocation model. However, Becker’s (1975) model focuses on utilization of total endowment of time and money in only three activities namely consumption, labor force participation, and human capital. It seems that Becker’s model may be a partial reflection of total resource allocation, whereas, Hamdani’s model mainly supplements it with religiosity. Both these frameworks do not reflect deeper analysis of resources in social capital and religious human capital. The
present study proposes that total resource allocation by individual is made in five activities; viz-a-viz, consumption, labor force participation, human capital, social capital and religious human capital.

Despite the fact that the role of religion is now well recognized in economic literature, human capital has not, yet been viewed in joint perspective of religion and social capital. Given the paramount importance of above aspects of a humanbeing’s life; we feel urge to go ahead in this area. It is also desired to know about the nature of social capital and its association with other types of capital, i.e. human capital and religious human capital. Variability in different dimensions of resource allocation and the factors affecting it, are also taken into account for analysis. We analyze various dimensions of resource allocation within social capital and introduce social capital matrix.

1.3 Study Objectives:

The main objectives of the study are:

1. To identify the process of resource allocation among consumption, labor supply, human capital, social capital, religious human capital and extend it along the lines of Becker (1975) human capital model and Hamdani (2004) faith-based life cycle time allocation model.

2. To review the existing literature on social capital and identify some of its neglected dimensions.

3. To empirically test the proposed framework using cross-section data of Pakistani households.
1.4 Organization

The study is organized in a way that chapter 2 presents literature review on human capital, social capital and religious human capital, followed by a survey of empirical literature. The review includes historical developments in resource allocation theories; Becker’s model of human capital, conventional and new theories of human capital. It also includes different types of social capital and religious human capital.

Chapter 3 proposes theoretical model of resource allocation in consumption, labor supply, human capital, social capital and religious human capital. It also discusses alternative channels through which social capital can be accumulated with the help of social capital matrix. In chapter 4, an empirical model of resource allocation is specified in terms of a set of regression equations. In the later part of this chapter, an empirical model for social capital matrix is presented. Chapter 5 highlights data issues and descriptive analysis. The methodological issues are classified. Estimation and results are presented and analysed in chapter 6, while chapter 7 concludes the study.
Chapter 2
LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the existing work on resource allocation in different activities of human life. It also highlights the works done on human capital theory and its applications. Seminal works on investment in social capital and its accumulation in different dimensions are reviewed in this part. Furthermore, a review of progress in the field of economics of religion and resource allocation with special reference to religious human capital is also provided. A review of some of important studies is provided below.

An individual’s allocation of resources (time and money) for enhancing his/her utility in life depends on economic, social, religious and environmental factors. The individual allocates resources in different activities and makes investment in order to obtain higher economic returns. These returns may be obtained in different stages of the individual’s life such as early age, middle age, later age, or in other words pre-employment, during employment and post retirement lives. An individual makes his/her resource allocation decision keeping in view private as well as social returns from various activities. Individuals’ time allocation preferences vary over the time with changes in their age (Becker,1993).

A few major questions one would confront while reviewing literature on human capital are:

In which activities resources are allocated?

What are main factors that affect decision making for resource allocation?

How and when resources are allocated?
What types of human capital and social capital are identified for resource allocation?

The next section presents the historical developments in the theory of resource allocation. The subsequent sections discuss human capital theories pertaining to conventional and also non-conventional point of view including recent developments in literature.

2.2 Historical Development in Resource Allocation Theory

The resource allocation theories can be divided into conventional and non-conventional points of view. Conventional point of view may be traced back to works of economists in 18th and 19th centuries. While discussing contribution of eminent economists to resource allocation, the Concise Encyclopedia of Economics (1999-2002) noted:

‘Just how individuals can best apply their own labor or any other resource is a central subject in the first book of the series [smith]. Smith claimed that an individual would invest a resource, for example, land or labor, so as to earn the highest possible return on it. Consequently, all uses of the resource must yield an equal marginal rate of return (adjusted for the relative riskiness of each enterprise). Otherwise reallocation would result. This idea, wrote George Stigler, is the central proposition of economic theory. Not surprisingly, and consistent with another Stigler claim that the originator of an idea in economics almost never gets the credit, Smith's idea was not original. French economist Turgot had made the same point in 1766’.

Similarly, citing works of other economists such as Marshal on resource allocation, the Concise Encyclopedia of Economics (1999-2002) documented that Alfred Marshall points out in his book Principles of Economics (1920) that:

‘The agents of production are commonly classed as Land, Labour and Capital. By Land is meant the material and the forces which Nature gives freely for man's aid, in land and water, in air and light and heat. By Labour is meant the economic work of man, whether with the hand or the head. By Capital is meant all stored-up provision for the production of material goods, and for the attainment of those benefits which are commonly reckoned as part of income. It is the main stock of wealth regarded as an agent of production rather than as a direct source of gratification’.
Hamdani (2004) noticed that ‘up to 1960s, economists (conventional point of view) followed the theory of consumer behavior considering that consumer divides his/her time between market work and leisure. Becker (1976) advocated reformulation of the theory, in the light of the potential generalizations, as already suggested in Becker (1965). He suggested systematic and symmetric incorporation of numerous constraints on household’s behavior. The study reduced the reliance on differences in tastes or preferences and also reduced the need of ad-hoc theorizing by the researcher. The main outcome of the Becker’s approach was that it paved the way for effective theoretical analysis of non-market activities and thereby enabled economists to analyze household behavior in its different dimensions, for example, health, fertility, marriage, and traveling. It encouraged the inclusion of certain new variables in economic analysis which are global in nature and took into account concepts such as envy, prestige, and physical and psychological health. In his theory of allocation of time, wherein Becker (1965) discusses that individual allocates time in consumption and labor force participation so as to draw utility. He analyses utility of individual by forming utility functions with consumption and labor force participation as its arguments. Similarly, Becker (1975, 1993), in his theory has discussed resource allocation into consumption, labor force participation and human capital.

Time allocation by an individual has been viewed distinctly by different economists. Gronaue (1977) finds that time is allocated in three activities i.e.

(1) home production
(2) labor supply
(3) leisure.
He is of the view that as time used in production of home goods is perfect substitute of time used in market production therefore, with changes in market wages, time allocation to home production also changes.

A number of economists and sociologists have studied various aspects of religiosity and resource allocation by individuals who want to enhance their utility by adopting and practicing religion. A more elaborated allocation of time and goods by individuals in household activities, religious activities and labor market activities is discussed by Ehrenberg (1977). He is of the view that with the increase in market wages, time allocation to religious activities decreases for men and with more participation in household production activities by female, lesser time is allocated to visit worship places. He also highlights that male and female life cycle synagogue attendance profile is U-shaped that first increases, then decreases and again increases with the increase in age. Similarly, household allocation of time in religiosity is discussed by Azzi and Ehrenberg (1975). They are of the view that with the increase in wages, an individual shifts towards less time-intensive forms of religious activities while with increase in unemployment rate, shift is towards more time intensive religious activities. They take into account returns to individuals in life-hereafter in time allocation decision making. They also support addition of religious activities in analysis of non market activities.

Analysis of allocation of time in perspective of religion is also carried out by Iannaccone (1992). He models religion as a club good that displays positive returns to “participatory crowding”. He is of the view that efficient religions with rational members may benefit from stigma, self-sacrifice, and bizarre behavioral restrictions. His model also
addresses sacrifice in non religious “social clubs”: fraternities, and communes, political parties, work groups, and families.

Time allocation by an individual in consumption, and religious activities along with factors affecting decision making process of allocation is analyzed by Long and Settle (1977). They pointed out that religious attitude of an individual’s parents substantially affect the religious participation and religious activities of their children. People with strong religious parents seem likely, ceterus peribus, to attend church more frequently than the individuals with lesser religious parents. They also pointed out that the more mobile families relative to settled families, less frequently attend church. So, mobile families perceive relatively lesser consumption benefits from frequent church attendance. They have added up more variables like wage rate, non wage income and wealth explaining variations in religiosity in explicit manner.

Allocation of time by individual on human capital, labor supply and leisure, are empirically studied by Parker, and Skoufias (2000). They pointed out that increases in school enrollment and reductions in the work of boys are approximately equivalent, implying substitution between these activities. They found no change in boys’ leisure time. However, they noted for girls, that reductions in work are less than the increases in school enrollment, implying that the leisure time of girls is slightly reduced. It is concluded by them that there is no significant impact on the leisure time of both male and female adults.

In view of above literary works, it seems that resource allocation is made in mostly consumption, labor force participation, home production, and religious activities. These works come across a short coming that there is hardly any study that highlights a joint resource allocation plan of individuals reflecting allocation in all dimensions and activities being
carried out in real life. This deficiency has been partially covered by some parallel works on resource allocation within a specific activity or across various activities.

Although a number of significant literary works are available on resource allocation yet these are partial representation of total resource allocation. These studies discuss one or two aspects and areas where an individual allocates resources, however, Becker (1975 and 1993) proposed a framework for simultaneous analysis of resource allocation in three areas.

2.3 Becker Model of Resource Allocation.

Becker presented a theory of allocation of time (1965) which generated a large number of subsequent researches in a new direction of resource economics. He discussed allocation of time in consumption and labor force participation and provided a utility function reflecting the arguments that enable an individual draw utility. Becker (1975, 1993) discussed resource allocation across consumption, labor supply and human capital accumulation. He evaluated time in terms of foregone earnings per unit of time to be utilized to participate in labor force or otherwise. His model explains that a representative individual draws utility by allocation of time and money in life cycle in following three activities.

A Utility is derived through utilization of time and expenditure in monetary form on consumption.

B Allocation of time and expenditure on labor force participation is made by an individual so as to earn income in lieu there-of the time spent.

C Time and money are allocated to accumulate human capital in order to increase earning potential as measured by wage rate.

Becker (1965) assumes that economic welfare of an individual depends on his/her consumption over time of objects of choice i.e. commodities. The objective is to maximize

\[^2\] A more elaborated model of mathematical derivation is available in Appendix 3.1 at the end of chapter 3.
utility which depends on varieties of commodities to be consumed during any period. A composite good is inturn produced at ‘home’ with inputs of “market goods” and individual’s “own time”. Composite market goods and composite amount of time are used for production in any time period. Individual allocates time on work through labor supply, consumption and human capital in a time period. Time available in a period is independent of the specification of period about which Becker assumes that all periods are equally long.

It is assumed that initially, time is allocated only between consumption and labor force participation (work) so individual’s economic welfare depends on his/her consumption over time of “objects of choice i.e. commodities and the amount of work”. Interest rate remains the same in each period in perfect capital market. The "endowment" in each period comprises amount of "income" obtained from fixed assets and the wage income obtained through labor supply in a period so the total income is affected by the hours spent at work, which is a decision variable.

Becker argues that present value of expenditure on goods must equal present value of incomes; right hand side is full wealth while left hand side shows how it is "spent" either on goods or on foregone earnings associated with the time in consumption. He assumed that wage is independent of composite goods and composite time

The marginal product of consumption time relative to the marginal product of goods equals the real wage rate in the same period, which is independent of interest rate. Consumption time has high marginal product with the high real wage rate. Productivity of goods and consumption do not vary with age, so production functions are the same. Since marginal productivities of linear homogeneous production function depend on factor proportions, Becker argues that if marginal product of time declines and the production of
commodities is relatively time-intensive and real wages are low and relatively good intensive when real wages are high. It is assumed that all production functions are homogeneous of 1st degree and productivity of goods and consumption do not vary with age, so production functions are the same. It is also assumed that prices remain unchanged in different periods.

Later in his analysis, Becker (1993) assumes that the individual allocates his/her resources in three activities namely; consumption, labor supply and accumulation of human capital i.e. education or training. Investment in human capital is made by each person who produces his own human capital, by using some of his time and goods to attend school, training etc. One of the determinants of the amount invested in human capital is its profitability or rate of return. A change in the return is from a change in the amount invested in human capital.

Becker assumes that only time is invested in accumulation of education while, tuition cost and other costs are ignored in production of human capital. He also assumes that production of human capital remains same for all the periods. He concludes that in equilibrium condition, the present value of marginal cost of investing in human capital becomes equal to the present value of future returns. However, it shows that the wage rate depends on human capital, similarly behavior of time allocated to work also depends on time allocated to human capital in addition to its complementarity with time allocated to consumption. Becker affirms that investment of time in human capital tends to decline with increase in age due to two reasons;

1) number of remaining period and the present value of future returns decline with age,

2) cost of investment rises with increase in human capital as wage rate increases and consequently / resultantly foregone earnings increase. He considers the analysis by
changing assumptions regarding time allocation to labor supply at very early age when legally or practically it is not possible to participate in labor market. In this case, the marginal cost of investment in human capital is not equivalent to foregone earnings, rather it would be measured by the marginal value of time used in consumption. Becker’s (1993) model provided an impetus to the development of a formal human capital theory.

2.4 Human Capital Theory

A number of economists have analyzed human capital with respect to investment in and returns from accumulated human capital that can be lumped into a ‘human capital theory’. Decision making of individual for allocation of resources in human capital and factors affecting returns from education are considered for analysis. In addition to private returns from human capital, external effects of human capital for individual and society have been discussed in literature. Few economists take into account non-conventional aspects of human being that influence investment in and return from human capital. Sufficient numbers of literary works are available on conventional and new theories of human capital, however, a few of those are discussed below.

2.4.1 The Conventional View of Human Capital

The conventional view of human capital traces back to works of earlier economists such as Adam Smith and Alfred Marshall in 18th and 19th centuries. The Concise Encyclopedia of Economics noted about human capital with reference to works of Adam Smith (1723-1790) from his The Wealth of Nations:

“Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society, which he has in view. But the
study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to the society”.

Similarly, about the difference in returns from human capital to individuals it is quoted in the Encyclopedia that Smith:

“Used this insight on equality of returns to explain why wage rates differed. Wage rates would be higher, he argued, for trades that were more difficult to learn, because people would not be willing to learn them if they were not compensated by a higher wage. His thought gave rise to the modern notion of human capital (see Human Capital). Similarly, wage rates would also be higher for those who engaged in dirty or unsafe occupations (see Job Safety), such as coal mining and butchering, and for those, like the hangman, who performed odious jobs. In short, differences in work were compensated by differences in pay. Modern economists call Smith's insight the theory of compensating wage differentials”.


“Capital consists in a great part of knowledge and organization: and of this, some part is private property and other part is not. Knowledge is our most powerful engine of production; it enables us to subdue Nature and force her to satisfy our wants. Organization aids knowledge; it has many forms, e.g. that of a single business, that of various businesses in the same trade, that of various trades relatively to one another, and that of the State providing security for all and help for many.”

Human capital has been formally recognized in the literature of economics as an important variable since 1960s with the works of Shultz (1963) Becker (1975) ‘and Mincer’s (1974). The work of Solow (1956, and 1957) is also a significant contribution in growth literature with respect to labor. Growth Theory by Solow (1956) took labor as an input with constant returns to scale production function, which paved the way for emergence of a formal human capital theory. This model delineates relationship of labor with physical capital as well as output.

Solow and Swan growth model is extended by Baro and Sala-i-Martin (2004) with addition of physical and human capital in Cobb-Douglas production function. They have recognized that technology grows at an exogenous rate. In their model, output could be used on a one-to-one basis for consumption or investment in either type of capital. In the like manner, with changes in assumptions Mankiw, Romer and Weil (1992) assuming that investment rates in both the forms of capital are constant and exogenous, henceforth they set the growth rates. Elaborate what did they do?

However, a shortcoming of this Solow growth approach is that the rates of return to physical and human capital are not equated. Many later economists followed Solow model. They mainly developed theoretical shoots of the neoclassical foundation and made it little distant from empirical realities. In 1980s, hallmark addition in pure theoretical framework was made by Romer (1986) and Lucas (1988) by incorporating human capital and investment in it as major growth elements. The work done by Romer used human capital as input in the production function with increasing returns to scale. Mincer (1974) gave life cycle earning
function of human capital. His earning function was used by many later economists. They used investment of time in year of schooling, for accumulation of human capital.

Allocation of resources for production of human capital is made in three different phases, especially with respect to marketing of their services, by Ben-Porath (1967). He also discussed life cycle earning of individual from human capital. He included, time allocation as foregone earning (opportunity cost), expenditure (direct cost) on physical input, initial stock of human capital in the society as determining factors of earning. Particular definition of human capital is used as a measure of the quantity of source of productive services. It is the stock that produces labor services in standard units and is thus analogue to machine in the case of tangible capital. Speed of adjustment, rate at which individual increases the stock of human capital, determines ultimate size of this stock.

After a long gap, extension in the work of Ben-Porath (1967) was done by Rangazas (2002, and 2005). Rangazas (2002) extended Ben-Porath model to include schooling of young children (who are unable to work) and a human capital externality in learning. Within the context of a standard one-sector neoclassical growth model, these extensions played important roles in generating human capital accumulation over US economic history. Human capital accumulation was estimated to contribute an average annual growth rate of 0.6 percent for over a century. Rangazas (2005) shows that his model can be used to explain for example six-fold differences in worker productivity across rich and poor countries which relates to investment in human capital formation.

Rangazas (2005b) model is more explicit and consistent form with empirical work. He used two sectors: agriculture and non-agriculture with two types of human capital i.e. manual and white color for each sector. He assumed decreasing return to scale. His important addition
to the model is the consideration of imperfect substitution of factors of production. Unlike Mincer’s (1974) framework, he used earning function based on:

1. Actual time allocation (within year of education) to human capital accumulation,
2. Physical inputs (direct cost) used in the production process and
3. Existing human capital stock that creates positive externality for creation of new human capital. The investment in and accumulation of human capital may be related to total time endowment and money to be utilized to invest in either of activities.

Resource allocation in human capital is also influenced by stock of human capital. As Romer (1990) views that societies with more skilled workers generate more ideas and grow faster, the same is reconciled by Mankiw, Romer and Weil, (1992) that the large disparities in income across countries are due in large part, to differences in human capital. Rauch (1993) also estimated human capital externalities and suggested that there are externalities on the order of 3-5 percent; his estimates are driven by differences in average schooling across cities. Acemoglu and Angrist (2000) are of the view that higher incomes might cause more schooling instead of vice versa. “Cities with greater average schooling may also have higher wages for a variety of other reasons.” Similarly, Moretti (1999) found a relationship between increasing numbers of college graduates and income in U.S. cities. He found sizable human capital externalities. Lucas (1988) has recognized that human capital has important external returns. Acemoglu and Angrist (2000) have given two types of theories on externality that are “pecuniary” and “nonpecuniary”. In “nonpecuniary” externality they argue that because the external effects work not through prices, but rather through the exchange of ideas, imitation, or learning by doing. Moreover, about the pecuniary externality, Acemoglu (1997a) and
Acemoglu (1996) discuss that firms find it profitable to invest in new technologies only when there is a sufficient supply of trained workers to replace employees who quit. Since greater human capital encourages more investment by firms and raises other workers’ wages via this channel, they found that human capital externalities arise because firms choose their physical capital in anticipation of the average human capital of the workers they will employ in future. Since physical and human capitals are complements in this setup, a more educated labor force leads to greater investment in physical capital and to higher wages.

Acemoglu (1996) suggests that as human capital externalities are additive, so the marginal product of a more skilled worker increases when the average workforce skill level increases. Moreover, Acemoglu (1998 and 1999) discuss as models in which wage differences between skilled and unskilled workers increase with average skill levels. Similarly, Acemoglu and Angrist (2000) estimate external returns of 1-3 percent and they recommend that the magnitude is sufficient to justify significant public subsidies for education.

About externalities of human capital, empirical analysis by Gould (1995) reconciles with the earlier findings of economists and suggests that the stock of human capital apart from its role as an input in production, is mostly responsible for higher growth in open economies. Similarly, accounting for the interaction between human capital and trade regime gives a higher estimate of the role of human capital as a separate engine of growth. Romer (1990a) in his empirical work found that, contrary to predictions based on conventional economic theory, the initial level of literacy also helps to explain subsequent rate of investment in human capital and thereby the subsequent income growth.

Resource allocation plan of an individual is affected in the presence of externality of human capital and physical capital. The externality effects of resources have been recognized
with respect to human and physical capital by Krueger (2003). He discusses time and money allocation in the form of human capital vested in teachers and physical capital available in the form of space and facilities based on expenditure per student in a classroom. He is of the view that the already carried out studies by different economists such as, Hanushek (1997), pertaining to impact of class size [role of resource allocation] on student achievement, when are given equal weight, resources are systematically related to student achievement. Similarly, work of Summers and Wolfe (1977, p. 649) suggests that ‘when there are extensive pupil-specific data [on resource allocation] available, more impact from school inputs is revealed’. Krueger (2003) is of the view that it’s more accurate: unless one weighs the studies of school resources in peculiar ways, the average study tends to find that more resources are associated with greater student achievement.

Many economists suggest that education has a causal effect on earnings [see for example, Barro and Salai Martin (1995 and 2004) Barro (1998 and 1999), Shultz (1963), Becker (1993 and 1975), Mincer (1964 and 1974), and Card (2002)]. Krueger (2003) identifies that there are two important benefits of improved school resources that students learn more and raise their educational aspirations, which pay off in terms of better job placements and higher earnings later on when students join the labor market. The individual’s decisions regarding resource allocation are also influenced with his/her preferences. The preferences of individuals are determined by their returns from human capital and their behavior in the society.

The above works on human capital mainly highlight investment in and accumulation of human capital under an implicit assumption that all human beings are same in their behavioral perspectives. Therefore, their investment patterns and returns from human capital
under certain assumptions are uniform, which is far from reality. They have ignored different factors and skills that affect investment and returns from human capital e.g. non cognitive skills. Realizing this deficiency in conventional works, new theories on human capital give way to description of few additional dimensions of human beings. A few of seminal works are discussed below.

2.4.2. New Theories of Human Capital

In addition to the above conventional models of resource allocation, an individual also allocates his/her resources to develop his/her behavioral aspects of life. An individual allocates his/her resource to develop different skills in personality such as cognitive and non-cognitive skills. These skills are developed directly and indirectly by endogenous and exogenous factors. This resource allocation gives way to develop human capital with different pace and manners, if all the other factors remain the same. The cognitive and non-cognitive capabilities of individuals develop differently with the resource allocation. The differences in cognitive and non-cognitive capabilities also determine returns from human capital in different magnitude.

Cognitive and non cognitive skills have been recognized in labor market [Heckman (2003) and Heckman et al. (2006)]. These skills at early age are mainly developed under the influence of parents and family members. The role of educational institutions extending education at early ages is significant in developing non-cognitive skills in children which enables them to get returns in later ages. Their performance in getting education and labor force participation is also affected accordingly. Therefore, any analysis without considering non-cognitive aspects is incomplete in understanding resource allocation by an individual.
Other social and behavioral aspects are recognized in the literature as well. For example, Bowles, Gintis and Osborne (2001) used a behavioral approach to understand differences among individuals with same human capital but with different cognitive and non-cognitive capabilities that enable them to get different returns. Heckman, Stixrud, and Urzua (2006) argue that their analysis supports the common sense view that non-cognitive skills matter. Their work reconciles with the work of Bowles and Gintis (1976); they find that schooling determines the measures of non-cognitive skills. They point out that latent non-cognitive skill, corrected for schooling and family background effects, raise wages through their direct effects on productivity as well as through their indirect effects on schooling and work experience.

Different studies provide evidence that both cognitive and non-cognitive skills are valued in the market and therefore are important to invest resources in. Heckman, Stixrud, and Urzua (2006) and Carneiro and Heckman (2003) find that parents play an important role in producing both the cognitive and non-cognitive skills of their children. There is a positive relation between the ability of parents and in turn produced cognitive and non-cognitive skills in their children. More able and engaged parents have greater success in producing both cognitive and non-cognitive skills. As both the cognitive and non-cognitive abilities are shaped early in the lifecycle, “differences in these abilities are persistent, and both are crucial to social and economic success, gaps among income and racial groups begin early and persist”.

Significance of non-cognitive traits has been recognized for successful social performance by Heckman, Stixrud, and Urzua (2006). Their work pertaining to development of non-cognitive skills in clusters, based on resource allocation, explains the phenomenon of
correlated risky behaviors by using low dimensional model of latent skills that explains wages, employment and schooling attainment. Their work reconciles with the work of Biglan (2004) who finds that risky behaviors such as antisocial behavior, cigarette smoking, alcohol use and the like are pursued by the same cluster of adolescents. The individuals allocate time and money to join their cluster, which in turn develops these skills in them. In their study on attitudes of employees and organization Bartel, Freeman, Ichniowski, and Kleiner (2003) document the existence and persistence of a genuine workplace effect on workers view about jobs and organizations. They point out that employees’ attitudes differ significantly across branches in ways that cannot be explained by branches [of bank] randomly drawing workers from a distribution of workers with different innate attitudes. Newly hired workers adopt the favorable or unfavorable attitudes that the branches [of bank] exhibited before they arrived.

Bowles and Gintis (1976) suggest that employers in low skill markets value docility, dependability, and persistence more than cognitive skills. Similarly, Edwards (1976) documents that dependability and consistency are valued more by blue collar supervisors than are cognitive ability or independent thoughts. Bowles, Gintis, and Osborne (2001) find that creation of incentive enhancing preferences employees allows employers to induce greater effort at a lower cost on the part of employees.

Both cognitive and non cognitive abilities determine social and economic success as concluded by Heckman, Stixrud, and Urzua (2006). The study argues that “For many dimensions of behavior and for the sense of ‘importance’, non cognitive ability is as important, if not more important, as cognitive ability. Although cognitive skills explain much more of the variance of (log) wages, their effects on (log) wages (as measured by skill gradients) are similar to the effects of the non cognitive traits. In fact, non cognitive skills are
about equally strong in many outcomes and are stronger for some outcomes. Of course, equal
strength in the sense we have used it does not translate into equal cost of changing these
skills”. The resources allocations by individuals vary to acquire these skills and expected
returns from these skills. It has been recognized in literature by Cunha, Heckman, and
Navarro (2005a and, b,) and Heckman, Stixrud, and Urzua (2006), that both cognitive ability
and non-cognitive ability affect the acquisition of skills, productivity in the market and a
number of other behaviors. Schooling raises individual’s measured cognitive ability and
measured non-cognitive ability. Similarly, non-cognitive ability, motivation, persistence and
self-esteem also play a substantial role in decisions making. By recognizing significance of
employees’ attitudes on productivity, Bartel, Freeman, Ichniowski, and Kleiner (2003)
conclude that branches [of banks ]with less favorable attitudes have higher turnover, lower
levels of sales, and lower rates of sales growth than branches where workers have more
favorable attitudes. They also conclude that employee attitudes are strongly correlated with
economic outcomes of work organizations.

Therefore, resource allocation of individuals is made for development of different
skills etc. Heckman, Stixrud, and Urzua (2006) argue that non cognitive traits matter for
successful social performance. Most of the ethnic groups encourage their respective ethnic
group members to get more education. Borjas (1992) also strongly contended the same results
of social capital with positive relation. This impact may have significant role in human capital
accumulation leading to production and the aggregate economic growth of the economy.

Explaining short run decline in growth of transitional economies, Campos (2002)
noted: “Although the labor force was highly educated, low moral was pervasive, and
incentives for the allocation of talent were distorted all resulting in low firms and no competition, organizational innovation was observed and technological progress lacking”. The education level as the only proxy for human capital is not a sufficient measure to determine economic growth. Rather other variables embedded in social capital play significant role in this regard. Schmid (2003) finds that human capital variables, disaggregating the labor input help some, but aggregate production functions still leaves a lot unexplained. Thus, individual has to consider other activities at the time of resource allocation specially investment in human capital for economic growth. Markins (1979) argues that

“Economic agent is endowed with energy as a human being - can modify local environment - affect other human beings. This depends on many variables (personal, social, cultural) so study of these should fall in purview of economics also but actually there is a dichotomy”.

In view of above the analysis of resource allocation to human capital in isolation is an incomplete analysis; one needs more holistic study in the perspective of social interactions. And human capital is redefined in the manner embedded in the social network. Seminal works of resource allocation pertaining to investment in human capital in social perspective are discussed in the following especially divine household production and human capital stock, creating positive externality for creation of new human capital. The investment in and accumulation of human capital thus may be related in a way to total time endowment and money to be utilized to invest in other social or human capital activities. Similarly, human capital stock significantly affects its accumulation and the same role may be expected to be performed by stock of social capital in the society as an externality. Therefore, resource allocation in social capital is also discussed in the following paragraphs
2.5 Social Capital

Individuals also allocate their resources in social interactions with other individuals, community, organizations and institutions, and state for social network, which generates social capital (Shah and Hamdani, 2006). It is argued that individuals allocate time and money in accumulation of social capital. The concept of social capital is being valued rapidly in the circles of scholars, practitioners and policymakers day by day. Comprehension, understanding, utilization and application of social capital in society and state is being recognized in development economics literature. Scholars from different disciplines have contributed to analysis of exploration and formalization of social capital, its types and dimensions in view of its nature and utilization by individuals and society. Individual’s preferences regarding accumulation of social capital and utility obtained through social capital have been discussed by many social scientists [Putnam (1993, 1995, 1997 and 2000), Woolcock (1998, 2001), Sobel (2001), Temple (2001), Carroll (2001) and Grootaert and Bastelaer (2002), Hamdani, (2004, 2006) and Hamdani and Shah, 2006)].

2.5.1 Some Concepts and Definitions

Social capital is accumulated with investment of a proportion of available budget comprising endowment of time and money for interaction with the members of family, friends, community, ethnic groups, organizations and state, etc. Carroll (2001) expresses that social capital is the trust, reciprocity, norms and networks of civic engagement in a society that facilitate coordinated action to achieve desired goals. Obviously, social capital is rooted in history, tradition, and culture. Unlike human capital, social capital is relational and embedded in social structure.
Human beings have evolved over time from different societal and social organizational stages with significant roles of religion, social capital and human capital in their lives. Human beings allocate, time and money to develop their social group, social networks, social organization in society which were being guided by norms, principles, ways and order, that enabled individuals to maintain reciprocal relationship with each others. This generates reciprocity of different type3 i.e. generalized reciprocity, balanced reciprocity and negative reciprocity. Individuals maintain their social interactions on the basis of their actual and expected returns from their relationship with other individuals. Sobel (2002) notes that one’s cultural capital includes his/her language, accent, manner, and familiarity with religious rituals.

Social capital is viewed as a trust and reciprocity among individuals and communities. Putnam, (1993) argues that working together is easier in a community blessed with a substantial stock of social capital. The social capital embodied in norms and networks of civic engagement seems to be a precondition for economic development as well as for effective government. Similarly, Carroll (2001) views that social capital is the trust, reciprocity and norms and networks of civic engagement in a society that facilitate coordinated action to achieve desired goals. Bjornskov (2003) views that people trust each other and cooperate more for common causes. Robinson and Flora (2003) are of the view that individual utility-maximizing behavior cannot be pursued independent of the well being of others. Social capital is a powerful resource that makes our choices interdependent. The social capital paradigm does not alter or contradict the basic economic theories of exchange. Therefore,

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3Reciprocity means exchange of goods and services between individual, group or organization etc. If there is no mention of time and amount of exchange of goods and services then it is generalized reciprocity. If time and amount of exchange of goods and services is decided then it is balanced reciprocity. Negative reciprocity may be a one way transfer of goods and services to a single interacting partner.
allocation of time in social capital is made to pursue socio-economic interests. The time is allocated in different types of activities contributing to accumulation of social capital in different dimensions for individuals and societies, enabling them to get private and social returns. Therefore, some studies pertaining to investment and returns from social capital are reviewed here.

### 2.5.2 Investment and Return from Social Capital

The economic literature now recognizes that human beings allocate time and money to develop or strengthen their social groups, networks and organizations in a society which is usually guided by some norms and principles enabling them to maintain a reciprocal relationship. This generalized reciprocity or balanced reciprocity helps sustain their social interactions on the basis of their actual and expected returns. Different aspects of investment in social capital and returns from accumulated social capital have been discussed in the literature. Putnam (1993) suggests that effective collaboration in institutions requires some interpersonal skills and trust, but those skills and trust are also inculcated and reinforced by organized collaborations. Such type of time allocation to its utilization as public goods or society’ goods varies from society to society. Cox (1996) contends that our lives are about our relationships with others, but involve levels of trust and cooperation or anger and distrust. These comprise our social capital, which make democracy work, make production rise and make cohesive the societies we live in. Grootaert and Bastelaer (2001, p.4) view social capital as “the institutions relationship, attitudes, and values that govern interaction among people and contribute to economic and social development”. In a study relating to institutional differences and their impacts on economic performance among OECD countries, Freeman (2002) documents “that the observed patterns do not support the superiority of particular
brands of advanced capitalism. Within the range of variation in institutions that differentiate
the United State, United Kingdom, Germany, Sweden, Japan, and so on, there is either a
relatively flat or a multiple peaked link between institutions and outcomes. Outside that range
institutional variations may have large effects on outcomes, but once a country has a strong
tradition of basic market freedoms – protection of property, rule of law, private ownership
rights, viability of contracts, etc – it has considerable leeway in the precise way it structures
its institutions.”

Coleman (1988) demonstrates that more than just human and financial capital is
required for children to succeed in school. The values, communities, friends, and contacts
(social capital) reinforce the perception of benefits of investing in education i.e. human
capital). Castle (2003) ascertains on the inquisitive work of Coleman (1988) that capital is a
temporal concept and social capital focuses attention on time. When this is recognized, time
as well as distance are the major dimensions defining the field of rural studies? When
attention is directed to time, the relation of social capital to other forms of capital comes to the
fore. Sobel (2002) noted that Putnam’s (1993) measures of social capital are highly correlated
with good educational outcomes, good health, and good government. He views that
economists find the social capital metaphor useful in studies of economic development,
transitional economies, common-resource property use, and education. Social capital of a
group and community is viewed by Borjas (1992) who holds that an immigrant’s ethnic
capital, which he measures as the average human capital of co-ethnics, influences his ability
to produce human capital. Helliwel (2006) also views that education tends to increase
respondents’ confidence in dealing with their circumstances that both the social and human
capital supplement to increase the adjustability of an individual to an alien environment.
Different studies have highlighted different types of returns from social capital; which is evident from a survey of literature from social capital. Resource allocation is also related to happiness and achievement in life. Coleman (1988) found that social capital influences the educational attainment of young people, which as stated above, subsequently lead to more happiness. Moreover, Helliwel (2001) reports in a survey on social capital and happiness that social capital influences a number of non-economic outcomes that increase people’s life satisfaction. Similarly, on the relationship of happiness and economic outcomes Bartel, et al (2003) document that there are happy and unhappy workplaces, as well as happy and unhappy workers, with very different patterns of turnover and productivity in these workplaces. Sobel (2002) view that the goods and services provided through one form of social capital can be obtained through other mechanisms.

In the presence of social capital the firms, individuals, groups, organizations, institutions and state acquire such information which not only reduces cost of information, but also helps to overcome Lemon’s market problem. Evidence from literature supports that social capital increases market efficiency, government service delivery system and effective governance and regulatory mechanism. A crucial component of this form of social capital is access to information and hence the importance of education and communication to marshal knowledge as a personal resource. Castle, (2003) affirms that a degree of trust, an expectation of reciprocity and exchange of information are expected to prevail in relations (social capital).

The resource allocation to attain utility through happiness is widely discussed in literature. Helliwell (2003 and 2004) highlighted the significance of the works of Aristotle and Durkheim in life on the role of social capital in wellbeing. Kahneman et al (1997); Kahneman et al. (2004) and Kahneman and Riis (2005), have discussed human wellbeing
through integrals of experienced utility and compared with unremembered utility. King et al. (2003) have pinpointed the measures of life satisfaction in line with social capital. Hellewell (2006) views that trust is sometimes seen a consequence, as well as a facilitation of frequently used networks. Life satisfaction appears to be related to various sorts of trust and also to the networks that may spawn or support trust. Helliwell and Huang (2005b) give estimation techniques and tools for measurement of life satisfaction specially pertaining to social capital.

Social capital is increased with participation of individuals and community as Rahn (1997) finds that community involvement increases trust. La Porta et al. (1997) highlighted that trust, which in turn, is associated worldwide with more efficient judiciaries, less corruption, and higher quality government bureaucracies. Similarly, trust is studied for economic growth by Knack and Keefer (1997) and for financial development by Guiso et al. (2000).

Social capital affects economic development mainly by facilitating transactions among individuals, households, and groups in developing countries as argued by Grootaret and Bastelaer (2002). Recognizing role of information attained through network for employment, Davern and Hachen (2006) conclude that we should rethink the mediators used to relate network structure to job mobility. Yet individuals with nonredundant contacts in their network are more likely to change jobs. Network structure is associated with job mobility.

Robinson and Hanson (1995) noted that “Social capital is important when firms and person known to each other agree to share the costs and benefits of a joint venture. It influences the willingness to divert resources away from the production of a private good to the production of a joint good”. One can acquire social capital through purposeful actions and can transform social capital into conventional economic gains. Bourdieu (1986) points out
that the ability to do so depends on the nature of social obligations, connections and networks available.

Interaction and social obligation of a group of individuals may affect their behavior and dealings with other groups. Asserting significance of social capital in labor market, James (2000) noted that many times firms in different societies make economic decisions dominated by their social systems and even discriminate labor force on the basis of color despite their potential level. They forego the prospective contribution of black talent pool in identification of needs and desires of black consumers. Harris (1997) observes that a given form of social capital that is valuable in facilitating certain actions may be useless or even harmful for others. Therefore, individuals make investment of resources (time and money) in different ways to accumulate social capital in various dimensions. A number of scholars have visualized different types of social capital and a few of them are discussed below..

2.5.3 Types of Social Capital

An individual allocates time and money to accumulate social capital by interacting with other individuals and communities that may accumulate social capital of a different type. Different economists and sociologists have categorized social capital with respect to its nature functions and dimensions. For example Cordes et al. (2003) have given three dimensions of social capital which are bonding social capital, linking social capital, and unity attachments. Their brief description is given below, [see Cordes et al. 2003].

a. **Bonding social capital:** It is defined as “the extent to which one’s close friends and relatives (other than the immediate household) are living within the community”.

b. **Linking social capital:** It is defined as “the extent to which one is networked within the community”.

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c. **Unity attachments:** It is defined that social capital “refers to those dimensions of attachment not directly related to existing or former human relationships. Examples include familiarity, routines, memories, loyalty, harmony with the local setting/natural physical environment, and whether or not the community is perceived as having a culture of caring and fairness”.

Similarly social capital is further categorized into two types by Uphoff (2000), namely; structural social capital, and cognitive social capital described as under.

1. **Structural Social Capital:** It refers to relatively objective and externally observable social structures, such as network, associations, and institutions and the roles, rules and procedures they embody.

2. **Cognitive Social Capital:** It comprises of more subjective and intangible elements such as generally accepted attitude and norms of behavior, shared values, reciprocity and trust. The cognitive social capital may create coherence and homogeneity in the group of people having more commonality in their norms, values, behavior, beliefs, reciprocity and attitudes.

Harris and De Renzio (1997) provide following six types of social capital as noted by Carroll (2001):

1. **Family and kinship connections:** It links single household, the extended family, and the clan, based on strong ties of blood or ethnicity. Such connections can extend to the village or neighborhood, in cases of relative homogeneity of culture.

2. **Social networks or associational life:** This relates to groups and organizations that link individuals belonging to different families or kinship groups in common activities for different purposes (economic, social/cultural, and political). These probably constitute the form of social capital closest to its more common definition of ‘networks of civic engagement’, linked to the concept of ‘local or community-level or local interest associations’.

3. **Cross-sectoral linkages** or contacts spanning differences in sectoral power: These may be termed ‘networks of networks’ that link together organizations belonging to different
sectors of society in the search for solutions of complex problems. By combining different resources and different kinds of knowledge (Brown 1995), cross-sectional linkages generate “complementarily”, in the form of “mutually supportive relations between actors” (Evans 1996) and of “co production” Ostrom (1997).

4. Sociopolitical capital: This represents relations between civil society and the state, giving a society the capability to mediate conflict by hearing, channeling, and composing multiple citizen demands. Political capital relates to the informal institutional arrangements that may lead, on one hand, to clientelism, rent-seeking, and exclusion and, on the other, to effective representation, accountability, and participation (Evans 1996).

5. Institutional and policy framework: This constitutes the set of formal rules and norms (constitutions, laws, regulations, policies) that regulate public life in a society (“macro-level social capital”). This form of social capital has a somewhat double nature, because it can influence the formation of other forms of social capital and at the same time be a resource that facilitates coordinated action by citizens.

6. Social norms and values: This is defined by a social group or a nation’s shared cultural beliefs (common convictions) and the effects these have on the functions of society as a whole (Fukuyama, 1995). These norms and values bear on all other forms of social capital.

Carroll (2001) suggests that the first three types can be characterized as operating at the micro level, while the second three can be thought of as macro types of social capital. Serageldin and Grootaert (1997) affirm that informal associations and networks become gradually replaced by more formal administrative and legal institutional structures. While this process may be construed as a decline in some forms of social capital, it can be interpreted as a substitution of one form (the rule of law) for another (horizontal and informal network).
2.6. Religious Human Capital

Individuals allocate time and money to carry out religious activities. Religious human capital is defined by Shah and Hamdani (2006) as the capacity of an individual attained through his mastery over and adoption of religiosity, which enables him to get socio-economic and psychological returns in this life and development of expectation to get divine rewards in life hereafter. Studies like Azzy and Ehrenberg (1975), Pollak and Wachter (1975), Long and Settle (1977) Iannaccone (1986, 1988, 1990, 1992, 1993, 1998 and 2000) and Granau (1977) consider allocation of time by an individual in non conventional manner in consumption, labor force participation and religious activities. They highlighted utility obtained by individuals through allocation of their resources in different activities. The economists also highlight different factors affecting decision making process of an individual.

Allocations of resources on religious activities have been modeled in economic literature by Iannaccone (1990). He derives the predictions of the model, and tests these predictions against observed behavior. He explains observed patterns in denominational mobility, religious intermarriage, conversion ages, the relationship between church attendance and contributions, and the influence of upbringing and interfaith marriage on levels of religious participation.

Religion affects different aspects of human beings such as human capital development, accumulation of religious human capital and individuals’ wellbeing. Religion may also contribute to generation of non-cognitive skills in individuals. Cognitive and non-cognitive skills have been recognized in labor market [Heckman (2003), Heckman and et al. (2006)]. These skills are mainly developed at early age under the influence of parents and family members. The roles of educational institutions that extending education at early ages
are significant in developing non-cognitive skills in children which enables them to obtain returns in later ages. Their performance in getting education and labor force participation is also affected accordingly. Parents with distinct levels of religiosity and surrounding religious educational institutions may produce different levels of religious human capital in children.

Human capital is affected by religiosity in its accumulation and increasing its welfare level through enhanced wages and employment. Religious beliefs also affect individuals’ wellbeing. Chamberlain and Zika (1988) discuss the relationship of religiosity and psychological wellbeing of individuals. Their results show that religiosity has a positive relationship with wellbeing but to a small extent. McCleary and Barro (2003) conclude that although religiosity tends to decline overall with economic development, the partial relations depend on the specific dimensions of development. They documented on the basis of empirical analysis that the measures of religiosity are positively related to education, negatively related to urbanization, and positively related to the presence of children. Increased life expectancy tends to be negatively related with church attendance but positively related to religious beliefs. Human capital is conventionally considered as a measure of quantity of productive services of a person but one cannot ignore the quality of services. It is well recognized that religion can affect the quality of human services as affirmed by Hamdani and Ahmad (2002).

Based on a review of both cross-section and aggregate time series studies, Iannaccone (1992) finds that religiosity and religious activity rates do not decline with increase in education or income. This is a fact that sectarian and denominational religions draw more members from poor and less educated groups of population. Iannaccone (2000) states that economic aspects of religious behavior as an outcome of resource allocation. For example,
“Empirical studies invariably show that the members of some religions (such as Jews in America) earn significantly higher wages and income than average. Religion also affects individuals’ rate of saving, occupational choice level of education and numerous other economically important behaviors such as voting, fertility, divorce, criminal activity, drug/alcohol consumption, denomination and earnings”. Shah and Hamdani (2006) note that religious human capital accumulation and getting returns from its given level may vary from person to person and society to society. The nature of religion and level of its observance by individual and the religion surrounding the individual affect the production of religious human capital and expected returns from it. Different interpretations are made regarding religious human capital in Islamic perspective and in Divine Economics perspective. Few of literary works regarding Islamic and Divine Economics perspectives are given in following subsections. Since religion influences returns on human capital to individual and society and subsequently affect economic growth of a society. Review of few works pertaining to religion and economic growth are also given in subsequent section.

2.6.1 Religious Human Capital in Islamic Perspective

The theory of religious human capital in Islam can be understood through Qur’an, which states that the man is created in the best of moulds and as a creation is superior to other creations and is honored to most of others. Qur’an says, “... Indeed We created man in the best structure. Then We reverted him to the lowest of the low. Save those who believe and do good deeds, for them shall a recompense incessant” (Qur’an 95: 4-6)

“... and We have exalted them over most of those whom We have created, by high decree of exaltation” (Qur’an 17: 70).

For this creature to justify as the best, God created two things; knowledge and faith (Tafseerul Muttaqeen 30:56; footnote 1). Qur’an categorizes man into three distinct groups, “.
and ye shall be (sorted into) three kinds; those on right side, those on left (wrong) side and those ‘foremost’ (in faith and practices)” (Qur’an 56:7). The right one are elaborated by many verses of Qur’an. They possess certain characteristics which have been enlisted in Divine Economics to develop religiosity scales.

Ali (2004) refers the Qur’an 57:14 and notes that: “There are three senses or spirits or the aspects of the human self in each human individual. The first is ‘Nafse Ammara’ on account of which the human soul is prone to evil. This tendency, if not controlled, will lead the individual to be totally lost in evil. To check this tendency towards evil the grace of the All-Merciful God provided man with the self-accusing self called ‘Nafse Lawwama’ which makes the individual conscious of the wrong way he treads and to resist it and to seek forgiveness of the Lord. The third sense is called the ‘Nafse mutmainnah’ i.e. the attainment of the perfect satisfaction for the soul to rest in peace which is achieved after a complete surrender of the self or the ego in human individual to the divine will”.4

So in the Divine Theory of Human Capital, the quality of human capital will be judged according to education, skills, experience etc and also by the divinely created characteristics of best and worst people. A human capital will be considered productive if, other things constant, it follows the divine path (for example see Qur’an 23) and counterproductive if follows otherwise (Qur’an 4:117-121, 15:39, 17:6268, 20:120; 34:20; 36:62; 57:14; 59:16).

Hamdani and Shah (2006) discussed the concept of Islamic human capital. They define it as:

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4 Qur’an also states that man is created in a shape that he can establish industries and can excel in different fields. This points to natural endowments in a human capital. Since everything has been created to a determined measure (Qur’an 54:49; 2318), the best human capital is the one who is capable of understanding the ‘measure’ as well as he can use and utilize things in due proportions without excess of anything or misery.
“Islamic human capital is a person’s technical, professional and behavioral capability to organize inputs and produce outputs by employing own time given a typical religiosity derived from Islamic principles”.

Here, “inputs may be staff member, funds, physical facilities and pool of information and outputs may be production of meals by a wife, health services by a clinic, provision of justice by a court or protection of folk heritage by the archeology department or sermon by a religious scholar or a supplication for success by a worshiper. The time is the key resource to every person belonging to management, staff, clientele etc. without utilizing which a person can hardly produce any good or service”. Similarly, ‘Islamic human resource’ may be differentiated from the ‘human resources’ on the basis of difference in acquired human capital which is ‘Islamic’ if it has Islamic education or knowledge of religion, rituals and doctrine, Islamic values, ethics, and life-goals and friendships with fellow Muslims, in addition to general education or specific training etc [for more details see Hamdani and Ahmad (2002)].

2.6.2 Religious Human Capital in Divine Economics

Since, in divine religions including Islam, “the individuals are accountable for their decisions and deeds performed during the life on earth and on the Day of Judgment there will be a reward or punishment depending on how they acquired and used the resources during life on earth” this has significant implications for the theory of human capital. This belief is likely to result in a distinct allocation of resources to consumption, social capital and religious capital etc. Some Muslim economists have attempted to pave the way towards such a theory of consumer behavior.

As is evident in the preceding section, the Divine Economics derives the theory of human capital from divine religions, including Islam. It rests itself on the foundation of human creation, human self, divine characteristics and divine path of knowledge and faith. In
this theory, man is seen as ‘human capital’ from perspective of three categories of people in every relative setting (right, wrong and foremost in faith and practices) as defined by God. The quality of human capital can be judged from the extent of an individual’s use of ‘self-accusing self’ or ‘perfectly satisfied-self’. Hence excellence of human capital in Divine Economics is conditional upon how proportionately it utilizes time and resources that have been created in a determined measure (Qur’an 54:49; 2318). This does not contradict or undermine the characteristics of human capital recognized in conventional economics, e.g. education, skills, experience etc. A human capital will be considered productive if, other things constant, it follows the divine path and counterproductive if it follows otherwise. This concept of human capital has been elaborated in a series of studies [Hamdani and Ahmad (2002), Hamdani, and Khalid, (2003), and Hamdani 2004], which presented a faith-based model of resource allocation which assumes that the individual is rational. Individual chooses activities or commodities (good or bad), that maximize his/her total satisfaction from alternative use of available time (24 hours). Regardless of what religion individual follows, individual is expected to possess some religious and normative peculiarities as it is required to succeed in current life or at least in life hereafter. This allows the individual to accumulate typical type of religious capital, social capital and moral capital. Therefore, individual is likely to substitute some part of personal consumption to charitable donations, and part of his market time and personal leisure time to religious activities as well as voluntary or social activities. Hence, taking religion as endogenous, makes a number of economic and non-economic behaviors explainable for the first time. The faith-based model not only satisfies the rational choice theory but is also applicable to all the three divine religions, hence it was

5 These may be crudely measured by a scale between zero and 100.
termed as ‘Divine Economics’. One of the studies of this framework (Hamdani (2004)) proposes that

“Time is valuable whether it is used for paid work, leisure, voluntary activities, or worship. The hours of wage work can be regarded as a true measure of human capital which together with non-human capital assets can be used for generating income, leisure, voluntary work or worship. These points to the fact that human capital is a determinant of output of economics, voluntary or worship services and is also influenced by each of these particularly religious factors”.

Hamdani and Ahmad (2002) presented ‘Walye Asr Model of Human Resource Management’ (VAM-HRM) based on Divine Economics Framework which suggests that a rational firm manager shall maximize firm’s benefits more efficiently with religion-embodied human resources as compared to the manager indifferent on that ground. The proposed model is applied via time allocation behavior of human resources. Using the same framework, Hamdani (2004), Hamdani and Ahmed (2002), and Hamdani and Shah (2006) studied human capital in the religious perspectives with its implications on different other behaviors and activities such as voluntary activities, donation behavior to help needy fellow being, personal leisure and labor force participation. It was observed that religiosity significantly affects donation behaviors of individuals, who allocate a regular proportion of their total income for donation to the low income and currently needy people with the expectations that this amount is an investment in the way of Allah. Similarly, time allocation plan of individuals especially time allocation to voluntary activities is also affected with varying preferences of individuals depending on their religiosity levels. As overall time utilization preferences vary with the level of religiosity, so do decisions of time allocation to labor force participation also taken by different individuals in different manners. Therefore, subsequently income levels, saving ratios and investment decisions are also affected in religious environment. In turn, societal
returns are also affected by these decisions. The framework also presents empirical evidences regarding self-satisfaction levels and religious capital interrelationships in these studies.

Shah and Hamdani (2006) explain that time management in Islamic and non-Islamic systems has significantly distinct features and therefore, may have distinct outcomes. They highlighted a “religious human resource” embodied in the employees of any organization that may affect the performance of employees. They also show that performance of more religious and least religious groups is systematically different.

However, the available literature lacks in deep analysis of religious human capital. Hamdani and Ahmad (2002) state that one reason for this neglect by economists to see the subject in real life perspective is non-availability of data. Obtaining religion-based quality data having a number of peculiarities is an extremely difficult job. This is because people usually tend to overstate their frequency of religious participation and understate economic achievements, assets, cash balances and related facts. Another problem in this regard is that religion is considered to be too subjective to measure, ignoring the fact that there are a number of other subjective things in economics that have been dealt well. Hamdani and Ahmad (2002) further suggested to first develop certain criteria and tools to collect religiosity based cross section data through, for example, a ‘religiosity level survey’ or a ‘religion and economic survey’.⁶ Individuals and institutions need to carry out panel data studies based on own-collected periodical data.

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⁶ For example, data on how faith in life after death or in the Day of Judgment affects the daily economic decisions of individuals regarding time allocation. The first ever such survey was conducted by Hamdani (2000) through the Department of Economics, Quaid-i-Azam University, Islamabad. A comprehensive questionnaire used in this survey is annexed at the end of this document.
Since religion may affect accumulation of human capital and its returns to individual and society, it is also expected to affect economic growth. A few pertinent works are reviewed in next section.

2.6.3 Religion and Economic Growth

Highlighting deficiency in literature of economic growth, Barro and McCleary (2003) document that empirical research on the determinants of economic growth has typically neglected the influence of religion. They use international survey data on religiosity for a broad panel of countries to investigate the effects of church attendance and religious beliefs on economic growth. They find that economic growth responds positively to the extent of religious beliefs, notably about hell, heaven, and life hereafter but negatively to church attendance. That is, growth depends on the extent of believing relative to belonging. Their results accord with a perspective in which religious beliefs influence individual traits that enhance economic performance. To them the beliefs are, in turn, the principal output of the religion sector, and church attendance measures input to this sector. Barro and McCleary (2003) pointed out that greater religious pluralism, measured by the diversity of adherence among major religions, is associated with higher church attendance and beliefs. Across the religions, attendance at religious services is higher for Catholic than for the other religions, except for Muslim. However religiosity is also affected by prevailing political and governance system. McCleary and Barro (2003) pointed out that the presence of a state religion is positively related to the religiosity measures, probably because of the subsidies that typically flow to the established religions. They find that religiosity is negatively associated with government regulation of the religion market and with the religious oppression that
accompany the presence of a communist government. The elimination of Communist regimes led to a recovery of religiosity in most of these countries during the 1990s.

In view of limitations of the studies reviewed above it is pertinent to mention that studies in economics of religion discuss how religious activities are determined through economics decisions. The need remains to study how religious activities affect economic activities. For example, there is great scope to develop economics of religious human capital.\(^7\) Beside these theoretical works, a number of studies carried out empirical analysis of human capital, social capital, and religious human capital. Few other empirical works are reviewed in the following section.

### 2.7 Empirical Literature

A number of literary works are available on the resource allocation decision of an individual in different activities. Empirical analysis by Gould (1995) reconciles with the earlier findings in works of Johnson (1960), etc and suggests that the stock of human capital – apart from its role as an input in production – is mostly responsible for higher growth in open economies. Similarly, accounting for the interaction between human capital and trade regime gives a higher estimate of the role of human capital as a separate engine of growth. Romer (1990 b) in his empirical work says that contrary to the conventional economics theory, his finding is that the initial level of literacy also helps to explain subsequent rate of investment in human capital and thereby the subsequent income growth.

\(^7\) Hamdani (2004) states “In the available studies, religiosity is mostly measured by the economists from merely rituals such as church attendance, reading bible, and affiliation to sect, etc. In practice, observing rituals may or may not represent one’s religiosity because religion is a multi-dimensional framework of life. Hence, it should be viewed through multiple indicators of religiosity that need to be developed in each religion’s context”.
Costa and Kahn (2003) examined the trends in social capital and made explanations for declines in social capital. They used an exhaustive list of data sets drawn from studies of the labor force, political participation, social surveys, time use studies, marketing studies, and studies of volunteering.

Various studies are available on social capital. Costa and Kahn (2003) study social capital through membership of individuals in their organizations. They observe that the data set they used also allow them to study time spent by individuals in entertainment activities. Their variables are based upon an individual recording in a 24 hour day any time spent 1) entertaining or visiting friends, 2) at a party or reception (with meals) given by or for the respondent, and 3) at party or reception, without meals, or in other social life. Social capital especially regarding well-being and life satisfaction is studied by Helliwell and Huang (2005b). They developed estimation techniques and tools for measurement of life satisfaction pertaining to social capital. According to Helliwell (2006) “Results in many countries are finding U-shaped patterns of well being over the life cycle, data support that in the shape the distribution of age effects is largely unchanged from decade to decade”. It is revealed that with addition of variables of stress related to work life balance the one-third of U shape is removed. Helliwell (2006) finds that the coefficients on social capital variables, such as time spent with family, friend and neighbors, and trust placed in neighbors and police, are unaffected by the inclusion of the personality variable. Helliwell also views that education tends to increase respondents’ confidence in dealing with their circumstances. Helliwell and Huang (2005a) provides estimates of the value of several non-financial aspects of the workplace and especially, of workplace trust. For example, a one-point change in job satisfaction,
on a ten-point scale, would have the same well-being impact as a change of more than 0.5 in log income.

In results from the Canadian ESC survey, those respondents who have frequent contact with family, friends and neighbors have SWB almost a full point higher, on the 10-point SWB scale, than others with no such contacts, (Helliwell, 2006). Trust is sometimes seen a consequence, as well as a facilitation of frequently used networks. Life satisfaction appears to be related to trust and also to the networks that may spawn or support trust.

Social capital accumulated at household level in United States is studied by Costa and Kahn (2003). They calculate by metropolitan area, the Gini Coefficient of weekly wages for full-time, full-year men aged 21 to 64. They contend that indirect measures are also used to compute the influence of social capital. The influence of social capital and socio-emotional goods alters the price of physical goods involved is an indirect measure of social capital’s influence. Flora et al. (2003) indirectly measure social capital the same way that measures the capacity of other forms of capital.

Becker’s (1965) model has also been used in empirical research on household resource allocation and religious behavior in Azzi and Ehrenberg (1975), Iannaccone (1986, 1988, 1990, 1992, 1993, and 2000) and Pollak and Watcher (1975). According to these studies, religious production (set of religious activities) is viewed as the outcome of a productive process like that for many other goods and services. The religious satisfaction (output) is determined by purchased goods, household time and human capital in similar way as meals, health and recreation. However, like recreation, many of religious commodities are unobservable, but their inputs, such as own time, can be measured.
Affects of stock of religious human capital are analyzed by Long and Settle (1977), who point out that religious attitudes of an individual’s parents substantially affect his/her religious participation in religious activities. People with strong religious parents seem likely, ceterus paribus, to attend church more frequently than the individuals with lesser religious parents. They also pointed out that more mobile families attend church less frequently compared to non-mobile families. It may be that mobile families perceive relatively less consumption benefits from frequent church attendance. The study included more variables including wage rate, non-wage income and wealth, thereby explaining variations in religiosity. Based on review of both cross-section and aggregate time series, Iannaccone (1992) finds that religiosity and religious activity rates do not decline with increase in education or income. This is despite the fact that sectarian and denominational religions draw more members from poor and less educated groups of population.

Some of the studies in Divine Economics [for example, Hamdani and Ahamd (2002)] forwarded some interpretations of ‘religious human capital’, ‘spiritual capital’ ‘moral capital, and ‘Islamic human capital’ and present empirical evidence that these types have systematic interrelationships with economics behaviors. In this regard religious human capital is defined by Hamdani and Shah (2006) as

“Religious human capital is a person’s technical, professional and behavioral capability to organize inputs and produce outputs by employing own time given a typical religiosity derived from Divine religions.

Human capital determines one’s capability to perform wisely, accurately and efficiently in any organization with and without supervision. This comes from general education, specific training, interaction with others and personal beliefs, perceptions and experiences. Thus, as explained in Hamdani and Ahmad (2002), whatever commodities are
produced by the individual, may be divided into three uses or parts; (a) own consumption (b) family’s consumption (c) society’s consumption (through charity or volunteering). In other words, the production that exceeds individual’s own needs is available to others for certain monetary or social costs. The model allows to empirically estimate the nature and magnitude of relationship among variables such as age, sex, personal endowments, skills, values and social styles. Hamdani and Ahmad (2002) also raise the question whether managers with different levels of religiosity have systematically different ways of management and does that produce any different results? The study attempts to illustrate an economic approach to Islamic management of human resources. It introduces a utility maximization model of time allocation behavior. The model can explain numerous empirical facts: patterns of religiosity, the relationship between religiosity and office/wage work hours, leisure time, voluntary services, and different values which determine the overall performance and achievements of human resources concerning not only to their organizations but also to their religion, family and society.

2.8 The Limitation of existing Literature

The review of literature presented above mostly shows that much has been explored in the field of human capital in conventional paradigm. As stated by Hamdani (2004), after emergence of home production function in 1960’s, the economists started considering social and apparently non-economic variables in the analysis of economic behavior. With this advancement, some studies also exist which present partial empirical findings relating to variables that seem relevant to any religiosity-based economic analysis but are confined to the context of Non-Muslim communities’. In contrast, the Divine Economics framework uses rational choice theorizing for scientific study of economic behavior under divine religions
using a data set belonging to Muslim Context. This framework paves the way for studying the interrelationship between human capital, moral capital and non-economic factors, yet no study under this framework has presented any formal model for analyzing human capital, social capital, and religious capital that may satisfy the mainstream economics as well as divine perspective. So an attempt has been made to make this review comprehensive by taking into account all these developments. Hence, this review has the following key points to mention.

i. The conventional economics is subject to limitations much discussed by mainstream economists as well as others.

ii. The studies pertaining to economics of religion mostly pertain to Christianity only and the context of other popular religions remains neglected.

iii. The studies in Divine Economics present theoretical underpinning of a faith-based theory of human capital but do not present any empirical testing of human capital and religious human capital jointly, hence limiting its scope for further applications.

Therefore, there is a need to extend both the Becker’s model and the Divine Economics framework for comprehensive understanding of resource allocation. Furthermore, it is also desirable to present a new model of joint resource allocation in perspective human capital, social capital and religious human capital that represents conventional rational choice theorizing. Individuals in this community follow a distinctly different code of life that may lead to a systematically different form of human capital.

The importance to study the neglected aspects of economic behavior and identification of different forms of social capital, human capital and religious human capital prevailing across diverse communities in the world is now evident. Therefore, extensions in earlier works, addition of some new concepts, revisions of some interpretations, confirmation of and contradiction to some earlier results and new findings are being presented in the subsequent chapters.
Chapter 3
THEORETICAL MODEL

3.1 Introduction

Although Becker’s work is a significant contribution in the literature of time and money allocation, there is a room for further research on the subject. Individuals make investment in human capital in order to enhance their earnings. However, they also allocate resources to consumption, labor force participation, social capital and religious human capital. This allocation of resources is, in a way, an investment by individuals that provide separate returns from these activities. The levels and patterns of this investment determine returns from each type of capital. Individuals make investment in human capital and other capital that complement or substitute its accumulation, thereby, directly and indirectly affecting returns from accumulated human capital. In addition to labor force participation, consumption and accumulation of human capital, time and money are also invested in social capital and religious human capital. In this chapter, we attempt to model this investment pattern and analyze the returns to human capital, social capital and religious human capital. Although social capital and religious human capital have been discussed in literature, there has not been any attempt to incorporate these into the framework of Becker’s Model. This study proposes a formal extension of Becker’s Model to include social capital and religious human capital.

As we have seen in the previous chapter that existing literature provides analytical models that covers resource allocation to consumption, labor force participation and human capital. The utility function adopted in this model is an extension of Becker’s (1975) model, which focuses on resource allocation to three activities.\(^8\) Becker (1975) includes leisure in

\(^8\) Mathematical derivation of Becker Model is given in Appendix 3.1 at the end of this chapter.
consumption time. However, in addition to these three activities, individuals also allocate resources to social and religious activities. More specifically, the present study assumes that total resource allocation by individuals is made in five activities i.e. consumption, labor force participation, human capital, social capital and religious human capital. It is assumed that in this case, preferences are strictly increasing and investment is made by the individual in all the five activities. It is assumed that optimal solution lies in the interior of the opportunity set. Similarly, equilibrium may be achieved by equalizing the value of marginal product of resources allocated to each activity. As in conventional model, consumer cannot completely satisfy all his/her wants within the budget constraint; there is always some good more of which is desirable. Deaton (p-14, 1980) points out that the use of equality constraint in this case rules out non-linearities, indivisibilities, uncertainties and interdependencies of the function.

Individual’s utility depends on allocation of total time endowment, and money in life cycle in the following five activities.

A Time and monetary expenditure are incurred on consumption to derive utility.

B Allocation of time and monetary expenditure on labor force participation is made so as to earn income in return for the time spent.

C Time and money are allocated to accumulation of human capital in order to increase earning potential as measured by wage rate.

D Time and money are allocated to accumulation of social capital in order to increase earning potential as measured by wage rate.

E Time and money are allocated to accumulation of religious human capital in order to increase earning potential as measured by wage rate.
The effect of religious human capital on individual’s earnings needs to be further elaborated. Individuals accumulate religious capital for divine purposes (for returns in life hereafter) rather than to increase wage rate. However, as the religiosity enhances honesty, commitment, loyalty etc it increases efficiency of an individual. So the increased wage rate may be a by-product of religiosity.

Investment is made in single period and return is generated in all remaining periods. The use of term investment signifies that certain forms of resource allocation enable an individual to accumulate some form of capital, which gives him/her returns in later periods. Therefore, resource allocation is analyzed in two steps: first step extends Becker’s model to four activities and second step extends to five activities.

3.2 Extension of Becker’s Model to Fourth Activity: Social Capital

We start our analysis in first step by assuming that the resource allocation plan of an individual is made in consumption, labor force participation, human capital, and social capital. Similarly, intra-sectoral analysis is carried out with the assumption that social capital is accumulated with investment of a proportion of available budget comprising time endowment and money. Social capital may accumulate through interaction with the members of family, friends, community members, ethnic groups, organizations, institutions and state etc. As discussed in literature review, Carroll (2001) has expressed that social capital embodies the trust, reciprocity, and norms and networks of civic engagement in a society that facilitate coordinated action to achieve desired goals. Obviously, social capital is rooted in history, tradition, and culture. Unlike human capital, social capital is relational and embedded in social structure.
Over ages, human beings have evolved from different societal and social organizational stages that have significant roles in their lives. Whatever, nomenclature may be used individuals have been allocating, time and money to develop their social groups, social networks, social organizations etc. They have been guided by norms, principles, ways and order, enabling them to maintain a reciprocal relationship. This reciprocity of either type i.e. ‘generalized reciprocity’, ‘balanced reciprocity’, ‘negative reciprocity’ maintained individuals’ social interactions on the basis of their actual and expected returns from the relationship that came out of investments.

3.2.1 Inter Activity Analysis

Now we assume that the resource allocation is made by the individual in four activities i.e., consumption, labor force participation, human capital and social capital. The objective is to maximize individual’s utility in presence of various constraints. Before formal mathematical analysis we denote different variables being used. List of variables alongwith their notations is given below.

\[ i = \text{Number of period ranging from 1......n.} \]
\[ t = \text{Total time available to an individual.} \]
\[ t_{wi} = \text{Time devoted to work by an individual.} \]
\[ t_{h} = \text{Time devoted to home production by an individual in period i.} \]
\[ t_{c} = \text{Time allocation to consumption by an individual in period i.} \]
\[ t_{e} = \text{Time allocation to human capital by an individual in period i.} \]
\[ t_{s} = \text{Time allocation to social capital by an individual in period i.} \]
\[ C_{i} = \text{An amount of commodity to be consumed during any period i.} \]
\[ i.f(.) = \text{Home production function of an individual in period i .} \]

*We can define reciprocity: It is exchange of goods and services between individual, group or organization etc. if there is no mention of time and amount of exchange of goods and services then its generalized reciprocity. If time and amount of exchange of goods and services are predetermined then it is balanced reciprocity. Negative reciprocity may be a one way transfer of goods and services to a single interacting partner.*
\( x_{it} = \) A vector of market goods purchased by the individual in period \( i \).

\( x_{et} = \) Market goods allocated to consumption by an individual in period \( i \).

\( x_{ei} = \) Market goods allocated to accumulation of human capital by an individual in period \( i \).

\( x_{Si} = \) Market goods allocated to accumulation of social capital by an individual.

\( r = \) Interest rate.

\( w_i = \) Individual’s wage rate.

\( \alpha_i = \) Payment per unit of human capital in period, \( i \), to individual.

\( \gamma_i = \) Payment per unit of social capital to individual in period, \( i \), to individual.

\( E_i = \) Level of human capital of individual in period, \( i \).

\( S_i = \) Level of social capital of individual in period, \( i \).

\( \phi_i = \) Output of human capital in \( i \)th period

\( E_{i+1} = \) Level of human capital at the beginning of period \( i+1 \)

\( d = \) Rate of depreciation of human capital.

\( \Phi_i = \) Output of social capital of a representative individual in period, \( i \).

\( \psi_i = \) Production function of social capital

\( S_{i+1} = \) Stock of social capital at the beginnings of period \( i+1 \).

\( \delta = \) Rate of depreciation of social capital.

\( U_j = \) Marginal utility.

\( f_x = \) Marginal productivities with respect to composite goods

\( f_t = \) Marginal productivities with respect to time.

\( \lambda = \) Lagrange multiplier equal to marginal utility of wealth.

\( p_i = \) Prices in period, \( i \).

\( p_j = \) Prices in period, \( j \).

\( v_i = \) Non-wage income from fixed assets of individual.
As per utility function given in equation (1) which contains $C_i$ as an amount of commodity to be consumed during any period $i$, which in turn is produced at ‘home’ with inputs of composite ‘market goods’ and his ‘own time’, as given in equation (2)

$$U = U(C_i, \ldots, C_n)$$  \hspace{1cm} (1)

$$C_i = f(x_{C_i}, t_{C_i}), i = 1, \ldots, n.$$  \hspace{1cm} (2)

Following constraints are assumed regarding allocation of resources

$$0 \leq t_{C_i} \leq t, 0 \leq t_{wi} \leq t, 0 \leq t_{ei} \leq t, 0 \leq t_{Si} \leq t, x_{C_i} \geq 0, x_{ei} \geq 0, x_{Si} \geq 0$$  \hspace{1cm} (3)

Total time allocation in a particular time period $i$ is given by:

$$t = t_{C_i} + t_{wi} + t_{ei} + t_{Si}$$  \hspace{1cm} (4)

Inequalities (3) indicate that optimal values of choice variables $t_{C_i}, t_{wi}, t_{ei}$ and $t_{Si}$ and $x_{C_i}, x_{ei}$ and $x_{Si}$ are assumed to exist in the interior of the region. Time used in any particular activity can not be more than the total available time $t$ and it can not be negative either. Individual allocates time to labor supply and thereby earn wages.

Let an individual’s wage rate be written as under:-

$$w_i = \alpha_i E_i + \gamma_i S_i$$  \hspace{1cm} (5)

---

10 According to Iannaccone (2000 and 2001) and Mack and Leigland, (1992), commodities are not necessarily tangible like goods but these may also be abstract like love and recreation. They define these commodities as ‘goods and services’ possessing some characteristics to satisfy a human need or desire or both. In words of Mack and Leigland (1992), “…a commodity such as an evening meal may be expected to have the desirable characteristics of satisfying hunger, of pleasure in taste, perhaps pride in cooking, and family contentment”.
Individual’s total income depends on his/her wage income and on non-wage income, \( v_i \), from fixed assets. Individual uses this income to purchase market goods. It is assumed that individual’s income and expenditure remain in equilibrium. Therefore, present value of expenditure on goods must equal present value of incomes under the assumption of equilibrium condition. That is;

\[
\sum_{i=1}^{n} \frac{x_{ci} + x_{ei} + x_{si}}{(1+r)^i} = \sum_{i=1}^{n} \frac{t_{ui} (\alpha_i E_i + \gamma_i S_i) + v_i}{(1+r)^i} \tag{6}
\]

Where \( x_i \) is a vector of market goods purchased by the individual.\(^{11}\) Following Becker (1975; 1993), it is assumed that interest rate remains the same in each period and that capital market is perfect.

Right hand side of equation (6) is total financial resources in each period, comprising of the amounts of income obtained from fixed assets and the wage income in period \( i \) so the total income is affected by the hours spent at work. The left hand side of equation (6) shows how the total income is spent either on goods in consumption or on foregone earnings associated with the use and time spent in human and social capital acquisition.

One of the determinants of the amount invested in human capital is its profitability or rate of return. A change in the rate of return is due to a change in the amount invested in human capital, which is itself a function of time and goods devoted to accumulation of human capital. That is,

\[
\phi_i = \psi(t_{ei}, x_{ei}) \tag{7}
\]

\(^{11}\) Here \( p \) a price vector, should be multiplied with \( x \) to obtain expenditure but we assumed it equal to one.
where $\phi_i$ is the output of human capital in $i$th period. The stock of human capital evolves over time according to following equation:

$$E_{i+1} = E_i + \phi_i - dE_i$$

(8)

We follow the same assumption for accumulation of social capital that it only accumulates with allocation of time in the form of foregone earnings which otherwise would have been utilized to labor supply and in turn enable earning income. Thus $\Phi_i$ is output of social capital of a representative individual given in the following equation.

$$\Phi_i = g(t_{si}, x_{si})$$

(9)

The stock of social capital evolves over time according to equation:

$$S_{s,t+1} = S_i + \Phi_i - \delta S_i$$

(10)

Each individual maximizes his/her utility function [equation (1)] subject to production function and constraints in equations (4) through (10).

Along the lines of Becker (1975), we may simplify our analysis by assuming that only time $t_{ei}$ is invested in accumulation of education and $x_{ei}$ tuition cost, and other costs are ignored in production of human capital $\phi_i$. We further assume that $\psi_i$ remains same for all the periods. Similarly, we assume $x_{si}$ is also negligible as $\Phi_i$ social capital production function depends on the time $t_{si}$ allocated towards it, and $g$ remains the same for all periods.

Let’s rearrange equation (6) in line with (5) and above assumptions.

$$\sum_{i=1}^{n} \frac{x_{ei}}{(1+r)^i} = \sum_{i=1}^{n} \frac{\alpha_it_{ei}E_i + t_{ei}x_{ei}S_i + v_i}{(1+r)^i}$$

(11)
By setting Lagrange function we may get first order conditions to observe changes in choice variables \( t_{wi}, t_{ei} \) and \( x_{ci} \) and its implications on the utility of individual.

Lagrange is set by using equation (1) and (11);

\[
L = U(C_i, \ldots, C_n) - \lambda \left[ \sum_{i=1}^{n} \frac{x_{ci}}{(1 + r)^i} - \sum_{i=1}^{n} \left( t_{wi} \alpha_i E_i + t_{wi} \gamma_i S_i + V_i \right) \right] \tag{12}
\]

where \( \lambda \) is Lagrange multiplier, which is equal to marginal utility of wealth. The first order conditions are as under

\[
\frac{\partial L}{\partial x_i} = \frac{\partial U}{\partial C_i} \frac{\partial C_i}{\partial x_i} - \frac{\lambda}{(1 + r)^i} = 0
\]

or

\[
U_{i,i} f_{xi} = \frac{\lambda}{(1 + r)^i}
\tag{13}
\]

and

\[
\frac{\partial L}{\partial t_i} = \frac{\partial U}{\partial C_i} \frac{\partial C_i}{\partial t_i} - \frac{\lambda}{(1 + r)^i} = 0
\]

\[
U_{i,i} f_{ti} = \frac{\lambda \alpha_i E_i + \gamma_i S_i}{(1 + r)^i}
\tag{14}
\]

Here \( U_i \) is marginal utility and \( f_x \) and \( f_t \) are marginal productivities with respect to composite goods and time, respectively.

It is assumed that all production functions are homogeneous of 1st degree. Similarly, productivity of goods and consumption does not vary with age so \( f_s \) remains the same. Since
marginal productivities of linear homogeneous production function is dependent on factor proportions, therefore, by using equation (13) and (14) we find that

$$\frac{U_i}{U_j} = \frac{p_i f_{xij}}{p_j f_{xji}} (1 + r)^{j-i} \quad i, j = 1, \ldots, n$$

(15)

$$\frac{U_i}{U_j} = \frac{f_{xji}}{f_{xij}} (1 + r)^{j-i}$$

(16)

Assuming perfect competition, wage rate is equal to the value of marginal product. Since \(p_i = p_j = 1\), it follows that

\[ w_i \leq w_j \]

\[ f_{xij} \leq f_{xji} \]

\[ \frac{U_i}{U_j} \leq (1 + r)^{j-i} \quad \text{as} \quad w_i \leq w_j \]

(17)

Equality of left hand side and right hand side of equation (17) in allocation of consumption over time holds if and only if wage rate are same in periods \(i\) and \(j\).

In period \(i\) investment is made in both human and social capitals. After accumulation of these capitals the positive returns are obtained from each in period \(j\) where \(j=i+1\). In order to observe investment behavior with respect to time allocation in human capital and social capital we may rearrange equation (4) as

\[ t_{wi} = t - t_{ci} - t_{ci} - t_{sji} \]

(18)
Now substitute $t_{wi}$ from equation (18) in Lagrange we get

$$L = U(C_1, \ldots, C_n) - \lambda \sum_{i=1}^{n} \left[ \frac{x_{ci}}{(1+r)^i} - \frac{\alpha_i E_{t} + \alpha_i E_{t+1} t_{ci}}{(1+r)^{i+1}} + \frac{\alpha_i E_{t+2} t_{ci}}{(1+r)^{i+2}} + \frac{\alpha_i E_{t+3} t_{ci}}{(1+r)^{i+3}} + \frac{\gamma_i S_{t} t_{ci}}{(1+r)^{i}} + \frac{\gamma_i S_{t+1}}{(1+r)^{i+1}} - \frac{V_i}{(1+r)^{i}} \right]$$

(19)

The first order conditions are given below;

$$\frac{\partial L}{\partial t_{ei}} = \lambda \left[ \frac{\alpha_i E_{t} + \gamma_i S_{t}}{(1+r)^{i}} - \sum_{j=i+1}^{n} \frac{\alpha_j t_{wi} \frac{\partial E_{j}}{\partial t_{ei}}}{(1+r)^j} \right] = 0$$

(20)

Equation (20) shows that present value of marginal cost of investment in human capital is equal to total return from human capital.

$$\frac{\partial L}{\partial t_{si}} = \lambda \left[ \frac{\alpha_i E_{t} + \gamma_i S_{t}}{(1+r)^{i}} - \sum_{j=i+1}^{n} \frac{t_{wi} \gamma_j \frac{\partial S_{j}}{\partial t_{si}}}{(1+r)^j} \right] = 0$$

(21)

Equation (21) is an equilibrium equation reflecting that present value of marginal cost of investment in period ‘$i$’ in social capital equals present value of returns from social capital in periods $j=i+1, \ldots, n$. With this pattern of investment in human capital and social capital, earlier implications of Becker (1975) results do not change. However, the path of wage rate is altered as it is determined by the endogenous variables $E_i$ and $S_i$ and behavior of $t_{wi}$ also depends on $t_{ei}$ and $t_{si}$.

In the above case cost of investment in both human and social capitals is incurred in one and the same period ‘$i$’. The returns are accrued in future periods $j=i+1, \ldots, n$. Both types of capital are relational to each.
The ratio of marginal productivities of time to marginal productivities of goods for investment in different activities shows relationship of investment of time and goods. Becker’s (1975), assumptions are followed in this regard.

Using equation (14) in (20) and then dividing equation (20) by equation (13) we get;

\[
\frac{f_{ti}}{fx_i} = \sum_{j=i+1}^{n} \frac{\alpha_j f_{wi}}{(1+r)^{j-i} \partial E_j}{\partial t_{ei}}
\]  

(22)

Similarly using equation (14) in equation (21) and then dividing equation (21) by equation (13) we get

\[
\frac{f_{si}}{f_{si}} = \sum_{j=i+1}^{n} \frac{\gamma_j f_{wi}}{(1+r)^{j-i} \partial S_j}{\partial t_{si}}
\]  

(23)

Equation (22) and equation (23) imply that

\[
\sum_{j=i+1}^{n} \frac{\alpha_j f_{wi}}{(1+r)^{j-i} \partial E_j}{\partial t_{ei}} = \sum_{j=i+1}^{n} \frac{\gamma_j f_{wi}}{(1+r)^{j-i} \partial S_j}{\partial t_{si}}
\]  

(24)

This implies that in equilibrium marginal returns in future from investment of time in human capital and social capital will be equal. So allocation of time between human capital and social capital will be substituted until the returns from both the capitals are equalized.\(^{12}\)

Therefore allocation of resources is made in consumption, labor supply, human capital and social capital by the individual. However, individual’s decision of investment of resources in a specific activity is also determined by individual’s rate of preference, and available stock of respective capital etc. For example, an individual allocating resources to social capital may consider his/her social group, society and state etc.

\(^{12}\) We are aware that in transitional countries like Pakistan there may not exist equal opportunities for human capital and social capital but for the sake of simplicity we assume however, in the long run it will hold.
3.2.2 Dimensions of Resource Allocation to Social Capital

The allocation of resources in social capital is made by an individual to carry out different activities through interaction and reciprocity with individual, group or community, institution or organization, and state. Individual develops reciprocal relationship based on time and monetary transaction and exchange or reciprocity with other individuals or group or state. The reciprocity may be in the form of exchange of emotions, feelings, sympathy, help and financial assistance etc. This enables an individual and society to accumulate social capital.\textsuperscript{13} The returns from social capital are not always equal to the cost of investment in one and the same period. Instead the shortfall is conceived as an investment that gives returns in future time periods. As Sobel (2002) also confirms that “social capital operates like gift exchange, taking advantage of social capital creates an obligation to honor future requests for assistance and increases the value of an individual’s connections”. Social capital has many types as discussed in literature review. However, social capital accumulates in one or more than one dimensions in different forms. The corresponding relationships among individual, group or community, institutions or organization, and state with other interacting partners are operationalised through cognitive and structural social capital. This is based on norms, values, rules and procedures. The social capital is drawn in different dimensions through interaction, reciprocal relation and exchange. Social capital in the society is reflected in a social capital matrix in the following section.

\textsuperscript{13} Hamdani (2004) presents a proposition regarding a Divine society having truly religious and not purportedly religious individual that; “If other things are held constant, a more religious individual will have a faith-based social utility function containing a vector of legitimate goods and services related to ‘self’ and a vector of legitimate goods and services related to ‘others’. Optimizing such a utility function by individuals will lead to both economic and moral satisfaction of the society at large, and also inherently promote human dignity, peace, equity and social justice”.

3.2.3 Social Capital Matrix

Social capital may exist in a number of dimensions for example: individual vs. individual, individual vs. group or community, individual vs. state, group or community vs. institution or organization, group or community vs. state, institution or organization vs. state, state vs. state, etc. Although these interactions and reciprocities have been discussed in literature, this discussion was somewhat scattered. We now consolidate that discussion in a matrix which we label as social capital matrix. This matrix, shown in Table 3.1, indicates how social capital can be accumulated through various forms of social interactions and reciprocal relations.

Table 3.1 Social Capital Matrix

<table>
<thead>
<tr>
<th>DIMENSIONS OF SOCIAL CAPITAL</th>
<th>Stake holders</th>
<th>Individual</th>
<th>Group/Community</th>
<th>Organization/institution</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Individual vs. Individual</td>
<td>Individual versus Group/Community</td>
<td>Individual versus Organization/institution</td>
<td>Individual versus State</td>
<td></td>
</tr>
<tr>
<td>Group/Community</td>
<td>group/community versus Individual</td>
<td>Group/Community versus Group/Community</td>
<td>Group/Community versus Organization/institution</td>
<td>Group/Community versus State</td>
<td></td>
</tr>
<tr>
<td>Organization/institution</td>
<td>Organization/institution versus Individual</td>
<td>Organization/institution versus Group/Community</td>
<td>Organization/institution versus Organization/institution</td>
<td>Organization/institution versus State</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>state versus Individual</td>
<td>state versus Group/Community</td>
<td>state versus Organization/institution</td>
<td>State versus State</td>
<td></td>
</tr>
</tbody>
</table>

The dimensions of social capital are elaborated in the above social capital matrix in following subheadings.

1. Individual vs. Individual

Individuals allocate resources for interaction and reciprocity with other individuals. Social capital is accumulated between two individuals through one individual’s interaction and reciprocity with another individual. Coleman (1990) points out that “social capital
constitutes a capital asset for the individual…it consists of some aspect of social structure and facilitates certain action of the individuals who are within the structure.” This relationship in turn develops trust between individuals that enable them to get returns in future.

Multidimensional existence of social capital among individual and state are viewed by Sobel (2002) “these problems involve small numbers of agents who know each other and interact repeatedly. The theory of repeated games explains how self-interested, calculating individuals can reach cooperative, efficient outcomes in this setting, but the same theory permits inefficient outcomes as well”.

2. Individual vs. Group or Community

Interaction between individuals and group or community members by allocation of time and money accumulates social capital. Robinson and Flora (2003) confirm that individuals and groups can consciously work to strengthen social capital. An important characteristic of networks is their permeability. This also affirms existence of social capital at the level of individual and group as Castle (2003) and Sobel (2002) noted that self-interests are important motivator for participation in groups. Sobel (2002) points out that an individual may draw his social capital from his connections (whom they know, but also connections through common group membership), the strength of these connections, and the resources available to their connections.

3. Individual vs. Institution or Organization

Individuals also interact with institutions or organizations through their members by allocation of resources that accumulate social capital for them. Individuals make investment through interaction and reciprocity with institution or organization that generates social
capital. This develops a level of trust among individuals and institutions or organizations. Sobel (2002) has the opinion that “studies of trust provide another example of the importance of institutions. Trust is the willingness to permit the decisions of others to influence your decisions or other to influence your welfare. Levels of trust determine the degree to which you are willing to extend credit or rely on the advice and actions of others”.

4. Individual vs. State

Social capital is accumulated between an individual and a state through the individual’s interaction with its institution or organization. Individuals make investment through reciprocity with state directly or indirectly through its institutions or organizations which develops their mutual trust. Evidence in literature shows that an individual with full trust in his state will be more cooperative citizen. Social capital sustains reciprocity between individuals and state. Cognitive social capital and structural social capital facilitates patterns of their interaction with each other.

5. Group or Community vs. Group or Community

Interaction of one group or community with another group or community by allocation of time and money accumulates social capital among them. Robinson and Flora (2003) confirm that individuals and groups can consciously work to strengthen the social capital. Existence of such type of social capital has also been affirmed by Castle (2003) and Sobel (2002). Similarly, Woolcock (1998) is of the view that physical capital and human capital are essentially the property of individuals, while social capital and extension inheres in groups. Stewart (1995) points out that a critical aspect of effective group functioning is that the action of individuals when acting within or on behalf of the group contributes to group aim.
Woolcock (1998) has argued that poor communities need to generate social ties extending beyond their primordial groups if developmental outcomes are to be achieved. The social capital is embodied within communities and according to Coleman, it refers to the relations within a group, including social norms and sanctions, mutual obligations, trust, and information transmission, the same is reconciled by Costa and Kahn (2003). Small communities develop different methods to solve collective-action problems. Sobel (2002) documented that these methods can be placed in a general theoretical framework, but they require sensitivity to local conditions to work.

6. Group or Community vs. Institution or Organization

A group or community interacts with institutions or organizations in order to accumulate social capital among them. Castle (2003) and Sobel (2002) have pointed out existence of social capital among groups due to common interests. Similarly Woolcock (1998) interprets that social capital is property of group. Stewart (1995) argues that critical aspect of effective group functioning is that the action of individuals when acting within or on behalf of the group contributes to group aim. Institutions serve as channels for collective action that is reinforced by diffused benefits, legitimization, and shared expectations. Social capital is best understood as the institutional dimension of transactions, markets and contracts. It determines the ways in which reliable and stable relationship and shared information among interacting partners can enhance the effectiveness and efficiency of both collective and individual interests.

About type of social capital that pertains to institutions, Robinson and Flora (2003) pointed out that institutions are the rules that make ordered and meaningful exchanges possible. They also pointed out establish property rights, membership requirements, rules for
resolving disputes and procedures for establishing new institutions. Institutions are the products of the collective response of persons in networks to the actions of others. Institutions often grow out of norms that establish responsibilities. Thus resources are allocated to develop such type of social capital among groups and institutions.

7. Group or Community vs. State

Interaction between group or community and state through their members by allocation of resources accumulates social capital for them. Individuals directly or indirectly on behalf of group make investment through interaction and reciprocity with state accumulates social capital which develops their reciprocity and trust in each others. Evidences from the literature support that a group or community with full trust in the state may cooperate with government policies. Social capital may sustain reciprocity between groups of individuals and state in order to develop trust in them. Cognitive social capital and structural social capital facilitates patterns of their interaction with each other.

Evans (1996) is of the view that for development purposes it is not enough to scale up micro-level capital but that contrary to most civil society advocates, the best effect results from state-society synergy. “Active government and mobilized communities can enhance each other’s development efforts”. While Evans admits that such a complementarity is mostly confined to egalitarian social structures and “robust, coherent state bureaucracies”, he argues that synergy can be created even in the more adverse circumstances typical of some developing countries. Similarly, Harriss (1997) reconciles with Putnam (1993) work on the nature and intensity of interaction in civil society in different parts of Italy to which he called as ‘networks of civic engagement’ as a major determinant of government performance. A study on social capital and participation in developmental activities in a district (Faisalabad)
of Pakistan is carried out by Beall (1997). Beall views that in many respects the interactions between state and civil society around urban services in Faisalabad had more in common with the vertical networks (social capital) Putnam (1993) described for southern Italy.

8. Institution or Organization vs. Institution or Organization

Individuals on behalf of their institution or organization make investment through interaction and reciprocity with other institutions or organization. Social capital generates reciprocity between institutions or organization and other institution or organization in order to develop their mutual trust.

Cognitive social capital and structural social capital facilitate and regulate patterns of mutual interaction of institutions or organizations. Sobel (2002) recognizes Turner (1999) who states that the term institution “denotes the way that members of a population are organized in order to face fundamental problems of coordinating their activities to survive within a given environment”. Ostrom’s (1999) contribution regarding common interests have been reconciled by Sobel (2002), that common-property resources, highlight the importance of institutions. Simon, McMillan, and Woodruffs (2000) work on institution pertaining to judicial system especially courts and contracts in transition economies highlight importance of social capital. They highlighted significance of social capital in dispute settlement in the presence of weak implementation power of the courts. Therefore, resources are also allocated by institutions to social capital for achievement of their interests and smooth functioning.

9. Institution or Organization vs. State

Individuals on behalf of an institution or organization make investment and develop reciprocity with a state directly or indirectly through its institutions or organization that
promotes trust in each others. Cognitive social capital and structural social capital facilitates patterns of interaction of institution or organization with state. Evans (1996) points out that for development purposes in addition to scaling up micro-level capital, state-society synergy can give better results. Social trust, norms of reciprocity networks of civic engagement and successful cooperation are mutually reinforcing. Putnam (1993) pointed out that for effective collaboration institutions require interpersonal skills and trust. These skills and trust are also inculcated and reinforced by organized collaborations. Institutions, organizations and state may allocate resources for accumulation of social capital to enhance effectiveness.

10. State vs. State

Two or more states interact with each other and allocate resources in any form or extend help, assistance or cooperation to each other. This exchange or reciprocity accumulates social capital among states. The accumulated social capital is used as a means to get returns in future. The states retain their reciprocal relations with each other by extending different form of cooperation’s and favours to each others. It is not necessary that state reciprocate the same commodities in the same form at the same time. Rather the quantum and form of exchange may be heterogeneous and more like a barter trade model. The exchange may depend upon need and demand of one state and supplying capability of the other.

In the social capital matrix, accumulation of social capital is also identified in other dimensions such as group or community versus individual, organization or institution versus individual, organization or institution versus group or community, state versus individual, state versus group or community and state versus organization or institution. However, for simplicity we assume that this is a symmetric matrix and, therefore, do not explain these dimensions. These corresponding relationships among individuals, groups or
communities, organizations or institutions and states have same output of social capital as explained in earlier part of this section. Besides, resources are also allocated by individuals to carry out other activities that promise them returns of different nature including returns in this life and life hereafter (Hamdani 2004 and Iannaccone 1998).

Individuals also carry out certain activities motivated by religiosity. Religious human capital is accumulated with the investment of budget by individuals in getting mastery over and adoption of religious practices. This in turn may affect preferences and other decisions of individual as consumer and producers. Individuals’ decisions to participate in labor force and income generation activities are also related to their decisions regarding effective hours allocation and behavioral aspects like honesty, abidance by contracts and job shirking, etc. Therefore, in addition to the above analysis, we extend this model of resource allocation for religious human capital.

3.3 Extension of Becker Model to Fifth Activity: Religious Human Capital

We now extend our analysis of utility optimization out of available budget of money and time by considering five activities, which are consumption, labor force, participation, human capital, social capital and religious human capital. Before formal analysis variables to be used in the mathematical work are denoted below.

\[
\begin{align*}
R_i & = \text{Level of religious human capital.} \\
\theta_i & = \text{Output of religious human capital.} \\
q & = \text{Production function of religious human capital.} \\
t_{R_i} & = \text{Time allocated to produce religious human capital.} \\
x_{R_i} & = \text{Composite market goods used to produce religious human capital.} \\
R_{i+1} & = \text{Stock of religious human capital at the beginning of period } i+1. \\
\kappa & = \text{Rate of depreciation of religious human capital.}
\end{align*}
\]
\[ \beta_i = \text{Per unit return from religious human capital} \]

Optimization problem is set in the following.

\[ C_i = f(x_i, t_i) \]  \hspace{1cm} (25)

where total time allocation

\[ t = t_{ci} + t_{wi} + t_{ai} + t_{ui} + t_{ri} \]  \hspace{1cm} (26)

And total composite market goods including \( x_{ci}, x_{ei}, x_{si} \) and \( x_{ri} \) are purchased from the income.

Individual allocates time to labor supply and earn wages.

Let the individual’s wage rates is

\[ w_i = \alpha_i E_i + \gamma_i S_i + \beta_i R_i \]  \hspace{1cm} (28)

The individual’s total income depends on his/her wage income and non-wage income \( v_i \) from fixed assets. He/she uses this income to purchase market goods. It is assumed that the individual’s income and expenditure remain in equilibrium. Therefore present value of expenditure on goods must equal present value of incomes, that is;

\[ \sum_{i=1}^{n} x_{ci} + x_{ei} + x_{si} + x_{ri} \frac{1}{(1+r)^j} = \sum_{i=1}^{n} t_{wi}\alpha_i E_i + t_{wi}\gamma_i S_i + t_{wi}\beta_i R_i + v_i \frac{1}{(1+r)^j} \]  \hspace{1cm} (29)

In equilibrium condition present value of expenditure (left hand side of the equation) is equal to present value of income (right hand side of the equation).

Religious human capital \( R_i \) is produced by an individual by allocating time and money to get mastery over and adopt true religiosity in perspective of producing religious
commodities such as worships, sermons, gatherings, literature and welfare activities.\(^{14}\) The output of religious human capital \(\theta_i\) is given below.

\[
\theta_i = q(x_{R_i}, t_{R_i}) \ldots
\]  

(30)

\[
R_{i+1} = R_i + \theta_i - \kappa R_i
\]  

(31)

\(R_{i+1}\) is stock of religious human capital at the beginning of period \(i+1\), while \(\kappa\) is the rate of depreciation of religious human capital. Each individual/household maximizes utility through Equation (1) subject to constraints (25) to (31). For optimization we set ‘Lagrange Function’. In line with Becker (1975) we assume that production of human and social capitals mainly depend on time allocation to respective activity. Likewise it is assumed that production of religious human capital \(\theta_i\) depends on only \(t_{R_i}\) the time allocation to its religiosity based activities, while role of goods \(x_{R_i}\) in this regard is ignored for simplicity, so equation (29) reduces to

\[
\sum_{i=1}^{n} \frac{x_{c_{ij}}}{(1+r)} = \sum_{i=1}^{n} \frac{t_{w_i} \alpha_i e_i + t_{w_i} \gamma_i s_i + t_{w_i} \beta_i r_i + V_i}{(1+r)}
\]  

(32)

Certain individuals, for example religious scholars, theologians, priest etc invest more in \(R_i\) and they get higher returns on this account. They extend services in worship places and meditation places and get high returns by accumulating larger amount of religious human capital.

The Lagrange is set in equation (33).

\[
L = U(C_i, \ldots, C_n) - \lambda \left[ \sum_{i=1}^{n} \frac{x_{c_{ij}}}{(1+r)} - \sum_{i=1}^{n} \frac{t_{w_i} \alpha_i e_i + t_{w_i} \gamma_i s_i + t_{w_i} \beta_i r_i + V_i}{(1+r)} \right]
\]  

(33)

\(^{14}\) Hamdani (2004) points out that these religious commodities may be produced with a worldly motive or a purely religious motive or with a blend of motive. He writes, “All worldly activities are considered Ibadah (worship-like) if performed in an ordained manner and with the intention to earn good will of Allah and all religious activities are considered worldly if these are performed with the intention of any only worldly benefits such as donating because of obtaining fame in the society or participating in a congregational prayer because of developing business relations with fellow-worshippers” (Chapter 3, footnote 86)
and first order conditions are given below

\[
\frac{\partial L}{\partial x_i} = \frac{\partial U_i}{\partial C_i} \frac{\partial C_i}{\partial x_i} - \frac{\lambda}{(1 + r)^2} = 0
\]

Or,

\[
U_{f_{st}} = \frac{\lambda}{(1 + r)}
\]

(34)

\[
\frac{\partial L}{\partial t_i} = \frac{\partial U_i}{\partial C_i} \frac{\partial C_i}{\partial t_i} - \lambda \left\{ \frac{\alpha_i E_i - \gamma_i S_i - \beta_i R_i}{(1 + r)^2} \right\} = 0
\]

\[
U_{f_{st}} = \frac{\lambda \alpha_i E_i + \lambda \gamma_i S_i + \lambda \beta_i R_i}{(1 + r)^2}
\]

(35)

For optimization of choice variables \( t_{ei}, t_{si} \) and \( t_{Ri} \), we rearrange and substitute value of \( t_{wi} \) in the constraint and, hence in (33) and optimize. By rearranging equation (26) we get

\[
t_{wi} = t - t_{ei} - t_{si} - t_{Ri}, \text{ so the Lagrange become}
\]

\[
L = U(\cdot) - \lambda \left\{ \sum_{i=1}^{n} \frac{x_{ei}}{(1 + r)^2} - \sum_{i=1}^{n} \frac{\alpha_i E_i [t + t_{ei} - t_{si} - t_{Ri}]}{(1 + r)^2} + \frac{\beta_i R_i [t - t_{ei} - t_{si} - t_{Ri}]}{(1 + r)^2} \right\}
\]

(36)

First order conditions are given below:

\[
\frac{\partial L}{\partial t_{ei}} = \lambda \left[ \frac{\alpha_i E_i}{(1 + r)^2} + \frac{\gamma_i S_i}{(1 + r)^2} + \frac{\beta_i R_i}{(1 + r)^2} - \sum_{j=i+1}^{n} \frac{\alpha_j \delta E_j}{(1 + r)^2} \right] = 0
\]

(37)

\[
\frac{\partial L}{\partial t_{si}} = \lambda \left[ \frac{\alpha_i E_i}{(1 + r)^2} + \frac{\gamma_i S_i}{(1 + r)^2} + \frac{\beta_i R_i}{(1 + r)^2} - \sum_{j=i+1}^{n} \frac{\gamma_j \delta S_j}{(1 + r)^2} \right] = 0
\]

(38)
\[
\frac{\partial L}{\partial t_{R_i}} = \lambda \left[ \frac{\alpha_i E_i}{(1+r)^i} + \frac{\gamma_i S_i}{(1+r)^i} + \frac{\beta_i R_i}{(1+r)^i} - \sum_{j=i+1}^{n} \frac{\beta_j}{(1+r)^j} \frac{\partial R_j}{\partial t_{R_j}} \right] = 0
\]  

Equation (37) is a standard equilibrium equation reflecting present value of marginal cost of investment in human capital in period \(i\), which is equal to present value of earning from human capital in period \(j\). Equation (38) is an equilibrium condition indicating that the present value of marginal cost of investing in social capital is equal to the present value of future return from social capital. Likewise equation (39) is an equilibrium condition setting the present value of marginal cost of investment in religious human capital equal to present value of future returns from religious human capital.

With this investment in human capital, social capital and religious human capital earlier implications of Becker (1975) results do not change much. However, the path of wage rate does not remain given; rather it is determined by the variables human capital \(E_i\), social capital \(S_i\) and religious human capital \(R_i\). Similarly behavior of \(t_{wi}\) also depends on \(t_{ei}, t_{si}\) and \(t_{Ri}\).

In the above case cost of investment in human capital, social capital and religious human capital is incurred in one and the same period ‘\(i\)’ and returns from human capital, social capital and religious human capital are accrued in future period \(j=i+1,i+2,\ldots,n\). All types of capitals are relational to each other.

In order to reach at logical conclusions regarding the relationship between investment of time and goods, we take ratio of marginal productivity of time to marginal productivity of goods for investment in different activities. Following assumptions already discussed in
Becker (1975) and using equation (35) in equations (37), (38) and (39) and then dividing these by equation (34) we get

\[
\frac{f_i}{f_{x_i}} = \sum_{j=i+1}^{n} \frac{\alpha_j t_{wi}}{(1+r)^{j-i}} \frac{\partial E_j}{\partial t_{ei}}
\]  

(40)

\[
\frac{f_i}{f_{x_i}} = \sum_{j=i+1}^{n} \frac{\gamma_j t_{wi}}{(1+r)^{j-i}} \frac{\partial S_j}{\partial t_{si}}
\]  

(41)

\[
\frac{f_i}{f_{x_i}} = \sum_{j=i+1}^{n} \frac{\beta_j t_{wi}}{(1+r)^{j-i}} \frac{\partial R_j}{\partial t_{ri}}
\]  

(42)

Equations (40), (41) and (42) imply that

\[
\sum_{j=i+1}^{n} \frac{\alpha_j t_{wi}}{(1+r)^{j-i}} \frac{\partial E_j}{\partial t_{ei}} = \sum_{j=i+1}^{n} \frac{\gamma_j t_{wi}}{(1+r)^{j-i}} \frac{\partial S_j}{\partial t_{si}} = \sum_{j=i+1}^{n} \frac{\beta_j t_{wi}}{(1+r)^{j-i}} \frac{\partial R_j}{\partial t_{ri}}
\]  

(43)

This means that in equilibrium marginal returns in future from investment of time in human capital, social capital and religious human capital will be equal. So allocation of time between human capital, social capital and religious human capital will be substituted until the returns from all the three types of capital are equalized.

However, individual’s decision of investment of resources in an activity is also determined by individual’s rate of preference and available stock of respective capital. By having interior solution through allocation of non-zero resources in all the above mentioned five activities; consumption, labor supply, human capital, social capital and religious human capital, an individual may accumulate all the types of capitals; thereby achieving returns in his/her life. With the help of this model one can understand the mechanism of resource allocation by an individual.
This theoretical model should be applicable to all societies and human beings and is testable accordingly. Therefore we will develop an empirical model in chapter 4 based on theoretical foundation of this model and provide a framework for statistical analysis of data.
3.1 a. Becker Model of Resource Allocation

Becker (1965) theory of Allocation of time has discussed allocation of time in consumption and labor force participation and gave utility function reflecting the arguments enabling an individual draw utility. Similarly Becker (1975, 1993,) in his theory has discussed resource allocation into three activities: consumption, labor force participation and human capital. He for the first time formally gave theory of time allocation and made it a part of his utility function and interpreted it in monetary term. He evaluated time in terms of foregone earnings per unit of time to be utilized to participate in labor force participation or otherwise.

His model explains that a representative individual makes allocation of time and money over the times in life cycle in following three activities in order to get utility.

A Utility is derived through utilization of time and expenditure in monetary form on consumption.

B Allocation of time and expenditure on labor force participation is made by an individual so as to earn income in lieu of the time spent.

C Time and money are allocated to accumulation of human capital in order to increase earning potential as measured by wage rate

He assumed that economic welfare depends on his consumption over time of objects of choice i.e. Commodities "C". The objective function is to maximize the utility as per utility function given in equation (1) which contains $c$ as an amount of commodity to be consumed during any period $i$. As $C_i$ is in turn produced ‘at home’ with inputs of his ‘market goods’ and his ‘own time’. Composite market goods used in period $i$ is $x_i$ and composite amount of time $t_i$ and $f^i$ production function in $i$ time periods. Where $t_{wi}$ is the amount of time spent on work through labor supply in period $i$ and $t_i$ is total time available during $i$ is independent of the specification of period which he assumed that all periods are equally long.

$$U = U(C_1, \ldots, C_n)$$  \hspace{1cm} (1a)

He starts his analysis by assuming that initially time is allocated only between consumption and labor force participation (work) so individual’s economic welfare depends
on his consumption over time of “objects of choice i.e. commodities and the amount of work”. He assumed that interest rate remains same in each period in perfect capital market.

He assumed that the "endowment" in each period comprises amount of ‘income’ \( v_i \) obtained from fixed assets and the wage income \( w_i \) obtained through labor supply in period \( i \) so the total income is affected by the hours spent at work, which is decision variable.

\[
C = f(x_i, t_{ei}), i = 1, \ldots, n. \tag{2a}
\]

\[
t_{ei} + t_{wi} = t, \quad i = 1, \ldots, n. \tag{3a}
\]

\[
\sum_{i=1}^{n} \frac{p_i x_i}{(1+r)^{t-1}} = \sum_{i=1}^{n} \frac{w_i t_{wi} + v_i}{(1+r)^{t-1}} \tag{4a}
\]

Where \( px \) is total expenditure with \( p \) as price vector and \( x \) as vector of market goods purchased by the individual. In equilibrium present value of expenditure on goods must equal present value of incomes; right hand side of equation (4a) is full wealth while left hand side shows how it is spent either on goods or on foregone earnings associated with the use and time in consumption. He assumed that \( w_i \) is independent of \( x_i \) and \( t_{ei} \), then,

By substituting value of \( t_{wi} \) from equation (3a) may get

\[
\sum_{i=1}^{n} \frac{p_i x_i + w_i t_{ei}}{(1+r)^{t-1}} = \sum_{i=1}^{n} \frac{w_i t + v_i}{(1+r)^{t-1}} \tag{5a}
\]

\[
0 \leq t_{ei} \leq t, \quad x_i \geq 0 \tag{5ab}
\]

He assumed that optimal values of choice variables \( t_{ei} \) and \( x_i \) will exist in the interior of the region given in this equation and wage rate \( w_i \) are independent of \( x_i \) and \( t_{ei} \).

Time used in consumption \( t_{ei} \) can not be more than the total available time \( t \). By setting Lagrange function of equation (1a),(2a),(3a)and(5a) he get first order conditions to observe change in choice variables such as \( t_{wi}, t_{ei} \) and \( x_i \) and its implications on the utility of individual. First order optimality conditions are given below.
\[ U_{i,t} = \frac{\lambda p_i}{(i + r)^{j-i}} \quad i = 1, \ldots, n \]  
\[ U_{i,t} = \frac{\lambda w_t}{(1 + r)^{j-i}} \quad i = 1, \ldots, n \]

\[ f_x = \frac{\partial f}{\partial x_i}, \]
\[ f_t = \frac{\partial f}{\partial t_{ci}}, \]
\[ U_i = \frac{\partial U}{\partial C_i} \]

Where \( U_i \) is marginal utility and \( f_x \) and \( f_t \) are marginal productivities with respect to composite goods and time respectively and \( \lambda \) is Lagrange multiplier equal to marginal utility of wealth.

\[ \frac{i f_t}{f_x} = \frac{w_i}{p_i} \quad i = 1, \ldots, n \]  
\[ (8a) \]

The marginal product of consumption time relative to goods equals the real wage rate in the same period is independent of interest rate. Consumption time has high marginal product with the high real wage rate. Productivity of goods and consumption do not vary with age so production functions are the same. Since marginal productivities of linear homogeneous production function depend on factor proportions. Equation (8a) shows that if marginal products decline the production of commodities is relatively time-intensive when real wages are low, and relatively good-intensive when real wages are high. It is assumed that all production functions are homogeneous of 1st degree and productivity of goods and consumption do not vary with age so \( i f, s \) are the same.

\[ \frac{U_i}{U_j} = \frac{p_i f_{ij}}{p_j f_{ji}} (1 + r)^{j-i} \quad i, j = 1, \ldots, n \]  
\[ (9a) \]

He assumed that prices remain same in different periods so, \( p_i = p_j = 1 \), then

\[ \frac{U_i}{U_j} = \frac{f_{ij}}{f_{ji}} (1 + r)^{j-i} \]  
\[ (10a) \]
As per homogeneity and diminishing returns to scale thus \( f_{xi} > f_{xj} \) hence

\[
\frac{t_{xi}}{x_i} > \frac{t_{xj}}{x_j} \quad \text{if} \quad w_j > w_i
\]

\( f_{xi} > f_{xj} \)

\[
\frac{U_i}{U_j} \leq (1+r)^{i-j} \quad \text{as} \quad w_i \leq w_j
\]

Equality of right hand side and left hand side in equation (11a) for allocation of consumption over time holds iff wage rates are the same in ith and jth periods. Becker then assumed that the individual allocates his resources in three activities, consumption labor supply and accumulation of human capital i.e. education or training. Investment in human capital is made by each person who produces his own human capital \( E \), by using some of his time and goods to attend school, training etc. One of the determinants of the amount invested in human capital is its profitability or rate of return. A change in the return is from a change in the amount invested in human capital.

\[
\phi = \psi(t_{ci},x_{ci})
\]

(13a)

Where \( \phi_i \) is the output of human capital in ith period and \( t_{ci} \) and \( x_{ci} \) are time and goods inputs respectively.;

\[
E_{i+1} = E_i + \phi_i - dE_i
\]

(14a)

Where \( E_{i+1} \) is stock of human capital at the beginning of period \( i+1 \) and \( d \) is rate of depreciation.

\[
t_{ci} + t_{wi} + t_{ei} = t \quad i = 1, \ldots, n.
\]

(15a)

\[
\sum_{i=1}^{n} \frac{x_i}{(1+r)^i} + \sum_{i=1}^{n} \frac{\alpha_i E_{wi} + v_i}{(1+r)^i}
\]

(16a)

Whereas \( w_i = \alpha_i E_i \) and \( \alpha_i \) is payment per unit of human capital in period \( i \).
He assumed that only time $t_{ei}$ is invested in accumulation of education and tuition cost and other costs are ignored in production $\phi_i$ of human capital. He also assumed that $\psi$ remains same for all the periods. Therefore first order conditions with respect to $x_i, t_{ei}, t_{wi}$ and $dt_{ei}$, are given below

$$U_{i, f_{xi}} = \frac{\dot{\lambda}p_i}{(i + r)^{i-1}} \quad i = 1, \ldots, n$$

(16a)

$$U_{i, f_{xi}} = \frac{\lambda}{(1 + r)^i} \quad i = 1, \ldots, n$$

(17a)

$$U_{i, f_{ij}} = \frac{\lambda \alpha E_i}{(1 + r)^i} \quad i = 1, \ldots, n$$

(18a)

$$0 = \lambda \left[ \frac{\alpha E_i}{(1 + r)^i} - \sum_{j=i+1}^{n} \alpha_{f_{wi}} \frac{\partial E_j}{\partial t_{ei}} \right]$$

(19a)

With this investment in human capital earlier implications of his results do not change. Equation (19a) is equilibrium condition reflecting that present value of marginal cost of investing in human capital equal to the present value of future returns, however it shows that the wage rate depends on human capital $E_i$, similarly behavior of $t_{wi}$ also depends on $t_{ei}$ in addition to its complementarity with $t_{ei}$. He affirmed that investment of time in human capital tend to decline with increase in age due to two reasons 1) number of remaining period and the present value of future returns decline with the age 2) cost of investment rise with increase in human capital as wage rate increases and resultantly foregone earnings increase. He considers the analysis by changing assumptions regarding time allocation to labor supply at very early age when legally or practically it is not possible to participate in labor market. In this case the marginal cost of investment in human capital is not equivalent to foregone earning rather it would be measured by the marginal value of time used in consumption

$$t_{wi} = 0 \quad i = 1, \ldots, q,$$

$$U_{i, f_{xi}} = \frac{\lambda}{(1 + r)^i} \quad i = 1, \ldots, q$$

(20a)
\[ U_i, f_{ni} = s_i \quad i = 1, \ldots, q \]  

\[ s_i = \lambda \sum_{j=i+1}^{n} \alpha_j t_{wi} \frac{\partial E_j}{\partial t_{ei}} \quad i = 1, \ldots, q \]  

\[ s_i \text{ is marginal utility of time spent on consumption} \]  

\[ \frac{U_i f_{ni}}{\lambda} = \sum_{j=i+1}^{n} \frac{\alpha_j t_{wi} \frac{\partial E_j}{\partial t_{ei}}}{(1 + r)^j} \quad i = 1, \ldots, q \]  

\[ \frac{f_{ni}}{f_{xi}} = \sum_{j=i+1}^{n} \frac{\alpha_j t_{wi} \frac{\partial E_j}{\partial t_{ei}}}{(1 + r)^{j-i}} \quad i = 1, \ldots, q \]

In view of Becker (1975) analysis that the marginal cost of investment in human capital is measured by the marginal value of time used in consumption that may bring an individual in an age bracket when consumption is naturally reduced and investment in human capital is considered less useful especially in the old ages. Such situation calls for comprehensive analysis that portrays allocation of time and money to the activities where marginal utility of allocation of resource increases and individual allocate their resources in substitution with human capital and consumption such as social capital and religious human capital. Therefore his model is extended.
Chapter 4

Empirical Model

4.1 Introduction

In this chapter, an empirical model is specified based on the theoretical results of the preceding chapter. Time and money allocation by individuals in various activities are herein focused through different variables. Empirical work on resource (time and money) allocation is available in the literature, but collective and integrated empirical work on time allocation to human capital, social capital and religious human capital is not available. Therefore, an empirical model is constructed for statistical analysis of data. Primary data is collected from Pakistani society. As explained in chapter 3, there are five main activities in which time and money resources are allocated by an individual. Resources are allocated to consumption, labor supply, human capital, social capital and religious human capital. Two types of equations are specified for allocation of resources; one reflecting time allocation and the other monetary expenditure. We have constructed a total of eight equations of which four deal with time allocation and four with monetary expenditures. The time based variables are: time to labor supply, time to human capital, time to social capital and time to religious human capital denoted by $t_{wi}$, $t_{ei}$, $t_{si}$ and $t_{ri}$ respectively. The monetary expenditure variables include expenditure on consumption, expenditure on accumulation of human capital, expenditure on accumulation of social capital and expenditure on accumulation of religious human capital denoted by $x_{ci}$, $x_{ei}$, $x_{si}$ and $x_{ri}$ respectively. A set of nineteen similar explanatory variables is constructed for these equations.
Arithmetic process is also performed for exploratory analysis, particularly, for statistical inferences of social capital matrix to show existence of social capital in different dimensions among individuals, groups or communities, institutions or organizations and states. Crude proxy variables constructed on the basis of time and money allocation for mutual interaction and reciprocity are used for analysis. Returns from social capital are also available in monetized and other form. To carry out estimation of empirical model an appropriate data set is used.

There were no comprehensive data giving information regarding micro foundation of the above, so despite their limitations and weaknesses, the data in hand (*Divine Economic Survey 2000*) have been considered the only choice to serve our purpose.

The data limitations coupled with resources constraint and scope of this study have made it difficult for us to directly estimate the theoretical model presented in Chapter 3. A few limitations and difficulties in this regard are highlighted as follows.

1. The equations to be estimated for labor supply, social capital, human capital and religious human capital are not fully parameterized.
2. Owing to scope of this study, along with time and resource constraints, some variables for example time to consumption and expenditure on labor supply cannot be easily measured.
3. A few of the independent variables have complex non-linear relationship with their respective dependent variable.

Similarly, a few of the variables are crudely proxied because they are difficult to measure exactly.
In the above mentioned circumstances, the theoretical formulation is manipulated for direct empirical estimation and for subsequent analysis because the empirical specification has to be consistent with the available data set.

4.2 An Empirical Model of Resource Allocation

We develop an empirical model in line with our theoretical results of previous chapter, and generate variables for empirical estimation. Our main criteria regarding choice of the variable are that the model embodies directly measurable variables. Such variables are either proxy or relatively more specific to represent consumption, labor supply, human capital, social capital and religious human capital.

Social capital is measured through budget allocated in activities such as extending social welfare activities, donation to other people, time allocation to friends, membership of different organization, guest entertainment, etc. Similarly, religiosity of an individual may be observed from his/her utilization of resources to carry out different religious activities such as prayer, recitations and religious studies, besides devotedness. Human capital is also measured by the level of education, number of years of education, time allocation to studies and training etc. of household. The time and money utilization in newspaper reading, internet, T.V. watching along with members of family etc is included in active leisure, while the passive leisure involves time spent on sleeping, taking rest etc. The justification to define leisure is different from its neoclassical definition that “leisure is the difference between maximum time available for work and hours worked” (Thomas 1990), etc. Alternatively, we define leisure as the difference between maximum time available (budget) for work and time (1) spent on work for market activity, (2) consumed in accumulation of human capital, (3) consumed in accumulation of social capital, (4) and consumed in accumulation of religious human capital.
This difference is equal to consumption, the same as Becker (1975). Therefore leisure is treated in the manner Becker modeled it as a part of consumption.

A system of eight equations along with a set of nineteen explanatory variables is constructed in the model.

\[ Y_i = \beta_{i0} + \sum_{j=1}^{19} \beta_{ij} X_j + U_i \]

Where \( Y_i \) is one of the eight dependent variables namely; \( x_{ei}, x_{ci}, x_{si}, x_{Ri}, t_{wi}, t_{ei}, t_{si} \), \( \beta_{i0} \) is intercept in the equations and \( \beta_{ij} \) are slopes of independent variables. \( X_j \) shows a vector of independent variables and \( U_i \) is random term in the equation.

Keeping in view our objectives, specification of the model and existing data we generated (different variables) and used appropriate methodologies for the sake of best representative analysis.

In view of the description of data noted above, the theoretical model is being empirically supported by selecting a few original variables of Hamdani (2002) alongwith modified variables. Construction of variables is according to standard economic procedure.

In the data we have values of time variables in hours in a year and money value in rupees in a year. Generation of variables, their definition, explanation, composition, rationale of use, and link with the theoretical model is being explained in the following sections.

4.3 Construction of Variables of Resource Allocation

We have eight dependent variables pertaining to consumption, labor supply, human capital, social capital and religious human capital. A few independent variables are adopted as such from Hamdani (2002) and remaining are modified according to specification of the model. Independent variables are pertaining to economic, personal, social, and religious
aspects of both the individuals and household. Dependent and independent variables of different types are described in the following sub-sections.

4.3.1. Dependent Variables of Resource Allocation\textsuperscript{15}:

The eight dependent variables are as follows.

**Consumption Variables**

The consumption variables are of two type one pertaining to time allocation and other to expenditure made in monetary terms. It reflects annual consumption expenditure incurred in rupees on purchase of all consumable commodities such as edibles, wearable, utility bills excluding expenditure made on human capital, social capital and religious human capital accumulation.

\( x_c \): This variable is the monetary expenditure on consumption and is the sum of all type of expenditures incurred on consumption on utility bill (gas, electricity, telephone, user charges etc.), food items, wearable, transportation and communication, house rent, recreation, medicine and expenditures on salary of domestic servants.

These expenditures variables do not include expenditure on specific hospitality, donations, and expenditure on welfare activities and expenditure incurred on religious activities etc.

\( t_c \): Time allocated to consumption reflects allocation of time on different activities relating to consumption and can be constructed by adding up allocation of time in main activities carried out for consumption.

Due to lack of sufficient data, this variable has been dropped from empirical analysis.

**Labor Supply Variables**

Labor supply consists of the number of hours allocated to labor force participation in full time jobs, part time jobs and part and casual jobs such as consultancy, etc. Labor supply may be in the form of self employment, or employment in public or private sector.

\textsuperscript{15} The list of all the variable is available in table 4.1
$x_w$: This variable measures monetary expenditure incurred by an individual in order to enable him/her supply his/her services in labor market, including expenditures on logistics, transportation and purchase of tools.

The role of the above expenditures (direct cost) is ignored because data on this variable is not available in the data set so we are constrained to ignore it. As an individual gets earning in lieu of time allocation to labor supply so in analysis of labor supply such time is included.

$t_w$: Time allocation to labor supply is the total number of hours allocated to labour for monetary return. This variable is constructed by adding up individual’s time allocation to main job, part time job, and extra time to the market.

**Human Capital Variables**

An individual’s human capital variables of resource allocation are time and monetary expenditure incurred in accumulation of human capital.

$x_e$: Monetary expenditure on accumulation of human capital reflects the allocation of resources in the form of money to acquire education, training, etc. This variable is the sum of expenditure on education and expenditure on purchase of books, etc. made by household.

$t_e$: Time based human capital variable reflects time to education and training. This variable is constructed by summing up individual’s annual time allocation to obtain education and training and time allocation to study different books.

Actual time allocation in a year by an individual to obtain education is also taken as a measure of human capital by Ben-Porath (1967) and Rangazas (2002 and 2005). Similarly, Hamdani (2004) also used this variable.

**Social Capital Variables**

Social capital variables are also categorized in two parts one based on monetary allocation and the other on time allocation.
Monetary expenditure on social capital is the sum of monetary resources used by an individual to carry out welfare activities, entertainment of guests, helping other persons, donation to other individuals or organizations.

Time variable of social capital reflects total number of hours invested by the respondent in different social activities. This variables includes allocation of time to welfare activities, voluntary works, attending social ceremonies, repair of home-wares, gardening and domestic affairs such as kitchen work, and child rearing.


Religious Human Capital Variables

Individual’s religious human capital variables of resource allocation are time and monetary expenditure on accumulation of religious human capital. The proxy for religious human capital variables have been constructed along the lines of the works of Hamdani (2004) and Iannaconne (1993, 1998, and 2000). Similarly, different adopted variables reconcile with the works of Alesina and laFeerara (2000), Smith (1990) and Costa and Kahn (2003). We define $x_R$ and $t_R$ as follows.

$X_R$: Monetary expenditure based variable reflects money allocated to investment in different religious activities such as help to kins and needy people. This variable also includes obligatory Islamic charities like zakat, khums and non-obligatory Islamic charities like alms, niaz, khairat, manat, sadqa, sacrifice of animals on Eid and other types of monetary expenditure on religious organizations, worship places, religious institutions for development of religious human capital.

It is understood that in addition to religious motives, individuals may be motivated by worldly gains. Therefore, this variable also includes donations either for worldly gains such as popularity among people, or other sheep skin benefits or tax rebates or socio-political gains.16

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16Interestingly for the Muslims as per religious literature (Quran and Hadith) even worldly activities are also religious if performed in accordance with religious norms as ordained by Allah and the Holy Prophet (SAWA).
Time based variable of religious human capital includes time allocation to offer obligatory prayers, non obligatory prayers, nawafil, recitation of special Islamic religious verses such as *kalima*, *darood*, prayers in congregation, religious activities, religious learning and time allocation to perform other religious activities.

The above variable is calculated by taking average time allocation to offer one unit of specific religious practice. This is very crude approximation and is not a perfect measure of time but in view of available data and resources, as well as variability in nature and style of offering worship, we adopt this method. We have approximated that individual’s average time utilization to offer one unit of nawafil is 0.65 minutes; one unit of *darood* is 0.15 minute, one prayer in congregation is 10 minute, and one unit of *kalima* takes 0.6 minutes. In order to make it more meaningful and compatible with other time based variables, we have divided it by 60 to convert our variables in hours.

In addition to above, religious human capital is also measured by taking its proxy from other variables pertaining to different aspects of religiosity which directly and indirectly influence the allocation of resource to accumulate human capital. This level of religious human capital may affect private returns of individual and society. An individual may get monetized and non-monetized returns in this life and life hereafter. Similarly, acquisition of religious human capital may have some external effect that may increase or decrease social returns of society. However, we adopted the variables in line with our theoretical model and available data and, thus ignored other variables that may also be their effect.
4.3.2 Independent Variables of Resource Allocation

Different independent variables are constructed in view of their expected relationship with dependent variables. The independent variables are classified into various categories, which are discussed as follows.

Economic Variables

The economic variables may affect an individual’s time and monetary allocations to different activities. These variables include wage, assets, and experience of individual.

\[ W = \] Wage rate of respondent giving per hour income from employment; it includes all benefits with deduction of taxes.

\[ W1 = \] Wage rate of respondent giving per hour income from full time employment; it includes all benefits and is adjusted for taxes.

\[ W2 = \] Wage rate of respondent giving per hour income from part time employment; it includes all benefits and is adjusted for taxes.

\[ At = \] Monetized value of all the net assets of respondent in one period. Net assets are total assets minus loan to be paid by respondent.

\[ EXPER = \] Work experience of respondent of the main job (work for other or self employed) in number of years.

\[ EXPER^2 = \] Square of work experience of respondent in main job (work for other or self employed) in number of years. It is done to capture quadratic effect.

\[ EXPERPC = \] Experience of respondent in number of years in part and casual jobs.

\[ EXPERPC^2 = \] Square of experience of respondent in number of years in part and casual jobs. It is done to capture quadratic effect.

Personality Variables

These variables give information about the personal characteristics of an individual. Personal characteristics may affect the individual’s for resource allocation.

\[ AGE = \] Age of respondent in number of years. This variable captures changes in preferences of an individual that may affect his/her decision making with age.

\[ AGE^2 = \] Square of the age of respondent, basically used to get quadratic impulse of age on other variables i.e. a variation in the dependent variables in later ages etc.

---

\[^{17}\] Variables are given in table 4.2
SEX= Dummy variable that gives information about the sex of respondent for male equal to 1 and for female is 0.

Married= Marital status of individual that shows whether the respondent is married or single. This is dummy variable equal to one if individual is married zero otherwise.

**Household Variables**

These variables give basic information regarding household members, which directly or indirectly affect individual’s decision making regarding resource allocation in different activities. Household variables also act as an externality for individuals at the time of their decision making and preference setting.

hhs= Total number of persons in a household.

The size of household directly and indirectly affects decision making process of an individual. Size of household affects responsibilities to be fulfilled by the head of family and in turn affect demands for good services. Therefore an individual may take into account household size while allocating resources in consumption, labor supply, human capital, social capital and religious human capital.

Disloc= The status of respondent with respect to his/her stay at residence of native place or out of native place, equal to 1 if dislocated from native home, zero, otherwise.

This variable reflects how much an individual is willing to make investment in accumulation of social capital and human capital due to his/her displacement from native home. Individual’s displacement may be either due to his employment or getting education. Construction of this variable reconcile with the work of Grootaert (2002) and SOCAT by Grootaert and Bastelaer (2002). It may be a crude proxy for status of social capital stock that enables an individual to move away from his home town and in his/her absence other individuals look after his/her local interests, inherited assets, etc.
**Human Capital Variables**

These include education level of an individual in years and percentage of education in household (ehh). These variables affect the decision making process of investment in human capital by an individual.

\[
ehh = \frac{hhmat \times 10 + hhgr \times 14 + hhpgr \times 16}{hhlit + hhmat + hhgr + hhpgr}
\]


**Fedu=** Education level of father of the respondent in years.

**Medu=** Education level of mother of the respondent in years.

The education levels of father and mother of the respondent may act as of human capital stock that affects individual’s decision of investment in education. Heckman (2003) and Heckman et al. (2006) also used the human capital stock and affirm the role of parents and family background in promotion of human capital.

**Oeduyrs=** Individual’s education level in years.

Construction of this variable is in line with Barro and Sala-i-Martin (1995 and 2004) and Heckman ((2003).

**Social Capital Variables**

Social capital variables of household are in the form of stock already accumulated due to cognitive and structural social capital in the society. This variable affects returns to social
capital. It also affects individual’s decision to make investment of time and money for accumulation of human capital, social capital and religious human capital.

Free = Value of goods and services that an individual gets without paying an explicit cost to its providers on that particular moment. For example free services for repair of electric appliances.

It is the monetized value of return from already accumulated social capital. An individual may obtain goods and services at the time of need from another individual, group, community, institution or organization. This variable may affect preferences and decision making of individual for resource allocation for accumulation of human capital, social capital, and religious human capital. Therefore, we include this independent variable in our regression model. A variable pertaining to non monetary return from social capital is also used by Hamdani (2004).

**Religious Human Capital Variables**

Religious human capital variables of household reflect stock of religious capital in the society. The stock of religious human capital affects in individual’s decision making regarding time and money allocation to make investment in consumption, labor supply and accumulation of human capital, social capital, and religious human capital.

Rbyothr = Monetary expenditure on religious activities by other members of household. This variable is taken as a proxy for stock of religious human capital in a house hold which reconciles with Hamdani (2004). Long and Settle (1977) have also found that religiosity level of an individual’s parents affects his or her religious activities. In literature, other stock variables are also used as a proxy for religious human capital but use of the variable religious expenditure by other members of household (rbyother) is more in line with our theoretical model in view of available data.
4.4 Empirical Model of Resource Allocation through Social Capital Matrix

Social capital matrix, constructed in chapter 3, shows that the allocation of resources in social capital is made by an individual to carry out different activities through interaction and reciprocity with another individual, groups or communities, institutions or organizations, and states. As Sobel (2002) states “social capital operates like gift exchange, taking advantage of social capital creates an obligation to honor future requests for assistance and increases the value of an individual’s connections”. An individual develops reciprocal relationships based on time and monetary transactions and exchange or reciprocity with other individuals or groups or state. The reciprocity may be in the form of exchange of emotions, feelings, sympathy, help and financial assistance etc. that enable individuals and societies to accumulate social capital.

Data that provide information on all the dimensions of social capital accumulation are lacking. Most available data sets encompass information on reciprocity among individuals or between individuals and groups or organizations. In this section, we use Devine Economics Survey 2000, of Hamdani (2000) to estimate some of the entries in social capital matrix as sample averages.

We calculate the values in seven cells of the social capital matrix pertaining to accumulation of and return from social capital in the dimensions of: Individual to individual, individual to community, individual to organization, individual to state, community to individual, organization to individual and state to individual. Directly quantifiable time variables are calculated and transformed into monetized values. Time allocated in different activities is multiplied with the individual’s wage rate so as to count foregone earnings. Wage

\[18\] List of variables is available at table 4.3
rate is calculated by taking average of wages from main job and part time job. Average level of investment in social capital or returns from social capital is calculated by summation of values across all individuals and then dividing the sum by total numbers of individuals. Details of calculations are given as follows.

**Individual to Individual Social Capital**

Here social capital is calculated by multiplication of average wage rates of individual with the number of hours allocated to the household members to extend help in domestic affairs and number of hours allocated to assist household to perform activities like repair and gardening etc. The monetized value of the time shows the amount of money an individual invest by allocating time accumulation of social capital. Although this is a crude proxy of social capital accumulated for an individual, yet, due to non availability of data this variable is constructed.

\[
\text{Individual to Individual pay-off} = \frac{1}{n} \sum_{i=1}^{n} W_i X_i
\]

where \( i = 1 \) to \( n \)

and \( W_i = \frac{(W^m_i + W^p_i)}{2} \)

\( i \) reflects an individual in the sample, \( W^m_i \) and \( W^p_i \) are wage rates of individuals in full time and part time jobs respectively. And \( X \) reflects average number of hours of individuals used in interaction with other household members in a year.
Individual to Community Social Capital

Social capital between an individual and community is calculated by multiplication of average wage rates of individual with the number of hours allocated to discussion with the members of the community and the number of hours allocated to social activities. The monetized values of the time show how much an individual invests in social capital accumulation with community

\[
\text{Individual to Community pay-off} = \frac{1}{n} \sum_{i=1}^{n} W_i X_i
\]

Individual to Organization Social Capital

Individuals in the society also give time to different social organizations like NGOs, labor unions, and other organizations. They extend services to or carry out certain activities for different organizations. Sum of variables like time allocation to religious organizations and time to volunteering organizations are taken as a crude proxy for investment in social capital between individual and organization. Monetized value of time invested in an organization is calculated by its multiplication with average wage rate of individual.

\[
\text{Individual to Organization pay-off} = \frac{1}{n} \sum_{i=1}^{n} W_i X_i
\]

Individual to State Social Capital

An individual in state gives time to different activities pertaining to state or state’s functionaries. The individual carries out a variety of activities that directly or indirectly enhance functions of the state. The individual may provide goods and services to societies that are substitute of public goods. The time allocation by individual to welfare activities is taken as a crude proxy for social capital between individual and state. Monetized value of this type
of social capital is counted through the multiplication of number of hours allocated by individual to the state with individual’s average wage rate.

Individual to State pay-off = \( \frac{1}{n} \sum_{i=1}^{n} W_i X_i \)

**Community to Individual Social Capital**

An individual obtains returns from the social capital existing between individual and community. Reciprocity of goods and services exists between the individual and community. Separate data are not available on the returns from community and organization. However, data based on responses of individuals to questions pertaining to joint returns individuals get from community and organization are available. Monetized value of goods and services that an individual obtains from community and organization is taken as a crude proxy for returns to the social capital. The goods and services community provides to the individual are also investment in social capital for future reciprocity. There exists generalized reciprocity, which does not exactly mention quantum and time of investment and return to social capital. Provision of returns to social capital develops credibility of the community, while surplus returns are investment in social capital. The individual gets joint returns from both community and organization on the basis of his/her time allocation. It is assumed that an individual obtains returns from the community with the proportion of time he/she gives to community. The average joint return from community and organizations to an individual is multiplied by the proportion of his or her average monetary value of time allocated to the community. This gives
Community to individual pay off:

\[
\frac{\frac{1}{n} \sum_{i=1}^{n} W_i X_i}{\text{Community}} - \frac{1}{n} \sum_{i=1}^{n} W_i X_i \right) + \left( \frac{1}{n} \sum_{i=1}^{n} W_i X_i \right) \right),
\]

Where \( G_{ei} \) represents gain from community and organization to individuals.

**Organization to Individual Social Capital**

An individual gets returns from the social capital existing between the individual and organization. Since individual gets joint returns from both community and organization on the basis of his time allocation respectively, it is assumed that an individual gets returns from the organization with the proportion he/she gives to organizations. Similarly, the total return is also divided in terms of the proportionate monetary value of the time devoted to the organization. Therefore,

\[
\text{Organization to Individual pay-off } = \\
\left( \frac{\frac{1}{n} \sum_{i=1}^{n} W_i X_i}{\text{organisation}} + \frac{1}{n} \sum_{i=1}^{n} W_i X_i \right) \right),
\]

**State to Individual Social Capital**

An individual gets returns from the state in different forms. Variable return from state shows monetized value of goods and services an individual gets from the state. This variable is taken as a crude proxy for returns to social capital. Although a direct variable pertaining to returns from state is not available, yet, a crude variable is constructed on the basis of information of transfer of goods and services to respondents. These responses are averaged out to get a single average gain from the state to individual.
State to Individual pay-off = \[ \frac{\sum_{i=1}^{n} G_{si}}{n} \],

where \( G_{si} \) is gain from state to individuals in monetized form.

The above procedure is used to fill in numerical values in first row and first column of the social capital matrix. The values of remaining entries in the matrix cannot be determined on the basis of the given data.
### Table 4.1

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>( xc )</td>
<td>Total expenditure on consumption is sum of following variables</td>
</tr>
<tr>
<td>Xcrecrtn</td>
<td>Expenditure on recreation annually</td>
</tr>
<tr>
<td>Xcutly</td>
<td>Yearly expenditure on utility bills (gas, electricity, water, telephone, etc)</td>
</tr>
<tr>
<td>Xtrans</td>
<td>Annual expenditure on transportation</td>
</tr>
<tr>
<td>Xcfood</td>
<td>Annual expenditure on eatables</td>
</tr>
<tr>
<td>Xcshoes</td>
<td>Annual expenditure on shoes</td>
</tr>
<tr>
<td>Xmedic</td>
<td>Annual expenditure on medicines</td>
</tr>
<tr>
<td>Xchous</td>
<td>Annual expenditure on house rent</td>
</tr>
<tr>
<td>Xcsert</td>
<td>Annual expenditure on payments to servants</td>
</tr>
<tr>
<td>( xe )</td>
<td>Total annual expenditure on educational activities is sum of following variables</td>
</tr>
<tr>
<td>Xei</td>
<td>Annual expenditure on education</td>
</tr>
<tr>
<td>Xebook</td>
<td>Annual expenditure on books</td>
</tr>
<tr>
<td>( xs )</td>
<td>Annual expenditure on investment in accumulation of social capital is sum of following variables</td>
</tr>
<tr>
<td>XSdw</td>
<td>paid as donation for welfare and guest</td>
</tr>
<tr>
<td>XShelp</td>
<td>Annual expenditure on helping others due to non-religious reason</td>
</tr>
<tr>
<td>XSguest</td>
<td>Annual expenditure made on entertainment of guest</td>
</tr>
<tr>
<td>( XR )</td>
<td>Annual expenditure on investment in accumulation of religious human capital is sum of following variables</td>
</tr>
<tr>
<td>XRzms</td>
<td>Annual paid as Zakat, Khums Sadqa Khairat, and Manat</td>
</tr>
<tr>
<td>XRactiv</td>
<td>Annual Expenditure on religious activities</td>
</tr>
<tr>
<td>XRhelp</td>
<td>Annual expenditure made on helping others</td>
</tr>
<tr>
<td>( tw )</td>
<td>Total time allocation to labor supply in a year is of following variables</td>
</tr>
<tr>
<td>tw1</td>
<td>hours allocated to main job in a year</td>
</tr>
<tr>
<td>tw2</td>
<td>hours allocated in a year to part time job</td>
</tr>
<tr>
<td>tw1ext</td>
<td>Extra-allocation of time in hours to main job</td>
</tr>
<tr>
<td>( te )</td>
<td>Total time allocation to accumulation of human capital in a year is sum of following variables</td>
</tr>
<tr>
<td>tetrain</td>
<td>Total time allocation to by respondent to get training in a year.</td>
</tr>
<tr>
<td>teword</td>
<td>Total time allocation to study different books in a year.</td>
</tr>
<tr>
<td>( ts )</td>
<td>Total time allocation to accumulation of social capital in a year is sum of following variables</td>
</tr>
</tbody>
</table>

104
tswelfr  Allocation of time in hours to welfare activities in a year.
tscerm  Allocation of time in hours to social ceremonies in a year
tshprod  Allocation of time in hours to home production in a year
tsvol  Time allocation to voluntary activities in a year
tshom  allocation of time in home activities in a year

$tR$  Total time allocation to accumulation of religious human capital in a year is sum of following variables

$tRactiv$  Allocation of time in hours to religious activities in a year.
tRelern  Allocation of time in hours to religious learning
tre  Allocation of time in hours to religious study
tRpray  Allocation of time in hours to prayers
tRcong  Time allocated to offer number of prayers in congregation
tRnwfl  Time allocated to offer number of Nawafil daily.
tRdrod  Time allocated to offer number of daily darood in a year
tRkalim  Time allocated to offer number of daily kalma in a year.
tRprayn  No of prayers offer daily in a year
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX</td>
<td>Sex of individual if female =0 and 1 for male</td>
</tr>
<tr>
<td>MARRIED</td>
<td>If the individual is married then =1 otherwise =0</td>
</tr>
<tr>
<td>AGE</td>
<td>Age of the individual in number of years</td>
</tr>
<tr>
<td>AGE(^2)</td>
<td>It reflects square of the age of respondent, basically used to get quadratic impulse of age on other variables i.e., a variation in the dependent</td>
</tr>
<tr>
<td>DISLOC</td>
<td>If dislocated from home for job etc then =1 otherwise =0</td>
</tr>
<tr>
<td>ASSETS</td>
<td>All the assets possessed by individual real assets, inherited etc. value in rupees</td>
</tr>
<tr>
<td>AT</td>
<td>Net assets (Assets-loan)</td>
</tr>
<tr>
<td>HHS</td>
<td>Total number of members of household</td>
</tr>
<tr>
<td>EXPER</td>
<td>Experience in number of years in main job</td>
</tr>
<tr>
<td>EXPERPC</td>
<td>Experience in number of years in part and casual job</td>
</tr>
<tr>
<td>EXPER(^2)</td>
<td>This variable is square of experience of respondent of working life (work for other or self employed) in number of years.</td>
</tr>
<tr>
<td>EXPERPC(^2)</td>
<td>This variable is square of experience of respondent in number of years in part and casual job.</td>
</tr>
<tr>
<td>W1</td>
<td>Wage rate of full time job</td>
</tr>
<tr>
<td>W2</td>
<td>Wage rate of part time job</td>
</tr>
<tr>
<td>ehh</td>
<td>It is level of education of household members interpreted in percentage of education (human capital) in household.</td>
</tr>
<tr>
<td>hhlit</td>
<td>It is number of members of household without any education or number of illiterate individuals in a household.</td>
</tr>
<tr>
<td>hhmat</td>
<td>It is number of members of household with Secondary education.</td>
</tr>
<tr>
<td>hhgr</td>
<td>It is number of members of household with Bachelor education.</td>
</tr>
<tr>
<td>hhpgr</td>
<td>It is number of members of household with above Bachelor education level including Master, M.Phil and Ph D.</td>
</tr>
<tr>
<td>Fedu</td>
<td>Education level of father of the respondent in years.</td>
</tr>
<tr>
<td>Medu</td>
<td>Education level of mother of the respondent in years.</td>
</tr>
<tr>
<td>eh</td>
<td>It is level of education of individual especially respondent.</td>
</tr>
<tr>
<td>ehlit</td>
<td>This variable shows that the individual is illiterate or without any formal education.</td>
</tr>
<tr>
<td>ehmat</td>
<td>It is level of education of individual especially respondent equivalent to secondary education.</td>
</tr>
<tr>
<td>ehgr</td>
<td>It is level of education of individual especially respondent equivalent to bachelor education.</td>
</tr>
<tr>
<td>ehpgr</td>
<td>It is level of education of individual especially respondent equivalent to Master, M.Phil or Ph D. Oeduyrs education level of respondent in years.</td>
</tr>
</tbody>
</table>
Free this variable gives information of return to respondent from social capital in rupees in a year. The services and goods an individual gets without paying an explicit cost to service providers.

Rbyothr this variable shows the amount of resource allocation in monetary terms by members of household in religious activities.

Oeduyrs own education of individual in years
Table 4.3

Variables for social capital matrix

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wp</td>
<td>wages from part time job.</td>
</tr>
<tr>
<td>Wm</td>
<td>wages from main job.</td>
</tr>
<tr>
<td>W</td>
<td>average of wages from main job and part time job.</td>
</tr>
<tr>
<td>Return from the community to individual: monetized value of goods and services individual gets from community/organization</td>
<td></td>
</tr>
<tr>
<td>Return from the State to the Individual: monetized value of goods and services individual gets from state</td>
<td></td>
</tr>
<tr>
<td>WELFAREM</td>
<td>number of hours allocated by individual to carry out welfare activities</td>
</tr>
<tr>
<td>HOMEM</td>
<td>number of hours allocated by individual to help household in domestic affairs</td>
</tr>
<tr>
<td>HWORKM</td>
<td>number of hours allocated by individual to assist household in repair and other works</td>
</tr>
<tr>
<td>DEENIM</td>
<td>number of hours allocated by individual to religious organisation</td>
</tr>
<tr>
<td>GUPM</td>
<td>number of hours allocated by individual for interaction with members of community</td>
</tr>
<tr>
<td>V</td>
<td>number of hours allocated by individual for voluntary works</td>
</tr>
<tr>
<td>SCOIALM</td>
<td>number of hours allocated by individual to carry out social activities</td>
</tr>
<tr>
<td>SSFrtot</td>
<td>Total number of friends of an individual</td>
</tr>
<tr>
<td>SSworg</td>
<td>membership of individual in number of organizations</td>
</tr>
</tbody>
</table>
Chapter 5
DATA ISSUES AND DESCRIPTIVE ANALYSIS

5.1 Introduction

Theoretical model presented in Chapter 3 and the subsequent empirical model in Chapter 4 are to be empirically tested with the data set. Primary data are used for empirical estimation. In this chapter, different issues of data set and descriptive analysis are discussed. Descriptive analysis is performed for preliminary identification of different possible dimensions of analysis, for example prospective relationship of certain variables, nature of association of the variables, and supporting evidences for understanding relationships of variables. Data collection methodology, questionnaire and different characteristics of data are discussed for understanding of possible use of dataset.

5.2 The Data

The present study uses cross-section primary data as no secondary data on social capital and religious human capital pertaining to economic behavior (cross section or time series) are available. The available data in Population Censuses, Labor Force Survey and Household Income Expenditures Surveys (HIES) provide information mainly on economic variables. The data available in Pakistan Socioeconomic Survey (PSES) 1998-99 are also subject to similar limitations. None of these data sources provide information with reference to religiosity, time allocation and expenditure taken together. Therefore, the present study relies on the only available data set i.e. Hamdani (2000; “Divine Economic Survey 2000 I” titled as Religiosity and Economic Survey). This data set provides information on socio-economic, demographic, human capital, labor supply, social, and religious dimensions of
economic agents. Survey methodology and data limitations are discussed in the following sections.

5.2.1 The Survey Methodology

The population under Divine Economics Survey-I 2000 included adults (between 18 and 65 years age) of Pakistan and Azad Kashmir. The sample selection was done in two stages. During the first stage, three cities and a town from Pakistan and four cities and a town from Azad Jammu & Kashmir were randomly selected on the basis of stratification. The number of cities and towns were kept limited to nine to keep the cost of the survey within manageable limits. The sampled areas represent a variety of characteristics of Pakistani urban population and hence satisfy the criteria of representation. For example, the chosen cities include large, medium and small sized cities in terms of area as well as population. Karachi is located in extreme south of the country, Muzaffarabad is located in extreme north while others are located in between the two geographical extremes. These other sites are representatives of urban areas in mountainous regions and those in plains.

During the second stage, a mix of convenience sampling and snow ball sampling method was used to select the respondents within each city/town. Some local support persons, who helped in rapport building with the respondents, were identified in each locality. This was essentially required because the survey contained a large number of sensitive questions relating to income, expenditures, personal and sectarian characteristics and other aspects that could create doubts in the minds of respondents. This practice also helped in reducing the usual hesitation among people who are usually reluctant to answer such questions unless they are fully assured about the sanctity of the objectives of survey and secrecy of information obtained from them. The total number of households interviewed was 405 out of which 103
households were later excluded from data analysis due to technical deficiencies in the filled-in questionnaires. The final sample size was, therefore, 302 households.

5.2.2 The Questionnaire

The questionnaire was designed in view of specific objectives of the study. It was focused on resource allocation with respect to beliefs, morals and deeds. These three aspects had remained central while designing the questions relating to various dimensions of human behavior including, in particular, money and time allocation for self, family, community and religion. The questionnaire sought information on various aspects, including socio-economic, demographic, religious and educational characteristics of households and their perceptions about their own and social statuses with respect to these characteristics. Three types of questions were included in the questionnaire; standard questions, open-ended questions and close-ended questions. To check the internal consistency of responses, some cross-questions were also included in the questionnaire.

5.2.3 The Collection of Qualitative Information

In addition to the main survey, some additional rapid assessments and case studies were also conducted in order to obtain qualitative information on how the level of religiosity affects daily economic decisions of individuals, particularly their time allocation between market activities, volunteering and religious participation. Special interviews of religious clergymen known as Ulama were also conducted. Similarly, some NGO workers were specially interviewed for knowing about volunteering avenues and practices in the sampled regions.
5.2.4 Limitations of Data

Some of the limitations of *Divine Economics Survey* data 2000 as given in the original source are described below for two reasons: (i) the results of present study should be seen in the light of data limitations because some of the results may have more insights than final conclusions. (ii) Any future researcher may improve study design where so needed.

These data lack certain important information pertaining to social capital, human capital and religious human capital. Time and money variables have to be reconstructed or modified so as to make them congenial to theoretical and empirical model. The reconstruction of variables may change the role of the original variable. Main thrust of these data was on religiosity and most of the variables are constructed in view of religious orientation. Social capital and human capital variables were not the main focus of the surveys, hence there exists room for improvement in future survey. It is explained in the data set that although formal education is not necessary for a respondent to answer a question yet illiterate people are less likely to comprehend them. Hence, a low response rate was observed among less educated people causing a bias in the data.

Donating behavior is common in all divine religions. However, as explained in the data set for philanthropist it is not necessary that every amount spent for others (as recorded by surveys) is truly religion-based or motivated by social capital or reciprocity. Only more explicit survey can separate the religion-based donations from others.

5.2.6 Sample Characteristics.

Characteristics of the sample are analyzed in view of its nature and composition with respect to economic concepts. The Sample consists of 302 respondents of nine cities and
towns of Pakistan, and their relative share is given in Table 5.1. The table shows that Muzaffarabad has the largest share and Garhi Dopatta is with the lowest share.

### Table 5.1: Relative Share of Cities in the Sample

<table>
<thead>
<tr>
<th>Name of City/Town</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karachi</td>
<td>42</td>
<td>13.91</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>42</td>
<td>13.91</td>
</tr>
<tr>
<td>Islamabad</td>
<td>49</td>
<td>16.23</td>
</tr>
<tr>
<td>Muzaffarabad</td>
<td>58</td>
<td>19.21</td>
</tr>
<tr>
<td>Vanekey</td>
<td>33</td>
<td>10.93</td>
</tr>
<tr>
<td>Garhi Dopatta</td>
<td>15</td>
<td>4.97</td>
</tr>
<tr>
<td>Bagh</td>
<td>19</td>
<td>6.29</td>
</tr>
<tr>
<td>Mirpur</td>
<td>17</td>
<td>5.63</td>
</tr>
<tr>
<td>Kotli</td>
<td>27</td>
<td>8.94</td>
</tr>
<tr>
<td><strong>The Entire Sample</strong></td>
<td><strong>302</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Different characteristics of the sample are given in the Table 5.2. The sample is represented by 93 female (30.79 percent) and 209 (69.29 percent) male respondents. Out of the male respondent 60 percent are unmarried, while out of females only 41 percent are unmarried. The sample represents highly educated respondents. Out of the total sample 48 percent have acquired education of 16 and above 16 or more years. Gender break down shows that 43 percent female and 50 percent males have acquired at least sixteen years of education. Only 3.6 percent of the sample comprises of illiterates. Age distribution shows that majority of the respondents are young with 49 percent being in the age bracket of 20-30 years. Less than 10 percent of the respondents lie in age groups below 20 years and above 50 years. Around 25 percent of the sample comprises of respondents of age group 30-40 years.
### Table 5.2: Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th></th>
<th>Male</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>percent</td>
<td>Number</td>
<td>percent</td>
<td>Number</td>
<td>percent</td>
</tr>
<tr>
<td>Un-Married</td>
<td>56</td>
<td>60.22</td>
<td>85</td>
<td>40.67</td>
<td>141</td>
<td>46.69</td>
</tr>
<tr>
<td>Married</td>
<td>37</td>
<td>39.78</td>
<td>124</td>
<td>59.33</td>
<td>161</td>
<td>53.31</td>
</tr>
<tr>
<td>Educational Levels of Respondent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>1</td>
<td>1.08</td>
<td>10</td>
<td>4.78</td>
<td>11</td>
<td>3.64</td>
</tr>
<tr>
<td>0-5 years</td>
<td>0</td>
<td>0.00</td>
<td>2</td>
<td>0.96</td>
<td>2</td>
<td>0.66</td>
</tr>
<tr>
<td>6-10 Years</td>
<td>11</td>
<td>11.83</td>
<td>26</td>
<td>12.44</td>
<td>37</td>
<td>12.25</td>
</tr>
<tr>
<td>11-15 years</td>
<td>41</td>
<td>44.09</td>
<td>66</td>
<td>31.58</td>
<td>107</td>
<td>35.43</td>
</tr>
<tr>
<td>16 and above years</td>
<td>40</td>
<td>43.01</td>
<td>105</td>
<td>50.24</td>
<td>145</td>
<td>48.01</td>
</tr>
<tr>
<td>Age of Respondent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20 years</td>
<td>7</td>
<td>7.53</td>
<td>5</td>
<td>2.39</td>
<td>12</td>
<td>3.97</td>
</tr>
<tr>
<td>20-30 years</td>
<td>58</td>
<td>62.37</td>
<td>91</td>
<td>43.54</td>
<td>149</td>
<td>49.34</td>
</tr>
<tr>
<td>30-40 years</td>
<td>13</td>
<td>13.98</td>
<td>62</td>
<td>29.67</td>
<td>75</td>
<td>24.83</td>
</tr>
<tr>
<td>40-50 years</td>
<td>12</td>
<td>12.90</td>
<td>37</td>
<td>17.70</td>
<td>49</td>
<td>16.23</td>
</tr>
<tr>
<td>50-60 years</td>
<td>3</td>
<td>3.23</td>
<td>13</td>
<td>6.22</td>
<td>16</td>
<td>5.30</td>
</tr>
<tr>
<td>60 and above Years</td>
<td>0</td>
<td>0.00</td>
<td>1</td>
<td>0.48</td>
<td>1</td>
<td>0.33</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>30.79</td>
<td>209</td>
<td>69.29</td>
<td>302</td>
<td>100.00</td>
</tr>
</tbody>
</table>

### 5.3 Analysis of Descriptive Statistics

In addition to general characteristics of data, we would like to observe mutual associations of different variables. For better exploratory analysis, cross tabulation is carried out for certain time variables. It is assumed that total time is allocated by an individual in consumption, labor supply and accumulation of human capital, social capital and religious human capital. It is likely that the decision of individual for resource allocation may vary across age group and sex. For cross tabulation analysis, continuous variables are reconstructed to make them estimable and interpretable. Time variables are divided into three groups: group one is up to 30 cumulative density, group two is between 31-80, and group three ranges up to 100 cumulative density. Time variables comprising number of hours in a year allocated by

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19 A complete List of variables is given in table 5.12
individual to labor supply, human capital, social capital and religious human capital are grouped respectively.

Groups of respective variables are made on the basis of cumulative density of the variable and spread of values in absolute terms. Reason for inequitable cumulative density based group formation is uneven spread of absolute value of variables in different groups. In the initial group, spread is low while in third group spread is the highest, so grouping in such pattern seems more justified. For relative harmony, size of groups is set in view of both cumulative density and spread of absolute values of variables. Construction of variables is flexible and may be revised even by changing size of cumulative density and spread of absolute values or by adopting only one of the criteria. Therefore, cross tabulation of different variables are given.

Table 5.3 shows cross tabulation of time to labor supply and time to social capital for males and females. On average the sample shows that there seems a substitution relation between time to labor supply and time to social capital. Individuals who allocate less time to labor supply, allocate more time to social capital, while those who allocate more time to labor supply, allocate less time to social capital. Individuals allocating moderate time to labor supply, also allocate moderate time to social capital. Females allocating less time to labor supply, may allocate more time to social capital. Similarly, females engaged in high labor supply contain them at middle and lower level of social capital. However, males from lowest labor supply group have second best choice of less time allocation plan to social capital, this pattern differs from other groups. On average, females relative to males allocate more time to social capital. More than half of females allocating lesser time to labor supply substitute their time to social capital.
Table 5.3 Cross tab of time to social capital and labor supply across males and females

<table>
<thead>
<tr>
<th>Annual hours of labor supply</th>
<th>Sex of respondent</th>
<th>Percent of respondents by annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent within female</td>
<td>&lt;1100</td>
</tr>
<tr>
<td>&lt;1500</td>
<td>12.24</td>
<td>32.65</td>
</tr>
<tr>
<td>1500-2500</td>
<td>17.50</td>
<td>62.50</td>
</tr>
<tr>
<td>&gt;2500</td>
<td>49.06</td>
<td>47.17</td>
</tr>
</tbody>
</table>

There is variation in second best choice of time allocation across males and females. This may be due to two reasons: first that most of females are likely to extend lesser labor supply in male dominated society and therefore they have sufficient time to be allocated to social capital. Second, females may have more sociable nature than males and hence are inclined to social activities. Our findings reconcile with empirical results of Costa and Kahn (2003) and Putnam (1993 and 2000) that females substitute their time spent on accumulating social capital with labor supply.

Table 5.4 shows cross tabulation of time to religious activities and time to social capital across males and females. On average, there seems a complementary relationship between religious activities and social capital. Individuals allocating less time to religious activities, on average allocate less to moderate time to social capital. Individuals allocating more time to religious activities allocate moderate time to social capital, while individuals allocating moderate time to religion mainly give moderate time to social capital. Females allocating less time to religion also allocate less time to social capital. Males from lowest religiosity group mainly follow the pattern; they reflect even more clear case of complementarity between social capital and religious activities. This complementary
relationship may be due to influence of religious teachings that guide its followers towards provision of social services to the society. Our findings are consistent with finding of Hamdani (2004). It is also true that religiosity also provides more opportunity to socialize through gathering on different religious occasions for example offering prayers in congregation.

<table>
<thead>
<tr>
<th>Annual hours allocated to religious human capital</th>
<th>Sex of respondent</th>
<th>Percent of respondents by annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;360</td>
<td>Percent within female</td>
<td>40.91 36.36 22.73</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>40.32 53.23 6.45</td>
</tr>
<tr>
<td>360-840</td>
<td>Percent within female</td>
<td>9.62 46.15 44.23</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>35.35 49.49 15.15</td>
</tr>
<tr>
<td>&lt;840</td>
<td>Percent within female</td>
<td>33.33 63.16 36.84</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>47.92 18.75</td>
</tr>
</tbody>
</table>

Table 5.5 shows cross tabulation of time to learning activities and social capital among males and female. Relationship between time to human capital and social capital seems of complementary nature. On average individuals allocating less time to education, allocate less time to social capital as usual; while those allocating moderate time to learning activities, also allocate moderate time to social capital. Similarly, individuals allocating more time to learning activities allocate moderate time to social capital. Females allocating more time to education, also allocate more time to higher level of social capital. Similarly, females allocating less time to education, also allocate less time to social capital. On average, second preference of females is likely to allocate more time to social capital. On average males allocating more time to human capital also allocate more time to social capital.
Table 5.5  Cross tab of time to social capital and human capital across male and female

<table>
<thead>
<tr>
<th>Annual hours allocated to human capital</th>
<th>Sex of respondent</th>
<th>Percent of respondents by annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;1100</td>
</tr>
<tr>
<td>&lt;50</td>
<td>Percent within female</td>
<td>36.67</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>55.74</td>
</tr>
<tr>
<td>50-480</td>
<td>Percent within female</td>
<td>5.88</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>25.24</td>
</tr>
<tr>
<td>&gt;480</td>
<td>Percent within female</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td>Percent within male</td>
<td>35.56</td>
</tr>
</tbody>
</table>

In addition to above, second preference of males differs from females that they allocate less time to social capital. This variation may be due to the reason that males allocate their more time to labor supply or in other areas which reduces availability of time for investment in social capital. Similarly, social capital is related to human capital. This relationship may also be due to any other variable affecting variations in both of these variables such as religiosity. It seems that there are certain threshold levels and cut points of different variables that determine their co movements. These findings are exploratory, therefore, these may guide for sophisticated estimation through regression analysis.

Besides the above, in light of a priori relationship of age with resource allocation we carry out similar analysis for already discussed variables across different age groups. Based on an individual’s resource allocation attitude, all individuals are categorized into five age groups; first, investor in human capital group (18-24), second, transitory group (25-30), third, labor supply group 1 (31-40), fourth, labor supply group 2 (41-50), fifth, labor supply group 3 (above the age of 50 years). Rationale of this age grouping of respondents is drawn on observation regarding social, economic and religious aspects of life. Initially, we divided respondents into groups of equal age intervals of 5 years to identify their actual affiliation to labor market, accumulation of human capital and social capital. But that seemed less
reflective of real behavior of individuals especially at the time using the data set that
dominates educated individuals. Ultimately, we adopted the above grouping that enables us to
capture individual’s age specific behavior of resource allocation to labor supply, human
capital, social capital and religious activities.

The group of “investors in human capital” contains respondents who are mainly
students making investment in human capital during this period. Therefore, they show
relatively peculiar resource allocation behaviors in volunteering, donation, worship and other
religious activities. “Transitory” age group comprises of respondents in the age bracket that
have normally completed investment in human capital and have started searching for job.
Even those who secure employment are more likely to continue search for better employment.
That decision affects their time allocation plan to other social and religious activities.

Individuals from labor supply group 1 (31-40 year) show a distinct behavior towards
resource allocation due to their consistent and systematic labor supply pattern and, thereby,
reflect relatively distinct time allocation behavior towards social capital and religious
activities. Moreover, respondents from labor supply group 2 (41-50 years) have to allocate
time to essential social activities, and systematic labor supply. Individuals from labor supply
group 3 allocate time to worship and religious activities in addition to the time allocation to
labor supply and essential social activities. Therefore, time allocation plan of individuals may
vary across age group [for more discussion see Becker (1975) and Heckman (1974)]. Thus
exploratory analysis is carried out through cross tabulation of time allocation to social capital
and labor supply across age group in table 5.6.

On average, individuals allocating relatively less time to labor supply especially these
in the age groups of 18-24, 31-40, 41-50 and above 50 years, allocate more time to social
capital. While, individuals allocating less time to labor supply in the age group 25-30 invest moderate time in accumulation of social capital. Individuals allocating moderate time to labor supply in age groups 18-24, 31-40, 41-50 and above 50 years allocate moderate time to social capital. Individuals allocating less time to labor supply in age group 25-30, allocate relatively less time to social capital. Individuals allocating more time to labor supply in age groups 18-24 and 31-40 years, allocate moderate time to social capital. While individuals allocating less time to labor supply in age group 25-30 and 41-50 years allocate relatively less time to social capital.

In conclusion, behavior of individuals from age groups 18-24, 31-40, and 41-50 years towards resource allocation with respect to time allocation to labor supply shows a substitution in labor supply and social capital. Contrarily, the behavior of age group 25-30 seems distinct from other groups and on average is less inclined towards social capital. Individuals in the age bracket 41-50 relative to other age groups, show clear patterns of substitution between time to social capital and labor supply. This may be due to the reason that individuals in this age are more likely to be employed and are conscious of best alternative utilization of time.
Table 5.6 Cross tab of time to social capital and labor supply across age group

<table>
<thead>
<tr>
<th>Annual hours allocated to labor supply</th>
<th>Age Groups</th>
<th>Percent of respondents by Annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>In years</td>
<td></td>
<td>In years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;1100</td>
</tr>
<tr>
<td>&lt;1500</td>
<td>18-24</td>
<td>14.29</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>8.33</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>22.22</td>
</tr>
<tr>
<td>1500-2500</td>
<td>18-24</td>
<td>26.47</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>42.00</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>23.33</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>14.29</td>
</tr>
<tr>
<td>&gt;2500</td>
<td>18-24</td>
<td>30.00</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>64.71</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>36.36</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>71.43</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>100.00</td>
</tr>
</tbody>
</table>

With increase in age, individuals allocate relatively more time to social capital as well as to labor supply. Productive use of time appears to be more likely in higher age groups of individual as compared to lower age. Individuals in early age groups allocate less time to social capital despite similar pattern for labor supply. It may be observed that they either allocate more time to consumption instead of allocating time to social capital.

Table 5.7 shows cross tabulation between time allocation to religion and social capital in different age groups. Individuals allocating less time to religiosity also allocate less time to social capital that reflects a complementarity, especially among earlier three age groups from 18 years to 40 years. Individuals in age group 41-50 years mainly allocate moderate time to social capital. Variation in time allocation behavior in this age group may be due to their essentially required level of social capital to pull on their normal life.
### Table 5.7 cross tab of time to social capital and religious human capital across age group

<table>
<thead>
<tr>
<th>Annual hours allocated to religious human capital</th>
<th>Age Group</th>
<th>Percent of respondents by annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In years</td>
<td>&lt;1100</td>
</tr>
<tr>
<td>&gt;360</td>
<td>18-24</td>
<td>41.18</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>44.12</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>43.48</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>20.00</td>
</tr>
<tr>
<td>360-840</td>
<td>18-24</td>
<td>14.71</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>41.86</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>21.05</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>26.92</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>20.00</td>
</tr>
<tr>
<td>&lt;840</td>
<td>18-24</td>
<td>21.43</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>31.58</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>14.29</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>30.77</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>14.29</td>
</tr>
</tbody>
</table>

Time allocation behavior of transitory age group; that is, 25-30 years seems different from rest of the age groups. In this age an individuals’ religiosity and social capital decisions are not perfect complements. This variation may be due to difference of their preferences pertaining to job or transitional activities for better settlement of their carrier. When they are settled, that is they adopt desired carrier, then their behaviors and time allocation plans may turn to be more systematic.

Table 5.8 shows cross tabulation of time allocated to human capital and social capital in different age groups. On average, social capital and human capital reflect complementary relation across age groups. Individuals allocating less time to human capital is also observed to allocate less time to social capital. Older age groups show relatively clear complementary relation between both the variables. Individuals allocating more time to human capital from
all age groups except age group 25-30 mainly allocate more time to social capital. Here again age group 25-30 shows a peculiar behavior towards human capital and social capital.

Table 5.8 cross tab of time to social capital and human capital across age group

<table>
<thead>
<tr>
<th>Annual hours allocated to human capital</th>
<th>Age Groups</th>
<th>Percent of respondents by annual hours allocated to social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>In years</td>
<td>&lt;1100</td>
<td>1101-2800</td>
</tr>
<tr>
<td>&lt;50</td>
<td>18-24</td>
<td>40.00</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>52.94</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>42.86</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>63.64</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>66.67</td>
</tr>
<tr>
<td>50-480</td>
<td>18-24</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>29.79</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>12.12</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>7.14</td>
</tr>
<tr>
<td>&gt;480</td>
<td>18-24</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>46.67</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>28.57</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>12.50</td>
</tr>
</tbody>
</table>

Although these findings of descriptive statistics are indicative, yet these give two types of information to make important decisions. The first, belongs to the resource allocation plan of individuals and second points to the type of estimators appropriate for such studies. Allocation of time in labor supply, human capital, social capital and religious human capital is interrelated. Therefore, time allocation to religiosity and social capital are important areas to be considered for overall economic analysis. These findings are consistent with earlier studies [for example Hamdani, 2004, Iannaccon, 1992 and 2000]

From the preceding discussion it emerges that due to observed association among time variables, the choice of better estimator may be made by using appropriate econometric technique. It would be appropriate if parameters of these variables be estimated in a system of
equations. System of equations may be estimated through seemingly uncorrelated regressions (SUR) model or Generalized Method of Moment (GMM). This method can better manage problem of over identification. The GMM only requires that the model should give specification of set of moment conditions. These moment conditions are satisfied with the specification of model and classification of variables into sets of endogenous and exogenous variables. GMM gives robust estimates and does not need information of the exact distribution of errors (Greene, 2004). On the basis of these advantages we choose Generalized Method of Moment for estimation.
Chapter 6

ESTIMATION AND RESULTS

6.1 Introduction

This chapter is devoted to the results and discussions of the estimation based on theoretical model and empirical model presented in chapters 3 and 4, respectively. Before presenting results, it seems pertinent to elaborate on the estimation procedure. Different estimation methods are tested and compared with respect to their efficiency and results. Most suitable estimator in line with specification of the model is selected. Consequently estimation is carried out through Generalized Method of Moments (GMM).

6.2. Estimation Procedure

OLS method does not take into account the potential contemporaneous correlation across equations and it also does not tackle the potential endogeniety of explanatory variables in the system. The feasible Generalized Least Square (GLS) method for seemingly uncorrelated regressions (SUR) model provides efficient estimates using the information on contemporaneous correlation across equations. But this method also ignores potential endogeniety problem. Thus the best choice available is Generalized Method of Moments (GMM). The GMM is used for estimation of the system of eight equations with 19 independent variables. A set of instrument is chosen which includes some of the independent variables in the model. Our initial results show that 41 out of 152 parameters are significant in the system of eight equations. Then the process of omitting the most insignificant variable from right
hand side on the basis of Wald test is initiated and continued until no insignificant variable is left in the system.

This led to 13 independent variables, each of which is jointly significant in the eight equations at 1 percent level of significance. However, the variables ‘father education (fedu)’ and ‘square of experience of part and casual job of individual (Experpc^2)’ are significant only in one and two equations respectively. Therefore, we omit these variables and perform estimation with 11 independent variables in the system of 8 equations. A total of 42 out of 88 regression coefficients are statistically significant in the system.

6.3. Results and their Discussion

The estimation results are shown in Table 6.1 to Tables 6.13. In order to test and authenticity of our methodology, we applied Wald test of coefficient restriction jointly for whole system of equations comprising eighty eight (88) slope coefficients. The results are found highly significant, which is an evidence of authenticity of system. We now discuss regression results while considering each independent variable one by one.

Sex of Individuals

Estimation results show that respondent’s sex is significantly related to expenditure on human capital, expenditure on social capital, time to labor supply and time to social capital. A female respondent incurs higher expenditure on education than her male counterpart. This result can be justified on two grounds. First, in most cases, male is the sole earner in household earns and is likely to make income compatible expenditures, while female seems less conscious about the income and expenditure compatibility. Second, as most of the shopping decisions are made by females they incur may make more expenditure including
expenditure on education, especially in Pakistani society where female normally deposit school fees and purchase books for their children.

Male respondent relative to female respondent, incurs more expenditure on accumulation of social capital. The results seem logical as most of the expenditure pertaining to hospitality, social activities, welfare activities and other donation are made by male members in male dominated Pakistani society. A recent empirical study indicates that male is about two times more decisive in household as compared to female (Hamdani, 2000). Male may have leverage to help and extend welfare activities out of their home while females are less likely to be involved in external affairs. Therefore, females may have fewer roles in making decision for expenditure on social and welfare activities.

Male respondents are observed to allocate more time to labor supply than female respondents and the difference is significant and large. This is because decisions of labor supply may be taken by male due to two reasons. In most of the cases male is sole earner and supplier of labor in the market so they may decide at their own. Since it is a male dominated society therefore, labor supply decisions of male and in a household female are likely to be dominated by the male, which is consistent with the empirical findings of Hamdani (2004). It is also observed that because of greater involvement of males in labour market, they may have more information about the working environment and possible surrounding risks than females. Therefore, they may dominate decision making in Pakistani society.

The results further show that male respondents relative to female respondents allocate less time to social activities. This result is according to expectation because most males substitute their time allocation to social capital with labor force participation. An individual with higher return to working hour may allocate lesser time to social activities. Similarly,
most females are unemployed therefore they are likely to allocate more time to social activities. Usually, females seem more inclined to sociability, especially in Pakistani society. Our results reconcile with findings of Costa and Kahn (2003) regarding female’s reduction in time to volunteering with their increased labor supply.

Sex variable shows statistically insignificant relationship with expenditure on consumption, expenditure on religious activities, time allocation to human capital and time to religious human capital. This insignificant relation may be due to fixed or committed nature of expenditure and time to be allocated to these activities for both male and female. It may be another reason that many a time allocation are jointly made by both male and female.

Marital status of individuals

Respondent’s marital status is significantly and negatively related to expenditure on consumption, expenditure on human capital, time to religious human capital Table (6.1b). Most of the unmarried respondents are not conscious about their expenditure and income rather, they make enough expenditure on consumption. Contrarily, a married person may allocate resources differently. First, a married respondent considers his/her liabilities and responsibilities to feed other members of household; therefore, he/she is likely to make less expenditure on himself/herself. This behavior may be induced from joint family system prevailing in Pakistani society. Second, there is also an economic reason of less per head expenditure for married person, i.e., economy of scale. Married individual’s normal needs may be fulfilled with less expenditure as he / she draws his / her consumption goods from main pool of household. An unmarried individual is more likely to make solitary expenditure in this society.
Expenditure on human capital is less among married respondents due to the reason that most of the individuals in this society are likely to first complete their education and training and then get married, while an unmarried individual may continue investment in human capital. A married individual may consider his/her other liabilities while making expenditure on education.

Time allocation to religious human capital is also lower among married individuals. One reason may be that they have to allocate their time to members of family. Married individuals are likely to allocate more time to make arrangements to cater for needs of members of their family. Even they may increase their working hours and reduce time allocation to religious activities, by substitution. Similarly, they may increase time allocation to their other activities. This is true for an Islamic society as maintained in Hamdani (2004) that “Islam guides its followers to maintain different activities in a balanced way so that each desirable activity receives its due share of time. Islam does not allow excessive involvement in religion nor does it appreciate excessive involvement in worldly attractions. It also does not fix any rigid time duration for performing different worldly or religious activities. The individual may shorten a prayer or prolong it. Qur’an declares he/she as the best judge of himself for selecting when and what he/she should do any act and to what extent” (section 3.3.3).

Marital status of respondents is insignificantly related to expenditure on social capital, expenditure on religious human capital, time to labor supply, time to human capital and time to social capital.
Net Assets

The results show that expenditure on consumption, expenditure on human capital, expenditure on social capital and time to religious human capital are all positively related to net assets. It seems in line with established economic theory that consumption is a positive function of wealth besides income. The same holds for the relationship of respondent’s net asset with expenditure on human capital and expenditure on social capital. An individual with higher wealth may make more expenditure on social and welfare activities as compared to an individual with less wealth. Time allocation to religious activities also increases with increase in wealth in net asset. As the permanent income is higher for individuals having more assets, they are likely to have more time to spend on religious activities in this society. These results support the findings of Hamdani (2004), regarding the effect of non-wage income on consumption and time allocation to religious activities.

Net asset has statistically insignificant impact on expenditures incurred on religious human capital, time spent on labor supply, time spent human capital and social capital accumulations.

Experience of individual

A respondent’s experience on his/her main job has significant and positive impact on expenditure on human capital and time to labor supply while it has negative impact on expenditure on consumption and time to religious human capital. With the increase in experience, individuals may improve their sense and skill of financial management and are more likely to prefer saving for their children by reducing their consumption. As on the job experience increases so does the expenditure on human capital. With the increase in experience an individual may earn higher returns from human capital in his/her main job.
Individual makes more investment in human capital with higher expected returns from it. Moreover with the increase in experience, other related variables, like number of children and their level of education, may increase.

The increase in experience increases time allocation to labor supply. This result is in line with economic theory pertaining to substitution effect, that is, with the increase in experience, wages increase and that increase may induce an individual to allocate more time in labor force participation. Time allocation to religious activities decreases with the increase in experience. An individual is likely to allocate more time to labor force participation in substitution of time allocation to religious activities. These results seem closer to findings of lifecycle model of money and time allocation in Heckman (1974) and recent empirical findings of Hamdani (2004).

Experience of respondents has statistically insignificant impact on expenditure on social capital, expenditure on religious human capital, time to human capital and time to social capital.

Increase in experience of part time and casual job will result into higher expenditure on consumption. This type of relationship has some economic justification as follows. With increase in part time experience temporary income may turn into permanent income which is likely to increase consumption. Moreover, increase in part time experience i.e. additional labor supply may be pulled by an increase in demand for expected expenditure on consumption. Increase in experience on part time and casual jobs negatively affects time allocation and expenditure on human capital. This result shows a substitution relationship between time allocation to human capital and part time employment in this society. Since an
individual has less time to allocate to investment in human capital therefore he/she is likely to make less expenditure on investment in human capital.

Experience of part time and casual job of respondent has statistically insignificant impact on expenditure on social capital, religious human capital, time to labor supply, time to social capital and time religious human capital.

**Wage rate of individual**

Wage rate of respondents who hold full time jobs has negative impact on expenditures on human capital, social capital and religious human capital. The same is consistent with the earlier results of economic studies [for example Becker 1993] that with higher wages individual make less investment in human capital as opportunity cost of human capital investment increases. Our results are consistent with life cycle model of money and time allocation in Heckman (1974) and recent empirical findings of Hamdani (2004). Supporting evidence that rising wage increases labor supply is also validated in empirical work of Costa and Kahn (2003). The time allocation to labor supply is in substitution to time allocation to religious activities, if wages of respondent increase. Wage rate earned on the main job by a respondent has statistically no significant effect on his/her consumption expenditure, time to labor supply, time to human capital and time to social capital.

Wage rate earned in part time and casual jobs has significant and positive effect on expenditures on social capital, and religious human capital, but negative effect on time to labor supply. This wage is considered as an additional and temporary income and is not made a part of permanent consumption basket. Rather a part of this income is likely to be used to develop social relationship and carry out welfare activities. Moreover, the belief regarding additional income in this society is based on religiosity or blessing from the divine; therefore,
the part of the same may be spent on philanthropic or religious activities. The same interpretation is true for expenditure on religious activities with the increase in wages of part and casual jobs. Hamdani (2003) documents similar findings for donation behavior. While respondent’s time allocation to labor force participation reduces with increase in the part time wage, it is due to substitution effect. It looks logical that an individual already allocating additional time on part time job at the cost of other activities may reduce that time as and when his financial needs allow.

Wage rate of part time and casual job of a respondent has statistically insignificant effect on his / her consumption and human capital expenditures, time to human capital, time to social capital and time to religious human capital.

**Age of Individual**

Age of respondent has statistically significant and positive effect on his/her expenditures on consumption and human capital, time to social capital and time to religious human capital. With increase in age, expenditure on consumption increases. As a person ages, other related variables like number of children and their needs increase so an individual commits more expenditure on consumption. The same is true for increase in expenditure on human capital with the increase in age of respondent.

With aging, an individual increases time allocation to social capital as he/she allocates more time to retain and nurture relationships with other individuals. The individual allocates more time to help needy people and carry out philanthropic activities as he/she gets older. Similarly, an individual may allocate more time to worship and religious activities as he/she grows older. It is more likely that individual’s realization for investment in religious activities increases with increase in age. Because individuals expect to get divine rewards to their
worship and other religious activities in life hereafter. As an individual gets older, he realizes more countdown in expected life. Therefore, older individuals in this society may prefer such an investment of time and money that gives them returns in life hereafter. Our results partially reconcile with findings of earlier studies [e.g. Hamdani (2003 and 2004)] regarding effect of age on religious activities and volunteering. Variation in our results may be due to composition of data set. One may find that the data set used for present study (i.e. Divine Economics Survey, Hamdani 2000) is dominated by specific age groups. Therefore, our results need further verification with a larger and wider data set. Age of respondent has statistically insignificant relation with expenditure on social capital, expenditure on religious human capital, time to labor supply and time to human capital.

**Human capital variables**

Education level of a respondent has statistically significant and positive effect on his/her expenditure on consumption, human capital, social capital, religious human capital and time to human capital. Increase in education level of an individual is likely to raise his/her living standard and civic ideas; thereby, increasing expenditure on consumption. Increase in level of own education of individual increases realization of importance of investment in human capital. It is empirically tested that individuals with higher human capital gets higher returns. Positive returns from human capital induce more investment of time and money in human capital. Our results are also similar to earlier findings of Becker (1975 and 1993), Acemoglu (2000) and Romer (1986 and 1990). Higher level of education enables an individual to get higher per hour returns from human capital; therefore, an individual may prefer to make money on social activities and help needy people. It is a trade-off between allocation of time and monetary expenditure to social activities. It depends upon marginal
utility of time and money that influence an individual in decision making process. Similar is true for an individual who incurs monetary expenditure on religious activities. Our results seem in line with Iannaccone (1992), who finds that religiosity and religious activity rates do not decline with increase in education or income. Empirical findings of Costa and Kahn (2003) are partially akin to our results. They found no relationship of volunteer time with education among men, but they found that volunteering increase among married college educated women with increase in education. Similarly, found that volunteering decreases among single college educated women with increase in education. Education level of respondent shows statistically insignificant effect of time to labor supply, time to social capital and time to religious human capital.

Education level of respondent’s mother has positive effect on individual’s expenditure on consumption and time to labor supply but negative effect on time allocation to religious human capital. The educated mother is likely to prefer higher living standard and possesses more civic sense; therefore, she may induce more expenditure on consumption. It may be that mothers influence habits of their offspring, especially consumption habits. Demand for finances may increase to incur more expenditure on consumption, so more finances may be obtained through increased labor supply. More time allocation to labor supply is in substitution of time to religious activities. Mother’s education has statistically no significant effect expenditure on human capital, expenditure on social capital, expenditure on religious human capital, time to human capital and time to social capital.

**Religious expenditures by other members of household**

It is found that religious expenditures by other members of household have positive effect on a respondent’s expenditure on human capital, expenditure on social capital, time to
labor supply, time to social capital and time to religious human capital. This type of expenditure may create a religious environment in household that may have the following effects;

1. It affects the behavior, actions and decision making of an individual as an externality.

2. It alters the whole consumption plan.

3. It produces a reciprocity effect among individuals in the society causing thereby, financial and non-financial benefits to individual or household such as free goods and services and minor gifts from the recipients of such expenditures.

The same is true for time allocation to religious and social activities with positive externality effect of religious human capital.

Our findings reconcile with findings of Long and Settle (1977), Iannaconne (2002, 1998) that religious attitude of an individual’s parents substantially affects the religious participation and religious activities of their children. These results are also similar with Hamdani (2003, 2004, and 2006) to the extent that increase in religiosity leads to more hours allocated to religious activities. However, our findings contradict with the findings of Hamdani (2004) pertaining to effect of religiosity on expenditure and time allocation to donation, volunteering and labor supply.

The increase in religiosity level of a household, increases expenditure and time allocation on social capital. A religious household spends more on help to needy people and carries out welfare activities. As most of the individuals are Muslims in our sample, therefore as per their religious teaching, they are promised of high rewards in life hereafter, for their voluntary and welfare activities. Thus, with the expectation of more returns in life hereafter
individuals make more investment in welfare and philanthropic activities. Pushed by the increase in religious expenditure by other members of family, the individual increases time allocation to labor supply. Additional labor supply may be due to increasing demand for financial resources to be incurred on religiosity and religious teachings in Islam induce Muslims to work hard, thereby increasing labor supply.

Religious expenditure by other members of household has insignificant effect on respondent’s expenditure on consumption, expenditure on religious human capital and time to human capital.

6.4. Concluding Remarks

Our results are in line with other studies pertaining to conventional economic variables but are innovative regarding the role of religious stock. New variables are added and their role as an externality to determine resource allocation plan of individual is found. This may be attributed to the religion’s promise that more practicing Muslims will be rewarded with high returns in life hereafter.20

For example, as elaborated in preceding analysis, religious expenditure by other members of household have an external effect on the individual’s decision of resource allocation. Decision-making process of an individual for expenditure in human and social capital is affected by religiosity of other members of household. Time allocation plan of an individual to labor supply, social capital and religious human capital is influenced by the stock of religious human capital of household. The higher religious expenditure of other members of family induces an individual to increase expenditure on human capital. All the respondents are Muslims and it is likely that due to religious motivations and knowledge, individuals are induced to make more investment in human capital, social capital, religious human capital and time to labor supply. Increase in religious human capital stock increases

20 “The parable of those who spend their property in the way of Allah Subhana’hoo wa tahaalah (SWT) is as the parable of a grain growing seven ears with a hundred grains in each ear. And Allah (SWT) multiplies for whom He pleases” (Qur’an 2:261). Qur’an further says (57.18):
“For those, men and women, who give in charity and loan to Allah, a Beautiful Loan, it shall be increased manifold (to their credit) and they shall have (besides) a liberal reward".
expenditure and time allocation on social capital. An individual extends more help to needy people and carries out welfare activities as per his/her religious doctrine.

6.5. Estimation of Social Capital Matrix

In this section social capital matrix is computed along the lines explained in Chapter 4. Allocation of time by one individual to another, community, organization and state accumulates social capital. Monetized value of gains to individual, community, organization and state are calculated and results are shown in table 6.5.

Table 6.5: Estimation of Social Capital Matrix

<table>
<thead>
<tr>
<th></th>
<th>Individual</th>
<th>Group/Community</th>
<th>Organization/Institution</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>51,742</td>
<td>27,716</td>
<td>37,669</td>
<td>7,806</td>
</tr>
<tr>
<td>Group/Community</td>
<td>3,904</td>
<td>NA*</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Organization/Institution</td>
<td>2,872</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>State</td>
<td>8,005</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Figures are in rupees per annum.

*NA: Not Available. It is difficult to get information through survey data because monetary cost and time requirement increases.

The individual spends his number of hours yearly on different activities that may directly benefit to other individuals. To get the monetary value of the hours he/she is devoting to other individuals, the average yearly allocated hours are multiplied to the average wage rate (Part time and full time wage) of each individual. The figures in table 6.5 show that on average rupees 51,742 is the value of amount an individual pays to other individual in terms of yearly allocated hours. Similarly, individuals also devote time to community, organizations and state. Monetary values of gain to community, organization and state are rupees 27,716, rupees 37,669 and rupees 7,806 respectively. The time devoted to individuals and other organizations has certain utility gain for individual in question. The individual also gets some goods and services from the community, organization and state. In view of data constraints mentioned earlier, only joint information pertaining to gain from community and organization is available. Therefore we have used relative share of community and organization on the basis of individual’s time allocation. Individual gets returns from state rupees 8005, from organization rupees 2872 and from community rupees 3904.

These statistics show that individuals get much less than what they pay to organizations and community, which seems less appealing. But a possible reason for this
result may be the prevailing sense of security (trust) of individual that he/she will get monetary and non-monetary returns from groups or community and organizations in future. It also shows existence of higher level of social capital in the society. Further, the quality or type of return from group/community and organizations accruable in future time may constrain or be an incentive to the individual. At the time of investment in religious and philanthropic activities, the individual also takes into account expected returns from divine in life hereafter. Therefore they keep on investing in the way of Allah. All type of returns and costs are not included in the data set, therefore, more comprehensive data set may be obtained for study with wider scope. Contrarily, individuals are getting more from the state than they pay to it. Gains to individual from state may include goods and services: for example protection of his life, property, and honor, supply of basic needs, health, water and sanitation, education, recreation and communication facilities. The result seems close to reality because in developing countries mostly individuals rely upon public goods provided by the state.

6.6. Limitations of this Study

Although this study has a set of peculiarities from the existing literature on the subject, yet, it has many limitations which are discussed in following paragraphs as precaution to future researchers.

We adopted some of the variables used by Hamdani (2004) as such but still some variables were reconstructed from the existing data, for example, combining two or more variables or calculating them according to our requirements. This may have led to a weak approximation in some cases. For example, time calculation of different religious activities such as prayer in congregation, and reciting kalma and darood varies from person to person. A few persons deeply involved in meditations may take more time to recite kalima as compared to others who recite the same thousand times a day. This variation is not fully captured in present study. Whereas a more appropriate strategy would be to collect fresh data exactly in accordance with the definitions of variables.

Similarly use of the variable ‘religious expenditures by other household members’ is a respondents guess about religious expenditures made by other members of household. Nobody can certainly know about such behavior of other individuals due mainly to three reasons. One, religious expenditure made by others is not exactly informed or quoted; rather it
may be somewhat random. Second, it may not be exactly remembered. Third, religion motivates its followers to hide charitable donations from others. An alternate method of obtaining more accurate data on this variable can be based on participant’s observation.

Moreover, variables pertaining to social capital and religious human capital are taken in quantitative terms from the available data set to perform required analysis. These variables may not be an exact representation for all individuals because marginal utility and opportunity cost of time and money varies across individuals. Therefore, a better representation may be done through improved questionnaires and case studies.

Another limitation due to *Divine Economics Survey* 2000 arises in the form of omitting variables such as time allocation to consumption, and expenditure on labor supply because they restrict the exact representation of our theoretical model. With more specific data, one may expect different results or many further insights.

Similarly, calculation of social capital through Social Capital Matrix is based on crude proxies. It covers only few dimensions of social capital. All type of gains, such as psychological, socio-economic and religious, are not separately taken into account.

From the above limitations mentioned in various parts of this study, it emerges that a more representative work may be carried out by improving the data set. An expanded data set of time and monetary allocation may be obtained through fresh surveys tailored according to needs of any future studies.
**Table 6.1(a): results of GMM Estimation of Empirical Model**

<table>
<thead>
<tr>
<th>Independent Variables: description</th>
<th>Codes of Independent Variables</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consumption ((x_{c,i}))</td>
<td>human capital ((x_{h,i}))</td>
</tr>
<tr>
<td><strong>Constant/intercept</strong></td>
<td>C</td>
<td>-5788.9 (-1.02)</td>
</tr>
<tr>
<td><strong>Sex of individual equal to 1 for male and 0 for female</strong></td>
<td>Sex</td>
<td>-5791.5 (-2.8)*</td>
</tr>
<tr>
<td><strong>Marital status equal to 1, if married and equal to 0, if zero otherwise</strong></td>
<td>Married</td>
<td>-7944.7 (-4.2)*</td>
</tr>
<tr>
<td><strong>Net assets of respondent</strong></td>
<td>At</td>
<td>0.001 (6.4)*</td>
</tr>
<tr>
<td><strong>Experience in number of years in main job</strong></td>
<td>Exper</td>
<td>373.03 (3.1)*</td>
</tr>
<tr>
<td><strong>Experience in number of years in part-time job</strong></td>
<td>Experpc</td>
<td>-370.3 (-3.2)*</td>
</tr>
<tr>
<td><strong>Wage rate in full time job</strong></td>
<td>W1</td>
<td>-53.7 (-3.1)*</td>
</tr>
<tr>
<td><strong>Wage rate in part-time job</strong></td>
<td>W2</td>
<td>15.8 (1.02)</td>
</tr>
<tr>
<td><strong>Age of the individual in year</strong></td>
<td>Age</td>
<td>346.1 (3.6)*</td>
</tr>
<tr>
<td><strong>Education level of the mother of respondent in years</strong></td>
<td>Medu</td>
<td>-11.1 (-0.07)</td>
</tr>
<tr>
<td><strong>Own education of individual in years</strong></td>
<td>Oeduys</td>
<td>1259.1 (3.6)*</td>
</tr>
<tr>
<td><strong>Religious expenditure by other members of household</strong></td>
<td>Rbyothr</td>
<td>0.2 (0.3)</td>
</tr>
</tbody>
</table>

Note: The values in parenthesis are t-statistics, While * and ** denote significance at 5percent and 10percent respectively. The values without parenthesis are estimates of coefficients.
### Table 6.1(b): results of GMM Estimation of Empirical Model

<table>
<thead>
<tr>
<th>Independent Variables: description</th>
<th>Codes of Independent Variables</th>
<th>Dependent Variable</th>
<th>Time allocation to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Labor supply ($t_{wl}$)</td>
<td>Human capital ($t_{wh}$)</td>
</tr>
<tr>
<td>Constant/intercept</td>
<td>C</td>
<td>1360.3 (5.3)*</td>
<td>-90.4 (0.8)</td>
</tr>
<tr>
<td>Sex of individual equal to 1 for male and 0 for female</td>
<td>Sex</td>
<td>581.3 (7.8)*</td>
<td>51.8 (1.4)</td>
</tr>
<tr>
<td>Marital status equal to 1, if married and equal to zero otherwise</td>
<td>Married</td>
<td>63.01 (0.6)</td>
<td>-72.8 (-1.6)</td>
</tr>
<tr>
<td>Net assets of respondent</td>
<td>At</td>
<td>0.000000393 (0.4)</td>
<td>0.000000427 (0.15)</td>
</tr>
<tr>
<td>Experience in number of years in main job</td>
<td>Exper</td>
<td>11.6 (2.01)*</td>
<td>-3.69 (-1.4)</td>
</tr>
<tr>
<td>Experience in number of years in part–time job</td>
<td>Experpc</td>
<td>-2.8 (-0.5)</td>
<td>-5.4 (-1.8)**</td>
</tr>
<tr>
<td>Education level of the mother of respondent in years</td>
<td>Medu</td>
<td>19.9 (2.6)*</td>
<td>2.6 (0.8)</td>
</tr>
<tr>
<td>Wage rate in full time job</td>
<td>W1</td>
<td>2.8 (1.1)</td>
<td>-0.5 (-1.5)</td>
</tr>
<tr>
<td>Wage rate in part time job</td>
<td>W2</td>
<td>-5.5 (-2.2)*</td>
<td>0.4 (1.3)</td>
</tr>
<tr>
<td>Age of the individual in year</td>
<td>Age</td>
<td>-5.7 (-0.9)</td>
<td>2.7 (1.1)</td>
</tr>
<tr>
<td>Religious expenditure by other members of household own education of individual in years</td>
<td>Rbyothr</td>
<td>0.01 (2.9)*</td>
<td>0.0004 (0.4)</td>
</tr>
<tr>
<td></td>
<td>Oeduys</td>
<td>10.5 (0.7)</td>
<td>22.2 (3.4)*</td>
</tr>
</tbody>
</table>

Note: The values in parenthesis are t-statistics. While * and ** denote significance at 5percent and 10percent respectively. The values without parenthesis are estimates of coefficients.
### Table 6.2: Results of Wald test of coefficient restriction for each equation

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Null hypotheses</th>
<th>Chi-square</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Each variable has no effect on expenditure on consumption</td>
<td>76.33355</td>
<td>0.000000</td>
</tr>
<tr>
<td>2</td>
<td>Each variable has no effect on expenditure on accumulation of human capital (education)</td>
<td>139.9109</td>
<td>0.000000</td>
</tr>
<tr>
<td>3</td>
<td>Each variable has no effect on expenditure on accumulation of social capital</td>
<td>65.52881</td>
<td>0.000000</td>
</tr>
<tr>
<td>4</td>
<td>Each variable has no effect on expenditure on accumulation of religious human capital</td>
<td>41.85060</td>
<td>0.000017</td>
</tr>
<tr>
<td>5</td>
<td>Each variable has no effect on time allocation on accumulation of human capital</td>
<td>46.21240</td>
<td>0.000003</td>
</tr>
<tr>
<td>6</td>
<td>Each variable has no effect on time allocation to labor force participation</td>
<td>110.7461</td>
<td>0.000000</td>
</tr>
<tr>
<td>7</td>
<td>Each variable has no effect on time allocation on accumulation of social capital</td>
<td>77.20742</td>
<td>0.000000</td>
</tr>
<tr>
<td>8</td>
<td>Each variable has no effect on time allocation on accumulation of social capital</td>
<td>84.90971</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

The results of Wald test show that probability of acceptance of Null Hypothesis is almost zero in all the above mentioned tests.
Table 6.3: Wald Test

<table>
<thead>
<tr>
<th>S No</th>
<th>Null hypothesis</th>
<th>Chi-square</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex either male or female has no affect on any of the eight choice variables</td>
<td>112.1577</td>
<td>0.000000</td>
</tr>
<tr>
<td>2</td>
<td>To be Married has no affect on any of the eight choice variables</td>
<td>49.67732</td>
<td>0.000000</td>
</tr>
<tr>
<td>3</td>
<td>Net asset has no affect on any of the eight choice variables</td>
<td>79.81526</td>
<td>0.000000</td>
</tr>
<tr>
<td>4</td>
<td>Experience of main job has no affect on any of the eight choice variables</td>
<td>29.07515</td>
<td>0.000308</td>
</tr>
<tr>
<td>5</td>
<td>Experience of part and casual job has no affect on any of the eight choice variables</td>
<td>45.42191</td>
<td>0.000000</td>
</tr>
<tr>
<td>6</td>
<td>Mother education has no affect on any of the eight choice variables</td>
<td>39.42090</td>
<td>0.000004</td>
</tr>
<tr>
<td>7</td>
<td>Wages of main job has no affect on any of the eight choice variables</td>
<td>30.97759</td>
<td>0.000142</td>
</tr>
<tr>
<td>8</td>
<td>Wages of part time job has no affect on any of the eight choice variables</td>
<td>38.00358</td>
<td>0.000008</td>
</tr>
<tr>
<td>9</td>
<td>Age of individual has no affect on any of the eight choice variables</td>
<td>98.28326</td>
<td>0.000000</td>
</tr>
<tr>
<td>10</td>
<td>Expenditure on religiosity by others in household has no affect on any of the eight choice variables</td>
<td>39.83458</td>
<td>0.000003</td>
</tr>
<tr>
<td>11</td>
<td>Own education in years has no affect on any of the eight choice variables</td>
<td>53.89380</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

The results of Wald test show that probability of acceptance of Null Hypothesis is almost zero in all the above mentioned tests.
A variety of testable hypotheses may exist about relationship between different variables. However, hypotheses about existence of a relationship between above mentioned explanatory and dependent variables are tested in the earlier pages. For example null hypothesis \( (H_0) \) that there is no effect of religious expenditure by other member of household on time allocated by individual to social capital was tested against the alternative hypothesis \( (H_1) \) that it has an effect. Similarly null hypothesis \( (H_0) \) that there is no effect of wage rate of main job on money allocated to religious activities was tested against the alternative hypothesis \( (H_1) \) that it has an effect so on and so forth. This analysis not only provided result of tested hypothesis but also discussed the direction and implications (if any) of the relationship between variables under study.

We used Wald test to check the restriction of two types

1. Individual independent variable has no effect (the coefficients of an individual variable in all equations are zero) on any of the eight choice variables (dependent variables).

2. Each independent variable has no effect on dependent variables (all the coefficients in the equation are zero).

The null hypothesis in both the cases are rejected which confirms validity of our empirical model.
### Table 6.4: Variables for Descriptive Statistics

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>No of Male members in the household</td>
</tr>
<tr>
<td>FEMALE</td>
<td>Number of Female members in a household</td>
</tr>
<tr>
<td>E0</td>
<td>Illiterate person without any formal education</td>
</tr>
<tr>
<td>E1</td>
<td>Level of formal education of individual up to secondary school</td>
</tr>
<tr>
<td>E2</td>
<td>Level of formal education of individual up to pre master degree</td>
</tr>
<tr>
<td>E3</td>
<td>Level of formal education of individual above Master Degree including M Phil and PhD. It also includes education in professional/technical field</td>
</tr>
<tr>
<td>ts group wise</td>
<td>Three groups of social capital are constituted. Individuals from group 1 allocates less than 1100 hours in a year to social capital, group 2 and 3 allocate 1101-2800 hours and above 2800 hours in a year respectively.</td>
</tr>
<tr>
<td>tw group wise</td>
<td>Three groups of labor supply are constituted. Individuals from group 1 allocates less than 1500 hours to labor supply, group 2 and 3 allocate 1500-2500 hours and above 2500 hours in a year respectively.</td>
</tr>
<tr>
<td>tr group wise</td>
<td>Three groups of individual’s allocating time to religious activities are constituted. Individuals from group 1 allocates less than 360 hours to religious activities, group 2 and 3 allocate 360-840 and above 840 hours in a year respectively.</td>
</tr>
<tr>
<td>te group wise</td>
<td>Three groups of human capital are constituted. Individuals from group 1 allocates less than 50 hours to human capital, group 2 and 3 allocate 50-480 and above 480 hours in a year respectively.</td>
</tr>
<tr>
<td>age group wise</td>
<td>Individuals are categorized into five age groups. Individuals from group 1 are in the range of 18-24 years, group 2 in the range of 25-30 years, group 3 in the range of 31-40 years, group 4 in the range of 41-50 years, and group 5 above the age of 50 years.</td>
</tr>
</tbody>
</table>
Chapter 7

CONCLUSIONS

The present study has been an attempt to extend Becker’s (1975) model of resource allocation to consumption, labor supply and human capital along the lines of recently developed Divine Economics Framework of Hamdani (2004) in perspective of human capital, social capital and religious human capital. Through the concept of reward and punishment in present life and in life after death, some studies in lifecycle framework have empirically established that a systematically different allocation of individuals’ financial and time resources emerges that can hardly be captured under conventional economic theory. In particular, the allocation of time and monetary resources for others in the form of voluntary work and donation leads to a newer concept of social capital and religious human capital. The present study explored and identified more areas of resource allocation (time and money) in the above mentioned faith-based direction, utilizing Becker’s formulation. Different factors affecting decision making of individuals for allocation of resources are also empirically tested. The study confirms some earlier findings that an individual’s allocation of resources depends on economics, non economic, social and religious variables. The study presents some new empirical findings and puts forward fresh insights on the subject.

For better understanding of the mechanism of resource allocation one has to take into account few obvious questions pertaining to the activity to which resources are allocated. For example, what are determinants of resource allocation; how intra-activity resource allocation is made and what are implications of this resource allocation? The present study develops a framework that provides theoretical as well as empirical ground to theory of resource allocation in multiple activities. It also provides theoretical as well as empirical framework for a particular activity covering variability in different dimensions and factors affecting intra-activity resource allocation, especially for accumulation of social capital introducing a social capital matrix.

The data we used in our analysis were drawn from a household survey of Pakistani society21. The theoretical result and the empirical model presented in this study may be

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considered applicable to most societies and individuals of different religions. Despite the fact that the data set we used was declared as the largest in world on religion and economics, yet the data set has few limitations which are highlighted in Chapter 4. Therefore, our conclusions should be viewed with some care. The major conclusions are briefly mentioned in the following paragraphs.

It is found that individuals optimize their utility by allocating time and money into five activities: consumption, labor force participation, human capital, social capital and religious human capital. Individual bears cost of investment in human capital, social capital and religious human capital in one and the same period while reaps returns from these forms of capitals in later periods. The path of wage rate is determined by the level of human capital, social capital and religious human capital. Therefore, resources are allocated to increase earning potential as measured by changes in wage rate. The theoretical results partially reconcile with findings of Becker (1975).

Similarly, behavior of time allocation to labor supply is related to time allocation to social capital accumulation and religious activities. The results based on the mathematical derivation imply that in equilibrium lifetime returns in future, from investment of time in human capital, social capital and religious human capital will be equalized. Thus, allocation of time between human capital, social capital and religious human capital will be substituted until the returns from all types of capital are equalized. Therefore, human capital is redefined in the manner embedded in the religious and social activities.

The behavior of individuals with respect to time and monetary allocation of resources may vary with age. It changes at certain stages of an individual’s life, such as early age, middle age, and later age, or in other words pre-employment, during employment and post retirement period. It is observed that individuals allocate more time to worship and religious activities as they grow older. Our results partially reconcile with findings of earlier studies of Becker (1965) and Heckman, (1974) regarding labor-age profile and with Hamdani (2004) regarding effect of age on religious activities and volunteering.

It is conventionally believed that an individual makes investment decision in view of expected returns. Many individuals have different rate of preference for investment on the basis of expected returns in their remaining lives. Since the present study is carried out on
faith-based model of resource allocation (i.e. Divine Economics), one may also view that an individual also allocates resources in view of expected returns in life hereafter (For elaborate discussion see Azzi and Ehrenberg, 1975 and Iannaccone (1990).

Another finding of present study is with regard to labor supply choices. It is found that with increase in net assets (non wage income), expenditure on consumption and time allocation to religious activities increases. These results reconcile with findings of Hamdani (2004).

Religious expenditure of other members of household affects decision making of an individual to allocate time and money to consumption, labor supply, human capital, social capital, and religious human capital. The econometric analysis of present study obtained an interesting result that increase in the level of religiosity of household members increases an individuals time allocation in religious activities. Our findings are in line with the results of Long and Settle (1975) that point out positive role of religiosity of parents in time allocation children to religious activities.

Increase in religious expenditure by other members of household has been found to positively affect expenditure on human capital. This may be due to the reason that most of the individuals are Muslims whose religious teachings encourage them to make more investment in human capital. Therefore, investment in human capital increases with the level of religiosity. The increase in religious expenditure of household members also increases the individual’s monetary expenditure and time allocation on social capital such as helping needy people, and welfare activities. This result seems plausible because with the expectation of more returns in life hereafter, individuals make more investment in social capital.

It is also noted that the increase in religious expenditure by other members of a household also increases the individual’s time allocation to labor supply. This result differs from the findings of Hamdani (2004) that more religious persons, on average, give relatively less time to market activities. But our results reconcile with Hamdani (2004) that more religious individual allocate proportionately more time to other activities ordained by Allah (leisure, voluntary work, religious duties), as compared to less religious persons. These conclusions imply that with the increase in religiosity in a household overall allocation of resources in accumulation of different capitals and labor supply increases. The investment of
resources by an individual increases in human capital, social capital, labor supply and religious activities at the cost of leisure/consumption time. The observed increase in religiosity that leads to enhancement of economic growth is a result that reconciles with the earlier findings of Barro and McCleary (2003).

The study constructs a Social capital matrix which that indicates 16 dimensions of interactions among individuals, groups or communities, organizations or institutions and states. Various dimensions of social interactions generate social capital for individuals vs. group or communities, individuals vs. institutions or organizations and individuals vs. states. The study provides various examples as to how this process of social capital accumulation takes place in real world. Social capital matrix is also empirically analysed. It is found that an individual makes investment of time and money in distinct manner to accumulate social capital in different dimensions. Individuals allocate their resources in social interactions and reciprocity with other individuals, community, institutions, and state that generates social capital. This social capital facilitates current and future reciprocity for further accumulation of social capital in community, group, organization and state.

The study holds the earlier postulates that social capital variables such as voluntary work and charity are similar to other economic variables and respond to factors like prices and wages, education, etc and additionally by religiosity also.

The results of present study are presented more as insight rather final conclusions because of the limitations discussed in Chapter 5. Nevertheless, the thesis provides various directions for future research.

On the data front, relatively smaller sample compromises the vastness of the subject. Therefore there is a need of conducting a fresh survey with a broader and more representative coverage of population.

Another direction in which this research can be extended is the concept of ‘religious human capital’. For example religiosity scales need to be developed under the guidelines of religious scholars for social capital, human capital and religious capital analyses.

The analysis may also be extended by substituting input variables of religious human capital and social capital with their respective output variables e.g. religiosity level, religious
commitment, beliefs, and practices, etc. Moreover, the analysis can be expanded by involving other important variables of social and religious human capital across individuals and societies.

More work can be done to identify new dimensions of resource allocation under the proposed social capital matrix approach suggested in the present study. The matrix can be extended to additional directions such as trade, investment, governance, human capital development, etc.
Bibliography


Hamdani, Syed Nisar Hussain (2006), Religiosity and Patterns of Rehabilitation: a framework for post disaster analysis of human behavior, Labor & Worklife Program, HLS, Harvard University, USA.


Qur’an (translations and commentaries; Tafheemul Qur’an by Maoulana Maudoodi, Tafseer e Muttaqeen by Imdad Hussain Kazmi, Translation by Ahmad Raza Khan Brelvi, Tafseer e Namoona by Nasir Makaram Shirazi; Commentary by Ashraf Ali Thanvi; English commentary by Abdullah Yousaf Ali)


Dear Sir,

A survey questionnaire is in your hands. The objective of this questionnaire is to collect some facts and figures about economic behavior of individual or family in relation to one’s religion. This research is being conducted in connection with Ph.D thesis under Department of Economics, Quaid-i-Azam University, Islamabad.
Kindly spare a few moments to fill in the questionnaire according to the instructions given below and participate in this academic and religious exercise.
Minimum 30 minutes are required to fill this questionnaire. I shall be obliged if you kindly fill and return it as early as possible.
Very sincere thank for your cooperation….

Syed Nisar Hussain Hamdani
Ph.D Research Fellow (Economics), Q.A. University
Date: 14-12-1999

Instructions

All the information will be kept secret. You have the choice to not mention your name. Some questions are of personal nature and relate to faith and psyche of respondent. Kindly give candid replies.
Only true and complete answers can make this research fruitful.
Kindly do reply each question, do not leave any box blank. If the box is left blank, it will hinder data processing in computers and the whole questionnaire will be useless.
If the question does not relate to you, kindly write ‘not applicable’ OR N.A.
It is very easy to fill in the questionnaire. The possible answers are given in different boxes. You can tick (✓) your answer in appropriate box, or you can write your answer in blank space.

FOR OFFICE USE ONLY:

Name of Interviewer ___________________________ Date of Interview

Place of Interview ___________________________ Started at: _____(hrs.) Ended at: _____(hrs.) __
SECTION-1

1 Gender (M/F) __________

2 Marital Status __________
   (Married/Unmarried/Widow/Widowed/divorced / Separated /More than one marriage/ Betrothed).

3 Age ________ years

4 If you are married, is it within Family /Outside Family-clan

5 Occupation of spouse? ______________________

6 Residence Sector/ward/Name of locality: ______________________

7 Since when living in this locality: ______________________

8 Presently staying in the locality/away from the locality /outside the country/mixed? _______________

9 To what extent are you involved in decision making of routine family affairs:
   Not at all/very little / little / to some extent/fully involved.

10 Are you responsible for meeting family’s financial needs?
   Not at all/very little/little/to some extent / full.

11 Number of family Members (Age-wise)
   Male <5 6-17 18-30 31-45 46-65 > 65
   Female <5 6-17 18-30 31-45 46-65 > 65

12 Other persons/wards living with the family (Orphan, widow, disabled)

13 What is your main profession/source of income?

<table>
<thead>
<tr>
<th>(1) Full Time</th>
<th>(2) Part Time</th>
<th>(3) Occasional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Services</td>
<td>Private Service</td>
<td>Consultant</td>
</tr>
<tr>
<td>Private Service</td>
<td>Personal Business</td>
<td>Commission</td>
</tr>
<tr>
<td>Own Business</td>
<td>Agriculture</td>
<td>Agent</td>
</tr>
<tr>
<td>Agriculture</td>
<td>NGO</td>
<td>Fine Arts</td>
</tr>
<tr>
<td>Not employed / household</td>
<td>Teacher</td>
<td>None</td>
</tr>
<tr>
<td>Teacher</td>
<td>Imam</td>
<td>Other</td>
</tr>
<tr>
<td>Imam</td>
<td>Tuition</td>
<td></td>
</tr>
<tr>
<td>Pensioner</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Monthly income from 3 types of jobs/sources mentioned above?
   Full Time: Rs:_______ Part Time: Rs: _______ Occasional: Rs _________

15. Expected income after one year.
   Full Time: Rs:_______ Part Time: Rs: _______ Occasional: Rs _________

16. When did your start job/business for the first time?
   Full Time: Year 19___ Part Time: Year 19___ Occasional: Year 19 ___
17. Total Income of other family members (excluding your income).
   None   1000-2000   2000-5000   5000-10000   10000-20000   20000-50000   50000-
   above 100000
18. In your perception, how much additional income is needed to live a life at your liking?
   Present income is enough 1000-2000   2000-5000   5000-10000   10000-20000
   20000-50000   50000-100000   more
19. Number of Family Members (According to Education) in each category below:

<table>
<thead>
<tr>
<th>General Education</th>
<th>Religious Education</th>
<th>Technical / Professional/ Other Training Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Literate</td>
<td>None</td>
<td>Computer Course</td>
</tr>
<tr>
<td>Primary</td>
<td>Reading</td>
<td>Tech. Course</td>
</tr>
<tr>
<td>Middle</td>
<td>By Heart</td>
<td>Diploma (s)</td>
</tr>
<tr>
<td>Matric</td>
<td>Tafseer/Hadith</td>
<td>Calligraphy/Painting</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Fazil/Nizami</td>
<td>Medicine / homeopathy</td>
</tr>
<tr>
<td>Graduate</td>
<td>Short Course/Diploma</td>
<td>NGO/HRD Courses</td>
</tr>
<tr>
<td>M.Sc./Professional</td>
<td>MA (Islamiat)</td>
<td>Training Workshops</td>
</tr>
<tr>
<td>M.Phil./PhD</td>
<td>Na'at/Nouha</td>
<td>Misc.</td>
</tr>
<tr>
<td>0. Other</td>
<td>Tibb-e-Nabavi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other Islamic Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jafar/Dreams/Spiritual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparative Religions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>History of Islam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arabic as language</td>
<td></td>
</tr>
</tbody>
</table>

20. Your Educational Information.
   General Education  Religion Education  Technical Education.
   use codes given above  use codes given above  use codes given above
21. Father/guardian’s Education
   use codes given above  use codes given above  use codes given above
22. Mother Education
   use codes given above  use codes given above  use codes given above
23. How many members of your family acquired religions education without attending any institution: (Numbers _________)?
24. In your opinion, what education/learning a good Muslim should have in present perspective. (Mark ( √ ) on any 4 of the options given below).
   10. Others
25. There are certain goods/services one may get from his/her acquainted persons/unexpected sources without any cost. Have you got any thing (list below) during last 3 months?

GOODS/SERVICES

| Services at Electrician / plumbers etc. | __________ |
| Repairs of computer, car, TV, Machine | __________ |
| Books / periodicals / cassettes / CD etc. | __________ |
| Free ride in travel | __________ |
| Concession in Training Course | __________ |
| Milk, Bother, Chicken, eggs, vegetables, fruits, cereals, etc. | __________ |
| Cloth Jewelry etc. | __________ |
| Services, Doctor, Tutor, Lawyer. | __________ |
| Others | __________ |
| Total: | __________ |

SECTION-2 EXPENDITURE PATTERN

26 a. Last month’s total HH expenses Rs.

| saving / committee | __________ |
| House | __________ |
| Utility Bill, water, electricity, telephone, other | __________ |
| Transport / Travel | __________ |
| Eatable | __________ |
| Clothes, Shoes, Etc | __________ |
| Medication | __________ |
| Expenses more by other members (estimate) | __________ |
| Total: | __________ |

26 b. Last years total HH expenses (Rs)

| Religious / propagation expenses | __________ |
| Zakat / Khums / Sacrifice | __________ |
| Sadqa / Khairat / Mannat / Niaz | __________ |
| Paid by way of helping other | __________ |
| Welfare / other donations | __________ |
| Books, periodicals, CDs etc | __________ |
| Tour / sight seeing | __________ |
| Hospitality, social ceremonies | __________ |
| Unexpected expenses and Misc. | __________ |
| Total: | __________ |

27. Do you have own / Government/ rented house? __________

28. Who bears the expenses given above

| Self/Head of Family/Family Joint | __________ |

29. How much you or your family owes to others. __________

30. How frequently do you need to take loan?

| (Often/time to time/Only on special occasions/never) | __________ |

31. Are your total expenses equal to your total income? __________

| (Equal/Exceeds Income/Sometimes less/Usually less than income) | __________ |
32. What is the importance of the ‘need of time’ (e.g. fashion/others’ trend) in your family expenditure pattern? (Negligible/ moderate / much/ too much)

33. Which of the following are possessed by your family:
   - Agri. Land
   - Commercial Land Plot
   - Animals
   - House
   - shop
   - Jewelry
   - Bank
   - Deposit
   - Cash
   - Car
   - Motor Cycle
   - Investment
   - Receivable loans
   - Insurance policy
   - Investment Assets

34. Mark (✓) in the cell or write the approx. value (in thousands) of the things as mentioned above.
   (Nothing, 10-50, 50-100, 100-300, 300-10,00, 10,00-50,00, 5000-10,000, 10,000 plus)

35. What is the value of your assets inherited?
   (Nothing, 10-50, 50-100, 100-300, 300-10,00, 10,00-50,00, 5000-10,000, 10000 plus)

36. What assets would you intend to leave behind for your children. Tell an expected value.
   (Nothing, 10-50, 50-100, 100-300, 300-10,00, 10,00-50,00, 5000-10,000, 10000 plus)

37. If you had to make your ‘will’ how much (assets/money) would you be willing to donate for welfare/religious purposes?
   (Nothing, 10-50, 50-100, 100-300, 300-10,00, 10,00-50,00, 5000-10,000, 10000 plus)

38. Which two of the four options you prefer to choose for your children for their financial safeguard?
   i) A business or job, ii) better skills/training, iii) an insurance policy, iv) Cash.

39. How many servants (full or part time) you have in your family? _____________
SECTION-3: TIME ALLOCATION PATTERN

40. How do you divide your 24-hours of a day among different activities? (Note: If some of activities do not fit in daily or monthly schedule answer in annual column. You can write minutes in place of hours where necessary.)

<table>
<thead>
<tr>
<th>Detail of Engagements</th>
<th>Min. Hrs/ day</th>
<th>Max. Hrs./ day</th>
<th>Hrs./ year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main job/Business etc.</td>
<td></td>
<td></td>
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<tr>
<td>Part time job</td>
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<tr>
<td>Rest and sleep</td>
<td></td>
<td></td>
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<tr>
<td>Self care (Bath, Shave, Etc)</td>
<td></td>
<td></td>
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<tr>
<td>Help in home production activities</td>
<td></td>
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<tr>
<td>Worship (Regular prayer, wazaifa, others)</td>
<td></td>
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<tr>
<td>Children’s training (on regular basis)</td>
<td></td>
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<tr>
<td>Daily Travel (for job, social work, recreation etc)</td>
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<tr>
<td>How many hrs. (Approximately) do you spend in Community welfare work, NGO work etc.</td>
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<tr>
<td>Regular work for religious, spiritual activity</td>
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<tr>
<td>Regular religious learning, delivery, propagation</td>
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<tr>
<td>Religion study; reading of Qur’an, Hadith,</td>
<td></td>
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<tr>
<td>Worldly studies – Newspaper, magazines etc.</td>
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<tr>
<td>Gossips, walk, sports, TV, Music etc</td>
<td></td>
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<tr>
<td>Training Courses/Internet use</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Custom/ Transmute/marriages/deaths/sick-</td>
<td></td>
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<td></td>
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<tr>
<td>House repairs / gardening / Misc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many extra ordinary hours you allocate for office/business work</td>
<td></td>
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</tr>
</tbody>
</table>

41. How much time is wasted due to bad-mood, unscheduled visitors and other disturbances? ____________ hrs. per month.

42A. At what time you get up in the morning during summer (Mark ( √ ) the relevant time). (Time O-clock: 3 4 5 6 7 8 9 10 )

42B. At what time you go to bed at night during summer (Mark ( √ ) the relevant time). (Time O-clock: 7 8 9 10 11 12 1 2 )

43. Do Your duty timings remain the same or keep on changing between morning, evening, night shifts?

44. (If employed) how many days you remain absent from duties/business/farm without proper leave /consent from the employer?

45. How many days do you take as ‘off-day’ from duties/business/farm per week.___

46. How many holidays do you take per year (in addition to weekly off-day)____

47. Usually, how do you pass your life? ((Mark ( √ ) the relevant answer).
48. How many more years you intend to continue job/business etc.? Year(s).

________

49. What is the distance between your home and place of work? Answer in terms of kilometers or minutes. ________.

SECTION-4: RELIGIOUS INCLINATIONS

50. Write the number of persons in your family having age 18 years or above who fall under each categories below with respect to their religiosity/spiritual level.
More Average Little Negligible Negative

________ _______ _______ _______

51. Distance of nearest mosque

52. Distance of nearest your own-sect mosque from home

53. Distance of nearest religions school from home

54. Distance of nearest sect affiliation religious school from home

55. How may children (if nay) go to religious school/or acquire regular religious education at home? __________

56. Mark the daily prayers which you attempt to perform regularly:
   Morning Mid-day Afternoon Sunset Night Friday Eids

56A. The prayer you offer Morning Mid-day Afternoon Sunset Night Friday Eids

56B. Prayer in congregation Morning Mid-day Afternoon Sunset Night Friday Eids

57. How many extra prayers (Nawafil) you offer per month

58. How many members of you family are regular in prayers

59. When did you begin to after prayers regularly? Year 19___ Never __ Don’t Know __

60. How many times you recite ‘Darood’ (salutation) to the Holy Prophet (PBUHAF) during last 24 Hours

60A. Usually how many times do you recite ‘Darood’ everyday? ______

61. How many times did you recite first Kalima during last 24 hours

61A. Usually how many times do you recite first Kalima everyday? ______

62. During last 2 years, how many number of fasts of Ramzan did you miss for being late for Sehri (breakfast) or having no mood for fasting

63. When did Hajj became obligatory on you because of your financial capability? Year 19___ Never ____ Don’t Know ____

63A. When did you perform Hajj Year 19

63B. By what date do you intend to perform Hajj Year 19
   Very soon ____ A few years later ____ Did not think about ______

64. Have you performed Umra? Year 19 Never Intending to (Y/N) ______

65. In your perception, observing religious commandments/rituals is?
   Personal Matter ____ Social/State affair ____ Human/Global affair ____ Never thought ______

66. Have you ever lost your any assets during past life (due to business, accidents, others). Its estimated value in Rs.? ______

67. Was this loss compensated by any source?
   No _____ Some ______ About half ____ To great extent ______ Full _____

68. In which religions/sectarian settings you were brought up?
   Brelivi __ Deobandi __ Ahlehadith __ Shia __ Liberal Muslim __ Non-Muslim __ Mix __ other ______

69. To which sect of Islam you are affiliated now?
   Brelivi __ Deobandi __ Ahlehadith __ Shia __ Liberal Muslim __ Mix __ other ______
70. Last year, the literature you purchased related to which sect/religion.
   Brelivi  Deobandi  Ahlehadith  Shia  Liberal Muslim  
   Non–Muslim  Mix  other  

71. For which sect/religion did you ever made efforts to enhance your knowledge?
   Brelivi  Deobandi  Ahlehadith  Shia  Liberal Muslim  
   Non–Muslim  Mix  other  

72. Keeping in view your last year’s activities and behavior, indicate how frequently you perform the following acts;
   (Mark ( √ ) the appropriate cell on the scale 0= never; 9 = always).

<table>
<thead>
<tr>
<th>RELIGIOSITY: GENERAL ATTITUDE</th>
<th>Never</th>
<th>Didn’t think</th>
<th>Little</th>
<th>Some</th>
<th>often</th>
<th>always</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-QUESTIONS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Always first in salutation to others</td>
<td></td>
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<tr>
<td>Fear of God/realization during religious talk.</td>
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<tr>
<td>Perseverance during hours of stress.</td>
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<tr>
<td>Helping others</td>
<td></td>
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<tr>
<td>Stop talks during <em>Azan</em></td>
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<tr>
<td>To be kind to person with little knowledge</td>
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<tr>
<td>To depend on God’s will in worldly matters</td>
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<tr>
<td>To be personally involved while serving guests</td>
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<tr>
<td>To be just in all dealings</td>
<td></td>
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<tr>
<td>To be kind to servants</td>
<td></td>
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<tr>
<td>To return loan on promise/schedule</td>
<td></td>
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<tr>
<td>To keep clothing ‘clean’</td>
<td></td>
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<tr>
<td>To keep cloths ‘pure’ (paak means clean for worship).</td>
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<tr>
<td>To maintain discipline in expenses</td>
<td></td>
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<tr>
<td>To get self-satisfaction from own-supplications</td>
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<tr>
<td>To be grateful to God for even small successes and happiness</td>
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<tr>
<td>To leave results to God in all matters</td>
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<tr>
<td>To strive to listen non-Arabic part of Friday sermon</td>
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<tr>
<td>To educates others in religion</td>
<td></td>
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<tr>
<td>To patiently behave when others don’t.</td>
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<tr>
<td>To resort to consultations in own or other affairs.</td>
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</tbody>
</table>
73: Keeping in view your last year’s activities and behavior, indicate how frequently you perform the following acts;  
(Mark (✓) the appropriate cell on the scale 0= never; 9 = always).

<table>
<thead>
<tr>
<th>RELIGIOUS DEVOTEDNESS</th>
<th>Never</th>
<th>Didn’t think</th>
<th>Little</th>
<th>Some</th>
<th>often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-QUESTIONS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Did you ponder on universe and its constituents</td>
<td></td>
<td></td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Did you cooperate in organizing religions gatherings</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Did you consult others in religious matters</td>
<td></td>
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<tr>
<td>Did you pray for those engaged in religions activities</td>
<td></td>
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<tr>
<td>Did you remembers death or hereafter</td>
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<tr>
<td>Did you offer late night (Tahajjud) prayer</td>
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<tr>
<td>Did you talk about Muslim history/Fiqh</td>
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<tr>
<td>Did you discuss spirituality subjects</td>
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</tbody>
</table>

Note: All the above questions pertain to various Islamic values and have been derived either from Qura’an or Hadith.

74: Keeping in view your last year’s activities and behavior, indicate how frequently you perform the following acts;  
(Mark (✓) the appropriate cell on the scale 0= never; 9 = always).

<table>
<thead>
<tr>
<th>RELIGIOSITY IN SOCIAL BEHAVIOR</th>
<th>Never</th>
<th>Didn’t think</th>
<th>Negligible</th>
<th>Some</th>
<th>often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-QUESTIONS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Do you maintain contacts with Family/clan</td>
<td></td>
<td></td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Do you participate in Qur’an khwani sessions</td>
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<tr>
<td>Do you discuss religion while at work/business</td>
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<tr>
<td>Do you make peace between friends when they have conflict/cold behavior</td>
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<tr>
<td>Do you get work done both by request and by order</td>
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<tr>
<td>How frequently do you spend from your own pocket for others</td>
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</tbody>
</table>

Note: All the above questions pertain to various Islamic values.
75. To what extent have you felt any change in yourself during last month? (0 = no change; 9 = too much change)

<table>
<thead>
<tr>
<th>RELIGIOUS DYNAMISM</th>
<th>No</th>
<th>Didn’t think</th>
<th>Negligible</th>
<th>Some</th>
<th>Much</th>
<th>Too much</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB-QUESTIONS</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Developed/enhanced interest to know about body and soul</td>
<td></td>
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<tr>
<td>Developed/enhanced interest in solution of social and community problems</td>
<td></td>
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</tr>
<tr>
<td>Developed/enhanced interest in rise and fall of nations</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Developed/enhanced in desire to work for some great positive goal/breakthrough</td>
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</tr>
<tr>
<td>Developed/enhanced interest for general reading and thinking</td>
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</tr>
<tr>
<td>Developed/enhanced inclination towards prayers</td>
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</tbody>
</table>

76. To what extent do you agree with the following statements? (0 = not agree at all; 9 = fully agree).

<table>
<thead>
<tr>
<th>RELIGIOUS PERCEPTION</th>
<th>Never thought</th>
<th>Fully Agree</th>
<th>Much agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Don’t agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB-QUESTIONS</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Money is solution of every problem these days.</td>
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</tr>
<tr>
<td>In the present age, it is difficult to get time for prayers due to multifarious other engagements.</td>
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</tr>
<tr>
<td>The overall environment of these days is such that <em>Taqwa</em> (piety) cannot be observed.</td>
<td></td>
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</tr>
<tr>
<td>A good religious person must avoid getting into enmity of bad and irreligious people.</td>
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</tr>
<tr>
<td>Our salvation in hereafter will be due only to Allah’s mercy and not due to our actions/deeds</td>
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</tr>
</tbody>
</table>

78. How many family males (above 18 years) are having beard? ______

78A. If having no beard then why (Mark (√ ).

Islam is not in having a beard but is in doing good deeds.
It is difficult to maintain respect of beard (by other good deeds also).
Want to keep beard but not now.
Other
78B. If you have kept beard, why (Mark (√)).
    Tradition of the Prophet (PBUHAP).
    It is obligatory.
    Family environment.
    Some religious/accidental motivation
    Like it.
    Nothing special / not thought over it.
    Other.

79. How many woman members of family (above 18 years) observe purdah? ____

79A. Reasons if they don’t observe purdah as prescribed by Islamic Shariah.
    Islam is not confined in purdah/head covering but is in doing good deeds.
    It is difficult to observe purdah/head covering now a days.
    Want to observe purdah/head covering but not now.
    Other.

79B. If you observe purdah/head covering, give reasons
    It is obligatory
    Family environment.
    Some religious/accidental motivation
    Nothing special/never thought over it
    Like it
    Other.

80. For better understanding of Islam, what do you read/study regularly or quite often?
    Qur’an with translation.
    Hadith
    Some commentary
    More than one commentary (comparative study)
    Fiqh
    History of nations
    Scientific literature
    Different Literature

81. Keeping in view your last year, tell what changes have occurred in your life in respect of economic/social/educational/religious matters:

<table>
<thead>
<tr>
<th></th>
<th>Deteriorated</th>
<th>No change</th>
<th>Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious inclination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

82. During last 12 months, how many times did you attend religious gathering/sermons/majalis/seminars/Urss sessions?
    O = None  1 = Some, 2 = Many, 3 = Too many
    Muharam _____ Safar _____ Rabiul Awal _____ Rabiu Sani _____
    JamadiulAwal _____ J.Sani _____ Rajab _____ Shaban _____
    Ramazan _____ Shawal _____ Ziqaad _____ Zil Hajj _____
83. Which religious groups/sects have established their educational institutions/ prayer hall/madarsa/ community centers/Tableeghi centers etc. nearby your home ward/mohalla/sector?

Mirzai  _____  Christian  _____  Hindu  _____  Other  _____
Barelvi,  _____  Deobandi  _____  Shia  _____  Ahlehadith_____

84. In your opinion what should be the priority number 1, 2 and 3, in matters of religious/martial progress and salvation. Choose 3 in order of your priority from the following: -
- Love for the Prophet’s Companions
- Love for the Progeny (Aal-e-Rasool) of the Holy Prophet
- Religious/General Education
- Services to Humanity
- Eradication of sectarianism
- Others

SECTION-5: HEALTH PROFILES

85. Count the number of your family members under each of the following health status;

<table>
<thead>
<tr>
<th>Usually good</th>
<th>Appropriate</th>
<th>Usually bad</th>
<th>Disabled</th>
</tr>
</thead>
</table>

86. Your own Health  

87. During last year, from which diseases did your family members suffer for longer period or repeatedly or intermittently?

<table>
<thead>
<tr>
<th>Fever/Malaria</th>
<th>Skin</th>
<th>Allergy</th>
<th>Stomach</th>
<th>Respiratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td>Heart</td>
<td>Depression</td>
<td>Blood pressure</td>
<td>Cancer</td>
</tr>
<tr>
<td>Sugar</td>
<td>Rheumatic Paralysis</td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

88. For how many days you could not attend your job/business/farm etc during the last year due to sickness? _______ days.

89. How much was your personal expenditure on medication last year? Rs. __________

90. How much was your family expenditure (approximate) on medication last year? RS. __________

91. Last year, when you felt (if any) urgent need for medical or similar emergencies, how you managed to come out of trouble by spending money or other way like public-relations etc.

<table>
<thead>
<tr>
<th>Source</th>
<th>Negligible</th>
<th>To some Extant</th>
<th>Satisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3</td>
<td>4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used own money</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Got timely Loan</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Acquaintance benefited</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Unexpected source</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Got govt. facilities</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Got free Treatment/services</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
</tbody>
</table>

92. Had public relations or in-kind-help not available, how much expenses might have incurred to manage the situation? Approximately Rs __________
93. What is the status of following community problems in your residential ward/vicinity/sector/village?

<table>
<thead>
<tr>
<th>COMMUNITY PROBLEMS</th>
<th>Not at all</th>
<th>Negligible</th>
<th>Little</th>
<th>Some</th>
<th>Much</th>
<th>Too much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Illiteracy</td>
<td></td>
<td></td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Physically Disability</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Diseases</td>
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<tr>
<td>Social/ethical problems</td>
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<td></td>
<td></td>
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<tr>
<td>Environmental hazards</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

94. At what age most of deaths took/place in your family or nearest relatives?
<50, 50-75, 75-100, >100

95. Although no body knows about the time of his/her death, still how many years more you expect to live in view of your present health and environment:
1-5 years, 6-10 years, 11-20 years, 21-30 years, 31-40 Years, 41-50 Years More

96. To what extent you and your family members have harmonious views in religious/social matters?
97. What is the level of your self-satisfaction from the following aspects of life?

<table>
<thead>
<tr>
<th>SELF-SATISFACTION LEVEL</th>
<th>Not at all</th>
<th>Negligible</th>
<th>Little</th>
<th>Some</th>
<th>Enough</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-QUESTIONS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Present house / residential area</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Drinking water</td>
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<tr>
<td>Transportation</td>
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<tr>
<td>Job</td>
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<td></td>
<td></td>
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<tr>
<td>Friends</td>
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<tr>
<td>Health</td>
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<tr>
<td>Own capabilities / performance</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Present designation/position, reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Family discipline</td>
<td></td>
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<td></td>
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<tr>
<td>Sense of protection of life and property</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Outcomes of friendships/ social relations</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest and sleep</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Taste of daily foods</td>
<td></td>
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</tr>
<tr>
<td>Mutual/reciprocated relations in family</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Accomplishment of targets</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self expression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credibility of own opinion/ thoughtfulness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall own-effectiveness</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Memory</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Life aims and goals</td>
<td></td>
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<tr>
<td>Own success rating in day to day affairs</td>
<td></td>
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<tr>
<td>Unexpected reversal of failures into successes</td>
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</tr>
</tbody>
</table>
98. What are the things/maters that causes fear and frustration for you and to what extent?.

<table>
<thead>
<tr>
<th>SELF DIS-SATISFACTION OR FRUSTRATION LEVEL</th>
<th>Not at all</th>
<th>Negligible</th>
<th>Little</th>
<th>Some</th>
<th>Much</th>
<th>Too Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-QUESTIONS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Possible bottle necks in future plans</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>6</td>
</tr>
<tr>
<td>Deterioration in financial, business or office affairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Chance of bad name in society</td>
<td></td>
<td></td>
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<td></td>
<td>8</td>
</tr>
<tr>
<td>Results/guilt of ill action of the past</td>
<td></td>
<td></td>
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<td></td>
<td>9</td>
</tr>
<tr>
<td>Possible problem with electricity / water pipes/ machines /home appliances etc.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Problem in repayment/recovery of loans</td>
<td></td>
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<tr>
<td>Family / marital conflicts</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Attitude of some person among relatives or colleagues or surroundings</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Losing business</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ethical problems of own children due to social conditions around</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Unexpected reversal of successes into failures</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

99. Memories of the past
A: Number of good events/occasions that you remember most.
   Note at all   Not many   A few   Many   Beyond count
B: Number of worst events/occasions that you remember most.
   Note at all   Not many   A few   Many   Beyond count

100. Recalling the last year`s conditions, tell generally what sensation dominated mostly?.
Hope / satisfaction
• Fear / Frustration
• Mixed

SECTION-6 VOLUNTARY ACTIVITIES

101. Do you work regularly for some voluntary initiative (Religious, Welfare, Education, Development)?
Never Sometime Regularly As required Very often.

102. Did your father/guardian work regularly for voluntary works (Religious welfare, Education, Development)?
Never Sometime Regularly As required Very often.
103. Of how many organizations, are you an active member?
- Social/cultural/welfare
- Education/Intellectual/Development
- Religious/Territorial/Clan

104. With what type of organizations/institutes do you cooperate (financially, advisory, technically or in other ways) without charging any remuneration?
- Social/Cultural/welfare
- Education/Intellectual/Development
- Religious/Spiritual
- Regional/ethnic/racial

105. Reason for why do you take part in voluntary welfare work.
- Financial gains
- Good name and fame
- Friends/environment
- Experience of Writing/communicating
- Awareness of problems
- Increase in knowledge
- Professional experience
- Circumstances and opportunities
- Spiritual satisfaction
- Other

106. Thinking of only those relatives/friends/colleagues/partners (With whom you wish to meet daily, monthly or very frequently) let us know how many of them are associated with the following groups. (Write number of such friends or put zero for none).
- Total number of friends
- Office/business/education/Colleagues
- Sports/picnics/other activity-friends
- Religious/Spiritual partners
- Social/Organization-fellows
- Others

107. Out of the above mentioned close friends/relatives etc., how many enjoy better financial position than yourself.
- Almost all
- Most of them
- Some of them
- None

108. Have your circumstances or future potential improved due to welfare activities:
- Not at all
- Negligible
- To some extent
- To great Extent

109. If you are not working part-time (such as consultant/contractor/commission agent/other) why?
- Paucity of time
- Not required
- Don’t like
- Suitable work not available
SECTION-7: MISCELLENCOUS

110. In very near future, how much money you will be needing for unforeseen/emergent situations like repayment of overdue loan, marriage of some family member, business need, welfare objective; (Rs. In thousands)
   None  10-50  50-100  100-300  300-1000  1000-5000  5000-10000  More.

111. If you can get money through three different sources, which one would you prefer?
   □ 100,000 Today   □ 300,000 after 3 years   □ 500,000 after 5 years.

112. If you have Rs. 100,000 which you can invest somewhere or retain for personal consumption. Choose any of the following option at which you will be ready to invest;
   • For one year if you get Rs 4 Thousand as profit.
   • For one year if you get Rs 8 Thousand as profit.
   • For one year if you get Rs 16000 as profit.
   • For one year if you get 20,000 as profit
   • Not interested

113. How many earning members (above 18 Years) you have in your family _______

114. How many members are in search of new or better job or business?

    * * * * *
    * * *
    *

    Would you be willing to cooperate in future as well? Yes/No

    Thanks for your cooperation!