National College of Business Administration and Economics Lahore

FISCAL DECENTRALIZATION AND HUMAN DEVELOPMENT IN PAKISTAN: AN EMPIRICAL ANALYSIS

BY

TAHIR MAHMOOD

MASTER OF PHILOSOPHY
IN
ECONOMICS

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A dissertation submitted to
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In Partial Fulfillment of the
Requirements for the Degree of

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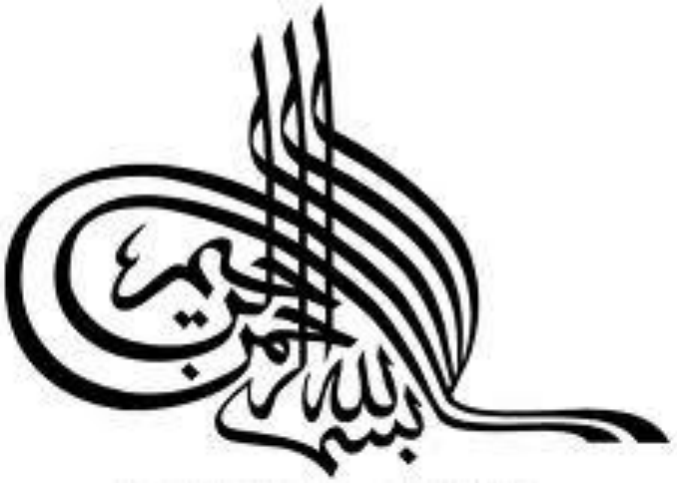

In the name of ALLAH,
The Most Beneficial,
The Most Merciful,

NATIONAL COLLEGE OF BUSINESS ADMINISTRATION AND ECONOMICS LAHORE

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Dissertation Committee:

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Chairman

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Member

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Member

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Rector
National College of Business Administration and Economics

DECLARATION

It is to declare that this research work has not been submitted for obtaining similar degree from any other university/college.

TAHIR MAHMOOD
October, 2015

Dedicated To

My Parents,

My Son, Muhammad Ayaan Haider

and

My Niece Hania Fatima

ACKNOWLEDGEMENT

Countless thanks and praises are due to omnipotent Allah who blessed me with the intellectual and physical capability and competency to complete this dissertation. I feel deepest and heartiest gratitude for different personalities who remained very cooperative and helpful during the writing of this thesis. First of all, I want to pay affectionate thanks to my parents and my wife for their countless prayers and encouragement. I owe a debt of gratitude to my kind supervisor Dr. Ahmed Imran for his sympathetic and precious suggestions during my research work.

I am highly obliged to my colleagues at Government Municipal Degree College, Faisalabad who continuously encouraged me to complete this research. I am also thankful to all my teachers and fellows from whom I learnt a lot.

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis entitled **"Fiscal Decentralization and Human Development in Pakistan: An Empirical Analysis"** has been carried out and completed by **Tahir Mahmood** under my supervision during his **M.Phil. Economics** Programme.

(Dr. Ahmed Imran)
Supervisor

SUMMARY

This study empirically analyses the impact of fiscal decentralization on human development of Pakistan. For this purpose time series data had been used ranging from 1982 to 2013. Ordinary Least Squares (OLS) method was applied for the analysis. Human Development Index (HDI) had been used as a proxy of human development. To quantify fiscal decentralization six measures were used. These measures include unadjusted and adjusted share of the provincial governments in the total federal expenditures and revenues. Furthermore, composite index of fiscal decentralization and average measure of fiscal decentralization were also used in the study. Resultantly, six models were estimated corresponding to each measure of fiscal decentralization. Johansen co-integration was used to analyze the long run relationship between human development and different measures of fiscal decentralization. Empirical results show that there exists a long run relationship between fiscal decentralization and human development in case of Pakistan. Long run coefficients indicate that there exists a positive and significant relationship between fiscal decentralization and human development. For the analysis of Short Run dynamics, Vector Error Correction Model (VECM) had been used. The results show that the variables have the tendency to converge to their long run equilibrium in case of any shock in the short run. To know the nature of causality granger was used which shows that in most of the cases causality runs from human development to fiscal decentralization.

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CHAPTER 1

INTRODUCTION

During the last half century or so political and economic concerns have forced the developed nations in general and developing nations in particular to think afresh about the intra state fiscal and political relations. Most of the world developing and developed economies are inclined towards the devolution of fiscal power to the lower tiers of the government. Fiscal decentralization exists when the legal framework of a country allows the sub-national Governments/Provinces/Local bodies to generate their own revenue and make expenditures (Tanzi, 1995, 1997; Oates, 1985, 1993, 1999). However, if the sub-national governments heavily rely on federal transfers instead for generating their own revenue and making expenditures according to local priorities, it will negate the spirit of fiscal decentralization (VO, 2008). To increase the efficiency of public sector through fiscal decentralization is receiving a great attention in the field of applied economics. Even in big Asian economies like India and China the concept of devolution received much attention (Rao, 2003; Purfield, 2004; Kalirajan and Otsuka, 2012). Still majority of the developing nations are reluctant to start the process of devolution of power to the sub-national governments. It is evident from the fact that twelve out of seventy two developing nations have started this process (Pose and Kroijer, 2009)

The growing concern has been as to which assignments relating to revenue and expenditures be handed over to the federating units to attain the objective of long run growth and macroeconomic stability. The failure of communism reveals that there is no win situation in case of application of any one economic model (Dafflon, 2006; Bardhan, 2002; Bardhan and Mokherjee, 2005). There is no uniform model of decentralization across the world. Each country adopts this policy depending upon its objectives and demands of the masses. Developed nations are keen to meet the welfare demands of their people and to materialize this objective such countries shift the responsibilities of the provision of social services to the local authorities. These economies must have stronger institutional infrastructure to realize the benefits of decentralization. On the other hand developed nations want to consolidate their political system and obtain the growth objectives (Petak, 2004).

1.1 THEORETICAL CONTROVERSIES

Public sector is responsible for the optimal provision of social goods to the heterogeneous segments of its population. But the spatial characteristics of public goods limit the central governments to fulfill this task (Musgrave, 1939; Tiebout, 1956; Oates, 1993). Some public goods are of national character (e.g. defense) and the benefits of such goods are not confined to a particular region, therefore, cost of provision of these goods is shared equally by all the segments of the society. However, some public goods are of regional or local character such as (e.g. street lights, education etc.). These are called the local public goods in the economic literature. To have pareto-optimality in the distribution of these public goods the concerned agency must have sufficient information regarding the preferences of the people (Stiglitz, 1982). Since the benefits of such goods are realized only by the specific region, therefore, the people of that region would have to bear the cost. When there is no fiscal decentralization the cost is divided across the entire population which causes inefficiency (Tanzi, 1995).

Furthermore, Information asymmetry limits the capacity of the central governments to provide that bundle of public goods to all the regions which could reflect the aspirations of the people of those regions. Coat and Besley (2003) and Elhiraika (2006) and has pointed out that local or provincial governments are well conversant with the needs, tastes and preferences of their people so they can provide social services more efficiently. Mello (2000) reveals that the lower tier governments are more familiar with the cultural, racial, linguistic, religious differences of their localities. Further, they better know the natural resource endowment, environment and institutions of the local areas. All this makes the local governments more efficient in the social and economic service delivery. Decentralization promotes the institutions, macroeconomic stability and democracy

The collective work of Musgrave, 1939, Tiebout, 1956 and Oates, 1993 regarding the effectiveness of fiscal decentralization is also known as T.O.M. model, as said by Dafflon (2006). The T.O.M. model postulates that people express their preferences through votes. So implicit in it is that people possess the minimal level of education and awareness about the needs and requirements of their locality.

The T.O.M. model revolves around the allocative efficiency of the local government, the need of which arises due to the geographically confined characteristic of the public goods. But Prud'homme (1995) has raised many meaningful points relating to this notion of efficiency. He says that the assumptions of this model are least relevant to the developing nations and

much emphasis has been given on the demand side. First, there is hardly any developing country where election could reveal the preferences for the public goods. Votes are often casted on ground of personal affiliations. Second, not to speak of preferences, people in most of the developing nations are striving for subsistence level. Third, what is the guarantee that local elected members would keep up their promises and would pass the accurate information to the federal government? Even if they are committed, what about resource gap and cooperation by the local bureaucracy? All this makes the efficiency theory of the T.O.M. model doubtful.

Tiebout (1956) sates that the people of different communities have complete awareness regarding the performance of the local government. They move toward those communities where their preferences are met more accurately. These phenomena create the sense of competition among the jurisdiction as well as build pressure on the federal governments. Local Government tries to enhance their expenditures on the better delivery of service to attract more people. In this way not only quality and quantity of public goods increases but the resources of the local government also increase. Oates and Schwab (1988) comments on this view by saying that to increase revenues more taxes will have to be imposed. This will negatively affect the incentives for investment and will be an invitation to the federal government to intervene. This theory is criticized by Bird, (1993), Bird and Wallich (1993), Bird and Vaillancourt (1998) and Bird, (2000) and they argue that to raise revenue, tax structure must be well defined and must be according to justice. Fiscal gap at all levels, that is, federal to local level and intra jurisdictions must be equal. The view that federal government will go on financing the development projects of the local government in case of revenue expenditure gap has been objected by Purfield (2004) by saying that this will cause the moral hazard problem. Because local governments will be confident that their deficits will be financed by the federal government, it will make them more sluggish and incompetent.

Sacchi and Salotti (2011) advocated the idea that fiscal decentralization can mitigate inequalities among the jurisdictions and intra jurisdiction. These inequalities initially may be due to initial resource endowment and then due to the policies of the successive governments. The political aspect of inequalities was discussed by Tanzi (1997). He says that to keep the federation intact it is necessary to devolve the financial power to the federating units. Since local government is more representative of the local needs so it can better solve the problem. Prud'homme (1995) and Bardhan (2002) said that corruption is more common at the local level than the federal level. At local level local elites are more influential and a nexus gets developed between the elites and local bureaucrats. And the likelihood that poor, minorities and other marginalized

sections will suffer at the hands of this nexus increases. Due to the influence of the local high ups poor may be deprived of the basic infrastructure and may be negated their right to progress. Pose and Kroijer, (2009) pointed out that the administrative staff of the backward regions is often less competent and training facilities are miserably lacking. Resultantly, good practices cannot be shared among the local governments and the benefits of the economies of scale are wasted. The political aspect that fiscal decentralization will make the fragmented sections loyal to the federation has also been dismissed by Prud'homme (1995) by saying that at local level personal affiliations and vested interest get more weight age than national interests.

With the increase in population the demand for health facilities, educational institutions, water and sanitation, houses etc. increases. For the provision of such basic goods optimally decentralized is required (Quigley, 2007; Bodman, 2011). With the more dense population it is cost effective to provide the public good at local level than at federal level (Wu and Wang, 2013). But if the cost of mobility is less, then people will move in and out of the locality. This will make the specific public good either used below optimal level or above the optimal level. This ultimately will waste the resources which otherwise might have been used more productively.

Last but not least T.O.M. model has failed badly to incorporate the macroeconomic aspects. Though, Mello (2000) has favored fiscal decentralization because he believes that this will increase the interaction among the different institutions of the state resulting in more stable macroeconomic performance. For the effective implementation of the fiscal and monetary policy federal government must have significant share in the total expenditure and revenue. With the overemphasize on the fiscal autonomy it undermines the federal governments capacity to attain macro-economic objectives as pointed out by Boadway et al. (2008), Tanzi (1995), Pru'domme (1995) and pose and Kroijer (2009). When more transfers are made to the lower tiers of the government and they make expenditure it causes inflation. When Fiscal decentralization was practiced in Eastern Europe and Africa, it resulted in inflation and macro-economic instability (Bardhan, 2002; Eller and Breuss, 2004; Bardhan and Mokherjee, 2005).

The pros and cons of fiscal decentralization obviates that fiscal decentralization is not the only solution of economic backwardness. There is great controversy among the economists regarding the effect of fiscal decentralization both theoretically and empirically. To reap the fruits of decentralization there must the well-defined institutional structure to monitor the implementation of devolution of financial and political power. Literature suggests that fiscal powers must not be unconditional. Federal transfers must

be linked with the performance of the concerned regions. It must be ensured that the people of the relevant regions are aware of the cost and benefits of the delivery of the public goods. Furthermore, there must be proper process of accountability so that the promises made by the representative members be fulfilled (Bardhan, 2002; Petak, 2004). In developing nations including Pakistan constituencies are formed taking into account the political concerns divorcing the economic considerations. This may hamper the process of development. Further, technological changes must be taken care of while providing the bundle of public goods and mix of social goods be reviewed after regular intervals (Pru'domme, 1995).

The weak points of the theory of fiscal decentralization do not make it useless. Rather it can be used to obtain the objectives of economic growth and human development by institutionalizing it. The empirical literature provides an ample proof of the positive impact of fiscal decentralization on the economic conditions.

During 1960s top down approach of economic development was adopted in Pakistan under the philosophy that the fruits of higher growth will trickle down. The primary objective of such obsession was achieved in the form of high growth rate but the secondary objective, that is, trickledown effect is still awaited. The higher growth rate of 1960s could not be translated into economic and human development as there was extremely skewed distribution of resources. These phenomena unleashed a wave of unrest in the eastern wing of Pakistan which resulted in separation (Zaidi, 2005 and Zaidi, 2012). Since then there is a growing concern among the politicians and the economists that the power of the central government must be devolved to the provinces and further to the local government. So far as devolution of power to the local governments is concerned it is still a dream. Though three efforts have been made to introduce the local government and all the three efforts have been made during the military regime. So in case of Pakistan decentralization would imply devolution of fiscal power to the provinces.

Fiscal federalism has been exercised in Pakistan via different revenue sharing Awards such as Reisman Award 1952, NFC Award of 1962, 1964, 1970, 1974,1979, 1985, 1990, 1996, 2000, Presidential Award 2006 and finally seventh NFC Award of 2009. Before the last NFC award distribution was made on the basis of population and this criterion had been criticized by small provinces. Sensing this non-satisfaction, three other indicators were also included in the distribution formula which benefitted the small provinces. During 2009 distribution was made on the basis of population (82%), poverty (10.3%), fiscal efforts (5%) and inverse population density (2.7%). The same formula has been retained in the federal budget 2015-2016. It is noteworthy

that in the seventh NFC Award the share of Provincial Governments in the public expenditure were expected to increase from 30 to 36 %. The same is 45% in India and 54% in China. Even though the distribution formula is straightforward still provinces get only 75% of these allocations which is often delayed (Ahmad et al., 2007; Nabi and Sheikh, 2010).

The diverse character of human development among the provinces and within the province of Pakistan calls for decentralization of fiscal power accompanied with administrative power. Pakistan is not a homogeneous society rather it has religious, racial, linguistic and ethnical character. Through decentralization inequalities among the people can be addressed and they may be induced to be loyal with the state (Tanzi, 1995). This will produce a congenial environment not only for domestic but also foreign investors.

1.2 IMPORTANCE OF THE STUDY

In case of Pakistan most of the researchers including, Anjum (2001), Pasha and Pasha (2001), Shah (2004), Cheema et al. (2005), Zaidi (2005 Ahmad et al. (2007), Nabi and Sheikh (2010), Jeffery and Sadat (2006), and Usman (2011) have discussed decentralization in historical perspective. However, Malik et al. (2006), Faridi (2011, 2012) and Iqbal et al. (2013) have explored the relationship between fiscal decentralization and economic growth. To the best of my knowledge no study, so far, has been conducted to know the relationship between fiscal decentralization and human development in Pakistan. So, this study will fill this gap.

In this study an attempt will be made to assess the implications of fiscal decentralization for human development. If this study establishes a positive connection between fiscal decentralization and human development then in future this aspect of fiscal decentralization may also be incorporated while designing the model of decentralization. Furthermore, this study will attract the attention of the researchers to this important topic which will pave the way for further research.

1.3 OPERATIONALIZATION OF FISCAL DECENTRALIZATION

To incorporate the fiscal decentralization in empirical investigation, it requires its quantification. Many researchers have contributed to conceptualize and measure fiscal decentralization (Musgrave, 1939; Tiebout, 1956; Oates, 1985, 1993, 1999; Oates and Schwab, 1988; Tanzi, 1997; Rodden, 2003; Schneider, 2003; Vazquez and Mcnab, 2003, 2006; Breuss and Eller, 2004;

Boadway et al., 2008; Weingast, 2009 and Gomes, 2013). In literature two measure of fiscal decentralization have been vastly used. One is the revenue share of the local government in the total federal government's revenue and the second is expenditure share of the provinces in the total central government's expenditure. These measures are further adjusted to make them more meaningful. In the crude form revenue measure means the ratio of the provincial revenue to the total federal revenue and expenditure measure means the ratio of sub national expenditure to the total federal expenditure. These indicators are further refined by subtracting the grants from the provincial revenues and defense expenditure and interest on loan from the federal expenditure. (The detailed description the measures of fiscal decentralization has been given in Chapter 3).

1.4 PROBLEM STATEMENT

Fiscal decentralization has important implications for human development and economic development. In Pakistan the process of devolution remained slow. By decentralizing financial and political powers human development can be enhanced. This study attempts investigate the impact of fiscal decentralization on human development in case of Pakistan. The information obtained from this study may be used to devise those policies which would be congenial for human development.

1.5 OBJECTIVES OF THE STUDY

- To know the impact of fiscal empowerment on human development.
- To analyze the long run relationship between fiscal decentralization and human development.
- To investigate the nature of causality between fiscal decentralization and human development.
- Policy suggestions as per analysis.

1.6 HYPOTHESES OF THE STUDY

- Fiscal decentralization has positive effect on human development.
- There exists long run relationship between fiscal decentralization and human development.
- Fiscal Decentralization does Granger Cause Human Development.

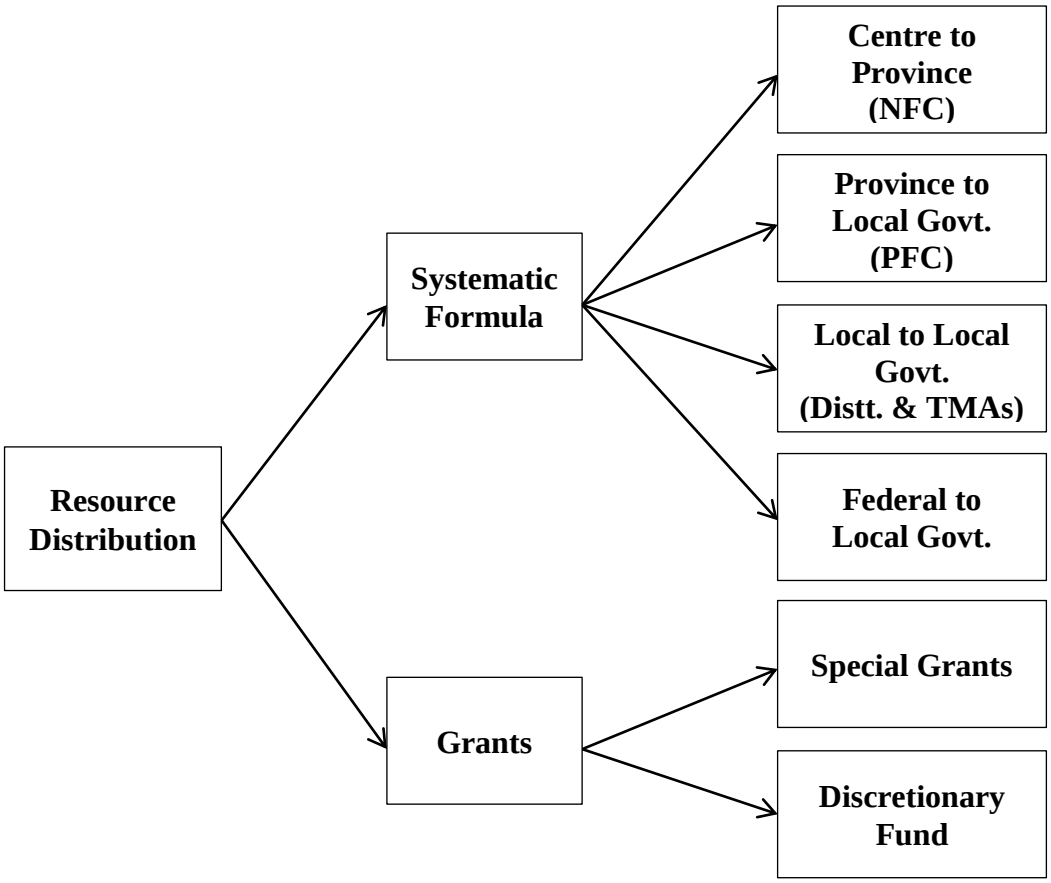
1.7 ORGANIZATION OF THE STUDY

The study has been organized as following. Chapter one is about the introduction of the concept. In Chapter two historical background and recent developments about fiscal decentralization in Pakistan have been presented. Chapter three consists of the literature Review. In Chapter four, theoretical framework of the study and econometrics and estimation issues are discussed. Chapter five comprises of the estimation results and finally in the sixth Chapter conclusion and policy implications are discussed.

CHAPTER 2

FEDERALISM IN PAKISTAN

The shortage of financial resources with the provincial governments to meet the local needs necessitated the devolution of financial powers to the lowers tiers of the government. As Nabi and Sheikh (2010) have pointed out that the provincial share of total government expenditure is 28% whereas, their share in tax collection is just 8%. During 2006 provincial share of expenditure as a percentage of GDP stood at 6.3% and provincial expenditure as a percentage of total national expenditure was 34.5%. During the same period sub-national revenue as a percentage of GDP was as low as 0.9% and sub national revenue as a percentage of total national revenue was 7%. This phenomenon resulted in the reliance of the provinces on the federal government for revenue transfers. The revenue sharing among the provinces requires the legal framework through which an agreed upon formula may be devised to devolve the financial power. This devolution may be divided into four steps as outlined by Jeffery and Sadat (2006). At the first step federal Government may delegate more financial powers to the provinces, at the second stage Provincial Governments may delegate this power to the local Governments, at the third stage Federal Government may give more financial autonomy to the Local Governments and lastly, Local Government may give financial powers to the lower tiers such as districts, tehsils and union councils. The schematic representation of the devolution financial powers to the different tiers of the Government is given in the following figure:



Source: Nabi and Sheikh (2010)

Fig. 2.1: Resource Distribution among the Different Tiers of the Government

Local Government system has not been regular in Pakistan except the military regimes. Therefore, intergovernmental financial relations are seen as a relation between federal and provincial governments.

2.1 FEDERALISM BEFORE THE INCEPTION PAKISTAN

During the British rule federalism was used to be exercised through the Niemeyer Award. He constituted this Award under the act of 1935. During this period income tax was the main source of earning and out total revenue 50% was distributed among the federating units. Under this Award Sindh and Baluchistan were given special grants which were withdrawn afterwards. This formula remained operational, with minor adjustments, since 1952.

In Pakistan, revenue sharing among the federating units has been exercised through different revenue sharing awards. The history of federalism

in Pakistan may be divided into two phases, that is, before separation of East Pakistan and after the disbandment of East Pakistan.

2.2 FEDERALISM BEFORE 1972

After the inception of Pakistan in 1947 Raisman put forward his revenue sharing formula however, it became operational in 1952. Pakistan was faced with severe financial crises after its birth. So, federal government was given 50% of the sales tax which previously was the provincial subject. Out of 50% of income tax receipts East Pakistan got 45 % while West Pakistan Was left with 55%. This was further divided among the four provinces and two princely states namely Bahawalpur and Khairpur. The share of the different units is given in the following table

Table 2.1
Distribution of Resources during 1952

Provinces/States	Percentage Share
Punjab	27.00
Sindh	12.00
Bahawalpur	8.0
NWFP	4.0
Baluchistan	0.6
Khairpur	0.6
Others	2.8

Source: Ahmad et al. (2007)

In 1955 the four provinces of Pakistan were declared as one unit. Thus Pakistan consisted of two unit's one East Pakistan and the second West Pakistan. Under one unit two finance awards were announced first in 1961 and second in 1964. The share of East and West Pakistan in the divisible Poole was 54% and 46%, respectively. Under the constitution of 1962, finance award was constituted in 1964 the divisible pool consisted of income tax, sales tax, excise duty and export duty. The share of central government and provincial Government was 35 % and 65%, respectively.

Before the disbandment of East Pakistan in July, 1970 new finance committee was formed in April, 1970 which retained the divisible Poole and

provincial shares as these were in 1964 award, however, the share of federal government was reduced to 20% and share of provincial government was increased to 80%. The 46% of West Pakistan's share was distributed among the four provinces of Pakistan as per the following table:

Table 2.2
Provincial Shares in 1964 and 1970 Finance Award

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	56.5	23.5	15.5	4.5

Source: Ahmad et al. (2007)

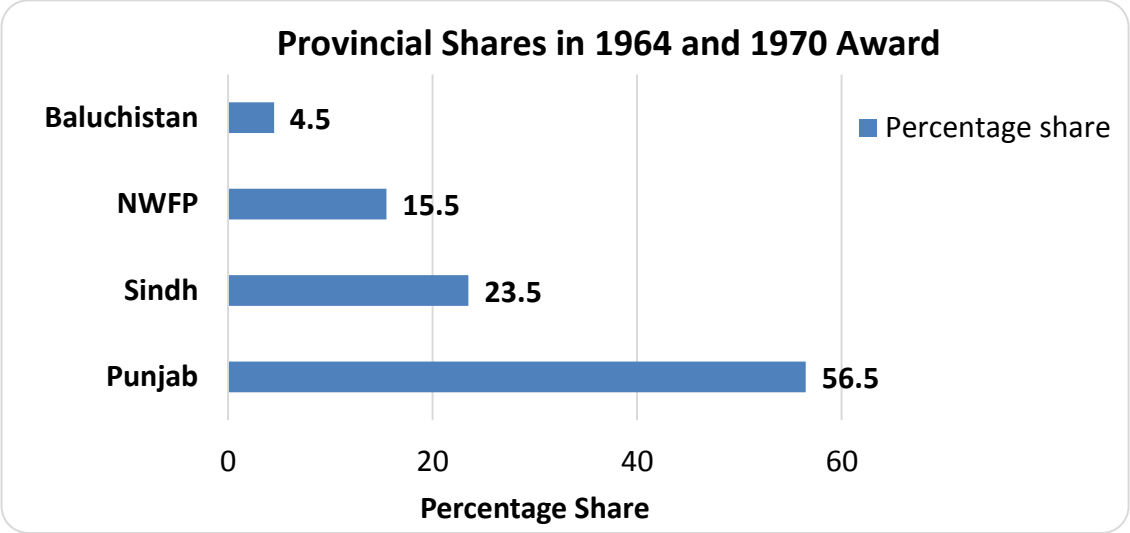


Fig. 2.2: Provincial Shares in 1964 and 1970 Finance Award

2.3 FISCAL TRANSFERS AFTER 1972

Federalism in Pakistan has been evaluated with reference to successive National Finance Commission (NFC) Awards. The NFC award have been evaluated to a great extent by Ahmad et al. (2007), Nabi and Sheikh (2010), Jeffery and Sadat (2006), Pasha and Pasha (2001) and Usman (2011). Most of the material used in this chapter has been taken from the said publications.

After the disbandment of East Pakistan seven National Finance Commission (NFC) Awards have been announced under the constitution of 1973 starting from 1974 to 2009. It was decided under this constitution that NFC Award will be announced after every five years without any interruption so that the grievance of the provinces be addressed. However, this regularity could not be maintained owing to dismal political and economic conditions. The brief history of the NFC award is given as under.

2.3.1 The First NFC Award (1974)

The first NFC award was announced in 1974. In this award the divisible Poole was contracted because it includes only three taxes namely, income tax, sales tax and export duty. The distribution of the proceeds was made on the basis of population only and the percentage of federal share and that of provincial was fixed at 20% and 80%, respectively. After this criterion the share of the Punjab increased significantly from 56.5% to 60.3% in the divisible Poole and the share of Sindh declined. NWFP got 13.4% and Baluchistan got 3.9%.

Table 2.3
Provincial Shares in 1974 NFC Award

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	60.3	22.5	13.4	3.9

Source: Ahmad et al. (2007)

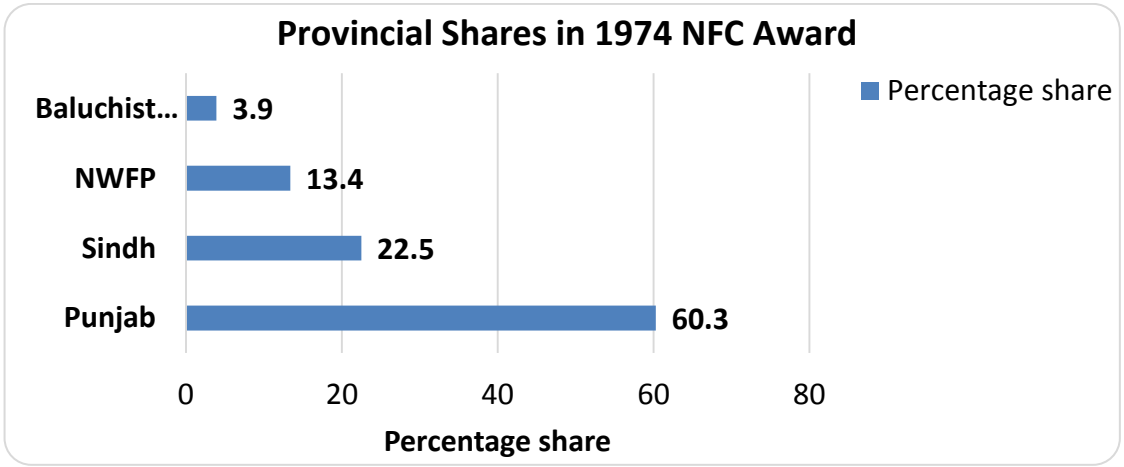


Fig. 2.3: Provincial Shares in 1974 NFC Award

2.3.2 The Second NFC Award (1979)

The NFC was announced in 1979 under the military regime of General Zia-ul-Haq without developing any consensus among the provinces. During 1979 to 1981 the resources were distributed according to the first NFC Award. However, after the census of 1981 the share of the provinces was changed according to the population. As a result the share of Punjab reduced from 60.3% to 58% whereas the share of Sindh and Baluchistan increased from 22.5% to 23.3% and 3.9% to 5.3%, respectively. The share of NWFP remained the same.

Table 2.4
Provincial Shares in 1979 Award

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	58	23.3%	13.4	5.3

Source: Ahmad et al (2007)

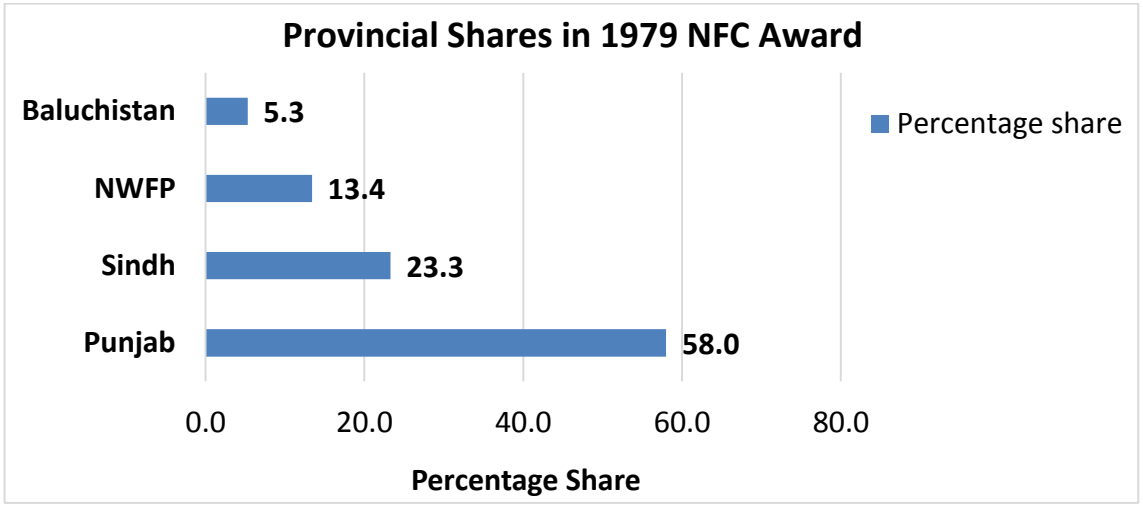


Fig. 2.4: Provincial Shares in 1979 NFC Award

2.3.3 The Third NFC Award (1985)

This NFC Award was also decided under the military rule and consensus could be built regarding the divisible pool and the sharing formula. Resultantly, the previous NFC Award was implemented with the same divisible Poole and same provincial shares.

2.3.4 The Fourth NFC Award (1990)

In the fourth NFC Award some positive developments were made. The divisible pool was expanded by encompassing the duty on sugar and tobacco. The other taxes and duties which this NFC award included were sale tax, income tax, excise duty, export duty. Like other NFC Awards this also lacked the consensus among the federating units. The revenues were shared according to the population of the four provinces. The resources of the divisible pool were shared between the federal and provincial governments with the percentage of 20 and 80. Under this Award the provincial share in the revenue receipts increased significantly round about 18% (Ahmad et al., 2007).

According to Pasha and Pasha (1994) the NFC Award of 1990 played a very vital role in decentralizing the financial powers to the provinces. The province's right on the excise duty on oil, development surcharges on gas and profits of hydle power were accepted. Thus, it increased the provincial autonomy. As a result, the provincial share in the total revenue increased from 28% to 45%.

Since population was the sole criterion of division of resource hence, Punjab got the largest share of 57.88%, Sindh got 23.28%, NWFP got 13.54% and Baluchistan's share was 5.3%.

Table 2.5
Provincial Share in NFC Award of 1990

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	57.88	23.28	13.54	5.3

Source: Ahmad et al. (2007)

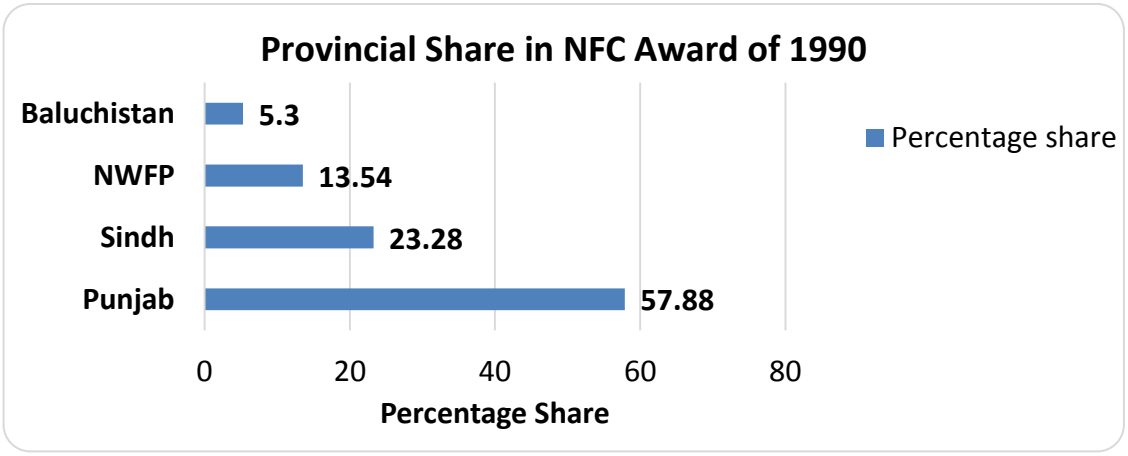


Fig. 2.5: Provincial Share in 1990 NFC Award

On the one hand financial transfers to the provinces increased due to the expansion of the divisible pool and on the other hand provinces were provided with the grants to meet the development requirements for three years. The share of Punjab, Sindh, NWFP and Baluchistan were Rs. 1,000 million, Rs. 700 million, Rs. 200 million and Rs. 100 million, respectively.

Criticizing the NFC Award of 1990 Sadat and Jeffery (2006) say that though under third Award financial transfers to the Provinces increased but it lacked the institutional framework which could enable the provinces to generate their own resources. There was no motivation for the capacity building.

2.3.5 The Fifth NFC Award (1996)

The fifth NFC award was announced with a lot of optimism to obtain the high growth targets. The divisible pool was further extended by including all the taxes and duties. With the inclusion of all taxes in the divisible pool the volume of the pool increased significantly which brought about phenomenal change in the provincial share. Apart from this royalty on crude oil and surcharges on natural gas were also given to the provinces. The share of the central Government increased from 20% to 62.5% and the share of the provinces declined from 80% to 37.5%. The formula of division of resources remained the same as a result provincial share also remain intact as is evident from the following table:

Table 2.6
Distribution of Resources in 1996 NFC Award

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	57.88	23.28	13.54	5.3

Source: Ahmad et al. (2007)

The implementation of this Award worsened the economic position of the provinces. The unrest among the provinces increased. Therefore, to counter this situation special grant of Rs. 3.3 billion and Rs. 4 billion were given to the NWPF and Baluchistan.

One important aspect of this Award was the introduction of the Matching Grants which would be destined to the province that will attain the revenue growth target of 14.2% per year. The maximum amount of matching grant is given in the following table:

Table 2.7
Provincial Grants in 1996 NFC Award

Provinces	Punjab	Sindh	NWFP	Baluchistan
Rs. Million	500	100	100	100

Source: Ahmad et al. (2007)

2.3.6 The Sixth NFC Award (2000)

Sixth NFC Award was announced during the military rule of General Pervez Musharraf. This commission could not finalize its recommendations since consensus could not the developed among the provinces. The issues of division criterion and magnitude of provincial share remained controversial.

2.3.7 The Seventh NFC Award (2009)

New finance commission was instituted in 2005 but it failed to create any consensus. The provinces gave the authority to the then president of Pakistan to announce the Award based on the cannons of justice. President of Pakistan, thus, amended the "Distribution of Revenues and Grants-in-Aid Order, 1997 through the Ordinance No. 1 of 2006. Resultantly, this presidential award became operational in 2006.

Under this Award the share of the provinces was decided to be 45 percent which will reach 50 percent in the next five years, as a result Rs. 418 billion were transferred to the provinces. In the next year the share of the provinces further increased to 46 percent. Out of total net earnings of sales tax provinces were entitled to one sixth part. Punjab got 50 percent, Sindh 34.35 percent, KPK 9.53 percent and Baluchistan got 9.93 percent. During this period the sharing percentage among the provinces was 57.36 percent for Punjab, 23.72 for Sindh, 13.82 percent for NWFP and 5.11 percent for Baluchistan.

Table 2.8
The Presidential Award of 2006

Provinces	Punjab	Sindh	NWFP	Baluchistan
Percentage share	57.36	23.72	13.82	5.11

Source: Ahmad et al. (2007)

Aside from this increased share the provinces were given special grants in the Budget of 2006-07 (Ahmad et al. 2007).

The scope of this presidential award was further broadened through the "Ordinance No. 5 of 2010". The divisible pool now comprises the Income tax, sales tax on the consumption and production, sale and purchase of the imported and exported goods, export duty on cotton, custom duty federal excise duty and any other tax levied by the federal government. This Award is

considered as a great breakthrough in the fiscal history of Pakistan. Through this award not only fiscal authority but also political authority has been transferred to the provinces. Therefore, it is claimed by many that this will lead to a massive fiscal decentralization. Eighteenth amendment was made to finalize the devolution plan. The effectuation of this amendment was to materialize in 2011-12.

First salient feature of this award is that the size of the federal government has been economized by delegating the more financial and fiscal power to the provinces for the better delivery of service to the masses. The list of basic right now also includes the right to education, right to fair trail and right to information. Education has also made the provincial subject. Out of 47 items on the concurrent list 44 will now by entrusted to provinces. This has resulted in the reduction of federal government's share in the total federal revenue and the share of provinces will increase significantly.

Secondly, the provinces now have the right to obtain loans from the domestic and foreign market with the consent of National Economic Council (NEC).The right of the provinces on the natural resources has also been admitted. Now it is with the provincial governments to impose taxes on non-renewable resources.

Thirdly, Political autonomy of the provinces has also increased by retaining the seventeenth amendment which is about the devolution of power to the local governments.

The volume of the federal government has been decreased and the more responsibilities are shifted to the provinces which is evident from the fact that during 2011 the transfer to the provinces has increased from 47.5% to 56%, almost doubled the share of the provinces. The distribution criterion has also changed. Now it not only takes into account the population but also poverty, inequality and inverse population density. The distribution criterion of 2009 is given in the following table:

Table 2.9
Distribution Criterion of Seventh NFC Award

Variable	Weight	Punjab	Sindh	KPK	Baluchistan
Share of Population	82.00	57.36	23.71	13.82	5.11
Poverty and Backwardness	10.30	23.16	23.41	27.82	25.61
Revenue generation and collection	5.00	44.00	5.00	5.00	1.00
Inverse Population Density (Area/Population ration)	2.70	4.34	7.21	6.54	81.92
Total Share (%)	**100**	**51.74**	**24.55**	**14.62**	**9.09**

Source: Nabi and sheikh (2010) and Federal Budget, 2015-16

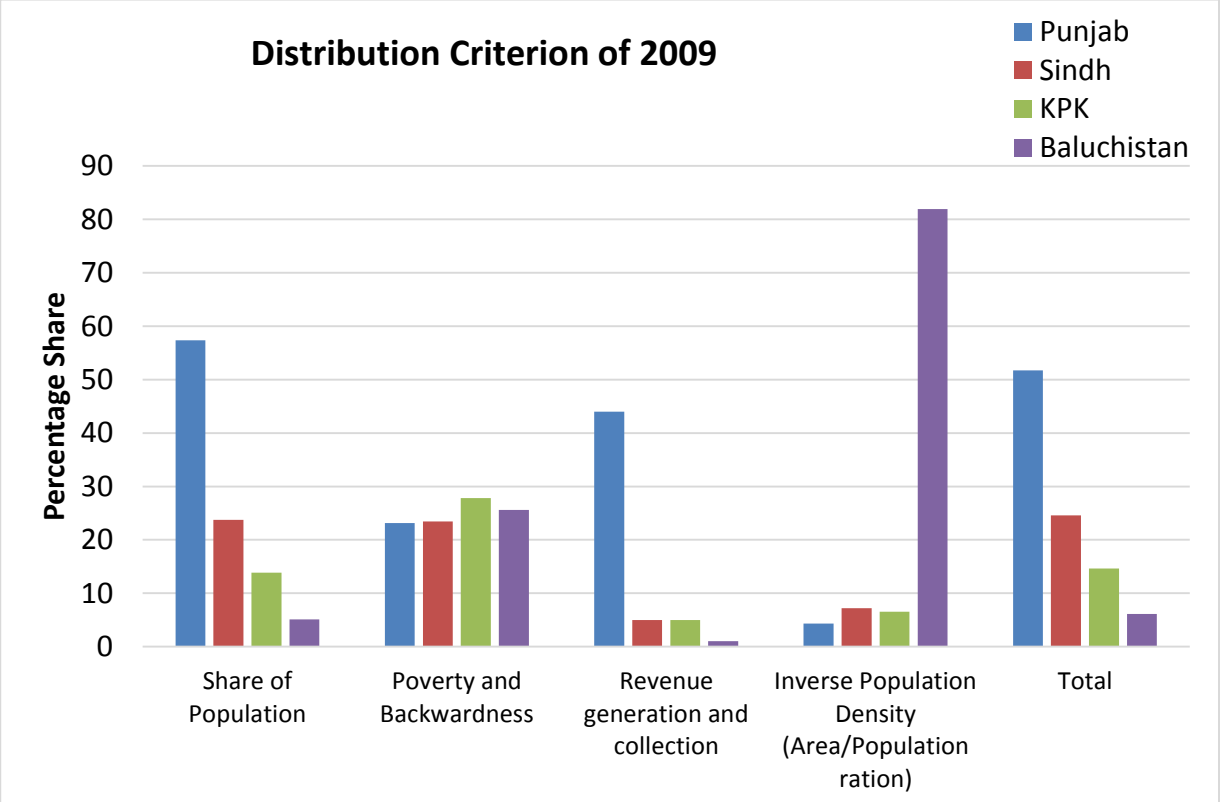


Fig. 2.6: Distribution Criterion of 2009

It is evident from the above Table 2.9 and Figure 2.6 that with the incorporation of three additional indicators, the share of the small provinces has increased and the share of Punjab has decreased. In 2006 the share of Punjab was 57.36 percent in the divisible pool which reduced to 51.74 percent in 2009, the share of Sindh was 23.72 percent which increased to 24.55 percent the share of KPK was 13.82 percent which increased to 14.62 percent and the share of Baluchistan increased from 5.11 percent to 9.09 percent. In the federal

budget 2015-16 the share of the provinces in the tax revenue has been estimated to increase by 17.4 percent. The provincial share in the federal taxes is given in the following table:

Table 2.10
Provincial Share in Tax Revenue

Provincial Share of Tax revenue (In percentage)	Year	
	2014	2015
Punjab	47.72	48.36
Sindh	26.26	26.11
KPK	16.18	16.25
Baluchistan	9.84	9.27

Source: Federal Budget of Pakistan, 2015-2016

According to the revised estimate of 20014-15 share of provinces in the federal taxes was Rs. 157,470,9 million which is Rs. 184,939,4 million in the federal budget of 2015-16 showing an overall increase of 17.44 percent.

The salient features of the all the financial awards are summarized in the following table.

Table 2.11
Summary of NFC Awards

Overall Federal and Provincial Share (%)			Distribution among Provinces			
Year	Federal	Provincial	Punjab	Sindh	NWFP/KPK*	Baluchistan
1974	20	80	60.25	22.5	13.39	3.86
1979	20	80	57.97	23.34	13.39	5.30
1985	Interim Award					
1990	20	80	57.87	23.29	13.54	5.30
1996	62.5	37.5	57.87	23.28	13.54	5.30
2000	Interim Award					
2006	54	46	57.36	23.72	13.82	5.11
2009	44	56	51.74	24.55	14.62	9.09

*KPK was formerly known as North West Frontier Provinces (NWFP)

The history of federalism shows that over the years Pakistan has made steady progress towards the decentralization of financial powers to the Provinces. Not only share of provinces in the divisible resources has increased but also federating units have been made comparatively more responsible to generate their own resources. Divisible pool has extended to a considerable extent including many taxes and duties. Throughout the history of resources distribution there has been differences among the provinces relating to revenue sharing formula. Until 2009 population was the only criterion of distribution which benefitted Punjab to a great deal. After the inclusion of three other indicators in the division formula, the grievances of the small provinces have been addressed to a great extent. After the seventh NFC award share of Punjab has decreased and that of other three provinces increased.

CHAPTER 3

LITERATURE REVIEW

Theoretical controversies regarding the impact of fiscal decentralization on economic growth and human development have been carried over to the results of the empirical investigations. As theorists of fiscal decentralization have different views about the effect of devolution of financial powers to the lower tires of the government, same is the case with empirical researchers. Some studies have found positive link between fiscal decentralization and socio-economic wellbeing and others established negative relationship. Country specific studies and panel studies have been conducted to know the outcome of decentralization.

The main thrust of researchers so for, has been to investigate the bearing of fiscal devolution on the economic growth. There are few studies which have concentrated to know the effect of fiscal decentralization on human development. Instead of incorporating all the necessary dimensions of human development, as Human Development Index (HDI) has encompassed, the analysts have studied the link between fiscal decentralization, health outcome, per-capita income and economic growth separately. Life expectancy, education and income are the main indicators of HDI so; the literature concerning the interaction between fiscal decentralization and these indicators and other contributors of human development has been reviewed. Besides the indicators of human development which have been incorporated in the HDI, there are many other variables which may affect the HDI directly or indirectly such as, income inequality, poverty and unemployment.

Devarajan et al. (1996) explored the relationship between the composition of public expenditure and economic growth using the data of 43 developing nations for 20 years ranging from 1970 to 1990. They found that growth not only depends on the public expenditure but also on its composition. Higher the developmental expenditure higher will be the growth rate of the economy.

Davoodi and Zou (1998), in their much quoted study, used the data of 46 countries comprising of developing and developed nation and investigated the effect of decentralization on economic growth over the period of 1970 to 1989. To measure the degree of fiscal decentralization the ratio of provincial government's expenditure to total federal governments expenditure was used. Higher ratio means higher decentralization. Based on the Barro (1991) model

they have drawn conclusion which is mixed one. In case of developing nations there exits negative relationship between fiscal decentralization and economic growth while in case of developed nations this relationship was opposite. A ten percentage point's increase in fiscal decentralization was attached with 0.7-0.8 percentage points decrease in the economic growth of developing nations.

Zhang and Zou (1998) estimated the impact of decentralization on the growth rate of Chinese provinces during 1978 to 1992. They used three indicators of fiscal decentralization which all are related to expenditures. First, they used the ratio of per capita consolidated provincial expenditure to the per-capita consolidated federal expenditures. Second, indicator was the ratio of per capita provincial budgetary spending to the per capita federal budgetary spending and third ratio was provincial extra-budgetary expenditure to the federal extra budgetary expenditures. They found negative and significant relationship between fiscal decentralization and economic growth. However, positive relationship was found between the federal government's expenditures and economic growth. They concluded that at the primitive stage of economic development physical infrastructure like railways, roads, communication etc. are more congenial for growth than the infrastructure of the local governments. Thus to implement the fiscal decentralization, the concerned nations must take into account their stage of development and available resources.

Xie and Zou (1999) investigated the relationship between fiscal decentralization and economic growth in the United States of America (USA). Annual time series data ranging from 1947 to 1994 was used for the analysis. To measure the magnitude of decentralization, they focused on the share of sub national government's spending in the total federal government' spending. They found that during the last 47 years the share of local governments has increased from 15% to 30% and which have positively affected the growth rate. The researchers have concluded that present share of sub national government in the total spending conform to the USA growth rate implying that no further decentralization is required.

Zhuravskaya (2000) analyzed as to how the incentives provided to the local Government enhances the performance of different regions of Russia. For this purpose he collected data of 35 large cities for the period from 1992 to 1995. He used the primary data and found that revenue sharing mechanism between the central and local government matter much regarding the efficiency of local government in providing the public goods in case of Russia. Further, it has been proved that higher the dependence of local governments on the federal government's transfers, lower will be the efficiency of the former.

Akai and Sakata (2002) using data from 1998 to 1992 for the USA economy regressed average annual per capita gross domestic product on fiscal decentralization. In this study four measures of fiscal decentralization have been used namely, revenue measure, expenditure measure autonomy and average of revenue and expenditure measure and found positive link between decentralization and growth thus contradicting the previous studies. Autonomy measure is defined as the ratio of province's own source revenue to provincial total revenue and average measure is obtained by summing the revenue and expenditure measures and dividing by two. The conclusions were that fiscal decentralization contributes positively toward growth of per capita income.

Khaleghian (2003) studied the effect of decentralization on the infant immunization by collecting the data of 140 low and middle income countries during 1980-1997. The result was different for the low and middle income countries. Among the low income nations the coverage of immunization was high for decentralized countries. However, in case of middle income countries the coverage for decentralized nations was less. When compared the low income and middle income courtiers the coverage rate was high in case of middle income nations. The researcher concluded that in low income decentralized economies institution fragility and socio economic conditions are the responsible for such results.

Habibi et al. (2003) investigated the interaction between decentralization and human development in 23 provinces of Argentina during 1970-1994 using the fixed effect model. To quantify human development they used infant mortality rate (per thousand) and secondary school enrollment (per thousand). To measure decentralization they used the ratio of province's own source revenue to the total provincial revenue and provincially controlled taxes to the total provincial own source revenue. They found a positive and significant relationship between human development and fiscal decentralization. During the period of analysis infant mortality rate declined from 72 per thousand to 22.5 per thousand and secondary school enrollment increased more than one hundred percent. Another important conclusion was drawn which states that as provincial income increased less resources had been devoted to the health and education. This has been justified by saying that in case of rich provinces people are more inclined toward the private service providers. Finally, they concluded that fiscal decentralization has empowered the provinces and as a result human development across the entire regions has increased and disparities have narrowed down.

Vazquez and Mcnab (2003) used the panel data comprising of 66 developed and developing countries for the period of 1972-2003 to study the effect of fiscal decentralization of economic growth. They used the revenue

share and expenditure shares as the standard measures of fiscal decentralization. In case of developed nations decentralization seem to lower the growth rate. No direct relationship was found between fiscal decentralization and economic growth rather it works through inflation channel. Decentralization causes inflation in developing countries thus retarding the economic growth.

Limi (2005) examined the effect of fiscal decentralization on the economic growth of fifty one countries during 1997-2001. Fiscal decentralization was measured by the local government's share in the total federal government's expenditure. He used the OLS and Instrumental Variable techniques to analyses the data. Both the techniques confirmed a positive relationship between fiscal decentralization and per capita income growth. However, he concluded that fiscal decentralization takes a fairly long period to effect the economic conditions.

Stansel (2005) investigated the impact of fiscal decentralization on the cross sections of three hundred and fourteen metropolitans of the USA. For this purpose he used the data from 1960 to 1990. To quantify fiscal decentralization local government's share in the total federal expenditure was used. The results show that there exists positive relationship between fiscal decentralization and economic growth.

Jin et al. (2005) studied the effect of fiscal decentralization on the economic growth of local areas of China during 1982 to 1992 using the ratio of provincial per capita spending to the federal government's per capita spending as was used by Zhang and Zou (1998). They have used panel data of 29 provinces of China and found that if there is fiscal decentralization and fiscal incentive, it will enhance the economic growth of China.

Malik et al. (2006) in order to investigate the relationship between fiscal decentralization and economic growth used the date for the period from 1971 to 2005. He split the revenue and expenditure indicators of fiscal decentralization into the following categories: The ratio of sub-national government expenditures to total government expenditures (RPEC); the ratio of sub-national government expenditures to total government (RPECA) expenditures less defense expenditures and payment of interest on debt; The ratio of sub-national government revenues to total government Revenues (RPRC); and the ratio of sub-national government revenues less grants-in-aid to Total government (RPRCA). When he regressed Gross Domestic Product (GDP) growth on different indicators of fiscal decentralization he found mixed type of results as RPEC, RPRCA were found to have positive effect on GDP growth while the remaining indicators had negative impact on GDP growth.

On the basis of his findings he concluded that at the early stage of development fiscal decentralization is not beneficial.

Elhiraika (2007) examined the impact of decentralization on the provision of education and health services in South Africa. He used the cross sectional data for the period consisting of 1996 to 2005. To estimate the model, random effect and fixed effect approach was used. Unlike previous studies in this study own source revenue has been take as independent variable and the percentage of the provincial expenditure on health and education are the dependent variables. The study found that if the revenue of the provinces increases they reduce the expenditure on health and education. This implies that in South Africa both the health and education are considered to be the subject of the federal government and for their improvement they look toward the federal government for fund transfers. If transfers to the provinces are tied to the performance of the provinces in the field of education and health, the outcome can be improved. Further it is suggested that the provincial government should be given more fiscal and administrative autonomy.

Thornton (2007) conducted a cross sectional study of 19 OECD countries to examine the effect of decentralization during 1980 to 2000. He used only revenue measure of decentralization and found that when only revenue indicator of fiscal decentralization is used the coefficient of decentralization turned out to be insignificant. So, appropriate measure of decentralization is necessary to test the relationship between growth and fiscal decentralization empirically.

Uchimura and Jutting (2007) used the data of 26 Chinese provinces to investigate the effect of fiscal decentralization on the health outcome during 1995-2001. The analysis found that those provinces which have better socio-economic conditions performed better as a result of decentralization as compared to those provinces where there is more social and economic heterogeneity. They further found that fiscal decentralization increases the health outcome if it is financed country's own resources. Thus the result of fiscal decentralization not only depends upon the socio-economic conditions but also on the domestically available resources.

Baskaran and Feld (2009) collected the date of 23 OECD nations to investigate the result of fiscal deregulation on economic growth for the period 1975-2001. Sub national revenue and expenditure has been used as a measure of fiscal decentralization. The results confirm the positive relationship, except revenue decentralization even in different model specification. It means that revenue decentralization adversely affect the economic growth in all the OECD countries. In case of Pakistan the result was opposite since according to

Iqbal et al (2013) revenue decentralization positively effects the economic growth but expenditure decentralization has negative effect on economic growth.

Rubio (2010) established a positive relationship between fiscal decentralization and health outcome. In his study panel data of 19 OECD countries for the period from 1965 to 2001 was used. Infant mortality was used as a proxy of health outcome and he found that 1 percent increase in expenditure decentralization leads to 0.2 percent reduction in infant mortality. He further found that an increase in education decreases the infant mortality rate.

Faridi (2011) tested the effect of fiscal devolution on the economic growth, of Pakistan during 1972-2009 using four measures of fiscal decentralization. One, He used the unadjusted and adjusted share of provincial governments in the total federal government' revenue. Second, He used the unadjusted and adjusted share of the provincial governments in the total federal government's expenditures. However, his findings are different from that of Malik et al. (2006). He found a positive relationship between fiscal decentralization and economic growth of Pakistan and suggested that provinces must be given more autonomy to increase the pace of economic growth.

Innocents (2011) conducted a qualitative research in order to know whether fiscal decentralization better equip the nations to overcome the economic crises. To assess the strength of local governments in South Africa he interviewed six Focus Groups each group having six panel members during 2011. The participants were from civil society, elected councilors and mayors from municipalities and government delegates. Analyses found that 79% of the respondents favored fiscal decentralization. They further argued that dominant central government is the source of economic crises. In this connection 85% respondents were of the view that local governments can better contribute toward local economic development and fight economic crises.

Sepulveda and Vazquez (2011) investigated the impact of fiscal decentralization on income inequality and poverty in a panel of developed and underdeveloped countries during 1971-2000. They used revenue share and expenditure share of the local governments as measures of decentralization and used the generalized least square (GLS) approach for analysis. They found that this relationship depends upon the size of the government in the economy. If size of the government in the economy is less than 20% of GDP, fiscal decentralization tend to worsen the income inequality and poverty and vise a versa.

Faridi et al. (2012) estimated the econometric model to know the impact of fiscal decentralization on employment using the data from 197-2009. They used revenue and expenditure share of the provinces as the measure of fiscal decentralization. They found a positive relationship between expenditure decentralization and employment, whereas, negative association was found in case of revenue decentralization.

Indian government in order to provide the social services to the rural population devolved the fiscal powers to the local bodies. These local bodies include urban local bodies and rural local bodies. Kalirajan and Otsuka (2012) conducted the study to investigate the effect of fiscal decentralization on rural development within the third tier of the Indian government. They collected the date from 25 states during 2001-2002 and 2002-2003. Agricultural product had been used as a proxy of rural development. To measure fiscal decentralization he used the ratio rural per capita spending to the urban per capita spending and found that this devolution has contributed toward rural development insignificantly. However, this decentralization has positive effect on the rural development across the states.

Philip and Isah (2012) explored the connection of fiscal decentralization with economic growth in Nigeria. He regressed per capita GDP, measure at current market price, on the three measures of fiscal decentralization and found mixed results. Among three indicators of fiscal decentralization two were found to have positive relationship with GDP growth while provincial expenditure share showed inverse connection with the growth. He concludes that quality of governance and corruption might have contributed toward negative growth.

Stoilova and Patonov (2012) analyzed the effect of fiscal decentralization on the economic performance of the six new member of European Union during 2000-2010. When they used sub-nations revenue and expenditure as measure of decentralization, the positive relationship was found between financial devolution and growth. However, when the ratio of sub national government's revenue and expenditure to GDP were used as the measures of fiscal decentralization the results changed altogether. The increase in the ratio of local government's revenue and expenditure to the gross domestic product were found to be negatively effecting

Pudjiharjo et al. (2013) conducted a study to know the relationship between fiscal decentralization and local development in East Jawa, Indonesia. For this purpose secondary data was used covering only three years, 2007-2010. Structural Equation Model (SEM) was used as an analytical technique.

The researchers examined the pattern of relationship among fiscal decentralization, physical development, human development and economic growth. Positive relationship was found between fiscal decentralization and human development which was measured by education index and health index.

Faridi and Nazar (2013) analyzed the impact of fiscal decentralization on poverty in Pakistan. The period of analysis was 1972-2010. They used adjusted and unadjusted shares of the province's revenue and expenditures in the total federal government's revenue and expenditures to quantify fiscal decentralization. They found a positive and significant relationship between fiscal decentralization and reduction in poverty and concluded that to eradicate poverty more fiscal autonomy be given to the provinces and concluded that by granting more fiscal autonomy poverty can be lessened.

Iqbal et al. (2013) investigated the role of fiscal decentralization and democratic institutions in determining the economic growth. He used the data for the period from 1972 to 2010. Three measures of fiscal decentralization were used in the study. First, The ratio of Unadjusted provincial government's revenue to the total federal government's revenue, the ratio of provincial government's expenditure to the total adjusted federal government's expenditure and composite measure of fiscal decentralization. He found a positive relationship between fiscal decentralization and economic growth when he used revenue and composite measures of fiscal decentralization. But the result was opposite when he used the expenditure as a measure of fiscal decentralization. He concluded that in the absence of well-formed institutions the positive effect of fiscal decentralization cannot be achieved.

Song (2013) studied the impact of decentralization on income inequality during 1978-2007. He used revenue share, expenditure share and autonomy measure as indicators of fiscal decentralization and found positive relationship between revenue and expenditure decentralization and income inequality. The autonomy indicator show mixed results. Before tax reform of 1994, there was increase in inequality however it tended to decrease after 1994.

Sobel et al. (2013) estimated the effect of fiscal decentralization on the business climate in USA. Business climate has been measured by nine popular state business climate indexes. The analysis shows that increase in fiscal decentralization increases the business climate index significantly because decentralization results in policies which are more suitable for business. Increasing decentralization by one standard deviation pushes the average state up by five to eight spots in the Milken Institutes' index.

Wang (2013) covered the period from 2001-2008 and found that the degree of fiscal decentralization play a vital role in the determination Foreign Direct Investment (FDI) in case of China and India. The indicators of fiscal decentralization used in the study were the share of the provincial governments in the total federal government's revenue, share of the provincial government's tax revenue in the total federal government's tax sources and share of provincial government's expenditure in the total federal expenditure. He found a positive link between fiscal decentralization and foreign direct investment. He says that both the too much and too little fiscal autonomy is not beneficial for the economy rather, it must be at moderate level if a nation want to reap the fruits of fiscal decentralization.

The Literature Review suggests that how the outcome of fiscal decentralization varies across the world depending upon different factors. These different results have been discussed by both the theoretical and empirical researchers. The divergence of outcome of fiscal decentralization is mainly due to the measurement error of fiscal decentralization (Vo, 2000; Schreinder, 2003; Ebel and Yalmaz, 2003) quality and availability of data (Iqbal et al., 2013), Socio economic conditions of the concerned nations (Uchimura and Jutting, 2007) quality of institutions (Bardhan and Mokherjee, 2005; Shah, 2004; Ardanaz et al., 2002, Iqbal et al., 2013) stage of economic development (Zhang and Zou, 1998; Davoodi and Zou, 1998; Malik et al., 2006), composition of expenditures (Devarajan and Swoorp, 1996) , macro-economic performance (Feld and Schnellenebach, 2010) and degree of Fiscal decentralization (Eller and Breuss, 2004; Wang, 2013).

CHAPTER 4

THEORETICAL FRAMEWORK

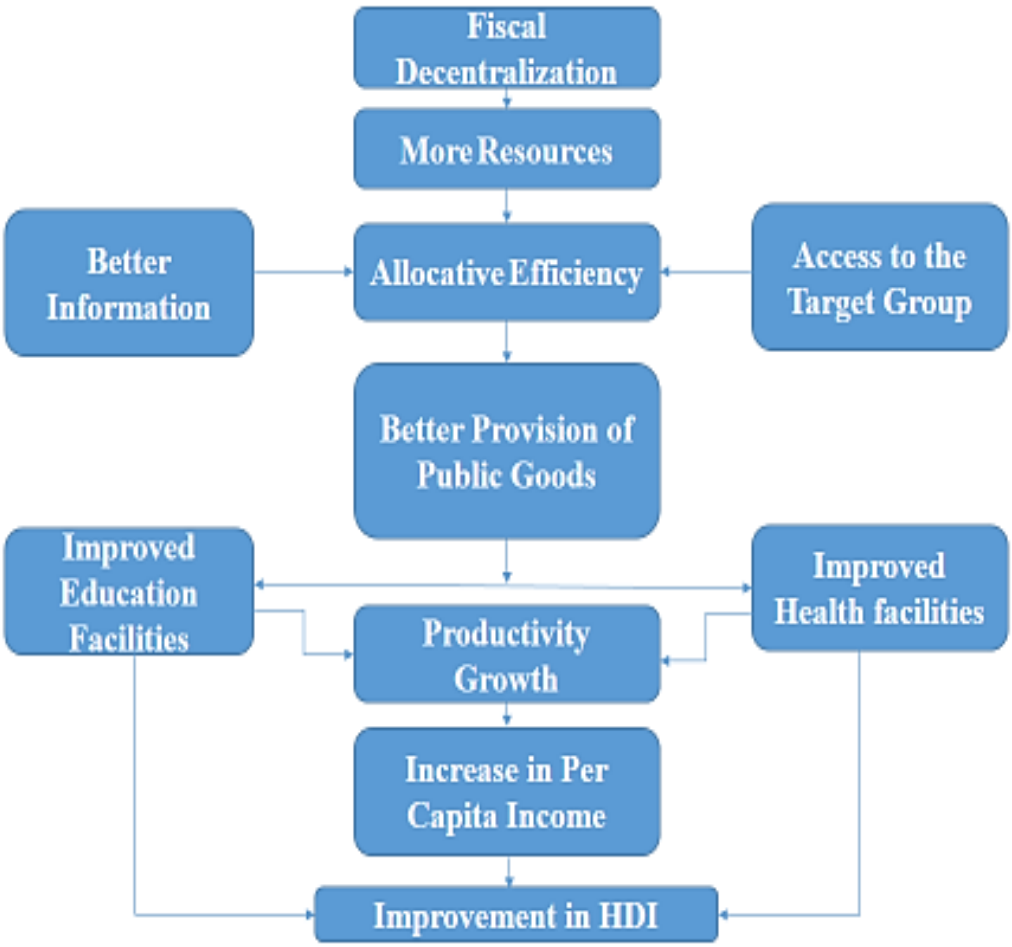
Fiscal decentralization enhances the economic growth and human development mainly due to allocative efficiency as suggested by Tiebout, Oates and Musgrave (T.O.M) model. The main motivating factor of fiscal decentralization is the allocative efficiency of the local governments, as supposed by the T.O.M. model. When more resources are at the disposal of the local governments and it is easy for them to access the target group or region they can better cater the needs of their jurisdictions. Better and uninterrupted delivery of services puts the regional people on the higher path of economic and human development.

4.1 TRANSMISSION MECHANISM OF FISCAL DECENTRALIZATION

Before the measurement of fiscal decentralization, it is necessary to discuss the channel through which fiscal decentralization effects human development (HDI). Literature of fiscal decentralization suggests that through the allocative efficiency of fiscal decentralization economic conditions of the developing nations can be improved. The efficiency channel has been discussed by Musgrave (1939), Oates (1985, 1998, 1993), Tiebout (1956), Zhuravskaya and Ekaterina (2000), Jin et al. (2005) and Mello, (2000).

Fiscal autonomy to the lower sub-national governments/ functionaries/Provinces of the state makes more resources available to them by levying their own taxes and tapping more natural resources. Sub national governments are more familiar with their people and their needs. These governments, on the basis of their information, use their resources more efficiently. Being close to their jurisdictions, the local members have more frequent interaction with their people and have easy access to the target group or target region. So, better information and easy access brings allocative efficiency in the local government's expenditure by providing those local public goods which are demanded by the people. Education and health facilities, being the part of pubic goods, improve over time. This affects HDI both directly and indirectly. Better education facilities are supposed to increase the literacy rate and enrollment ratio. And health care opportunities improve the life expectancy. So, increased education and life expectancy helps the country to improve its HDI directly. Better education and improved health affects the HDI indirectly by increasing the productivity of the factors of

production and this in turn increases the per capita income which is one of the indicators of HDI. This direction of causation from fiscal decentralization to HDI is depicted in the following Figure:



Source: Authors own calculation

Fig. 4.1: Transmission Mechanism of Fiscal Decentralization

Thus to improve the human development decentralized government must focus on health and education. Expenditures must made to improve the quality of these sectors which ultimately will lead to high score on Human Development Index.

This trickledown effect of fiscal decentralization may be challenged on various grounds. The positive effect of F.D. cannot reach to the lower level due to corruption, inefficient administration, incomplete information, favoritism and coordination failure as pointed out by Prud'homme (1995), Boadway et al. (2008) and Pose and Kroijer, (2009).

4.2 OPERATIONALIZING FISCAL DECENTRALIZATION

To incorporate fiscal decentralization into the empirical model its quantification is required. It is a multi-dimensional concept and to measure it no composite index exists. Owing to this fact researchers have mostly used expenditure and revenue measures of fiscal decentralization. These are simple ratios of provincial/local government's expenditure and revenue to the total federal government's expenditure and revenue. Higher the ratio higher will be the decentralization. These measures of fiscal decentralization were initially pioneered by Oates (1993). Woller and Phillips (1998) further adjusted these measures by subtracting the grants from the local government's revenues and defense and interest on loans from the expenditures of the federal government. The grants were subtracted from the local government's revenues to avoid double counting. The subtraction of defense and interest expenditures from the federal government's expenditure is due to the fact that these are the part of non-decentralized expenditures.

In this study unadjusted and adjusted measures of fiscal decentralization have been used in line with various analysts including Akai and Skata (2002), Baskaran and Feld (2009), Davoodi and Zou (1998), Zhang and Zou (1998), Malik et al. (2006), Faridi (2011) last but not the least Iqbal et al. (2013). Furthermore, two other indicators of fiscal decentralization have also been used namely composite, to see the collective effect of both the measures, and average measure of fiscal decentralization. These measures contain the information of both the revenue and expenditure measure of fiscal decentralization according to Akai and Skata (2002) and Iqbal et al. (2013). The detail of these indicators is given as under:

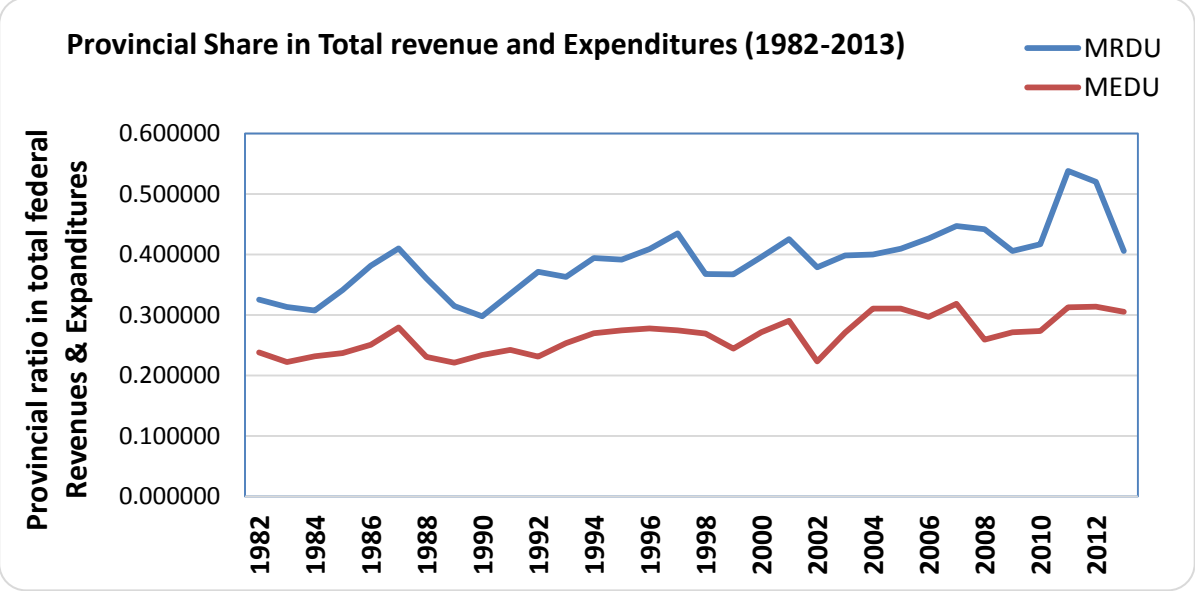
1. **Measure of Revenue Decentralization, Unadjusted (MRDU):** To calculate this measure total provincial revenue is divided by the summation of provincial government's revenue and federal government's revenue and the ratio of provincial government's revenue to the total national revenue is calculated. Higher the ratio higher will be revenue decentralization $MRDU = \frac{PGR}{FGR + PGR}$

   This is a straight forward measure of fiscal decentralization wherein the ratio between the provincial averment's revenue (PGR) to total national revenue (FGR+PGR) is determined. Higher the ratio higher the decentralization and vise a versa. During the analysis period (1982-2013) it remained on average at 0.39.

2. **Measure of Expenditure Decentralization, Unadjusted (MEDU):**
To calculate this index provincial expenditure (PGE) are divided by the sum of provincial and federal expenditure (FGE) and the Ratio of provincial government's expenditure to the total national expenditure is obtained. Higher the ratio higher the decentralization and vise a versa. The calculation formula is given as:

$$MEDU = \frac{PGE}{FGE + PGE}$$

On average this ratio remained 0.26 during 1982-2013. The trends of revenue and expenditure decentralization Pakistan have been summarized in the Fig. 4.1 which shows that during 2011 there was rapid jump in the revenue share of the provinces. During this period there was 26 % increase in the provincial tax collection. Federal government's revenue fell owing to non-realization of proceed of 3g license. Further there was high debt servicing and no external support. At the same time provincial government's revenue increased as compared to 2011 (SBP, 2011) so, significant increase in the share of provincial government in the total revenues was seen.



Source: Authors own Calculation

Fig. 4.2: Provincial Share in Total Revenue and Expenditures (1982-2013)

We see that during 1982 to 2013 there has been steady increase in the provincial share in total federal government's revenue and expenditures.

3. **Measure of Revenue Decentralization, Adjusted (MRDA):** Ratio of provincial government's revenue less grants to the total national revenue. $MRDA = \frac{PGR - Grants}{FGR + PGR}$

   Measure of revenue decentralization, adjusted has been calculated by abstracting the federal government grants to the provinces. Since, these grants do not represent the provincial revenue as pointed out by Iqbal et al., (2013), Malik et al. (2006) and Faridi (2011). On average this ratio remained 0.50 during the analysis period.

4. **Measure of Expenditure Decentralization, Adjusted (MEDA):** Ratio of provincial government's expenditure to the total national expenditure less interest payment on loans and defense expenditure.

   $$MEDA = \frac{PGE}{PGE + FGE - (Def + Int)}$$

   Adjusted measure of fiscal decentralization has been calculated by abstracting the defense and interest on loans from the total expenditures of the federal government. Since these expenditures are incurred to the federal government before the decentralization (Iqbal et al. 2013).

5. **Measure of Composite Fiscal decentralization (MCD):** This measure has been taken from Iqbal et al. (2013) and is calculated by dividing the MRDU by one minus MRDU. This measure takes into account the collective effect of both the revenue and expenditure decentralization.

   $$MCD = \frac{MEDU}{1 - MRDU}$$

6. **Average of Revenue and expenditure indicator (AVG_MFD).** To avoid the overestimation or under estimation of FD as a result of use of only revenue or expenditure indicators, the average of both the indicators have been used.. This measure is also used by Akai and Skata (2002) and is calculated as:

   $$AVG\_MFD = \frac{MEDA + MRDA}{2}$$

So, in this study six maximum measure of decentralization have been used to analyses the impact of fiscal decentralization on human development

4.3 HUMAN DEVELOPMENT AND CONTROL VARIABLES

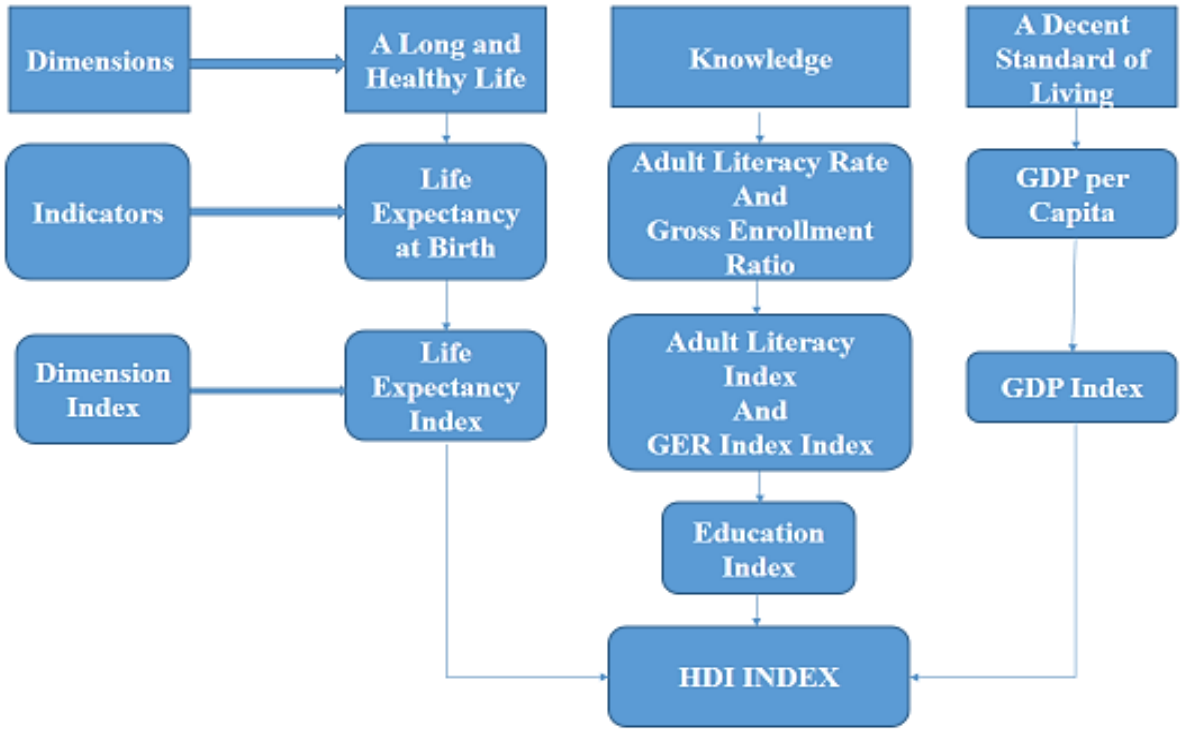
To know the impact of fiscal decentralization on human development HDI has been used as a dependent variable. The control variables include Education expenditure, Health Expenditure, Inflation, Debt servicing and gross domestic savings.

4.3.1 Human Development Index (HDI)

To measure the Human development, Human Development Index (HDI) will be used in this study. Since, HDI summarizes the necessary elements of human development by incorporating education, health and per capita income. To calculate HDI human development is divided into three dimensions like a long and healthy life, knowledge and decent standard of living. Since these dimensions cannot be directly quantified, therefore, these are further split into three indicators namely life expectancy at birth, adult literacy rate and gross enrollment and finally GDP per capita. From these indicators health index, education index and GDP index is formed. The HDI is the geometric mean of health index, education index and GDP index (HDR, 2013) and is calculated by using the following formula.

$$\sqrt[3]{I_{life} \cdot I_{education} \cdot I_{income}}$$

The HDI calculation is depicted in the Fig. 4.3.



Source: World Development Report 2013

Fig. 4.3: HDI Calculation

The value of the HDI ranges from 1 to 0. Closer the value to 1 higher will be the human development and vise a versa. In case of Pakistan its value remained 0.4498 on average during 1982-2013. The trends in human development index in Pakistan are summarized in the following Figure:

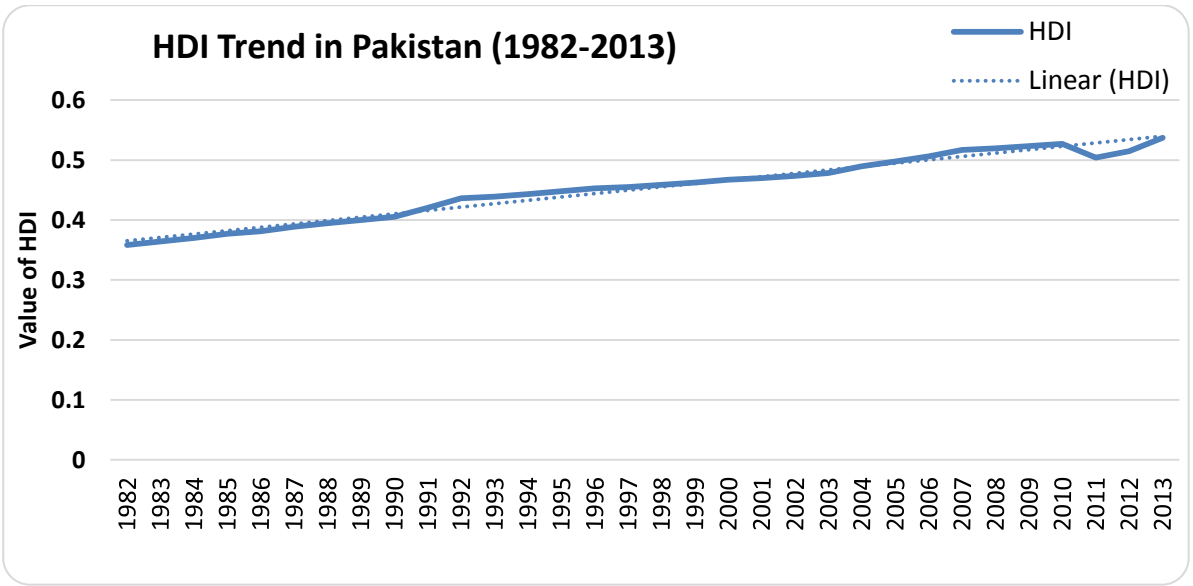


Fig. 4.4: HDI Trend in Pakistan during 1982 to 2013

It is evident that HDI showed a steady increase overtime starting from 0.3582 in 1982 and 0.5730 in 2013. On average it remained at 0.4498.

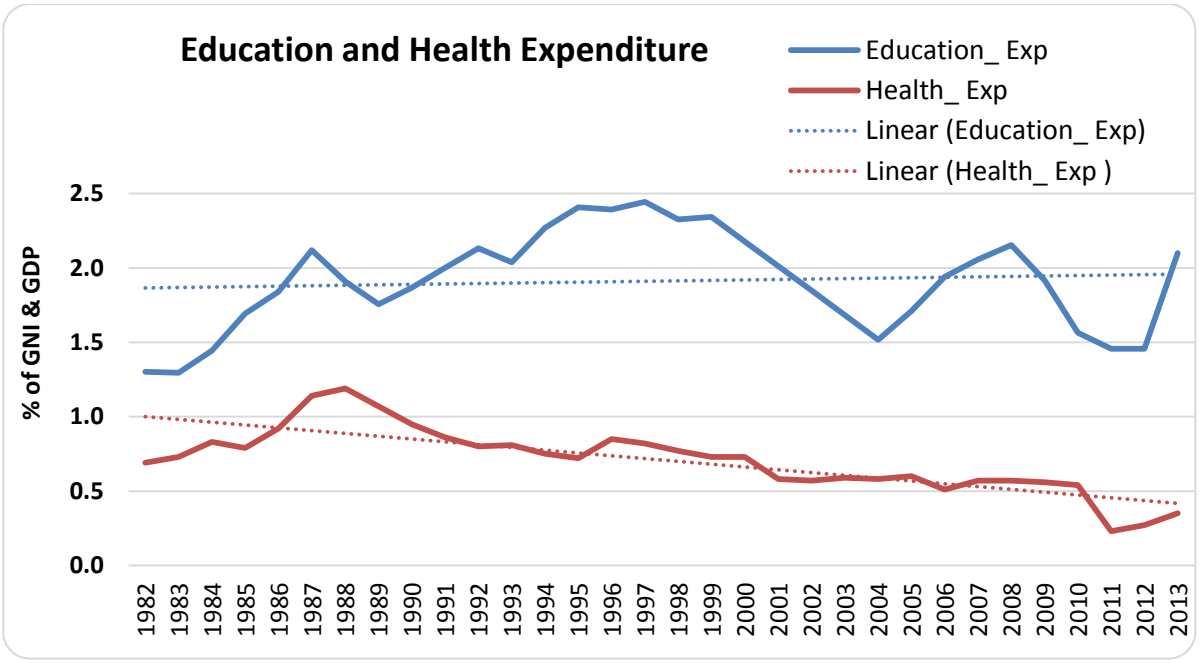
4.3.2 Education Expenditure (% of GNI)

Expenditure on education partly determines the literacy rate and enrollment ratio and is expected to have positive link with the HDI. It is an important determinant of HDI hence, this variable has been used. However, it is not just the expenditure which may contribute positively toward HDI rather the outcome of these expenditures matters. In Pakistan, education expenditure has been very low. From 1982-2013 on average 1.91% of GNI have been expended on education.

4.3.3 Health Expenditure (% of GDP)

Life expectancy at birth is one of the indicators of HDI. Public sector expenditure may influence the life expectancy significantly by devoting more resources. It is pity that in Pakistan health expenditures have been miserably low averaging 0.73% of GDP during 1982 -2013. Not only this but overtime these expenditures showed a declining trend with 0.69% in 1982 and only 0.35% in 2013. It is to be remembered that it is not necessary that only public health expenditures only positively affect HDI. There are so many private health service providers catering the needs of the people. So, even in case of reduction in public expenditures on health, infant mortality may decrease and life expectancy may increase.

The trends of education and health expenditures have been depicted in the following Figure:



Source: World Development Indicators

Fig. 4.5: Education and Health Expenditure in Pakistan

It is obvious that education expenditures have shown a positive trend whereas health expenditure has shown negative trend overtime.

4.3.4 Inflation

Annual percentage of Consumer Price Index (CPI) has been used to capture the effect of inflation on HDI. Inflation can affect the HDI both positively and negatively. With the increased decentralization government expenditure increases which may increase the price level. In the short run people may suffer but in the long run it may have positive effect (Zhang and Zou, 1998; Bardhan, 2002; Sepulveda and Vazquez, 2011). In Pakistan during 1982-2013 inflation, on average, remained below the double digit which was 8.42%.

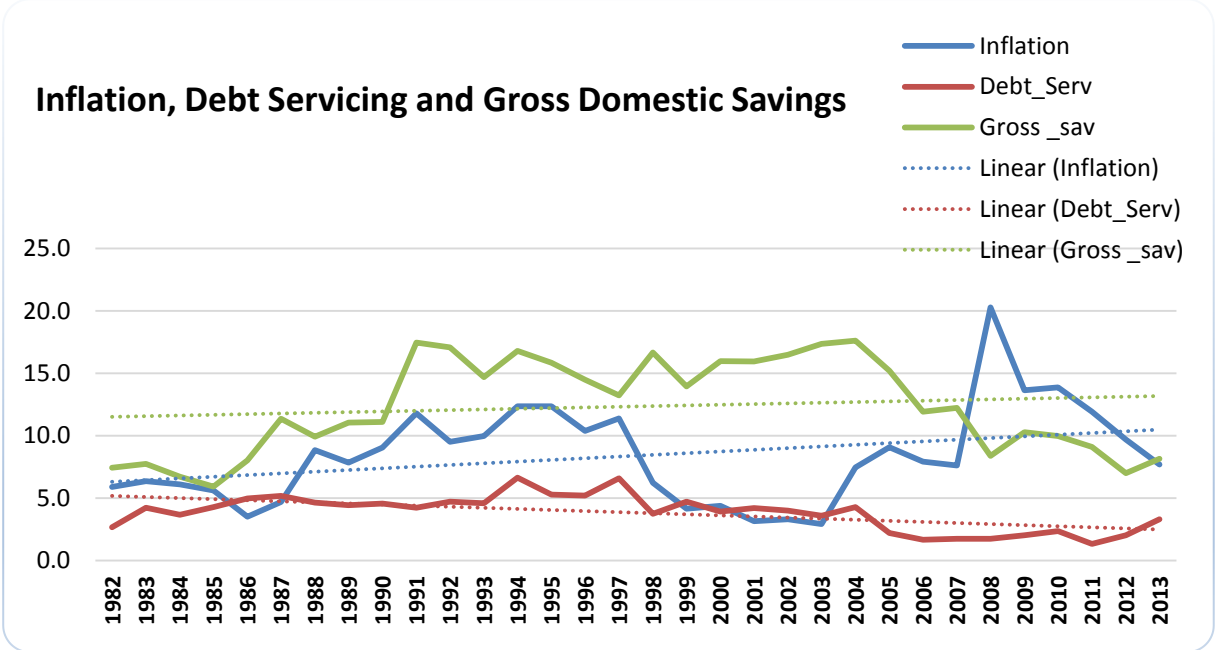
4.3.5 Debt Servicing (% of GNI)

Debt servicing eat away the vital resources of the economy which otherwise might have been used to boost the overall standard of living. Increased debt servicing may hamper the human development. Its mean value during the analysis period remained 3.85% of GNI with maximum value of 6.63% and lowest value of 1.35 %.

4.3.6 Gross Domestic Savings (% of GDP)

Savings are one of the main lubricants of the economy. All the growth models emphasis the importance of the savings. With increased saving there will be chances of higher investment, higher growth and resultantly higher level of human development. Pakistan, throughout the history has not been much successful in mobilizing the high saving rate. It is evident from the data for the period 1982-2013 that mean saving during this period remained 12.83% which is not very high.

The trends in inflation, debt servicing and gross domestic saving are captured in the following Figure:



Source: World Development Indicators

Fig. 4.6: Inflation, Debt Servicing and Gross Domestic Savings and their Trends

Measures of fiscal decentralization and human development index are our core variables whereas; health expenditure (as a percentage of GDP), education expenditure (as a percentage of GNI), inflation (CPI annual percentage) debt servicing (as a percentage of GNI) and Gross Domestic Savings (as a percentage of GDP) are the control variables which will remain the same in different model specifications.

With the incorporation of the above mentioned measures of fiscal decentralization, HDI and control variables the empirical model becomes

$$HDI = f(FD, \text{Edu\_Exp}, \text{Health\_Exp}, \text{Inflation}, \text{Debt\_Serv}, \text{Gross\_Sav}) \quad (4.1)$$

$$HDI_{it} = \alpha_{it} + \beta_{it} FD_{it} + \eta_{it} Edu\_\text{Exp}_t + \pi_{it} Health\_Exp_t + \xi_{it} Inflation_t + \psi_{it} Debt\_Serv_t + \omega_{it} Gross\_Sav_t + \mu_{it} \quad (4.2)$$

where

$$i = 1, 2, 3, 4, 5, 6$$

where,

HDI = Human Development Index as a proxy of human development

FD = Six Measures of fiscal decentralization as have already been defined.

Edu_Exp = Education expenditure as a percentage of GNI

Health_Exp = Health Expenditure as a percentage of GDP

Inflation = Annual percentage of CPI

Debt_Serv = Debt servicing as a percentage of GNI

Gross_Sav = Gross Domestic saving as a percentage of GDP

4.4 ECONOMETRIC ISSUES

When time series data is non- stationary then application of the Ordinary Least Squares Method (OLS) gives spurious results. It is because, OLS techniques assume that the mean and the variance of the variables are constant that is, it is time independent. However, in case of time series data it may not be true and simple "t" and "f" test may not be useful. Thus according to Granger and Newbold (1974), Phillips (1986, 1998) and Cochrane (1991) time trend present in the data makes it necessary to check for the random walk process in the data to avoid the misleading results.

Thus to go ahead with the analysis first of all we have to check the data for unit root. To do so different techniques have been devolved by the

econometricians however, Augmented Dicky-Fuller test, pioneered by Dicky and Fuller (1979, 1981) is mostly used in the economics literature. In this method the differences of the variable are determined at which data becomes stationary (Harvey, 1980; Pantula and Dicky, 1987).

4.4.1 Detection and Correction of Unit Root through ADF Test

This method was devised by Dicky and Fuller (1979, 1981). In this study ADF test is applied using the following system of equations:

$$\Delta X_t = \alpha + \delta X_{t-1} + \sum_{t-i}^{q} \lambda_i \Delta X_{t-i} + \mu_{it} \quad (4.3)$$

$$\Delta X_t = \alpha + \beta t_1 + \delta X_{t-1} + \sum_{t-i}^{q} \lambda_i \Delta X_{t-i} + \mu_{it} \quad (4.4)$$

$$\Delta\Delta X_t = \alpha + \delta \Delta X_{t-1} + \sum_{t-i}^{q} \lambda_i \Delta\Delta X_{t-i} + \mu_{it} \quad (4.5)$$

$$\Delta\Delta X_t = \alpha + \beta t_1 + \delta \Delta X_{t-1} + \sum_{t-i}^{q} \lambda_i \Delta\Delta X_{t-i} + \mu_{it} \quad (4.6)$$

where

q = Number of lags in the independent variable
X = Concerned variable which is being tested for unit root
$\Delta X_t = X_t - X_{t-1}$
$\Delta\Delta X_t = \Delta X_t - \Delta X_{t-1}$

Following hypothesis will be developed to check the unit root:

H0 : δ = 0 (Xt has the problem of unit root i.e. non-stationary)
H1 : δ < 0 (Xt has not the problem of unit root i.e. stationary)

If $\tau_{(calculated)}$ is less than the $\tau_{(tabular)}$ or "p" is less than the level of significance (α), the null hypothesis will be rejected implying that there is no problem of unit root.

4.4.2 Long Run Relationship among the Variables/Johansen Approach

In the absence of co-integration the results obtained through Ordinary Least Square (OLS) method have little importance (Phillips, 1986). Furthermore, long run equilibrium or relationship among the variable is generally sought out through co-integration technique. This approach was first pioneered by Engle and Granger (1987) and was subsequently refined by Stock and Watson (1988), Johansen and Juselius (1990) and Johansen (1991, 1995). Both the techniques require that the variables must be integrated of the same order. Engle and Granger approach fails when there are more than one co-integrating vectors. However, Johansen's co-integration technique is Vector Auto Regression (VAR) based and thus helps to find more than one co-integrating vectors in the VAR representation. Further, it is considered a better technique when error term is not normally distributed and the dynamics of the Error Correction Model are not known.

In this study six models are to be estimated and each model contains seven variables, therefore, there will be 42 equations which can be represented in the metrics form in the following way

$$Y_t = \alpha + \beta_t Y_{t-1} + ... + \beta_k Y_{t-k} + \varepsilon_t \qquad (4.7)$$

where

$Y_t = (n*1)$ column Vector of variables integrated of the same order

$\alpha = (n*1)$ column Vector of constants

βs = parameters

ϵ = error term

VAR presented in the above equation can be modified in the form of Vector Error Correction (VECM) format in the following way

$$\Delta Y_t = \alpha + \sum_{i=0}^{q-1} \pi_i \Delta Y_{t-i} + \phi ECT_{t-1} + \varepsilon_t \qquad (4.8)$$

where, Δ is the difference operator, α is the n*1 column vectors of constants, Y is the vector of variables integrated of order one, $q-1$ means that when VAR is of q order, in VECM we use the differences hence losing the lags, at the end we are left with $q-1$ lags. π and ϕ represents the coefficient metrics. The coefficient of the lagged error term (ECT_{t-1}) shows the short run dynamics. If the coefficient of the Error Correction Term (ECT) is negative

and significant it is the proof of convergence. Its coefficient further tells the speed of adjustment.

The VECM in accordance with our variables will be as follows:

$$\begin{aligned}\Delta HDI_t = \alpha_1 &+ \sum_{j=0}^{q} \gamma_{1j} \Delta MEDU_{t-j} + \sum_{j=0}^{q} \gamma_{2j} \Delta Edu\_Exp_{t-j} \\ &+ \sum_{j=0}^{q} \gamma_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \gamma_{4j} \Delta Inflation_{t-j} \\ &+ \sum_{j=0}^{q} \gamma_{5j} \Delta Debt\_Serv_{t-j} + \sum_{j=0}^{q} \gamma_{6j} \Delta Gross\_sav_{t-j} \\ &+ Ø_{1t} ECT_{t-1} + \varepsilon_{1t} \end{aligned} \quad (4.9)$$

$$\begin{aligned}\Delta HDI_t = \alpha_2 &+ \sum_{j=0}^{q} \varphi_{1j} \Delta MEDA_{t-j} + \sum_{j=0}^{q} \varphi_{2j} \Delta Edu\_Exp_{t-j} \\ &+ \sum_{j=0}^{q} \varphi_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \varphi_{4j} \Delta Inflation_{t-j} \\ &+ \sum_{j=0}^{q} \varphi_{5j} \Delta Debt\_Serv_{t-j} \\ &+ \sum_{j=0}^{q} \varphi_{6j} \Delta Gross\_sav_{t-j} + Ø_{2t} ECT_{t-1} + \varepsilon_{2t} \end{aligned} \quad (4.10)$$

$$\begin{aligned}\Delta HDI_t = \alpha_3 &+ \sum_{j=0}^{q} \lambda_{1j} \Delta MRDU_{t-j} + \sum_{j=0}^{q} \lambda_{2j} \Delta Edu\_Exp_{t-j} \\ &+ \sum_{j=0}^{q} \lambda_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \lambda_{4j} \Delta Inflation_{t-j} \\ &+ \sum_{j=0}^{q} \lambda_{5j} \Delta Debt\_Serv_{t-j} \\ &+ \sum_{j=0}^{q} \lambda_{6j} \Delta Gross\_sav_{t-j} + Ø_{3t} ECT_{t-1} + \varepsilon_{3t} \end{aligned} \quad (4.11)$$

$$\Delta HDI_t = \alpha_4 + \sum_{j=0}^{q} \eta_{1j} \Delta MRDA_{t-j} + \sum_{j=0}^{q} \eta_{2j} \Delta Edu\_Exp_{t-j} + \sum_{j=0}^{q} \eta_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \eta_{4j} \Delta Inflation_{t-j} + \sum_{j=0}^{q} \eta_{5j} \Delta Debt\_Serv_{t-j} + \sum_{j=0}^{q} \eta_{6j} \Delta Gross\_sav_{t-j} + \emptyset_{4t} ECT_{t-1} + \varepsilon_{4t} \quad (4.12)$$

$$\Delta HDI_t = \alpha_5 + \sum_{j=0}^{q} \varpi_{1j} \Delta MCD_{t-j} + \sum_{j=0}^{q} \varpi_{2j} \Delta Edu\_Exp_{t-j} + \sum_{j=0}^{q} \varpi_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \varpi_{4j} \Delta Inflation_{t-j} + \sum_{j=0}^{q} \varpi_{5j} \Delta Debt\_Serv_{t-j} + \sum_{j=0}^{q} \varpi_{6j} \Delta Gross\_sav_{t-j} + \emptyset_{5t} ECT_{t-1} + \varepsilon_{5t} \quad (4.13)$$

$$\Delta HDI_t = \alpha_6 + \sum_{j=0}^{q} \nu_{1j} \Delta AVG\_MFD_{t-j} + \sum_{j=0}^{q} \nu_{2j} \Delta Edu\_Exp_{t-j} + \sum_{j=0}^{q} \nu_{3j} \Delta Health\_Exp_{t-j} + \sum_{j=0}^{q} \nu_{4j} \Delta Inflation_{t-j} + \sum_{j=0}^{q} \nu_{5j} \Delta Debt\_Serv_{t-j} + \sum_{j=0}^{q} \nu_{6j} \Delta Gross\_sav_{t-j} + \emptyset_{6t} ECT_{t-1} + \varepsilon_{6t} \quad (4.14)$$

where j = 0,1,2,….,q.

Co integration shows the long run relationship among the variables, however, this relationship may get disturbed by certain shocks in the short run. To incorporate the short run dynamics the ECT has been added in the above model. The significance and sign of the ECT shows the stability, convergence or divergence of the long run equilibrium.

Significance and negativity of the ECT coefficient tells that the equilibrium is convergent and stable one as pointed out by Banerjee et al. (1998). Long run equilibrium will be divergent if ECT coefficient is positive and significant. If Ø equals one, it means that adjustment takes place instantaneously and if it is equal to zero, it signifies that adjustment never takes palace.

4.4.3 Granger Causality

To know the nature of causality between the human development and fiscal decentralization, Granger Causality Test is applied. This test not only tells the existence of causality but also the direction of causality which may be unidirectional or bilateral causality. The validity of this test depends upon the order the VAR and stationarity of the concerned variables. This test is widely used by the policy makers since it tells as to which variable must be focused to influence the other. So it can be said that this test helps to find out the policy variable.

Dynamic relationship among variables can be gauged by using the VAR. It is a system of OLS in which each of a set of variables is regressed on lagged values of both itself and other variables in the set. In our case we have seven variables and six models. Therefore, there will be 42 equations in the system, that is, seven equations for each model. To keep things simple this will be represented by the seven equations where "FD" will be used to represent all the six measures of Fiscal decentralization.

$$HDI_t = \sigma_1 + \sum_{i=1}^{k} \tau_{1i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{1i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{1i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{1i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{1i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{1i} Gross\_sav_{t-i} + \varepsilon_{1t} \quad (4.15)$$

$$FD_{it} = \sigma_2 + \sum_{i=1}^{k} \tau_{2i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{2i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{2i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{2i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{2i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{2i} Gross\_sav_{t-i} + \varepsilon_{2t} \quad (4.16)$$

$$Edu\_Exp_t = \sigma_3 + \sum_{i=1}^{k} \tau_{3i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{3i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{3i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{3i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{3i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{3i} Gross\_sav_{t-i} + \varepsilon_{3t} \quad (4.17)$$

$$\text{Health\_} Exp_t = \sigma_4 + \sum_{i=1}^{k} \tau_{4i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{4i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{4i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{4i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{4i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{4i} Gross\_sav_{t-i} + \varepsilon_{4t} \quad (4.18)$$

$$Inflation_t = \sigma_5 + \sum_{i=1}^{k} \tau_{5i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{5i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{5i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{5i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{5i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{5i} Gross\_sav_{t-i} + \varepsilon_{5t} \quad (4.19)$$

$$Debt\_Serv_t = \sigma_6 + \sum_{i=1}^{k} \tau_{6i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{6i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{6i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{6i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{6i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{6i} Gross\_sav_{t-i} + \varepsilon_{6t} \quad (4.20)$$

$$Gross\_Sav_t = \sigma_7 + \sum_{i=1}^{k} \tau_{7i} HDI_{t-i} + \sum_{i=1}^{k} \theta_{ij} FD_{j(t-i)} + \sum_{i=1}^{k} \omega_{7i} \text{Edu\_} Exp_{t-i} + \sum_{i=1}^{k} \xi_{7i} Health\_Exp_{t-i} + \sum_{i=1}^{k} \psi_{7i} Inflation_{t-i} + \sum_{i=1}^{k} \Omega_{7i} Debt\_Serv_{t-i} + \sum_{i=1}^{k} \Gamma_{7i} Gross\_sav_{t-i} + \varepsilon_{7t} \quad (4.21)$$

where

i = 1, 2,3,….,k

J = 1,2,3,4,5,6 (Six measure of fiscal decentralization).

4.5 DATA SOURCES

Annual time series data from 1982-2013 was used in the study. The data was collected from the Handbook of Statistics of Pakistan economy, Economic Survey of Pakistan (Various issues), Annual Reports of the State Bank of Pakistan, Human Development Reports and World Development Indicators (WDI).

CHAPTER 5

DATA ANALYSIS AND EMPIRICAL RESULTS

In time series data analysis, to move forward it is needed to ascertain the characteristics of data, that is, whether it is stationary or not. If the entire variables are stationary at the same level only then Johansen co-integration among the variables can be checked.

5.1 AUGMENTED DICKY – FULLER TEST

To test the stationarity of the variable Augmented Dicky-Fuller test has been applied. According to this test all the variables have been found to be stationary at first difference. Hence, it is safe to use the co-integration test to check the long run equilibrium among the variables. The Results of the test have been reported in the Table 5.1.

Table 5.1
ADF Test for Unit Root

Variables	AT LEVEL			
	Intercept		Trend and Intercept	
	ADF Stat	P-Value	ADF Stat	P-Value
HDI	-0.821554	0.7989	-3.019069	0.1438
MRDU	-2.405758	0.1484	-5.906856	0.0002
MRDA	1.914028	0.3218	-3.89999	0.0247
MEDU	-2.521633	0.1203	-4.428809	0.0071
MEDA	-3.966513	0.0047	-4.66793	0.0166
MCD	-2.888150	0.0582	-3.888948	0.0248
AVG_MFD	-2.903415	0.0564	-3.952527	0.0215
Edu_Exp	-3.293877	0.0242	-3.231386	0.0976
Health_Exp	-0.688146	0.8428	-2.984582	0.1523
Debt_Serv	-1.162313	0.6772	-2.205785	0.4695
Inflation	-2.549378	0.1142	-2.569592	0.2956
Gross_d_sav	-1.701135	0.4208	-1.448236	0.8256

Variables	AT LEVEL			
	Intercept		Trend and Intercept	
	ADF Stat	P-Value	ADF Stat	P-Value
First Difference				
HDI	-4.360375	0.0018	-4.533425	0.0059
MRDU	-6.402955	0.0000	-6.163734	0.0001
MRDA	-6.260671	0.0000	-6.051732	0.0001
MEDU	-6.960713	0.0000	-6.826393	0.00000
MEDA	-6.822378	0.0000	-6.790729	0.0000
MCD	-7.450932	0.0000	-7.372762	0.0000
AVG_MFD	-7.198154	0.0000	-7.180967	0.0000
Edu_Exp	-2.864963	0.0619	-3.524244	0.0568
Health_Exp	-4.508008	0.0012	-4.564815	0.0053
Debt_Serv	-4.780412	0.0006	-4.748648	0.0036
Inflation	-6.776271	0.0000	-6.671845	0.0000
Gross_sav	-6.418772	0.0000	-5.819314	0.0005

5.2 SELECTION OF OPTIMAL LAG LENGTH

To select the optimal lag length, various criteria have been used in the econometrics literature. These criteria include Sequential Modified LR test statistic (LR), Final Predictor Error (FPR), Akaik Information criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ).

In this study Schwarz-Information Criterion (SC) was used which gave the optimal lag length of one in all the six models. The results of all the six models are summarized in the following tables.

Table 5.2
Schwarz-Information Criterion (SC) of Lag Selection

	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
Lag	**SC**	**SC**	**SC**	**SC**	**SC**	**SC**
0	3.855991	6.104387	4.669377	4.525608	5.790765	5.291059
1	-0.794612*	2.527461*	0.250709*	0.442709*	1.304843*	1.624270*
2	1.030183	3.615348	1.371485	2.338918	2.770927	2.823717
* indicates lag order selected by the criterion SC: Schwarz information criterion						

5.3 JOHANSEN CO-INTEGRATION

To test the long run relationship among Human Development Indicator, Measures of Fiscal decentralization, Education expenditure, health expenditures, inflation and debt servicing and gross domestic saving, the Johansen Co-Integration technique has been used.

The number of co-integrating vectors has been decided on the basis of Trace Statistics. There will be as many null hypothesis as there are variables in the model as it is VAR based co-integration test. In VAR the number of equations is equal to the number of variables since independent variable in the one equation appears as a dependent variable in the next equation and so on. The rejection of each null hypothesis means that there is at least one co-integrating vector. If the entire six null hypotheses are rejected, it means that there are six co-integrating vectors. The null hypothesis of no co-integration will be rejected if value of Trace Statistics is greater than the critical value.

We have estimated six models corresponding to each measure of fiscal decentralization. In Model-1, MEDU is independent variable, in Model-2 MEDA, in Model-3 MRDU, in Model-4 MRDA in Model-5 MCD and in Model-6 AVG-MFD are the independent variables. The results of Johansen Co-Integration of all the six models have been reported in the following six tables for the six models.

Table 5.3
Unrestricted Co-Integration Rank Test (Trace)

H_0	H_1	Model-1			Model-2		
		Trace Statistics	Critical Value	Probability	Trace Statistics	Critical Value	Probability
R = 0	R ≥1	177.3018	120.3673	0.0000	182.9322	120.3673	0.0000
R ≤ 1	R≥ 2	116.5128	91.11028	0.0009	106.8912	91.11028	0.0069
R ≤ 2	R≥ 3	76.67598	65.81970	0.0128	73.85446	65.81970	0.0230
R ≤ 3	R≥ 4	48.55287	44.49359	0.0429	46.68071	44.49359	0.0642
R ≤ 4	R ≥ 5	24.80153	27.06695	0.1686	24.72898	27.06695	0.1713
R ≤ 5	R ≥ 6	11.06039	13.42878	0.2078	11.95286	13.42878	0.1592
R ≤ 6	R ≥ 7	2.400721	2.705545	0.1213	2.100628	2.705545	0.1472

Table 5.4
Unrestricted Co-Integration Rank Test (Trace)

H_0	H_1	Model-3			Model-4		
		Trace Statistics	Critical Value	Probability	Trace Statistics	Critical Value	Probability
R = 0	R ≥1	179.2614	120.3673	0.0000	154.6683	120.3673	0.0003
R ≤ 1	R≥ 2	121.4816	91.11028	0.0003	102.5975	91.11028	0.0155
R ≤ 2	R≥ 3	84.49590	65.81970	0.0022	72.08152	65.81970	0.0326
R ≤ 3	R≥ 4	53.26893	44.49359	0.0142	45.88409	44.49359	0.0757
R ≤ 4	R ≥ 5	25.80736	27.06695	0.1346	22.73866	27.06695	0.2591
R ≤ 5	R ≥ 6	10.13845	13.42878	0.2702	9.457814	13.42878	0.3247
R ≤ 6	R ≥ 7	1.527668	2.705545	0.2165	1.208306	2.705545	0.2717

Table 5.5
Unrestricted Co-Integration Rank Test (Trace)

H_0	H_1	Model-5			Model-6		
		Trace Statistics	Critical Value	Probability	Trace Statistics	Critical Value	Probability
R = 0	R ≥1	173.5108	120.3673	0.0000	179.3698	120.3673	0.0000
R ≤ 1	R≥ 2	118.3993	91.11028	0.0006	104.5384	91.11028	0.0108
R ≤ 2	R≥ 3	81.17914	65.81970	0.0047	73.21426	65.81970	0.0261
R ≤ 3	R≥ 4	50.25769	44.49359	0.0292	46.82594	44.49359	0.0623
R ≤ 4	R ≥ 5	24.77330	27.06695	0.1697	24.11265	27.06695	0.1957
R ≤ 5	R ≥ 6	10.28961	13.42878	0.2591	11.20005	13.42878	0.1995
R ≤ 6	R ≥ 7	1.810325	2.705545	0.1785	1.833050	2.705545	0.1758

The results of the model 1 and 2 are given in the Table 5.3. In case of model 1 the first null hypothesis of no co-integration (R = 0) has been rejected in favor of alternative hypothesis (R=1). It means that there is at least one co-integrating vector. The value of the trace turn out to be 177.3018 and the critical value is 120.3673. The second null hypothesis (R ≤ 1) of one co-integrating equation has also been rejected in favor of alternative hypothesis of at least two co-integrating (R=2) equation, trace statistics being 116.5128 and critical value 91.11028, the third null hypothesis (R ≤ 2) has trace statistics value of 76.67598 and critical value. So third null hypothesis is also rejected which means that there are at least three (R=3) co-integrating equations. The fourth null hypothesis (R ≤ 3) is also rejected as the value of the trace statistic is 48.55287 with critical value 44.49359. However, fifth and sixth null hypothesis cannot be rejected as the value of trace is lower than that of the critical value. So, in case of model 1 we can conclude that there are four co-integrating vectors. The trace statistic of the first four null hypothesis are 182.9322, 106.8912, 73.85446, and 46.68071 against the critical values of 120.3673, 91.11028, 65.81970 and 44.49359, respectively.

The results of model 3 and 4 are reported in Table 5.4. In case of Model-3 the first null hypothesis of no co-integration (R = 0) has been rejected in favor of alternative hypothesis (R=1). Implying there is at least one co-integrating vector. The value of the trace turns out to be 179.2614 and the critical value is 120.3673. The second null hypothesis (R ≤ 1) of one co-integrating equation has also been rejected in favor of alternative hypothesis of at least two co-integrating (R=2) equation, trace statistics being

121.4816 and critical value 91.11028. The third null hypothesis ($R \leq 2$) has trace statistics value 84.49590 and critical value 65.81970. So third null hypothesis is also rejected which means that there are at least three (R=3) co-integrating equations. The fourth null hypothesis ($R \leq 3$) is also rejected as the value of the trace statistic is 53.26893 with critical value 44.49359. The fifth and the sixth null hypothesis cannot be rejected as the value of the trace statistic is less than the critical value. So, model 3 has also for co-integrating equations. The results are not different for the fourth model. As the trace statistic of the first four null hypothesis are 154.6683, 102.5975, 72.08152, and 45.88409 against the critical values of 120.3673, 91.11028, 65.81970 and 44.49359, respectively.

The results of model 5 and 6 are given the Table 5.5. The results are similar to the previous four models. The trace statistics in case of first four null hypothesis of model 5 are 173.5108, 118.3993, 81.17914, 50.25769, whereas the critical values are 120.3673, 91.11028, and 65.81970, respectively. Same is the case with model 6. Its trace and critical values are 179.3698, 104.5384, 73.21426, 46.82594 and critical values are 120.3673, 91.11028, 65.81970, and 44.49359, respectively.

Hence, we can say that all the six models have four co-integrating vector each. It is the evidence of the existence of long run relationship among the variable of the models.

5.4 LONG RUN RELATIONSHIP AMONG THE VARIABLES

Since co integration exists among the HDI, measures of fiscal decentralization, education and health expenditures, inflation and debt servicing and gross domestic savings, hence OLS estimates will be reliable.

Table 5.6
Long Run Relationships (Model-1)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
MEDU	0.381580	2.068673	0.0495
Edu_Exp	0.046333	2.100393	0.0464
Health_Exp	-0.098473	2.610552	0.0153
Inflation	0.002463	-3.152187	0.0043
Debt_serv	-0.014055	-3.052483	0.0055
Gross_Sav	0.003570	2.494061	0.0199
Constant	0.320238	5.488745	0.0000
R^2 = 0.854171 **Adj-R^2** = 0.817714 **F-Statistic** = 23.42937 **Prob-F-Statistic** = 0.000000 **Durbin Watson Statistic** =1.494643			

Table 5.7
Long Run Relationships (Model-2)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
MEDA	0.142150	2.579119	0.0165
Edu_Exp	0.033143	1.776330	0.0884
Health_Exp	-0.133621	-5.000596	0.0000
Inflation	0.003327	2.808583	0.0097
Debt_serv	-0.012662	-2.805059	0.0098
Gross_Sav	0.003385	2.451612	0.0219
Constant	0.390138	13.30264	0.0000
R^2 = 0.865458 **Adj-R^2** = 0.831823 **F-Statistic** =25.73050 **Prob-F-Statistic** = 0.000000 **Durbin Watson Statistic** =1.489742			

Table 5.8
Long Run Relationships (Model-3)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
MRDU	0.294877	2.664227	0.0136
Edu_Exp	0.034397	1.888649	0.0711
Health_Exp	-0.068308	-1.967689	0.0608
Inflation	0.002219	1.983709	0.0588
Debt_serv	-0.015418	-3.566486	0.0016
Gross_Sav	0.004759	3.417382	0.0023
Constant	0.299726	5.520206	0.0000
R^2 = 0.867389 **Adj-R^2** = 0.834236 **F-Statistic** =26.16334 **Prob-F-Statistic** = 0.000000 **Durbin Watson Statistic** =1.772673			

Table 5.9
Long Run Relationships (Model-4)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
MRDA	0.351945	3.591134	0.0015
Edu_Exp	0.019444	1.074281	0.2934
Health_Exp	-0.019767	-0.510104	0.6146
Inflation	0.001749	1.680645	0.1058
Debt_serv	-0.015018	-3.780549	0.0009
Gross-Sav	0.003691	2.961604	0.0068
Constant	0.299468	7.030695	0.0000
R^2 = 0.888228 **Adj-R^2** =0.860285 **F-Statistic** =31.78720 **Prob-F-Statistic** =0.000000 **Durbin Watson Statistic** =1.795259			

Table 5.10
Long Run Relationships (Model-5)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
MCD	0.166937	2.619972	0.0150
Edu_Exp	0.037034	2.068478	0.0495
Health_Exp	-0.071696	-2.095876	0.0468
Inflation	0.002289	2.040202	0.0525
Debt_serv	-0.014959	-3.440548	0.0021
Gross-Sav	0.004502	3.264003	0.0033
Constant	0.323900	6.882527	0.0000
R^2 = 0.866384 **Adj-R^2** = 0.832980 **F-Statistic** =25.93652 **Prob-F-Statistic** = 0.000000 **Durbin Watson Statistic** =1.733249			

Table 5.11
Long Run Relationships (Model-6)

Dependent variable = HDI			
Variables	**Coefficients**	**T -Statistics**	**Prob-Values**
AVG_MFD	0.238131	3.207277	0.0038
Edu_Exp	0.024545	1.336640	0.1939
Health_Exp	-0.096054	-3.543051	0.0017
Inflation	0.002961	2.742081	0.0114
Debt_serv	-0.012916	-3.068718	0.0053
Gross_Sav	0.003396	2.609961	0.0154
Constant	0.352841	10.52224	0.0000
R^2 = 0.879721 **Adj-R^2** = 0.849651 **F-Statistic** =29.25602 **Prob-F-Statistic** = 0.000000 **Durbin Watson Statistic** =1.664974			

The results reported in Tables 5.6 through 5.11 show that all the six measures of fiscal decentralization, namely Measure of Expenditure Decentralization, unadjusted (MEDU), Measure of Expenditure Decentralization, adjusted (MEDA), Measure of Revenue Decentralization, unadjusted (MRDU), Measure of Revenue Decentralization, adjusted (MRDA), Measure of Composite Decentralization (MCD) and finally Average Measure of Decentralization (AVG_MFD), are positively related to HDI and their coefficients are significant.

Table 5.6 represents the results of model-1. MEDU and HDI are positively related and this relationship is statistical significant. It means that by increasing the expenditure decentralization HDI can be improved. Education expenditure and HDI have also been found to be positively and significantly related. It implies that education expenditure have resulted in the increase of adult literacy rate and mean year of schooling. Health expenditure and HDI are found to be negatively related. The relationship requires a bit explanation. Health expenditure doses not directly affect the HDI rather indirectly through the decrease in the infant mortality rate. Over the years health expenditures have shown a declining trend. However, at the same time infant mortality at birth has come down significantly from 119.3 per thousand in 1982 to 69 per thousand. And life expectancy at birth was 58.69 years in 1982 which has increased to 66.44 in 2012 (WDI, 2015). This development in health sector has caused to improve the HDI. The negative effect of diminishing government's expenditure in health sector has been partly offset by the private investment in the sector. As a result the net effect remained positive and HDI improved. These results are supported by the findings of Habibi et al. (2003) and Elhiraika (2007). Both the studies show that public spending on health and education has declining trend, due to reliance on private sector, yet the education and health outcome has improved. Inflation and HDI have also been found to be positively related. And their result was also significant. It is against the conventional wisdom that inflation adversely affects the poor. Actually increased decentralization puts the upward pressure on the government expenditures which ultimately results in inflation. Moderate inflation enhances the economic activity which results in the improvement of socio-economic conditions (Zhang and Zou, 1998; Bardhan, 2002; Vazques and Mcnab, 2006; Bardhan and Mokherjee, 2005). In the short run it may adversely affect the people but when economic activity states, the incomes of the people may increase. This translates into better health and education facilities, thus improving the HDI. Debt servicing has been found to be negatively related. This result is quite understandable. Higher debt servicing means less resource left for domestic use. This phenomenon will badly affect all the sectors of the economy and slow down the human development. Lastly, gross domestic savings have positive and significant link with HDI. Higher

savings mean more resources for investment. Savings play a determining role in the capital accumulation and trigger the economic growth (Mankiw, Romar and Weil (1992); Barro, 1998; Barro, 1991; Barro and Martin, 2004; Acemoglu, 2009). Positive growth increases the human development provided that distributional aspect of growth is taken care of.

Table 5.7 gives the overview of the results of model-2. The results are similar to that of model-2. In this model adjusted measure of expenditure decentralization (MEDA) has been used. This is also positively and significantly related to HDI. Health expenditure and debt servicing are found to be negatively related to HDI but all other variables have positive and significant relationship with HDI.

The results of model 3 have been represented in the Table 5.8 in which revenue (MRDU) has been used as a measure of fiscal decentralization. Higher the share of provincial government in the total national revenue higher will be the level of human development. This relationship between HDI and MRDU is significant. Other variables including education expenditure, health expenditure, inflation, debt servicing and gross domestic savings showed the same behavior as was in the first and second model.

The results of model 4 are shown in the Table 5.9, this model uses the adjusted measure of fiscal decentralization (MRDA). MRDA and HDI are positively and significantly related. Education expenditure has positive but insignificant effect on HDI. Health expenditure has negative but insignificant impact in HDI. Inflation has positive and insignificant effect on HDI. The impact of debt servicing is negative and significant and the effect of gross domestic savings is positive and significant.

Table 5.10 gives the results of fifth mode which uses the composite index of fiscal decentralization (MCD) as a dependent variable along with the other control variables. MCD and HDI have been found to have positive and significant link. Education expenditure and debt servicing are reported to have negative influence on HDI. Education expenditure, inflation and gross domestic saving have favorable and significant effect on HDI.

Finally, the results of the model 6 are given in the Table 5.11. In this model average measure of fiscal decentralization (AVG_MFD) has been used as independent variable accompanying with other control variables. This measure of fiscal decentralization has also positive and significant effect on HDI. However the effect of education expenditure on HDI is positive but insignificant. All other variable are found to have statistically significant effect

on HDI with the difference of signs. Health expenditure and debt servicing has negative relationship but education, inflation and savings have positive signs.

The analysis of the long run relationship among the different measures of fiscal decentralization shows that, HDI and fiscal decentralization are closely linked. The human development can be accelerated by giving the provinces more autonomy.

5.5 SHORT RUN DYNAMICS

The co-integration and long run analysis confirms the existence of long run relationship among the variables. But the nature of relationship is yet to be determined. In the short run variables may drift apart due to certain shock to the system. The question arises whether these variables will again return to their long run equilibrium or not? And if these variables converge to their long run path how long it will take? The answer to these questions can be sought by applying the Vector Error Correction Model (VECM). The sign and the significance of the coefficient of the Error Correction Term (ECT) answer these questions. If the coefficient of the error correction term is negative and significant, it means the convergence of the long run equilibrium. The absolute value of the coefficient of ECT shows the speed of convergence. However, if sign is negative but insignificant, it confirms neither convergence nor divergence. Positive sign of the coefficient of the ECT shows the divergence.

The results of the Six VEC Models are reported in the Tables 5.12 through 5.17.

Table 5.12
Short Run Dynamics (Model-1)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.005293	4.974977	0.0002
ΔMEDU	0.076046	1.090393	0.2940
ΔMEDU(-2)	0.055253	0.762664	0.4583
ΔEDU_EXP	-0.005208	-0.588474	0.5656
ΔEDU_EXP(-2)	-0.014125	-1.901697	0.0780
ΔHEALTH_EXP	0.002045	0.139987	0.8907
ΔHEALTH_EXP(-2)	0.020963	1.221966	0.2419
ΔINFLATION	0.001227	1.991452	0.0663
ΔINFLATION(-2)	0.000999	2.637755	0.0195
ΔDEBT_SERV	-0.000576	-0.422505	0.6791
ΔDEBT_SERV(-2)	-0.000604	-0.564755	0.5812
ΔGROSS_SAVING	0.001697	2.847816	0.0129
ΔGROSS_SAVING(-2)	-0.000149	-0.266744	0.7936
ECT(-1)	-0.352606	-2.950961	0.0105
R^2 =0.689306 **Adj-R^2** =0.400804 **F-Statistic** =2.389261 **Prob-F-Statistic** =0.059251 **Durbin Watson Statistic** =1.542027			

Table 5.13
Short Run Dynamics (Model-2)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.005522	5.146053	0.0001
ΔMEDA	0.026478	1.126142	0.2790
ΔMEDA(-2)	0.016835	0.716365	0.4855
ΔEDU_EXP	-0.000725	-0.089239	0.9302
ΔEDU_EXP(-2)	-0.014847	-1.713365	0.1087
ΔHEALTH_EXP	0.008395	0.550203	0.5909
ΔHEALTH_EXP(-2)	0.018305	1.093305	0.2927
ΔINFLATION	0.001331	1.867278	0.0829
ΔINFLATION(-2)	0.000998	2.517494	0.0246
ΔDEBT_SERV	-0.000156	-0.091625	0.9283
ΔDEBT_SERV(-2)	-8.54E-05	-0.074987	0.9413
ΔGROSS_SAVING	0.001299	2.371227	0.0326
ΔGROSS_SAVING(-2)	4.66E-05	0.090779	0.9290
ECT(-1)	-0.307281	-2.815956	0.0137
R^2 =0.669041 **Adj-R^2** =0.361722 **F-Statistic** =2.177026 **Prob-F-Statistic** =0.080986 **Durbin Watson Statistic** =1.728426			

Table 5.14
Short Run Dynamics (Model-3)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.006439	6.000999	0.0000
ΔMRDU	-0.017358	-0.253070	0.8042
ΔMRDU(-1)	-0.056178	-1.259186	0.2301
ΔMRDU(-2)	-0.045452	-0.814789	0.4299
ΔEDU_EXP	0.006231	0.833837	0.4194
ΔEDU_EXP(-2)	-0.009854	-1.043380	0.3158
ΔHEALTH_EXP	0.012061	0.940479	0.3641
ΔHEALTH_EXP(-2)	0.004580	0.214557	0.8334
ΔINFLATION	0.000688	1.429661	0.1764
ΔINFLATION(-2)	0.000669	1.896691	0.0803
ΔDEBT_SERV	-0.001511	-0.960079	0.3545
ΔDEBT_SERV(-2)	-0.000799	-0.623544	0.5437
ΔGROSS_SAVING	0.001315	2.136666	0.0522
ΔGROSS_SAVING(-2)	-0.000238	-0.502120	0.6240
ECT(-1)	-0.342483	-2.045885	0.0616
R^2 = 0.765457 **Adj-R^2** = 0.512873 **F-Statistic** = 3.030502 **Prob-F-Statistic** = 0.026674 **Durbin Watson Statistic** =1.698798			

Table 5.15
Short Run Dynamics (Model-4)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.005703	4.954857	0.0002
ΔMRDA	-0.025346	-0.467055	0.6476
ΔMRDA(-2)	-0.008570	-0.197597	0.8462
ΔEDU_EXP	0.008291	1.056999	0.3084
ΔEDU_EXP(-2)	-0.005418	-0.644670	0.5296
ΔHEALTH_EXP	0.011266	0.850614	0.4093
ΔHEALTH_EXP(-2)	-0.003554	-0.187957	0.8536
ΔINFLATION	0.000384	0.871706	0.3981
ΔINFLATION(-2)	0.000812	2.197271	0.0453
ΔDEBT_SERV	-0.000546	-0.347963	0.7330
ΔDEBT_SERV(-2)	-0.000658	-0.564398	0.5814
ΔGROSS_SAVING	0.001066	1.909030	0.0770
ΔGROSS_SAVING(-2)	-6.58E-05	-0.132520	0.8965
ECT(-1)	-0.205056	-1.758746	0.1004
R^2 = 0.683241 **Adj-R^2** =0.389107 **F-Statistic** = 2.322894 **Prob-F-Statistic** =0.065270 **Durbin Watson Statistic** =1.595087			

Table 5.16
Short Run Dynamics (Model-5)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.005837	5.234648	0.0001
ΔMCD	-0.023032	-0.712592	0.4878
ΔMCD(-2)	-0.021121	-0.667674	0.5152
ΔEDU_EXP	0.007611	1.000185	0.3342
ΔEDU_EXP(-2)	-0.006765	-0.852177	0.4085
ΔHEALTH_EXP	0.009606	0.704324	0.4928
ΔHEALTH_EXP(-2)	-0.003528	-0.192540	0.8501
ΔINFLATION	0.000399	0.797552	0.4384
ΔINFLATION(-2)	0.000736	1.886000	0.0802
ΔDEBT_SERV	-0.000658	-0.482844	0.6367
ΔDEBT_SERV(-2)	-0.000474	-0.418222	0.6821
ΔGROSS_SAVING	0.001298	2.090329	0.0553
ΔGROSS_SAVING(-2)	5.56E-05	0.114339	0.9106
ECT(-1)	-0.213921	-1.804110	0.0928
R^2 = 0.709527 **Adj-R^2** = 0.439802 **F-Statistic** = 2.630557 **Prob-F-Statistic** = 0.042004 **Durbin Watson Statistic** =1.677647			

Table 5.17
Short Run Dynamics (Model-6)

Dependent Variable = ΔHDI_t			
Explanatory Variables	**Coefficients**	**T-Statistics**	**Prob-Values**
Constant	0.005400	4.692188	0.0003
ΔAVG_MFD	0.028293	0.626943	0.5408
ΔAVG_MFD(-2)	0.012985	0.309110	0.7618
ΔEDU_EXP	0.001261	0.138461	0.8918
ΔEDU_EXP(-2)	-0.011844	-1.180750	0.2574
ΔHEALTH_EXP	0.013534	0.965578	0.3506
ΔHEALTH_EXP(-2)	0.013931	0.771549	0.4532
ΔINFLATION	0.000973	1.254425	0.2302
ΔINFLATION(-2)	0.000975	2.288845	0.0381
ΔDEBT_SERV	-0.000703	-0.430598	0.6733
ΔDEBT_SERV(-2)	-0.000420	-0.376182	0.7124
ΔGROSS_SAVING	0.001254	2.101683	0.0542
ΔGROSS_SAVING(-2)	6.03E-05	0.116506	0.9089
ECT(-1)	-0.288783	-2.366105	0.0329
R^2 = 0.660197 **Adj-R^2** = 0.344666 **F-Statistic** = 2.092335 **Prob-F-Statistic** = 0.091967 **Durbin Watson Statistic** =1.629603			

The results of model 1 are reported in the Table 5.12. The coefficient of the lagged error term (ECT (-1)) has been found to be significant at 5% level of significance. The convergence starts at second lag. The value of the coefficient of the lagged error term turned out to be -0.352606. This means that almost 35% of the error is corrected annually. So it takes less than three years for the variable of the model 1 to return to their long run equilibrium.

Table 5.13 gives the results of model 2. The coefficient of the error correction term is significant at 5% level of significance. It means that the variables of the model 2 also have the converging behavior after a shock. The numerical value of the error correction term is -0.307281. This shows that almost 31% of the short run error is corrected annually. It will take more than three and less than four years for the variables to converge to their long run trend.

The results of model 3 are summed in the Table 5.14. In case of this model the coefficient of the lagged error term turned out to be -0.342483 which is significant at 10% level of significance.

Table 5.15 gives the summary results of model 4. In case of fourth model the coefficient of the (ECT (-1)) is -0.205056 which is significant at 10% level of significance. About 20% of the error is corrected annually thus taking almost five years to return to the long run equilibrium.

Model 5 uses the composite index of fiscal decentralization and the result of VECM are reported in the Table 5.16. The value of the coefficient of the error correction term is -0.213921. This is significant at 10% level of significance taking almost five years to return to the long run equilibrium.

The results of the model 6 are given the Table 5.17. The coefficient of the error term is found to be significant at 5% level of significance. Its vale is -0.2887. In case of model 6 it takes less than five years for the variables to return to their long run equilibrium.

So, all the six models show that if there is some disequilibrium in the short run, the variable converge to their ling run path in the long run. The results of the VECM further confirms the con-integration among the variables.

5.6 GRANGER CAUSALITY

After confirming the long run relationship among the variables, now the direction of causality between the fiscal decentralization and HDI will be

sought out. Since, our primary concern was to find out the direction of causality between the fiscal decentralization Human Development (HDI), hence, causality between other variables has been disregarded in this study. The results of Granger Causality are reported in the Table 5.18.

5.18
Granger Causality Results

Null Hypothesis	F-Statistics	Probability
MEDU does not Granger Cause HDI	2.53807	0.1224
HDI does not Granger Cause MEDU	9.64237	0.0043
MEDA does not Granger Cause HDI	0.00541	0.9419
HDI does not Granger Cause MEDA	0.96998	0.3331
MRDU does not Granger Cause HDI	1.89438	0.1796
HDI does not Granger Cause MRDU	8.17141	0.0079
MRDA does not Granger Cause HDI	3.82288	0.0606
HDI does not Granger Cause MRDA	14.5799	0.0007
MCD does not Granger Cause HDI	1.86692	0.1755
HDI does not Granger Cause MCD	10.6686	0.0004
AVG_MFD does not Granger Cause HDI	0.56143	0.4599
HDI does not Granger Cause AVG_MFD	6.74144	0.0148

The results show the uni-directional causality among the six measures of fiscal decentralization and HDI. The null hypothesis, that MEDU does not granger cause HDI, cannot be rejected. However, the null hypothesis that, HDI does not granger cause MEDU, has been rejected at 5% level of significance. Hence, instead of MEDU rather HDI granger cause fiscal decentralization. So in case of HDI and MEDU the direction of causality is from HDI to MEDU. High value of HDI will result in more decentralization.

In case of MEDA and HDI no causality has been confirmed.

There exists uni-directional causality between MRDU and HDI. The null hypothesis that, HDI does not granger cause MRDU, has been rejected at 5% level of significance.

There exists by directional causality between MRDA and HDI. Since the null hypothesis that, MRDA does not granger cause HDI, has been rejected at 10% level of significance and the null hypothesis that, HDI does not granger cause MRDA, has been rejected at 5% level of significance.

In case of MCD and Avg_MFD both are granger caused by HDI. Since the null hypothesis that, HDI does not granger cause MCD, and HDI does not granger cause Avg_MFD, have been rejected at 5% level of significance.

So we see that in most of the cases causality runs from HDI to the different measures of decentralization implying that the policy makers must focus on the improvement of human development along with granting more fiscal autonomy to the provinces.

5.7 DIAGNOSTICS TESTS

The results of diagnostic test of all the six models have been summarized in the following Tables 5.19, 5.20 and 5.21. The hypothesis for the diagnostic test are outline as under

For normality test

H0: μ is normally distributed and
H1: μ is not normally distributed

For Serial Correlation

H0: μ is not serially correlated and
H1: μ is serially correlated

For heteroscedasticity

H0: μ is not hetroscedastic and
H1: μ is heteroscedasticity

For model specification

H0: Model is correctly specified and
H1: Model is not correctly specified

The test results show that all the main assumptions of OLS have been satisfied. The hypothesis of normal distribution, no heteroscedasticity no autocorrelation and model's correct specification have been accepted in all the six models

Table 5.19
Diagnostics Tests Results

TESTS	Model-1		Model-2	
	Test Statistic	Probability	Test Statistic	Probability
Jarque Bera Normality Test	0.116004	0.943648	0.274529	0.871740
Breusch-Godfrey Serial Correlation LM Test	0.695250	0.4130	0.628081	0.4362
Auto Regressive Hetroskedasticity Test (ARCH)	0.030855	0.8618	0.234765	0.6318
White Hetroskedasticity Test	0.966129	0.4687	1.145007	0.5329
Ramsey Model Specification RESET Test	0.063115	0.8039	0.538704	0.4704

Table 5.20
Diagnostics Tests Results

TESTS	Model-3		Model-4	
	Test Statistic	Probability	Test Statistic	Probability
Jarque Bera Normality Test	0.309316	0.856708	0.976666	0.613649
Breusch-Godfrey Serial Correlation LM Test	0.022668	0.8816	0.007879	0.9300
Auto Regressive Hetroskedasticity Test (ARCH)	3.653161	0.0662	3.293180	0.0803
White Hetroskedasticity Test	0.664295	0.7644	0.604428	0.7997
Ramsey Model Specification RESET Test	2.454729	0.1308	2.490331	0.1282

Table 5.21
Diagnostics Tests Results

TESTS	Model-5		Model-6	
	Test Statistic	**Probability**	**Test Statistic**	**Probability**
Jarque Bera Normality Test	0.211591	0.899608	0.214095	0.898483
Breusch-Godfrey Serial Correlation LM Test	0.110126	0.8962	0.128913	0.7228
Auto Regressive Hetroskedasticity Test (ARCH)	3.011945	0.0936	0.822894	0.3721
White Hetroskedasticity Test	1.685283	0.3753	4.676284	0.1141
Ramsey Model Specification RESET Test	2.396943	0.1352	0.009589	0.9228

In case of all the six models the error term has been found to be normally distributed having no autocorrelation. There is also no problem of heteroscedasticity and model misspecification. So OLS technique gives the reliable results.

CHAPTER 6

CONCLUSION AND POLICY RECOMMENDATIONS

In this chapter the conclusions drawn on the basis of data analysis is discussed. Apart from this, on the basis of literature review and data analysis necessary recommendations will be given as to how human development can be improved further.

6.1 CONCLUSION

This study investigated the impact of fiscal decentralization on human development by incorporating six indicators of fiscal decentralization. The analysis of data reveals that in Pakistan fiscal decentralization positively effects human development. The results of granger causality obviates that causality runs from human development to fiscal decentralization. There also exists long rung association between fiscal decentralization and human development. Education expenditures, gross domestic saving and inflation rate are found to have positive effect on human development. However, health expenditure and debt servicing have negative relationship with human development.

Fiscal decentralization does not itself effect the human development rather it does so by interacting with other variables such as improving health, education and living standard. One important point of this study is that it established a negative relationship between fiscal decentralization and health expenditure. But this is not synonymous to say that increased health expenditure will decrease HDI. Over the years health expenditures have shown a declining trend but at the same time health indicators go on improving. This happened due to the heavy investment by the private sector in the health sector. That is why despite the decreased health expenditure by the government of Pakistan HDI improved. On the basis of these results it can be said by taking care of the health sector and devoting more resources to this sector HDI can be improved significantly. Over all this study found a positive and significant relationship between fiscal decentralization and human development. These results are supported by the findings of Habibi et al. (2003) and Elhiraika (2007).

This study contributes toward research literature by investigating the human development aspect of fiscal decentralization unlike previous studies

which have focused on the relationship between fiscal decentralization and economic growth. It is concluded that fiscal decentralization must be enhanced but it must not be unbridled. There must be proper system of check and balance to reap the fruits of decentralization. Social services, like health and education, must not be left entirely to the provincial governments rather federal government should pursue the human development policy. Despite the usefulness of fiscal devolution, it remains unresolved as to what should be the optimum level of fiscal decentralization so that social aspects of decentralization may not be compromised which directly affects the human development? This necessitates more research in this field.

6.2 POLICY RECOMMENDATIONS

The positive and significant relationship between fiscal decentralization and human development necessitates that the provinces must be given more fiscal autonomy. Sheer transfer of more financial resources to the provinces does not grant them fiscal autonomy. Rather arrangements must be made to minimize their dependence on the federal transfers. For this institutions must be strengthened to make the provinces more capable of generating their own resources and making expenditures according to the local needs.

Tax base is required to be broadened at both the federal and provincial level to ensure the availability of more resources to be used for development purposes. In this regard provinces are required to be enabled to levy their own taxes. Proper guidance and training must to impart to the provincial administration to tap the natural resources. The revenue sharing among the provinces through NFC Award must be made more equitable. In this regard every possible effort must be made to address the grievance of the provinces. It will make them more loyal to the state, as Tanzi (1997) has stated, and force them to work whole heartedly to uplift the nation. Expenditure side of decentralization requires proper training and guideline to the provincial administration to pursue the national goals. Expenditure assignments of the provinces must be clear cut and without any ambiguity. It must be ensured that the expenditures made by the provincial governments do not contradict the goals of fiscal and monetary policy as it will result in macro-economic instability (Prud'homme, 1995; Bardhan, 2002; Breuss and Eller, 2004).

The effectiveness of fiscal decentralization requires well designed institutions to coordinate the economic activities of the provincial and federal governments (Iqbal et al., 2013). In this way provincial governments can be made more accountable and this will help to curb corruption and reduce unproductive use of scarce resources.

There must be effective and responsible local government system to make independent decision regarding the delivery of services like health, education, sanitation etc. However, in such fields, intervention by the federal government is very much needed for the welfare of the marginalized class. Without autonomy of decision making the benefits of decentralization are hard to realize as pointed out by Gomes, (2012). There must be devolution of fiscal, administrative and political powers to the lower tiers of the government accompanying the set of clearly delineated rules and regulations.

Collection and maintenance of data is very important to assess the impact of decentralization. It must be disaggregated to a reasonable extent. In the respect provincial administrations require proper training.

Education and health are the main components of HDI and increased expenditure will improve the education and health status and resultantly HDI may improve. More resources must be devoted to education sector. Expenditures on health and education must not only increase the physical infrastructure but the quality of service delivery must also improve. Increased expenditure on health and education and the improvement in the service delivery will contribute significantly towards human development (Irfan and Ijaz, 2011; Ali et al., 2012; Iheoma, 2014).

Though decentralization also creates inflation yet, it must be kept at moderate level. Since rapid increase in inflation may eat away the potential benefits of decentralization by adversely affecting the wellbeing of the masses (Vazquez and Mcnab, 2006). Hence, monetary and fiscal policy must exercise with caution. Provincial governments must be persuaded to achieve the targets of the said policies.

Saving is found to have positive effect on human development. Historically savings have been very low in Pakistan. It is one of the main determinants of economic growth and human development. Saving institutes must be made competent and access of the people to the banks must be insured.

Negative relationship has been found between human development and debt servicing charges. So, Instead of relying on the borrowing, to fill the gap between revenue and expenditure, efforts must be made to generate domestic resources as increase in the debt servicing badly effects the human developed. Uchimura and Jutting (2007) has pointed out that positive effect of decentralization can be achieved by relying on the domestic sources instead of increasing borrowing.

6.3 NEED OF FURTHER RESEARCH

The researchers so far have concentrated to know the direct relationship between fiscal decentralization and economic growth and human development. However, fiscal decentralization may affect economic condition indirectly rather directly. The channel of causation may be from fiscal decentralization to macro-economic conditions and then to human development. Further, determinants of fiscal decentralization got a little space in the literature. So, there is dire need of incorporation of these aspects of fiscal decentralization.

An attempt must be made to devise the generalized composite index of fiscal decentralization like composite index of human development (HDI). It is due to that fact that in literature many indicators of fiscal decentralization have been used. The result varies while using different measures of fiscal decentralization. A gain from fiscal decentralization becomes doubtful in the absence of efficient institutions. So quantification of institutional efficiency is required.

In Pakistan Malik et al. (2006), Faridi (2011) and Iqbal et al. (2013) have examined the direct interaction between fiscal decentralization with the economic growth. The results of these studies are different. As Faridi (2011) has concluded the positive relation between fiscal decentralization and economic growth whereas, Malik et al. (2006) and Iqbal et al. (2013) obtained mixed results while using the same indicators of fiscal decentralization. One indicator of fiscal decentralization show the positive results and the other indicator show the opposite result. This difference of results may be partly due to the measurement error of decentralization. Hence, more studies are required to be conducted so that more representative measure of fiscal decentralization must be devised. Also indirect relationship between the fiscal decentralization and its economic consequences must be investigated.

The research on the human development side of the fiscal decentralization has been ignored in general and particularly in case of Pakistan. Though attempts have been made to explore the effect of decentralization on poverty, Poverty and inequality and level of employment (Faridi and Nazar, 2012; Faridi et al. 2012; Faridi et al. 2013) yet, there is scope of more research in this field.

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APPENDIX

DATA USED IN THE STUDY

Year	HDI	MRDU	MEDU	MRDA	MEDA	MCD	AVG_ MFD	Education _ Exp	Health _ Exp	Inflation	Debt_ Serv	Gross _sav
1982	0.3582	0.3251	0.2377	0.2520	0.3804	0.4265	0.3162	1.3010	0.6900	5.9035	2.6470	7.4423
1983	0.3643	0.3130	0.2222	0.2206	0.3707	0.4024	0.2956	1.2958	0.7300	6.3620	4.2232	7.7407
1984	0.3700	0.3075	0.2318	0.2267	0.3799	0.4002	0.3033	1.4431	0.8300	6.0872	3.6569	6.7148
1985	0.3771	0.3409	0.2367	0.2498	0.3904	0.4466	0.3201	1.6931	0.7900	5.6148	4.2628	5.9293
1986	0.3814	0.3814	0.2505	0.2915	0.4946	0.5089	0.3931	1.8395	0.9200	3.5064	4.9603	8.0085
1987	0.3886	0.4099	0.2790	0.3123	0.6278	0.5685	0.4701	2.1195	1.1400	4.6812	5.1717	11.3655
1988	0.3949	0.3604	0.2304	0.2566	0.4838	0.4683	0.3702	1.9083	1.1900	8.8379	4.6257	9.9304
1989	0.4002	0.3144	0.2212	0.2357	0.4509	0.4038	0.3433	1.7552	1.0700	7.8443	4.4383	11.0476
1990	0.4053	0.2978	0.2339	0.2798	0.5244	0.3887	0.4021	1.8676	0.9500	9.0521	4.5571	11.1025
1991	0.4205	0.3345	0.2424	0.2955	0.4753	0.4416	0.3854	2.0011	0.8600	11.7913	4.2147	17.4656
1992	0.4362	0.3713	0.2310	0.3486	0.4386	0.4828	0.3936	2.1322	0.8000	9.5090	4.7173	17.0675
1993	0.4391	0.3626	0.2533	0.3467	0.5755	0.4856	0.4611	2.0388	0.8100	9.9737	4.5949	14.6839
1994	0.4431	0.3939	0.2697	0.3784	0.3820	0.5393	0.3802	2.2713	0.7500	12.3682	6.6284	16.7844
1995	0.4479	0.3913	0.2746	0.3562	0.3939	0.5395	0.3751	2.4094	0.7200	12.3436	5.2634	15.8327
1996	0.4527	0.4086	0.2777	0.3784	0.6361	0.5657	0.5073	2.3943	0.8500	10.3738	5.2073	14.4727
1997	0.4552	0.4346	0.2745	0.4250	0.6741	0.5990	0.5495	2.4461	0.8200	11.3755	6.5928	13.2308
1998	0.4586	0.3677	0.2690	0.3583	0.6161	0.5030	0.4872	2.3258	0.7700	6.2280	3.7286	16.6691
1999	0.4627	0.3672	0.2444	0.3602	0.5200	0.4860	0.4401	2.3438	0.7300	4.1426	4.7173	13.9520
2000	0.4671	0.3958	0.2710	0.3837	0.6157	0.5430	0.4997	2.1786	0.7300	4.3667	3.9222	15.9797
2001	0.4700	0.4250	0.2901	0.4145	0.6268	0.5986	0.5207	2.0133	0.5800	3.1483	4.2046	15.9439
2002	0.4737	0.3784	0.2233	0.3416	0.4031	0.4872	0.3724	1.8481	0.5700	3.2903	3.9815	16.4924
2003	0.4783	0.3980	0.2709	0.3892	0.5008	0.5458	0.4450	1.6828	0.5900	2.9141	3.5888	17.3515
2004	0.4899	0.4000	0.3103	0.3832	0.5670	0.5800	0.4751	1.5175	0.5800	7.4446	4.2826	17.6117
2005	0.4976	0.4092	0.3106	0.3874	0.5426	0.5936	0.4650	1.7109	0.6000	9.0633	2.1927	15.2070
2006	0.5065	0.4262	0.2968	0.4066	0.5107	0.6061	0.4586	1.9423	0.5100	7.9211	1.6636	11.9182
2007	0.5169	0.4468	0.3184	0.4239	0.5994	0.6556	0.5116	2.0574	0.5700	7.5987	1.7285	12.2259
2008	0.5197	0.4416	0.2590	0.4211	0.4388	0.5960	0.4299	2.1544	0.5700	20.2861	1.7377	8.3763
2009	0.5232	0.4054	0.2711	0.3974	0.5025	0.5562	0.4500	1.9179	0.5600	13.6478	2.0198	10.2691
2010	0.5270	0.4168	0.2735	0.4015	0.4584	0.5737	0.4300	1.5647	0.5400	13.8811	2.3448	9.9682
2011	0.5040	0.5377	0.3124	0.5312	0.4723	0.7820	0.5017	1.4560	0.2300	11.9168	1.3254	9.1106
2012	0.5150	0.5198	0.3134	0.5124	0.4647	0.7570	0.4886	1.4560	0.2700	9.6851	2.0056	6.9860
2013	0.5370	0.4055	0.3050	0.3967	0.5845	0.5834	0.4906	2.1000	0.3500	7.6895	3.2882	8.1465

Note: The data presented in the column 3 to 8 is author's own calculation. The data was collected from the Handbook of Statistics of Pakistan economy, Economic Survey of Pakistan (Various issues), Annual Reports of the State Bank of Pakistan, Human Development Reports and World Development Indicators (WDI).