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Fiscal Decentralization in A Federal Developing Economy: Lessons from Human Development Outcomes

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ABSTRACT

This paper investigates how fiscal decentralization influences human development in Pakistan from 1995 to 2022, drawing on three core components of the Human Development Index: life expectancy at birth (health), primary school enrollment (education), and gross national income per capita (prosperity). Using Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) estimation techniques, the study evaluates expenditure decentralization, revenue decentralization, and a composite decentralization measure, alongside factors such as foreign direct investment, financial sector development, trade openness, and public investment in education and health. The results indicate that fiscal decentralization supports improvements in educational outcomes but is linked to declines in economic growth and life expectancy, reflecting uneven policy effects across sectors. These findings suggest that decentralization's potential for advancing human development in Pakistan depends on effective governance, fair resource distribution, and robust institutional capacity. The study adds to the literature on territorial governance by offering evidence of the differentiated sectoral impacts of decentralization within a federal developing economy.

Introduction

The Millennium Development Goals (MDGs) is a global agreement which was formulated by the United Nations in 2000 to address social, political and economic challenges with the intension to raise living standards historically at unprecedented rates through collaborative multilateral action. In the context of social development MDGs, highlighted the importance of human capital in terms of improved universal primary education and health opportunities (Baldacci, Clements, Gupta, & Cui, 2004). Better educational and health opportunities help individuals to equip themselves with knowledge, skills, and capabilities which are necessary for sustainable economic growth (Mincer, 1984; Wilson & Briscoe, 2004). Moreover, through investment in human capital, developing economies can empower their populations, drive sustainable development, and work towards a more prosperous and equitable future. However, many developing nations have limited financial resources and spend a greater portion of their budgets on necessities such as food, water, and infrastructure development, so a little proportion of the budget is left for investments in education, healthcare, and other aspects of human capital development (Bloom & Rosovsky, 2007).

Moreover, human capital is a significant driver of economic growth and productivity. When individuals have access to quality education, training, and skill development opportunities, they acquire the knowledge and skills needed to participate effectively in the workforce (Nowak & Kijek, 2016). A skilled and productive workforce enhances a nation's capacity to innovate, produce goods and services efficiently, and drive economic development. Similarly, human capital development contributes to social development and well-being. Access to education, healthcare, and other forms of human capital investment improves the overall quality of life for individuals. It empowers people to make informed decisions, engage in active citizenship, and lead healthier, more fulfilling lives. Literature adopted the concept of the Human Capital Index (HCI) to assess and measure the overall human capital development of a country or region (Mulligan & Sala-i-Martin, 2000). The human capital index has three dimensions; health, education and prosperity. Health is indicated by life expectancy at birth, education is measured by expected years of schooling, and prosperity is measured by per capital gross national income (Kraay, 2018).

Thus keeping in view the social and economic advantages of human capital, it is necessary to identify how human capital formation can be accelerated. In developing nations, market forces do not operate properly and externalities are also linked with social spending, so the provision of basic health and education services are considered obligations of central and sub-national governments. It is considered mandatory that government spending on education and health services can enhance the access of the masses to these facilities and can promote human capital (Okafor, Ogbonna, & Okeke, 2017). Thus public sector is responsible for providing accessible and quality education to all individuals, regardless of their socioeconomic background. Public schools and universities ensure that education is available to a wide range of students, including those from disadvantaged communities. By investing in education infrastructure, curriculum development, teacher training, and scholarships, the public sector helps build the foundation for human capital development (Kumari, 2016).

However, in developing nations, centralized public policies alone may face limitations in effectively promoting human capital formation because centralized policies may not adequately consider local context, including regional differences in socio-economic conditions, cultural factors, and educational disparities. Moreover, the central government may have difficulty in addressing localized issues and responding quickly to specific challenges faced by communities (Briassoulis, 2004). Therefore, rigid structures and slow decision-making processes can hinder the ability of a country to adapt quickly to emerging trends, changing skill requirements, and evolving needs in the labour market. Hence timely interventions and flexible support are required to address emerging issues, such as changing labour market demands, technological advancements, or local socio-economic disruptions. Decentralized decision-making can enable more agile responses to these localized issues because a one-size-fits-all approach may overlook the unique needs and contextual circumstances of different communities (Benneworth, Pinheiro, & Sánchez-Barrioluengo, 2016).

Following the same line, literature (Grootaert, 2003) advocate that centralized policies fail to allocate resources in the areas based on local need and priorities because centralized policies may not involve local stakeholder like local communities, educators, employers, and civil society organizations that possess valuable insights and expertise that can contribute to developing and executing the strategies which help to promote human capital.

Therefore, Inclusive and participatory approaches ensure that policies align with the actual needs and priorities of the people they aim to serve. Literature also documented that centralized policies may discourage experimentation and innovation in human capital development strategies (Mumford, 2000). A more centralized approach tends to favour standardized approaches and conservative decision-making. However, fostering human capital formation often requires experimentation with new approaches, pedagogical methods, and collaborative initiatives (Hénard & Roseveare, 2012). Thus decentralized policies can create an environment that encourages innovation and allows for the exploration of diverse approaches to human capital development.

Fiscal decentralization is an efficient way of allocating resources for political, social and economic development because it is held responsible to sub-national or local government for authorities and responsibilities rather than the central government. The concept of fiscal decentralization is based on Richard Musgrave's seminal work, "Voluntary Exchange Theory of Public Economy" which latter become popular with the name of the Musgrave Three-Function Framework'. According to this framework, the government is responsible for resource allocation, distribution of income, and stabilization of macroeconomic indicators (Musgrave, 2009). However, the Musgrave resources allocation function is more relevant to fiscal decentralization because local governments are more able to allocate resources according to the need and preferences of their communities. Fiscal decentralization is based on local government accountability and efficiency in the provision of goods and services that are tailored following the unique characteristics and demands of different regions or localities (Otoo & Danquah, 2021). However, in the context of developing nations, most of the time local government failed to provide local public goods and services efficiently and was not held accountable due to significant flaws in the accountability process; so the basic assumption of fiscal decentralization, efficiency and accountability, violated in the context of developing nations (Escaleras & Chiang, 2017). Hence, an efficient and effective local government investment creates no diseconomies and negative spillover effects; so fiscal

decentralization is acceptable in those economies where externalities can be adopted and economies of scale are acceptable (D'Inverno, Moesen, & De Witte, 2022).

Fiscal Decentralization Trends in Pakistan

During 1947-1970, in Pakistan fiscal powers were centralized and the central government had control over revenue-generating resources and was responsible to allocate resources for the betterment of the society and the development of the economy. In the constitution of 1973, efforts were made to strengthen local governments and promote fiscal decentralization and provide a clear distinction between central and local government rights and duties (Cheema, Khwaja, & Qadir, 2006). In 1974, Zulfiqar Ali Bhutto formed the first National Finance Commission (NFC) which declared an 80:20 per cent ratio of shares between central and provincial Govt. and in the 7th NFC awards, the share between national and sub-national Govt. revised and became 56:44 respectively (Ahmad, Mustafa, & Khalid, 2007). In 1979, a Local Government Ordinance 1979 was introduced to disseminate the administrative and financial powers to local bodies; however, political instability and subsequent military interventions hindered the implementation of a robust decentralized system. Moreover, in the early 2000s, Pakistan embarked on significant local government reforms, such as President Pervez Musharraf's devolution plan 2001 and the 18th constitutional amendments 2010, which aimed to transfer fiscal powers and decision-making from central to provincial and provincial to local levels. These reforms aimed to empower provincial and district governments with revenue collection authority and greater autonomy in resource allocation. All these reforms were introduced to enable the provincial and district government to provide more public goods and services in more demanding areas to upgrade the living standards of their local communities but unfortunately, it has been observed that during the last five, the share of provinces in income has been increased up to 56% as per 1996 NFC award but the health and education expenditure shrank in average at the provincial level. Now the question is whether this empowerment and autonomy of provinces as per the 7th NFC award help to increase expenditures in the socials sector of Pakistan. Thus the main objective of this paper is to investigate the impact of fiscal decentralization on human development in terms of education, health and decent living standards. Most of the empirical studies focus on the role of fiscal decentralization in economic growth (Lin & Liu, 2000; Martinez-Vazquez & McNab, 2003; Thornton, 2007) while some studies explain the relationship between FD and environmental quality (Khan, Ali, Dong, & Li, 2021). However, a few studies have investigated the moderating role of human capital on the relationship between FD and infrastructural development (Shao & Razzaq, 2022). In many federations, fiscal decentralization and intergovernmental transfers serve as key financial sources for sub-national governments, enhancing efficiency, accountability, transparency, and public involvement. In Pakistan's case, the federal government generates more than 94% of total revenues, and reliance on population as the sole basis for distribution has contributed to vertical fiscal gaps, uneven regional development, and growing discontent among provinces (Memon, 2005). Effective fiscal decentralization can improve how resources are allocated by ensuring that public expenditure reflects the priorities and requirements of local communities. Yet, in the absence of strong accountability systems, it may widen regional inequalities and weaken the quality of public services. To make decentralization effective, greater transparency and stronger institutional capacity are essential (Memon, 2017).

Therefore to extend the exiting literature, this study aims to investigate the role of FD in human capital development. This study also contributes to the literature by utilizing three measures utilized to measure human capital; first life expectancy at birth (LEB), second primary enrollment for schooling and third is per capita national income to capture prosperity while most of the literature utilized literacy rate, and primary enrollment as a measurement of human capital (Papagapitos & Riley, 2009; Wößmann, 2003). Similarly, most prior studies (Lingyan et al., 2022; Omodero, 2021) utilized revenue decentralization and expenditure decentralization to capture fiscal decentralization and a few studies opted for a composite fiscal decentralization index (Sun & Razzaq, 2022). This study contributes to the literature by utilizing RD, ED, and composite FD to investigate the role of FD in human capital formation. Fiscal decentralization has shown minimal influence on Pakistan's human development, contributing significantly only to improvements in life expectancy (Khan & Malik, 2024). This paper is structured in four sections

Literature Review

Conceptualization of Human Capital

The concept of human capital traces its origins to the rise of classical economics in 1776, and it was further refined into a scientific theory by Fitzsimons (1999). Following the establishment of this theory, many scholars such as Sheltuz, Mencer, and Beker have made noteworthy contributions to the acceptance and understanding of HC theory, reshaping the perspectives of policymakers in the 1960s by emphasizing HC and placing it into the centre of the development process (Alika & Aibieyi, 2014; Burchi, 2006; Gillies, 2011). Furthermore, Mincer (1997) explained that human capital is key to societal growth and development. Thus, the influential research work of theses thinkers diverts the global attention towards human capital, both at the individual and organizational levels (Alika & Aibieyi, 2014).

The inherent characteristics of human beings to attain, adapt, and develop new knowledge, skills, and attitudes provide the foundation for human capital formation (HCF) (Irughe, Edafe, & Eregha, 2020). Education plays a crucial role in unlocking this potential, allowing individuals to realize and harness their capabilities (Pasban & Nojedeh, 2016). Academic literature categorizes human capital into three main categories, each category is offering unique insights. First, the concept of human capital is associated with individuals like Schultz (1961) considered human capital as something similar to property and emphasized that the productive capacity of human beings exceeds all other forms of wealth combined. Similarly, Beach (2009) explain that human capital means the knowledge and skills embedded within an individual. Garavan, Morley, Gunnigle, and Collins (2001) concluded that knowledge, skills, education, and abilities that are specific to human beings are known as human capital while P. Rastogi (2002) stated two stances about HCF; first, he asserted that human capital is the merger of knowledge, capability, attitude, and behaviour that an individual possesses, and second, human capital can be created and enhanced through a process of accumulation; for example, various educational activities and training enhance individual knowledge and skill (De la Fuente, 2003). However, this stand of literature ignored the learning of individuals through personal experiences. The third approach considered the production capability of the individual as human capital; for instance, Romer (1990) stated that the production capacity of labour is a main determinant of business activities while Rosen (1999) explained that the investment in individuals to enhance their productive capacity is called human capital. Moreover, Frank (2007) introduced a comprehended set of individual abilities, “such as education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative”, that can influence the value of a worker's output while some researchers defined human capital is a set of “knowledge, skills, competencies” and attributes within individuals that help personal, social, and economic prosperity (Rodriguez & Loomis, 2007).

Method to Measure Human Capital

There are two main stream methods to measure human capital in literature, first conventional methods and second contemporary methods. Conventional methods used output, cost, and income methods while contemporary methods utilized the human development index to measure human capital.

Output-Based Method

Output-based methods identify school enrollment, school attainment, literacy rate and average years of schooling as a proxy of HC; for instance, Barro (1991) utilized school enrollment to measure human capital and examined the effect of HC on economic growth in the context of a developing nation. Barro and Lee (1993) also measure the human capital level in each sampled developing country by utilizing the ratio between the school age of individuals and the total number of students enrolled in schools. Similarly, Nehru, Swanson, and Dubey (1993) conducted a study to measure the stock of human capital in 85 countries. The study utilized the perpetual inventory method and average years of schooling of labour force data to calculate the stock of capital. The study posited that the accumulation of human capital is determined by adding up the years of schooling of each individual. Contrary, Romer (1990) described a formula to measure human capital, i.e. skilled adults divided by total adults in the economy while the “Organization for Economic Cooperation and Development (OECD)” employs the “International Adult Literacy Survey (IALS)” develop a formula to measured human capital and described human capital is equal to literate adults divided by total adults. Finally, Psacharopoulos and Arriagada (1986) used average years of schooling to measure human capital and concluded that individuals with more average years of schooling have greater productivity while individuals with less average years of schooling exhibit lower productivity.

Cost-Based Methods

The cost-based approach indicated that human capital is the aggregate expense of an individual that he consumes to acquire knowledge and skill. Kendrick (1984) considered that an individual's investment costs are subject to depreciation and Jorgenson and Fraumeni (1989) indirectly measure human capital by utilizing discounted future income. However, it becomes challenging to accurately distinguish between investment and consumption when considering the costs associated with human capital.

Income-based Method

This approach revolves around the returns an individual receives from the labour market as a result of investing in education. Sala-i-Martin and Mulligan (1995) propose that human capital can be measured from the income of an individual that he receives from participation in the labour market. The higher income level indicates a higher level of human capital. However, this study neglects the other factors that can influence the individual’s earnings, so this approach often fails to provide a comprehensive measurement of human capital.

Demerits of Conventional Measures

All measures utilized in output-based methods have a few limitations. Adults may acquire knowledge and skill through trainings and workshop without properly having formal education. Similarly, productivity can also be enhanced through informal and non-formal learning activities such as self-directed learning and on-the-job training. Firstly, Winkler (1987) criticized conventional methods to measure human capital and presented screening models in which he proposed a process that is essential to determine the productive abilities of an individual. The author discussed that education is a mechanism through which each individual earns his or her educational credential according to his/her abilities. Moreover, the author found an unclear causality link between the educational credential and employability and concluded that their investment in human capital does not necessarily determine by the outcome of the education investment but certain other outcome-unrelated factors are more effective in deciding to invest in human capabilities.

Secondly, conventional measures of human capital only discuss the quantitative aspect while qualitative aspects, such as family health, fertility and child mortality, of human capital is completely ignored. As McMahon (1998) argues that human capital produces not only economic benefit but also beneficial for social progress education play a significant role to reduce fertility rate, population growth rate, improvements in public health, democratization, human rights, political stability, poverty reduction, lower property crime rates, environmental impacts, increased divorce rates, delayed retirement, continued work after retirement, and engagement in community service.

Third, other indicators like social capital and personal experiences also contribute to individual success, the conventional method did not consider them. Bassani (2008) documented that social capital and human capital are significantly correlated with each other. Similarly, Coleman (1988) stated that certain social aspects contribute to a child's academic success and develop a supportive environment for the individual to attain a high level of achievement. Therefore, to have a comprehensive measure of human capital, qualitative aspects should be considered while the development of measurement for human capital.

Fourth, the growth of human capital alone does not guarantee social progress, as highlighted by Schuller (2001), who states that simply increasing the stock of human capital within a society does not ensure economic or social advancement. The conventional measurement of human capital has limitations in capturing the full extent of social progress. To truly assess the impact of human capital on constituents' development from a normative perspective, it becomes crucial to explore new approaches to measuring human capital that specifically considers the dimensions of social progress.

Human Development Index (HDI)

"United Nations Development Programme (UNDP)" developed a new measure of the Human Development Index (HDI) in 1990, keeping in view the demerits of traditional measures of human capital to investigate the country's human development and well-being. The HDI is abstract and measured by utilizing three dimensions named as health, education, and living standards. One dimension of HDI is life expectancy at birth, which indicates the overall health and well-being of a population. Longer life expectancy is often associated with better access to healthcare, nutrition, and overall human capital development. Similarly, education is the second essential component of HDI and it captures the knowledge and skills acquired through formal education. Thus, the first two components of HDI are directly related to human capital while the third component, per capita gross national income, indirectly reflects the economic opportunities available to individuals, which can influence their ability to invest in education, health, and skills development. Therefore, the first two indicators of HDI reflect a quantitative aspect of human capital while the third indicator indicates the qualitative characteristic of human capital. The international labour office (ILO) also utilizes an index based on key indicators of the labour market to measure human capital and the index is very similar to HDI.

Moreover, social capital has a prominent place in the development of new approaches to measuring human capital within the framework of human development. The accumulation of human capital can be significantly facilitated through social capital. Rather than being in isolation, an individual's level of knowledge and skills can be greatly enhanced through connections with family, colleagues, social networks, and other constituents, as highlighted by Coleman (1988). This assumption provides a crucial insight into understanding the role of human capital in societal progress. Furthermore, the new approach, HDI, to measuring human capital should provide clarity regarding the indicators that can accurately capture its various dimensions. While conventional measurements often rely on proxies such as an individual's productivity, it is necessary to explore indicators that have a stronger correlation with the potential for human capital development. Conclusively, this study contributes to the literature by utilizing a new and emerging method for the measurement of human capital development.

Empirical Literature

Economic Growth and Human Capital Nexus

Ample empirical studies are available on the relationship between human capital and economic growth. Human capital formation significantly promotes economic growth but the magnitude of development differs between developing and developed nations. For instance, Hanushek (2013) documented human capital as a driver of economic growth in developing nations. The study concluded that developing nations can access new heights of prosperity by focusing on school attainment. At the same time study also suggest that improvement in the quality of education can help developing nations bridge the gap with developed nations in terms of economic performance.

Similarly, Behrman et al. (2017) discussed that different level of education has varying impact on economic growth, a country with higher education level experienced a higher growth rate than a country with a lower level of education. Moreover, some studies found that human capital contributes more in economic growth than physical capital (Chen & Kee, 2005; Pelinescu & Craciun, 2014). Lee and Lee (1995) used secondary school achievement to measure human capital and then concluded that human capital plays a significant role in economic development. However, this study emphasized that students' achievement scores are more influential than school enrollment. Moreover, it has been observed that higher levels of education are associated with increased human capital compared to lower levels (Fernandez & Mauro, 2000). Asteriou and Agiomirgianakis (2001) have also explored the link between health status, human capital, and economic growth. The study utilized school enrollment and life expectancy to measure human capital and concluded that improvements in human capital in terms of life expectancy positively affect economic performance in Greece. However, poor quality and quantity of schools and health services create significant barriers in the development process (Hoselitz, 1952; Spolaore & Wacziarg, 2014). Higher levels of education are associated with improved living standards, reflected in higher wages for workers. For each additional year of education, individuals, on average, experience a 7% increase in earnings (Moock, Patrinos, & Venkataraman, 2003). In summary, in literature, the role of human capital in the economic development of both developed and developing countries is well established but a few studies have examined how human capital can be promoted to reap the positive impacts of human capital.

However, a few studies empirically investigate the impact of economic growth on human capital. it has been observed that financial, physical and human capital growth is closely associated with the economic development of a country (Howitt & Aghion, 1998). Rich countries spend more to provide health and educational services to their citizens, so economic growth plays a crucial role in human development by positively impacting the income of disadvantaged families. When economic growth benefits impoverished households and enables women to have control over household spending, it leads to poverty reduction, making it an even more substantial contributor to human development. Additionally, Ranis, Stewart, and Ramirez (2000) demonstrate that economic growth generates essential resources for public expenditure, healthcare, and education. Moreover, some empirical studies suggest a causal relationship between economic growth and human capital, as healthy and educated people are expected to possess higher productivity which positively contributes to increase economic growth (Pelinescu, 2015). On the other hand, literature also suggests that economic development contributes to the improvement of health and educational infrastructure which leads to improved levels of human capital in a country (Bradshaw, Martorano, Natali, & De Neubourg, 2013). Hence, most of the literature discussed the relationship between human capital and economic growth or economic growth and human capital development but literature ignored the relationship between fiscal decentralization and human capital.

Determinants of Human Capital Formation

Furthermore, C. Rastogi and Gaikwad (2017) contributed to the literature to examine the impact of foreign direct investment along with GDP on human capital development in the context of BRICS countries by utilizing the data from WDI for the period of 2005-2015. The study employed a fixed effect model to examine the empirical relationship between FDI and human capital and concluded that FDI and economic growth have a positive and significant relationship with human capital formation. Contrary, Zulkifli, Zulkifli, Yusuf, and Eem (2018) conducted a study in Malaysia from 1982-2014 and found that FDI and unemployment have an insignificant impact on human capital. Following the line Tsaurai (2020) extended the list of determinants of human capital by incorporating trade openness, financial development, and infrastructural development as a determinant of HC along with FDI and GDP and conducted his research in the context of emerging markets for the period of 1994-2014. The study employed panel data analysis and concluded that trade openness, financial development, infrastructural development, FDI, and GDP exert a positive and significant impact on human capital formation. Shaharudin, Zulkifli, Gui, and Fernando (2021) conducted a study at the micro level in Malaysia to investigate the relationship between organizational factors and human capital in Malaysian Public Companies. The study collected the data through a questionnaire and concluded that organizational, technological and environmental factors are major determinants of human capital formation in Malaysian Public Companies.

On the other hand, some studies suggested that government health and education expenditure in addition to infrastructure development exert a positive and significant impact on human capital formation (Railaite & Ciutiene, 2020; Razmi, Abbasian, & Mohammadi, 2012). Individuals in developing nations are poor and spend a major share of their income on basic needs and are left with a smaller proportion of their income which is available to spend on their children's education and health (Kousar, Ahmed, Afzal, & Segovia, 2023), so these studies concluded that government expenditure on health and educational infrastructure bring vibrant impact on human capital formation. Moreover, literature (Kalalahti, Silvennoinen, Varjo, & Rinne, 2015) proposed two stances regarding government spending on education and health services named universalism and slectivisum; universalist economists emphasized that it is the responsibility of the government to provide more educational and health services to all citizen while selectivism approach highlighted that in the context of developing nations, the government are poor and are not in position to provide educational and health services equally, so government select the marginal areas and communities and provide them basic educational and health services to promote human capital (Hultqvist & Hollertz, 2021).

Fiscal Decentralization and Human Capital

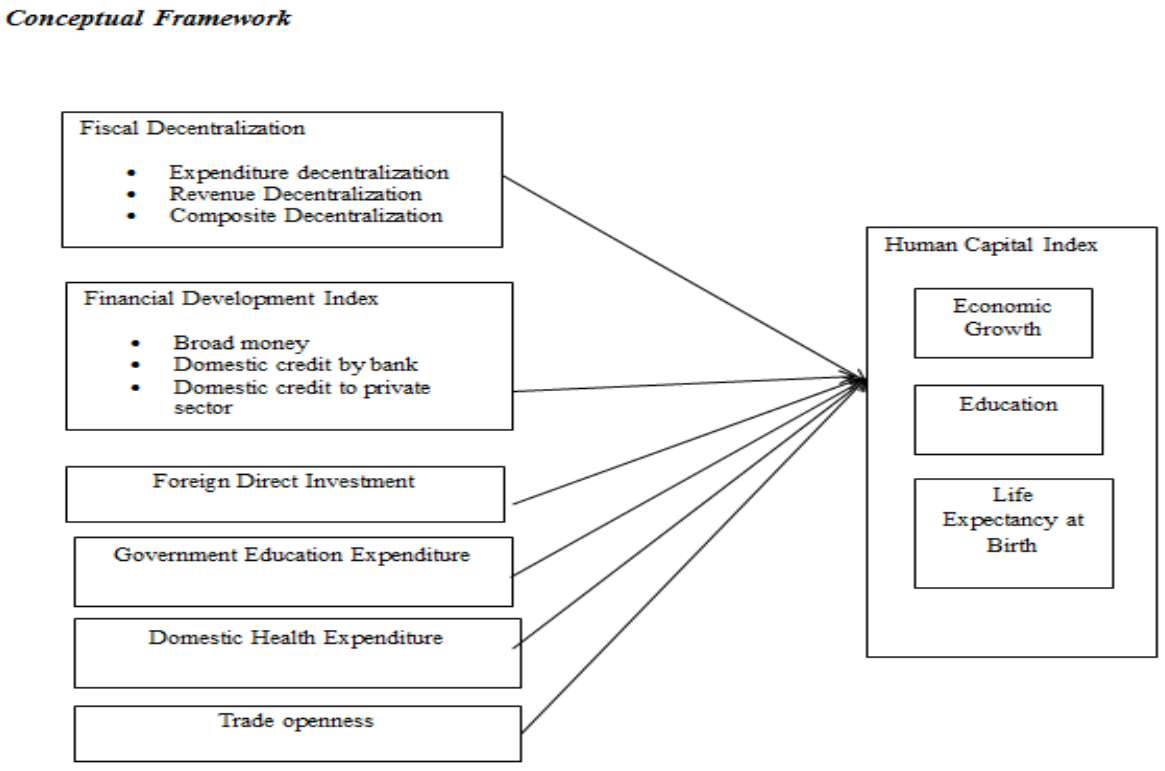
Most of the studies examined the relationship between fiscal decentralization and economic growth, for instance (Kalirajan & Otsuka, 2012) investigated the impact of fiscal decentralization on economic growth in the context of India and concluded that the federal framework plays an important role to provide basic health and educational opportunities and distribute the fruits of development equally across all states. However, state-rural local bodies' decentralization plays no significant role in the development process. Thornton (2007) also revisited the nexus between fiscal decentralization and economic growth in the context of 19 OECD member countries. The study utilized the full autonomy of sub-government in tax collection as a measure of fiscal decentralization and concluded that fiscal decentralization has no significant impact on economic growth. Another study conducted by Khan et al. (2021) to investigate the role of fiscal decentralization in reducing carbon dioxide emissions. This study used a balanced panel data set of seven OECD member countries from 1990 to 2018 and concluded that fiscal decentralization improves environmental quality only in the presence of improved institutional quality and human capital, so this study utilized human capital as a channel through which fiscal decentralization can affect environment quality. Pasichnyi, Kaneva, Ruban, and Nepytaliuk (2019) examined the impact of fiscal decentralization in 27 advanced and emerging economies in Europe for the period of 1992-2017. The study found that expenditure decentralization has a minor impact on long-run economic development while revenue decentralization has a greater association with long-run economic growth. The study also found that demographic structure is more important for sustainable economic growth instead of fiscal decentralization. Kiran (2005) investigated the gains of decentralization in sixteen states of India by utilizing the data of 1980-2001 and found that per capita income increases in the presence of fiscal decentralization, but the impact varies in different states along with the degree of variability in fiscal decentralization. Poor states are benefitted less from fiscal decentralization while rich states gain more benefits from fiscal decentralization, so in this way, the regional disparity is enhanced in India due to fiscal decentralization. Contrary to the relationship between fiscal decentralization and economic development, Elhiraika (2007) examined the impact of fiscal decentralization on public services delivery in the context of South Africa. The study found that provincial government expenditure decentralization negatively correlated with health services and assumed that provision of health services is the responsibility of central government but expenditure decentralization positively associated with regional prosperity and create more business opportunities. Study also found that expenditure decentralization unrelated with educational facilities. Hence study concluded that fiscal decentralization is unrelated with the quantity and quality of public service delivery.

A few studies examined the impact of fiscal decentralization on the human development index, for instance, Halder (2007) used three different measures, revenue ration, expenditure ratio and composite ratio to measure fiscal decentralization and assessed the role of fiscal decentralization in the human development index. The study found a positive correlation with HDI in terms of prosperity and life expectancy while fiscal decentralization has a negative correlation with infant mortality rate. Moreover, Fjeldstad (2003) established in the context of Tanzania that fiscal decentralization aggravates high corruption, poor tax structure, and distorted public services in poor countries, so without restructuring the local bodies and without judging the capacity of sub government, fiscal decentralization is ineffective. Peterson (2002) presented a report to World Bank about the issues attached to fiscal decentralization in Pakistan. This report highlighted that due to poor governance and political instability in Pakistan, fiscal decentralization is unable to provide public services. This report suggests to the World Bank allocate funds directly to private organizations and enhance private citizen participation to provide better health and education services. Moreover, the report documented that citizen community boards, and nonprofit organizations, can play an important role to improve public service delivery and enhance accountability and resource mobilization. The report further elaborates that although district governments are providing basic human services like education and health services the efficiency of the services delivery is dependent on the skill of employees, and the availability of public resources. The report also highlighted that Pakistan, provincial government fails to provide quality services because of low own revenue, high dependence on foreign grants, and poor tax structure. Usui (2007) published a report in collaboration with Asian Development Bank and provide

conceptual issues of decentralization. This report stated that fiscal decentralization can produce desirable results only when the local accountability system is strong and government and sub-government are linked with clearly established rules. The effectiveness of fiscal decentralization in advancing human development remains contested. For instance, Khan and Malik (2024) challenge the optimistic view that fiscal devolution inherently produces broad-based improvements. From their perspective, decentralization in isolation is a blunt instrument; without strong provincial governance, institutional robustness, and coherent strategic planning, the policy risks becoming a hollow reform rather than a transformative tool. Yet, proponents of decentralization argue that context matters. Ahmed (2024) provides evidence from Punjab's districts suggesting that proximity to decision-making hubs (particularly the provincial capital) plays a decisive role. His findings imply that decentralization can yield educational benefits, but these are spatially uneven. The closer a district is to the administrative core, the more likely it is to secure resources and implement effective policies. This raises a critical question for policymakers: should decentralization be restructured to address geographic inequities, or should resource allocation mechanisms be redesigned to ensure that remote regions are not disadvantaged? Expanding the debate beyond Pakistan, Al Mamun and Rahim (2025) assess public sector efficiency in education and health spending across India, Pakistan, and Bangladesh. Their VAR-based analysis reveals that outcomes are not uniform; health spending drives short-term human development in Bangladesh and India, while education expenditure consistently matters, but with varying effectiveness depending on institutional and governance contexts. These cross-country contrasts reinforce the argument that fiscal decentralization's success hinges on tailoring strategies to each country's structural realities, rather than adopting a one-size-fits-all model.

Based on the prior studies, the conceptual framework (Figure 1) is developed. Conclusively, it has been observed in the existing literature that most of the studies examine the relationship between fiscal decentralization and economic development and some project has been done to highlight the issues related to the process of decentralization or why decentralization is fail to produce desired results. However, a few studies examined the impact of fiscal decentralization on the human development index.

Figure 1



Source: Developed by Authors

Methodology

Data and Variables

This study utilized three dimensions, named health, education and prosperity to measure the human development index. Moreover, this study utilized primary enrollment (PE) for education, life expectancy at birth (LEB) for health and gross national

income (GNI) for prosperity. Similarly, this study used "broad money (M2), domestic credit to the private sector (DCP), domestic credit to the private sector by banks (DCB)" to develop the financial index. Furthermore, this study developed three different constructs to measure fiscal decentralization following the study of Iqbal (2013); **First**, revenue decentralization is measured as the ratio of the provincial government's revenues (PR) to the total government revenues (FR+PR), i.e. RD=PR/FR+PR, **Second**, expenditure revenue is measured by the ratio of provincial government expenditures (PE) to the total government expenditures (TE) (federal plus provincials) excluding the defence expenditures (DE) and interest payments on debt (IE) since these expenditures are mainly considered as part of the non-decentralized government expenditures, i.e. ED= PE/PE+FE (DE+IE), and **Third** composite decentralization is measured by using both RD and ED. The CD captures the information in expenditure and revenue ratios by following Martinez-Vazquez and Timofeev (2010), i.e. CD=RD/1-ED. Moreover, this study utilized some other variables like trade openness, government expenditure on education, domestic health expenditure, and foreign direct investment. This study used HDI as a dependent variable while fiscal decentralization, financial index, trade openness, foreign direct investment, government expenditure on education, and domestic health expenditure as independent variables. This study derived time series data from economic surveys and WDI for the period of 1995 to 2022. Moreover, detailed descriptions, measurements and information are provided in **Table A1 (See Appendix)**. This study employed principle component analysis to develop a financial index and results are reported in **Table A2 (See Appendix)**. Results indicate that

Table 1: Descriptive Statistics

	LNGNI1	LEB	ED	RD	CD	FDI	FI	GEE	PE	TO
Mean	8.22	63.87	1.38E+12	1.49E+12	1.1E+11	-1.97E+09	0.01	12.24	5.39E+11	30.75
Median	8.28	64.14	1.42E+12	1.22E+12	3.7E+10	-1.76E+09	0.14	11.75	4.02E+11	32.07
Max.	8.57	66.76	3.47E+12	4.54E+12	1.0E+12	-2.97E+08	1.31	15.45	1.73E+12	36.85
Mini.	7.80	59.88	586.30	437.70	-1.6E+12	-5.49E+09	-1.4	8.49	20.30	24.70
Std. Dev.	0.25	2.04	1.17E+12	1.50E+12	5.2E+11	1.46E+09	1.00	1.86	5.71E+11	3.62
Skewness	-0.49	-0.51	0.30	0.62	-1.43	-1.30	-0.16	0.23	0.73	-0.06
Kurtosis	2.00	2.24	1.78	2.13	7.70	3.92	1.35	2.37	2.20	1.76
Jarque-Bera	1.70	1.41	1.63	2.01	2.47	4.70	2.48	0.53	2.40	1.36
Prob.	0.43	0.50	0.44	0.37	0.40	0.09	0.29	0.77	0.30	0.51
LNGNI1	1									
LEB	0.982	1								
ED	0.396	0.388	1							
RD	0.353	0.343	0.951	1						
CD	0.123	0.113	0.483	0.729	1					
FDI	-0.383	-0.31	-0.107	-0.061	0.066	1				
FI	-0.748	-0.78	-0.276	-0.231	-0.041	-0.226	1			
GEE	0.858	0.400	0.105	0.005	-0.221	-0.606	0.02	1		
PE	0.365	0.349	0.950	0.994	0.716	-0.024	-0.27	-0.02	1	
TO	-0.503	-0.58	-0.223	-0.230	-0.159	-0.156	0.73	0.031	-0.238	1

factor loadings for M2, DCP, and DCB are greater than .4, so all indicators can be utilized for developing a financial index. The value of average variance explained that 90.25% of the variance in the financial index is explained by the M2, DCP, and DCB. The value of KMO is above 0.5 and the value of Bartlett's test (ρ= 0.000), indicates the construct/index is reliable and orthogonal.

The results of descriptive statistics and correlation analysis are reported in Table 1

The probability value of Jurqa Bera indicates that the data for all series are normally distributed, so we can use this study to produce reliable results. Similarly, the correlation statistics indicate that all independent variables correlate less than .07, so data is free from the problem of multicollinearity. However, LNGNI, LEB, and GEE are dependent variables and their correlation statistics are greater than .07, so, this study estimates three econometric models, in model 1, the study used LNGNI, in model 2, LEB and model 3, PE as dependent variable while fiscal decentralization, financial index, trade openness, foreign direct investment, government expenditure on education, and domestic health expenditure are used as independent variable.

Econometric Model

This study utilized the Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) methods to examine the relationship between fiscal decentralization and human capital development. Before the application of FMOLS and DOLS, this study used the necessary pre-estimation test to enhance the reliability of the estimates. First, this study examined the stationarity, mean-variance, and covariance constant over time, of series by using Augmented Dickey-Fuller (ADF) unit root test to avoid the nonsense relationships among the modelled variables. The estimates of ADF are based on the following equation

$$\Delta x_t = \beta_0 + \alpha T + \eta x_{t-1} + \sum_{i=1}^{q=1} \delta \Delta x_{t-1} + \in_t$$

Where Δ represents the first difference operator, x_t denotes the variable tested for unit root; β_0 is the constant; α, η, and δ are the slope coefficient; the time trend variable is T; q is the number of lags and to avoid the problem of autocorrelation in the residuals, q is the number of lags based on Schwarze Bayesian Criteria. The null hypothesis for the ADF test is, the series is non-stationary: in other words, it contains a unit root. Results are reported in Table 2 and results indicate that all series are stationary at the first difference at a 5% level of significance except CD which is integrated at level, I (0).

Secondly, this study used Johnson Co-integration Test to examine the long-run relationship with long-run characteristics among the modelled variable. Hansen and Johansen (1999) used likelihood ratio (LR) and calculate trace statistics and maximum eigenvalue statistics to determine the presence of co-integration vectors in series co-integrated at first difference. The trace statistics and maximum eigenvalue statistics are based on the following equation

$$\lambda_{trace}(\tau) = -T \sum_{i=r+1}^{n} ln(1 - \lambda_i)$$

$$\lambda_{max}(r, r+1) = -Tln(1 - \lambda_{r+1})$$

T represents the sample size

n is used for the total number of variables, λ_i is the i th largest canonical correlation between residuals from the three-dimensional processes. The null hypothesis is that there is no co-integrated equation existing in co-integrated vectors; so full rank r ≠ n co-integration vector. Results are reported in Tables 3, 4, and 5. In Table 5, the LNGNI is used as the dependent variable and the value of the trace test and Max-Eigen value test indicate that in the first model, there are seven co-integrating equations exist at the 0.05 level of significance while Trace test results in Table 6 indicate that in the second model, where LEB is the dependent variable, 4 co-integrating equations exist at the 0.05 level and Max-eigenvalue test indicates 3 co-integrating equations exist at the 0.05 level. Similarly, in Table 7, the results of the Trace Test and Max-eigenvalue indicate that in model 3, 5 and 3 equations exist respectively at a 5% level of significance.

Table 2: Augmented Dickey-Fuller Unit Root Test

Series	At level		At first difference	
	t-statistics	Prob*	t-statistics	Prob*
ED	-1.865056	0.3426	-3.267536	0.0272
RD	-1.733035	0.4041	-5.115386	0.0003
CD	-4.731343	0.0008	-	-
FDI	-2.522137	0.1212	-3.278279	0.0258
FI	-0.143035	0.9349	-4.066492	0.0042
GEE	-2.788458	0.0786	-2.976557	0.0554
LNGNI	1.352860	0.9981	-3.472196	0.0169
PE	-1.722497	0.4091	-5.088840	0.0004
TO	-2.375548	0.1587	-5.096491	0.0005
LEB	-1.308504	0.6113	-6.202449	0.0000

DEH	-1.858153	0.3422	-4.922647	0.0010

Table 3: Johnson Co-integration Test Model 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.978948	333.2606	159.5297	0.0000
At most 1 *	0.920164	232.8806	125.6154	0.0000
At most 2 *	0.868420	167.1584	95.75366	0.0000
At most 3 *	0.816388	114.4266	69.81889	0.0000
At most 4 *	0.674569	70.35847	47.85613	0.0001
At most 5 *	0.571659	41.17074	29.79707	0.0016
At most 6 *	0.484497	19.12702	15.49471	0.0135
At most 7	0.070439	1.899125	3.841466	0.1682

Decision: Trace test indicates 7 cointegrating eqn(s) at the 0.05 level:

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.978948	100.3800	52.36261	0.0000
At most 1 *	0.920164	65.72220	46.23142	0.0002
At most 2 *	0.868420	52.73174	40.07757	0.0012
At most 3 *	0.816388	44.06817	33.87687	0.0022
At most 4 *	0.674569	29.18774	27.58434	0.0309
At most 5 *	0.571659	22.04372	21.13162	0.0371
At most 6 *	0.484497	17.22789	14.26460	0.0165
At most 7	0.070439	1.899125	3.841466	0.1682

Decision: Max-eigenvalue test indicates 7 cointegrating eqn(s) at the 0.05 level:

Table 4: Johnson Co-integration Test Model 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.983974	292.8790	159.5297	0.0000
At most 1 *	0.906537	185.4072	125.6154	0.0000
At most 2 *	0.869076	123.7823	95.75366	0.0002
At most 3 *	0.696765	70.92073	69.81889	0.0407
At most 4	0.613818	39.89632	47.85613	0.2263
At most 5	0.308630	15.15871	29.79707	0.7697
At most 6	0.137513	5.562618	15.49471	0.7465
At most 7	0.063880	1.716297	3.841466	0.1902

Decision: Trace test indicates 4 cointegrating eqn(s) at the 0.05 level:

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.983974	107.4718	52.36261	0.0000
At most 1 *	0.906537	61.62488	46.23142	0.0006
At most 2 *	0.869076	52.86160	40.07757	0.0011
At most 3	0.696765	31.02441	33.87687	0.1055
At most 4	0.613818	24.73761	27.58434	0.1110
At most 5	0.308630	9.596094	21.13162	0.7816

At most 6	0.137513	3.846321	14.26460	0.8752
At most 7	0.063880	1.716297	3.841466	0.1902

Decision: Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

Table 5: Johnson Co-integration Test Model 3

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.985960	306.7786	159.5297	0.0000
At most 1 *	0.927991	195.8660	125.6154	0.0000
At most 2 *	0.856916	127.4610	95.75366	0.0001
At most 3 *	0.651914	76.90855	69.81889	0.0122
At most 4 *	0.541045	49.47056	47.85613	0.0350
At most 5	0.435636	29.22167	29.79707	0.0582
At most 6	0.352216	14.34820	15.49471	0.0739
At most 7	0.110998	3.059036	3.841466	0.0803
Decision: Trace test indicates 5 cointegrating eqn(s) at the 0.05 level:				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.985960	110.9126	52.36261	0.0000
At most 1 *	0.927991	68.40499	46.23142	0.0001
At most 2 *	0.856916	50.55244	40.07757	0.0024
At most 3	0.651914	27.43799	33.87687	0.2406
At most 4	0.541045	20.24890	27.58434	0.3242
At most 5	0.435636	14.87347	21.13162	0.2978
At most 6	0.352216	11.28916	14.26460	0.1403
At most 7	0.110998	3.059036	3.841466	0.0803
Decision: Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level:				

Fully Modified Ordinary Least Square

As pre estimation test suggests that Auto Regressive Distributed Lag (ARDL) is appropriate but the condition of at least 30 observations required to perform ARDL is violated. However, if the data are stationary at the mixed level of integration, some series are stationary at the level and some are at the first difference, and ARDL is not possible due to lack of sufficient observations, then the FMOLS technique is appropriate to produce reliable estimates. This study employed FMOLS non-parametric approach due to a lack of sufficient observation, FMOLS provide consistent and efficient estimators with a small number of observations. Moreover, FMOLS also overcome the problem of autocorrelation and endogeneity by incorporating the Phillips and Hansen (1990) semi-parametric correction into the OLS estimator. Moreover, the FMOLS model transforms both data and parameters (Park, 1992) and produces valid t statistics for the long-run period by regulating the problem of the traditional Engle-Granger co-integration technique (Amarawickrama & Hunt, 2008). General Models and general econometric respective equations

Model 1

$$LNGNI = \beta_0 + \beta_1 ED + \beta_2 FDI + \beta_3 FI + \beta_4\ GEE + \beta_5 DEH + \beta_6\ TO + \in_t - (EQ.1)$$

$$LNGNI = \beta_0 + \beta_1 RD + \beta_2 FDI + \beta_3 FI + \beta_4\ GEE + \beta_5 DEH + \beta_6\ TO + \in_t - (EQ.2)$$

$$LNGNI = \beta_0 + \beta_1 CD + \beta_2 FDI + \beta_3 FI + \beta_4\ GEE + \beta_5 DEH + \beta_6\ TO + \in_t - (EQ.3)$$

Model 2

$$LEB = \beta_0 + \beta_1 ED + \beta_2 FDI + \beta_3 FI + \beta_4\ GEE + \beta_5 DEH + \beta_6\ TO + \in_t - (EQ.4)$$

$$LEB = \beta_0 + \beta_1 RD + \beta_2 FDI + \beta_3 FI + \beta_4\ GEE + \beta_5 DEH + \beta_6\ TO + \in_t - (EQ.5)$$

$$LEB = \beta_0 + \beta_1 CD + \beta_2 FDI + \beta_3 FI + \beta_4 GEE + \beta_5 DEH + \beta_6 TO + \in_t - (EQ.6)$$

Model 3

$$PE = \beta_0 + \beta_1 ED + \beta_2 FDI + \beta_3 FI + \beta_4 GEE + \beta_5 DEH + \beta_6 TO + \in_t - (EQ.7)$$

$$PE = \beta_0 + \beta_1 RD + \beta_2 FDI + \beta_3 FI + \beta_4 GEE + \beta_5 DEH + \beta_6 TO + \in_t - (EQ.8)$$

$$PE = \beta_0 + \beta_1 CD + \beta_2 FDI + \beta_3 FI + \beta_4 GEE + \beta_5 DEH + \beta_6 TO + \in_t - (EQ.9)$$

This study will obtain FMOLS estimators based on Adom (2015), which is represented as follow.

$$\hat{o} = \left(\sum_{t=1}^{T} Z_t \, Z'_t \right)^{-1} \left(\sum_{t=1}^{T} Z_t \, Y^{+}_t - T \left[\gamma_{12'_o}{}^{+} \right. \right)^{-1} - (EQ.10)$$

In the equation, term 10 Y+ and ʎ+12 are used to correct the serial correlation and endogeneity (Adom, 2015). This study also utilized DOLS for robust checks.

The DOLS Estimates

The DOLS is a parametric approach which is equally efficient to produce estimates of long-run relationships in a model in which all series are co-integrated at mix level of integration even in the presence of endogeneity. The DOLS model deal with simultaneity and small sample bias by including leads and lags (Kurozumi & Hayakawa, 2009). The DOLS efficiently correct the problem of auto serial correlation and residual non-normality (Kurozumi & Hayakawa, 2009).

$$yt = a + bXt + \sum \phi i \Delta Xt{+}i \; i{=}k \; i{=}{-}k + \epsilon t \quad \text{--- (EQ. 11)}$$

Equation (12) b indicates long-run elasticity while the term ø's are the coefficients of leads and lags differences of I(1) regressors.

Results and Interpretation

Model 1

In Model 1, there are three equations have been estimated. economic growth is the dependent variable in all three equations while in equation 1, expenditure decentralization, FDI, FI, TO, GEE, and GHE are explanatory variables, in equation 2, revenue decentralization, FDI, FI, TO, GEE, and GHE are used as independent variables. Similarly, in equation 3, composite decentralization, FDI, FI, TO, GEE, and GHE are used as independent variables. The results of Model 1 are reported in Table 6. Results indicate that expenditure decentralization and revenue decentralization has a negative and significant long-run association with economic growth (β = -3.99*; β = -5.53*) while composite decentralization has a positive and significant long-run association with economic growth. Results indicate that as expenditure decentralization and revenue expenditure increase, it will cause decreases economic growth. Similarly, this study finds that foreign direct investment has a negative and significant association with economic growth in all three equations (β = -4.59*; β = -6.22*; β = -6.77*); so as FDI increases economic growth will decrease in the long run period. Moreover, the study found that financial development has a positive and significant long-run association with economic growth in all three equations (β = 0.26*; β = 0.25*; β = 0.245*). Government expenditure on education has an insignificant association with economic growth in all three equations (β = 0.02; β =0.02; β = 0.024) while domestic health expenditure has a positive and significant association with economic growth (β =0.02*; β = 0.01*; β = 0.006**). However, the size of the impact on economic growth is little and negligible. Similarly, trade openness has a positive but insignificant association with economic growth (β =0.00; β = 0.0009; β = 0.005). the value of adjusted R square indicates that in equation 91%, in equation 2, 90% and in equation 3, 91% variations in the dependent variable are explained by independent variables, so our model is well explained. Furthermore, this study employed DOLS for the robustness of results and found similar results as has been found in the FMOLS model.

Table 6: FMOLS and DOLS Estimates of Model 1

Dependent Variable = LNGNI1
Method: Fully Modified Least Squares (FMOLS)

	Equation 1			Equation 2			Equation 3		
Variable	**β**	**S.E**	**t-Statistic**	**β**	**S.E**	**t-Statistic**	**β**	**S.E**	**t-Statistic**
ED	-3.99*	1.57	-2.54						
RD				-5.53*	1.73	-3.19			
CD							6.16*	2.42	2.54

FDI	-4.59*	1.76	-2.60	-6.22*	2.05	-3.03	-6.77*	1.89	-3.58
FI	0.26*	63.47	15.28	0.25*	0.02	12.81	0.245*	0.018	13.24
GEE	0.02	41.57	1.15	0.02	0.01	1.36	0.024	0.014	1.74
DEH	0.02*	18.96	3.05	0.01*	0.01	1.98	0.006**	0.004	1.73
TO	0.003*	18.40	-1.63	0.0009*	0.01	0.09	0.005*	0.006	0.96
C	8.56	1217.50	3.98	8.16	0.39	20.99	7.798	0.312	25.02
R-squared	0.931			0.924			0.932		
Adjusted R^2	0.911			0.901			0.911		
Method: Dynamic Least Squares (DOLS)									
	Equation 1			Equation 2			Equation 3		
Variables	β	S.E	t-Statistic	β	S.E	t-Statistic	β	S.E	t-Statistic
ED	-1.57	0.061	-25.73						
RD				-2.21	2.13	-1.04			
CD							5.820	4.200	1.386
FDI	-1.87	0.07	-26.71	-5.99	2.58	-2.32	-6.260	2.350	-2.664
FI	908.7	72.79	12.48	0.23	0.02	9.56	0.234	0.023	10.083
GEE	39.1	44.38	0.88	0.02	0.02	1.01	0.022	0.016	1.376
DEH	55.0	21.53	2.56	0.01	0.01	1.61	0.008	0.005	1.688
TO	13.3	21.18	0.63	0.00	0.01	0.20	0.002	0.007	0.329
C	5. 304	3.43	1.45	8.24	0.48	17.32	7.953	0.382	20.836
R-squared	0.925303			0.932073			0.939149		
Adjusted R^2	0.902894			0.912665			0.921763		

Model 2

In model 2, this study utilizes education (primary enrollment) as the dependent variable and estimate three equation with the same independent variables as has been used in model 1. The results of estimated equations through FMOLS have been reported in Table 7. Results indicate that expenditure decentralization, revenue decentralization and composite decentralization has a positive and significant impact on education in term of primary enrollment (β= 6.72*; β=4.81*; β= 5.64*); results show that as fiscal decentralization increases, it will cause improve the literacy rate in Pakistan. Moreover, results indicate that FDI has a negative and significant association in equation 1 (β= -4.35*) while the positive and significant long-run association with literacy rate in equations 2, and 3 (β= 3.66*; β= 2.59*). Similarly, financial development has a positive and significant association with the literacy rate in equations 1 and 2 (β= 3.13*; β= 2.83*); so as financial development increases, it will cause to increase in the literacy rate in Pakistan. GEE and DHE have a positive and significant long-run association with literacy rate (β=2.08*, β=1.55*, β= 6.61*; β= 0.76**, β=3.33*, β= 1.36*); as government expenditure on education and domestic health expenditure increases, it will cause to increase literacy rate. Moreover, trade openness also has a positive and significant long-run association with literacy rate (β=2.32*; β=0.32*) in equations 1 and 2; so as trade openness increases, literacy rate will also increase. The value of adjusted R square indicates that more than 50% of variations in the dependent variable are explained by the independent variables in all three equations. The DOLS produce consistent results with FMOLS.

Table 7: FMOLS and DOLS Estimates Model 2

Dependent Variable: LNPE									
Method: Fully Modified Least Squares (FMOLS)									
	Equation 1			**Equation 2**			**Equation 3**		
Variable	β	S.E	t-Statistic	β	S.E	t-Statistic	β	S.E	t-Statistic
ED	6.72*	1.61	4.17						
RD				4.81*	1.16	4.147			
CD							5.64*	1.87	3.02
FDI	-4.35*	0.44	-9.89	3.66*	0.38	9.632	2.59*	0.58	4.47
FI	3.13*	1.35	2.32	2.83*	1.31	2.162	2.62	1.55	1.69
GEE	2.08*	0.88	2.35	1.55*	0.61	2.538	6.61*	1.15	5.74
DEH	0.76**	0.40	1.88	3.33*	0.37	8.870	1.36*	0.31	4.42
TO	2.32*	0.39	5.93	0.32*	0.01	42.188	-0.19	0.46	-0.41
C	31.05	25.87	1.20	32.39	26.20	1.236	86.65	26.11	3.32
R-squared	0.620575			0.624105			0.531001		

Adjusted R^2	0.506747			0.511336			0.690302		
Method: Dynamic Least Squares (DOLS)									
	Equation 1			Equation 2			Equation 3		
Variable	β	S.E	t-Statistic	β	S.E	t-Statistic	β	S.E	t-Statistic
ED	6.06*	2.97	2.04						
RD				4.39*	2.03	2.161			
CD							5.43*	1.99	2.73
FDI	-7.52*	2.69	-2.80	-2.95*	1.46	-2.021	6.69*	2.24	2.99
FI	2.80*	1.01	2.77	2.20*	0.33	6.684	0.81*	0.21	3.94
GEE	3.20*	1.53	2.09	1.59*	0.49	3.232	4.54*	1.50	3.04
DEH	0.22*	0.04	5.20	2.36*	0.65	3.600	5.22*	0.43	12.04
TO	0.38*	0.02	17.66	0.45	0.72	0.627	0.03	0.02	1.51
C	30.42	47.35	0.64	29.80	45.40	0.656	74.52	36.30	2.05
R-squared	0.631865			0.637524			0.556006		
Adjusted R^2	0.526684			0.533959			0.429151		

Model 3

In model 3, this study utilizes life expectancy at birth (LEB) as the dependent variable and estimate three equation by utilizing FMOLS and DOLS with the same independent variables that have been used in model 1 and 2. The results of estimated equations through FMOLS have been reported in Table 8 and results indicate that expenditure decentralization and revenue decentralization has a negative and significant impact on LEB (β= -4.940*; β=-2.428*); results show that as fiscal decentralization increases, it will cause to decrease LEB in Pakistan. Moreover, results indicate that FDI has an insignificant association with LEB.

Similarly, financial development has a negative and significant association with LEB in equations 1, 2, and 3(β= -0.029*; β= -0.028*; β= -0.027*); so as financial development increases, it will cause to decrease in LEB in Pakistan. Moreover, GEE and DHE have a positive and significant long-run association with LEB (β=0.207*, β=0.222*, β= 0.003*; β= 0.432**, β=-0.002*, β= -0.001*); as government expenditure on education and domestic health expenditure increases, it will cause to LEB. Moreover, trade openness also has a negative and significant long-run association with LEB in equations 1 and 2 (β=-0.020*; β= -0.002*); so as trade openness increases, the literacy rate will also increase. The value of adjusted R square indicates that in Equation 1, 89%, in Equation 2, 87%, and in Equation 3, 88% variations in the dependent variable are explained by the independent variables. Moreover, the DOLS produce consistent results with FMOLS.

Table 8: FMOLS and DOLS Estimates of Model

Dependent Variable: LNLEB									
Method: Fully Modified Least Squares (FMOLS)									
	Equation 1			**Equation 2**			**Equation 3**		
Variable	B	S.E	t-Statistic	β	S.E	t-Statistic	β	S.E	t-Statistic
ED	-4.940*	1.680	-2.94						
RD				-5.025*	2.070	-2.428			
CD							6.222	4.052	1.537
FDI	-2.860	2.400	-1.19	-4.610	2.460	-1.874	-4.361	3.231	-1.34
FI	-0.029	0.002	-12.89	-0.028	0.002	-12.008	-0.027	0.002	-12.544
GEE	0.207	0.001	140.14	0.222	0.002	136.907	0.003	0.002	1.823
DEH	0.432	0.001	641.90	-0.002	0.001	-2.581	-0.001	0.000	-2.557
TO	-0.020	0.001	-30.64	-0.002	0.001	-2.276	-0.001	0.001	-1.649
C	4.264	0.043	98.72	4.220	0.047	90.370	4.174	0.037	113.209
R-squared	0.916046			0.906680			0.909165		
Adjusted R^2	0.890859			0.878684			0.881914		
Method: Dynamic Least Squares (DOLS)									
	Equation 1			Equation 2			Equation 3		
Variable	B	S.E	t-Statistic	β	S.E	t-Statistic	β	S.E	t-Statistic
ED	-4.670	1.550	-3.013						
RD				-9.67	3.57	-2.71			

CD							5.552	1.302	4.265
FDI	-3.862	0.112	-34.482	-5.43	4.33	-1.25	-6.041	2.091	-2.889
FI	-0.029	0.004	-7.430	-0.27	0.00	-66.90	-0.027	0.004	-6.744
GEE	0.172	0.002	73.356	0.02	0.00	6.36	0.023	0.003	8.461
DEH	0.002	0.001	2.102	0.02	0.00	14.47	0.652	0.001	823.359
TO	-0.002	0.001	-1.661	-0.02	0.00	-11.97	-0.001	0.001	-0.846
C	4.255	0.072	58.706	4.22	0.08	52.87	4.178	0.066	62.984
R-squared	0.919993			0.914435			0.918161		
Adjusted R^2	0.897134			0.889988			0.894778		

Results and Discussion

Results indicate that expenditure decentralization (ED) and revenue decentralization (RD) has a negative and significant long-run association with economic growth and life expectancy at birth while ED and RD have a positive and significant association with literacy rate. In literature, the impact of fiscal decentralization on economic growth is varying depending on the specific context, especially in Pakistan poorly managed expenditures and revenue are unable to produce desired results. Our results are contradicting with existing literature (Martinez-Vazquez & McNab, 2003; Thornton, 2007) but our results are consistent with Davoodi and Zou (1998) and Rodríguez-Pose and Krøijer (2009) who have documented negative and significant relationship between fiscal decentralization and economic growth. Moreover, in Pakistan, decentralization increases regional disparity because some province like Punjab has more resources and capacity for development project while other provinces are struggling with limited resources. Moreover, lack of coordination and inefficiency among the provinces leadership also cause suboptimal allocation of resources which could not bring fruitful result and hamper overall economic growth (Keefer, 2007). Moreover, it has been examined that poor governance and poor quality of institutions waste resources and hinder economic growth. Similarly, in poor countries, expenditure decentralization weakens policy coordination and coherence across different regions and implementation of economic policies becomes challenging discouraging private investment (De Mello, 2010), creating barriers to trade and commerce (Zhang, 2006), and hindering the smooth functioning of markets (Jie, Larry, & Qunyan, 2003), all of which can hurt economic growth. Same in line, decentralization also affects the quality and availability of healthcare facilities in different regions differently which causes disparities in healthcare quality among regions.

These disparities may affect negatively life expectancy at birth when individuals become unable to access or afford essential healthcare services (Cantarero & Pascual, 2008). Especially in Pakistan due to decentralization, politicians spend more in some urban areas which has a greater impact on election decisions while rural areas are deprived of resources for healthcare infrastructure; so a large population of Pakistan do not have opportunities to access and afford necessary health care opportunities for women and children (Simatupang, 2009). Our result of a positive association between fiscal decentralization and education is aligned with McGinn and Welsh (1999) and Sawada and Ragatz (2005). Decentralization empowered local authorities to spend on educational opportunities based on local needs and priorities. Moreover, local governments spend on educational infrastructure to influence the people in Pakistan to vote for them for a bright future for their children, in this way decentralization brings a positive impact on educational opportunities. Moreover, local authorities lead to increased responsiveness and adaptability in addressing local educational challenges, improving the quality and relevance of education facilities.

This study found that foreign direct investment has a negative and significant association with economic growth while a positive and significant association with literacy and an insignificant association with LEB. Our results of a negative association between FDI and economic growth are contradicting the studies (Batten & Vo, 2009; Har, Teo, & Yee, 2008) who have ascertained that FDI positively affects the economic growth of the host country through several channels, such as increased capital inflow, job opportunities, technology transfers and access to new markets but it also has been observed (Saqib, Masnoon, & Rafique, 2013; Siddique, Ansar, Naeem, & Yaqoob, 2017) that in poor countries the relationship between FDI and economic growth is not as simple as has been described; especially in poor countries when foreign industries dominate the local industries and local industries become unable to compete them in term of quality and prices. Therefore, in poor countries, FDI negatively affects local business and create hindrance to economic growth. Moreover, the countries that heavily rely on FDI for their economic growth may face a decline in economic growth when any type of shock (economic or political) affects the sentiments of foreign investors and they transfer their entire money to their home country or stop to make further investment in host country projects.

Our results also indicate a positive and significant association with literacy rate. Our results are consistent with existing literature (Dutta & Osei-Yeboah, 2013; Saqib et al., 2013). Moreover, FDI also provides additional financial resources for the education sector in the host country and foreign companies improve the living standards of the host countries by providing them with prestigious job opportunities which motivates the parents to invest more in the children's education (Blomström &

Kokko, 2002). Similarly, foreign investment may help the host countries to develop educational infrastructure which improves the access and affordability of educational services and improve the literacy rate (Michie, 2001).

Financial development has a positive and significant long-run association with economic growth and literacy rate while financial development has a negative and significant association with LEB. Our results are consistent with existing studies that have documented a positive relationship between financial development and economic growth (Masoud & Hardaker, 2012; Yang, 2019). Financial development increases the access and opportunities of credit and investment for individual investors that help to accelerate the process of economic growth in a nation. Moreover, financial development reduces the chances of risk by providing a well-functioning risk management mechanism and allows economic agents to invest in more ambitious projects and foster the economic development process (Ibrahim & Alagidede, 2018). This study also found negative associations between financial development and life expectancy at birth, our results coincide with Alam, Islam, Shahzad, and Bilal (2021) and Shahbaz, Shafiullah, and Mahalik (2019) who have highlighted the importance of financial development in life expectancy at birth. Generally, financial development improves life expectancy at birth by increasing economic growth and improving healthcare opportunities but in poor countries, financial development increases the process of industrialization without considering the quality of the environment. So excessive provision of credit to industrialists without any consideration of environment quality, so excessive industrialization harm environment which further adversely affect pregnant women and children less than the age of five.

Government expenditure on education has an insignificant association with economic growth while domestic health expenditure has a positive and significant association with economic growth. Our results are consistent with Bedir (2016) and Erçelik (2018) who have documented that higher domestic health expenditure leads to higher economic growth. It has been observed that more domestic health expenditure causes to increase in healthcare opportunities which increases the access and affordability of individuals to healthcare services. Easy access to healthcare opportunities positively affects labour productivity and enhances labour participation in economic activities (Piabuo & Tieguhong, 2017). Moreover, this study found government health and education expenditures have a positive and significant long-run association with literacy rate and life expectancy at birth. Our results are consistent with existing studies (Kousar et al., 2023; Kousar, Batool, Batool, & Zafar, 2020). Results highlighted that as the government increases expenditure on education and health; it means more education and health facilities are available to individuals that ultimately improve human capital in terms of education and health of children less than five years.

Moreover, the study found trade openness has a significant and positive association with education while a negative and significant association with life expectancy at birth. Trade openness affects education positively directly and directly. Trade openness improves educational quality and diversity through improved textbooks, educational technology, and learning materials. Moreover, trade openness improve exports and import of the country which accelerate production activities and create a job for the resident, their living standards improve and they spend more on their children's education; so in this way trade openness indirectly improve school enrollment.

However, trade openness affects life expectancy at birth negatively because due to trade openness, economic activities and industrialization process are enhanced which deteriorate the quality of the environment in poor countries. Poor environmental conditions adversely affect the health of individuals, especially the health of women and children less than 5 years. Moreover, excessive emission of carbon dioxide increases respiratory diseases and cancer, which can impact the life expectancy of individuals.

Conclusion and Policy Implication

The main objective of this study is to explain the role of fiscal decentralization in human capital formation. For this purpose, the study utilized three measurements to explain fiscal decentralization; named as expenditure decentralization, revenue decentralization, and composite decentralization. Moreover, this study used three dimensions of human capital development such as economic growth, primary enrollment, and life expectancy at birth. This study used three models, each model contains three equations to measure the impact of fiscal decentralization on human capital formation. The study also explained the impact of foreign direct investment, government education expenditure, domestic health expenditure, trade openness and financial development in the promotion of human capital formation. This study utilized the data for all variables from WDI from 1995 to 2022. This study used FMOLS and DOLS techniques to explain the long-run association among modelled variables.

Results indicate that expenditure decentralization (ED) and revenue decentralization (RD) has a negative and significant long-run association with economic growth and life expectancy at birth while ED and RD have a positive and significant association with literacy rate. This study also found that foreign direct investment has a negative and significant association with economic growth while a positive and significant association with literacy and an insignificant association with life expectancy at birth. This study found that financial development has a negative and significant association with economic growth while a positive

and significant association with literacy and an insignificant association with life expectancy at birth. Government expenditure on education has an insignificant association with economic growth while domestic health expenditure has a positive and significant association with economic growth. Moreover, this study found government health and education expenditures have a positive and significant long-run association with education/literacy rate and life expectancy at birth. Moreover, the study found trade openness has a significant and positive association with education while a negative and significant association with life expectancy at birth. The findings of this study suggest; first, centralized policies should be devised for economic growth and health opportunities. Second, educational policies should be devised at the local level to improve educational facilities. Third, this study suggests that Pakistan should not heavily rely on foreign direct investment for its economic growth and should generate resources within the country to accelerate the process of growth. Fourth, this study suggests encouraging foreign direct investment which is associated with education and health services. Fifth, the findings of this study suggest that financial institutions should impose restrictions on the use of credit like financial institutions should issue more credit to those industries that have environmentally friendly policies and types of machinery. Sixth, the government should allocate more resources to education and health services to increase education and life expectancy at birth.

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