The Impact of Remittances and Financial Development on Labor Productivity in Pakistan

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CERTIFICATE

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IN THE NAME OF ALLAH

The Most Beneficent The Most Merciful "To Allah belongs whatever is in the heavens and whatever is in the earth. Whether you show what is within yourselves or conceal it, Allah will bring you to account for it. Then He will forgive whom He wills and punish whom He wills, and Allah is over all things competent."

(Al-Baqarah, 2:284)

GOLDEN SAYING OF THE HOLY PROPHET

(Peace and Blessings of Allah be Upon Him)

"Do not wish to be like anyone except in two cases. (The first is) A person, whom Allah has given wealth and he spends it righteously; (the second is) the one whom Allah has given wisdom (the Holy Qur'an) and he acts according to it and teaches it to others".

(Al-Hadith)

DECLARATION

I Shabana Akhtar hereby declare that this thesis, neither as a whole nor as a part thereof, has been copied out from any source. It is further declared that I have prepared this thesis entirely on the basis of my personal effort made under the sincere guidance of my supervisor and colleagues. No portion of work, presented in this thesis has been submitted in support of any application for any degree or qualification of this or any other university or institute of learning.

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M.Phil. Economics and Finance

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Abstract

In Pakistan after 2000 remittances inflows increased speedily. Migration normally cuts the bulk of the labor participation in the home country although remittances rise the capital stock at the home country. Thus, there is a possibility to change intentionally the plentiful labor power into capital stock and enhance the suboptimal capital-labor share for many labor exporting countries. Constructed on this argument, we can foresee that remittance may meaningfully progress the local labor efficiency or productivity. In case of Pakistan there is a little work carry out to determine the influence of remittances on internal labor output or productivity in the presence of abundant labor force. This paper has examined the impact of remittances and financial development on labor productivity in Pakistan over the period 1973–2018, using Autoregressive Distributed Lag (ARDL) approach. We are using the Long Run Form and Bound Test to find out the co-integration relationship in the model and focusing on the F-statistic value which shows long run relationship between labor productivity and financial development and there is also exist long run relationship between labor productivity and remittances. We found that there is positive and statistically significant relationship between labor productivity and remittances in the long run. On the other hand financial sector development also have positive affect on the labor productivity in the long run in case of Pakistan. But financial development is negative and statistically significant in the short run while remittance have positive and statistically significant impact on labor productivity. The results also indicates that the threshold level of remittances and financial development for labor productivity are 7.9 and 15.2 respectively. Both of independent variables (Remittances and Financial development) have non-linear relationship with dependent variable (labor productivity) in case of Pakistan.

Chapter: 1   Introduction

1.1   Background:

Labor productivity is expressed as the real GDP ratio to working persons in a country. In the long-run development plan must emphasis on enhancing the countrywide labor productivity because economic development is significantly succeeded through the labor productivity growth Al-Mamun et al (2015). And also evaluates the capability of an economy to produce output by using available human resources (Pilat, 1996). The productivity growth in an economy is the main power to achieve the growth as long run per capita, it is highlighted in the modern work for economic growth (Hal & Jones, 1998).

The productivity growth is one of the most important feature for the economic growth in the underdeveloped nations (Korkmaz & Korkmaz, 2017). Specially, the labor exporting countries are labor abundant and have shortage of capital and need more capital for the increase of the labor productivity (Stark & Bloom, 1985). Labor productivity has strong relationship with economic growth and also has significantly positive relation with high life style standard (Andersen, 2012).Different factors can play a significant role to produce output in a country. The effective use of production factors, such as land, labor, and capital is a main requirement of the sustainable economic progress in a country. Nobel Laureate Paul Krugman tells us about the importance of productivity as: "Productivity isn't everything, but in the long run it is almost everything.

Labor productivity performance receives little attention in Pakistan, which is evident from the lack of data on this critical metric. A detailed analysis of Pakistan's labor productivity development is revealing and extremely disturbing. When observed the labor productivity in 1980s, which raised at 4.2 % per annum, in the 1990s this figure had dropped to 1.8 %, dropping

more to 1.3 % throughout 2000–15, meanwhile in 2007, it raised only 1 % from 1980-2015. The role of inputs of production such as physical capital and human capital (education) rests uncertain and there has been a decreasing movement in TFP progression. This indicates that Pakistan's economy has not occupied complete benefit of the promising technological improvements and fast globalization duration. The judgment stated in latest studies that Pakistan's development has been determined mainly by factor inputs, specifically labor and capital, not through the growing of the total factor productivity (TFP)[1]. (Amjad & Awais 2016).

According to productivity analysis of Pakistan the rate of the labor productivity growth 5.01 % stayed maximum in the duration of 1966-70 and -0.33 % was recorded lowermost throughout in the 2006-10. In 1970s and 1990s the labor productivity, remained too low Similar as GDP. The ordinary growth level of labor productivity remained 2.51 % during 1961 and 2010. Currently in Pakistan the problems and challenges of the development of the labor productivity and TFP (total factor productivity) can be increase because of the rising energy disaster, bad law and order condition, declining investment, great fiscal deficit, high inflation level, worldwide financial crunch. The great joblessness and underemployment mostly in agriculture zone, lesser literacy ratio, big amount of untrained labor, fewer spending on education as % of GDP, and fewer spending on research and development can also negatively influence the labor productivity in Pakistan.

1.1.1 Labor productivity and remittances

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1 Total factor productivity (TFP) is a measure of productivity calculated by dividing economy-wide total production by the weighted average of inputs i.e. labor and capital. It represents growth in real output which is in excess of the growth in inputs such as labor and capital.

The money sent by international workers has the largest part of the financial inflows in developing countries. The international remittances can sustain economic stability at macro level and also can reduce the adverse effects of economic shock by manipulating economic progression in the developing nations (Jouini, 2015). Foreign remittances inflows have vital role and important for cushion to the balance of payment Taylor et al (2004). In the developing countries, the foreign employees about $413 billion sent back to the motherland in 2016. The World Bank organization (Migration and Remittances) report tells that the inflow of remittances in the lower and middle income countries $483 billion in 2017 and reached to $529 in 2018 with the increase of 9.6 percent as compared high income countries got $633 billion in 2017 and touched $689 billion in 2018.

The money sent by foreign workers to their families also influence the labor supply in the home country Drinkwater et al (2003). Remittances seem to have forceful influences on supply and demand of labor in receiver economies. The remittances decrease the contribution of labor power and rise easiness in the supply side of the labor market. Remittances increase the demand of the labor and decrease the general joblessness in the demand side of the labor market Chami et al (2018).When remittances increases the income of jobless people in the migrant's family that raise the unwillingness to work and dependency also increases (Airola, 2008). Remittances are the non-wage income which decreases the supply of labor in the labor market due to increasing the non-labor income by using the labor-leisure framework (Borjas, 2017). So, low labor participation can lead high unemployment which decreases the labor productivity in the country (Chami et al (2005). The inflow of foreign workers' remittances cannot influence the economic development Barajas et al (2009).

The arrivals of globalization and free movement of the factors of production require a certain method to obtain advantages from plenty of labor force for highest of the labor abundant

nations by intentionally changing plentiful labor into capital. Though, the inflow of remittance might be develop counterproductive approach for development, if it is observed contained with the labor–leisure context Al Mamun et al (2016).

1.1.2   Trend analysis of remittances in Pakistan

Pakistan is in the world's top ten remittance collecting countries. The trend and flow of remittances can change due to the variation of economic movements in a country. The fluctuations in the trend of remittances also seen in Pakistan during the boom and economic meltdown period. After independence of Pakistan. In the beginning unskilled and semi-skilled workers left Pakistan for England in response to the demands for industrial workers at destination. During 60s and early 70s skilled and qualified Pakistanis found their way to other Western countries and Arab world.. In 1973 vast developmental projects were started in the Arab world that could not be completed without the role of non-Arab work power. Being a kind of Islamic country Pakistan rapidly responded and became one of the main providers of manpower to the region. This phase was followed the movement of educated and professional Pakistanis for wealthy parts of the world including Canada, Middle East, United Kingdom, and United States.

From 1975 to 1982 there was increasing trend in remittances inflows due to the extensive outflow of foreign workers in other countries especially in the Middle East. During 1981 to 1986 in the labor market of Middle East the Pakistani worker reduced their trend as other Asian economies like India, Sri Lanka, Philippines, Thailand and Bangladesh competing with Pakistani labor force, so due to bad economic conditions Pakistan have reduced remittances inflows in 1983 to 2000 and the demand for Pakistani labor force also declined in the Middle East. The inflow of remittances in Pakistan decreased in the start of 1990 due to less earning opportunities of labor

force in the Middle East. From 1998 to 2000 the foreign exchange accounts of Pakistan were hold succeeding to nuclear explosion. However, from 2001 onward remittances kept growing year by year pushing the average to almost US $5 billion per year, except FY04 when the annual inflows declined to less than US $4 billion from a total of more than US $4 billion the preceding year .The inflow of remittances increased from 2001 to 2004 the main cause of this increase was the depreciation of the currency in Pakistan due to the incident of 9/11. The major part of the remittances inflows originated from Saudi Arabia and USA is second major source of remittance in Pakistan. In 2009 the remittances inflow increased from the Middle East. The main factor of increasing trend in the remittances was increasing the capability of Pakistani people as well skill and education of Pakistani migrants in UK and USA. The annual remittances to the country in absolute terms touched almost US $9 billion figure by 2010 .The workers' remittance in Pakistan reached to $19.9 billion according to the report of State Bank of Pakistan in 2015-16.

The support by overseas Pakistan has been traditionally vital for the economy and it continued with a growth of 1.4 percent in the financial year 2017-18 compared with to the last financial year. According to State Bank of Pakistan (SBP), overseas Pakistani workers remitted $19.622 billion during FY18, showing a growth of 1.4% compared to $19.351 billion received during the same period in the preceding year. During the FY19 from July-18 to April-19 International Pakistani workers sent 17,875.23 million US Dollar, showing 8.45% of growth as compared with 16,481.82 million US Dollar received during the same period of in the previous year. This figure increased to 20.191 billion in next month of FY19 and reached to 21.841 billion dollar in June 2019.

1.1.3   Labor productivity and financial development

The development of the financial sector is expressed as the expansions in the quality and quantity of the financial activities, with the involvement of the financial markets (stock markets, bond

markets) and financial organizations such as banks (Seifollahi & Hazeri 2016). Recently the link between financial progress and economic development catch a significant level of consideration. Several studies must emphasized on the presence of a strong financial structure indicates to economic development, the importance of financial expansion and its progressive relation with economic growth examined in the literature. It is documented that financial growth is essential for economic evolution (Calderón & Liu, 2002). King and Levine (1993) discussed that financial progress indicates to economic growth in the country.

A strong financial markets and developed financial institutions mobilizes savings and investments and manages risks. Financial improvement can be expressed as the development in the dynamics, plan and strategies, and the development of the organizations that lead to the effective intermediation and efficient financial markets. However, there are containing views regarding the consequence that the financial structure may be reason of the economic evolution. Consequently, it is improving the capability of the financial market to do accomplish professionally as an intermediary to motivate economic evolution Alomari et al (2019). Levine (2005) analyzed from literature that financial organizations such as banks and also as insurance companies, financial markets (containing stock, bond, and derivative) markets employ a dominant effect on economic enhancement and economic strength.

In the financial system it is crucial step that supports to allotment of the resources, expansion of economic prospects and also fosters the progress when banks monitors the borrowers and classify firms with the greatest encouraging prospects Levine (2012). Another important way in which finance raises economic progress when financial institutions and markets organize savings by the households to the investment in progressive plans and projects. When financial bodies screen the usage of investments for the projects and inspect administrative performance

then Competence of organizations is boosted, fraud through the insiders is reduced Cihak et al (2012).

In a country the growth of labor productivity can increase by the proper utilization of human capital and physical resources which are available in the country (Sharpe, 2007). Factors of production (labor and capital) surely matter for production but some other factors such as education, government regulation are significantly important for the improvements in the production in a country. There are some macroeconomic factors that affect the labor productivity such as (inflation, government consumption and budget deficit).some other factors like Foreign direct investment, financial sector depth, private credit, significantly affect the labor productivity in the country (Khan, 2005). The analysis of the determinants of labor productivity highlighting the importance of human capital, structure of the public sector, financial progress and established macroeconomic situation in the long run Belorgey et al (2006).

A country's capability to develop its standard of living with the passage of time practically rest on its aptitude to increase output per employee. Labor productivity, or output growth per worker, can be documented in three main features, the first is to rises the physical capital, second is increases in human capital and the third one is the TFP (total Factor productivity) which measures the involvement of technological evolution and additional effective usage of the present resources.

Financial enlargement and remittances have been recognized as key drivers of development of the economy specifically in emerging states (Chowdhury 2016). Through dropping the expenses of approaching to credit, a well-developed financial market can support through remittances to developments that produce the maximum profit and then boost economic progression (Giuliano & Ruiz-Arranz, 2009).The inflow of international Remittances beneficial for decline in poverty,

reduction in unemployment and also improve the household's living standard Taylor et al (2005).Remittances inflows in a country for investment can help to attain the balanced growth of labor productivity in long run through labor-capital optimization (Al-Mamun et al (2015). Remittances openly rise productivity per employee if accompanied with education. The unintended impacts are inspected through the influences of foreign worker's earnings on the supports of physical capital, human capital, and total factor productivity to productivity per employee (Ssozi & Asongu, 2014). foreign worker's earnings have an significant share to GDP and gross savings with wider socio-economic impression, and the involvement of foreign worker's earnings are unavoidable in the economic evolution in the emerging economies and foreign workers can collect capital, to determination the capital-scarcity issue and economic progress in the long-run is well represented over and done with labor output progression and it is the crucial objective of any economic progress approach (Akter, 2018).

The basic perception is that financial markets are likely to improve the efficiency of capital allocation in degradation process more effectively, lead to the transfer of capital from industries in decline to industries with prospects for good growth, and bring about improvements in the services delivered via the financial organizations through reducing the cost of information and transactions resulting in increased innovation and productivity in country.

The issue of labor productivity in the economy is of an increasing significance in achieving real stability. This issue is influenced by various financial and nonfinancial factors. The domestic credits of the private sector, by way of a part of GDP surely affect labor output and also high stages of education and wellbeing in the health sector principal to an extraordinary level of labor efficiency and output. Over all, growing trade freedom by the transfer of technology and knowledge contributes to the improvement of labor productivity (Seifollahi & Hazeri 2016).

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1.2   Motivation of the study: the case of Pakistan

In Pakistan after 2000 remittances inflows increased speedily. According to State Bank of Pakistan the overall foreign worker's remittances are $10.30 billion in April 2011 which was about 4.2% share of GDP in 2008. The international worker's remittances are $13.186 billion in 2010-2011 which is highest amount in any fiscal year in the history of Pakistan and reached to $19.9 billion in 2015-2016 and touched to $20.19 billion in June FY19. Pakistani migrants those settled in North America, Western Europe and in oil producing Arab states played significant role in foreign exchange reserves and development of the economy (Hussain & Anjum, 2014).

A lot of studies are there in the literature examined the effects of international workers' earnings in the developing countries. It is significantly observed that many remittance receiver states have same qualities like labor abundant as (China, Bangladesh, India, Indonesia, Pakistan and some others), also have capital shortage; consequently, for long-run progress, any policy need to be established on enhancing the output of the labor strength of these countries in the long-run Al-Mamun et al (2015). Migration normally cuts the bulk of the labor participation in the home country although remittances rise the capital stock of the home country. Thus, there is a possibility to change intentionally the plentiful labor power into capital stock and enhance the suboptimal capital-labor share for many countries. Constructed on this argument, we can foresee that remittance may meaningfully progress the local labor efficiency or productivity. In case of Pakistan there is a little work carry out to determine the influence of remittances on internal labor output or productivity in the presence of abundant labor force. The inflow of foreign worker's earnings can be used as a substitute for unproductive or non-existent credit markets through assisting to native businesspersons escape the nonexistence of collateral (guarantee) or high

loaning costs and start creative activities. In current period, considerable emphasis has been placed on the probable effects of financial progress and remittances on economic evolution and dissimilarity over the occupation building and poverty relief Bang et al (2016).

A large group of works exists in favour of the share of financial enlargement as a serious supporter to economic development. In Pakistan the financial zone has experienced important restructurings since 1990s with a struggle to guarantee of better productivity and yield (Kumar, 2011). With the respect of Pakistan's financial sector, it has undertaken numerous transformations or reforms ended in the different time Ahmad et al (2010). Later, several scholars and researchers ensure to give prominence to financial growth as contributing to progress of the economy. Though, few research studies evaluates the growth equation without concerning of the inputs (capital and labor) those are the essential contributing elements (Muhammad & Umer, 2010), Anwar et al (2011) however some other researchers choose GFCF (gross fixed capital formation), used in place of investment, as a substitute for capital stock as input of production function Lal et al (2009). (Ahmad & Malik 2009) suggest that financial development has a very small effect on per capita GDP. It is indicated that increasing figure of electronic banking facilities like ATM, balance enquiry and funds transfers, phone and mobile banking are beneficial for economic development Sumra et al (2011).

An additional study by Jalil & Ma (2008) discovered that financial progress has an important impact on economic development in Pakistan. Zaman et al (2012) observed that financial part of growth contains three things ,the first is Financial deepening, which consists of the growth of financial mechanisms generally estimated by the share of monetary sums to GDP, the second is Financial broadening, which indicates a rise in the sum of financial bodies, financial connections over and done with cheques, and financial tools, and the third one is Financial

liberalization, which specifies deregulation of interest rates, free movement of foreign capital, and elimination of other boundaries.

It is important to remind that the degree at which the financial part enlargement matters. When the financial sector develops too fast, affecting too much financial sector increasing, it can lead to some procedure of uncertainty and instability in the sector. It can also boost larger risk-taking and unexpected leverage, if poorly controlled and managed. After that it approaches to financial expanding, there are speed limits. This places a premium on emerging well-intentioned institutional and supervisory structures as financial growth proceeds. Studies that must observed at financial sector enlargement and economic development have ignored the speed of adjustment in financial sector expansion and its impression on economic advancement.

The link among financial growth and economic development has been broadly observed, little is known about the inspiration of financial growth on productivity progress. A recent part of literature has discussed that the optimistic influence of financial development on economic progress weakens after a threshold point of financial enlargement is touched. Such a diminishing effect at higher points of financial growth stems after the effects of financial expanding on the total factor productivity (TFP) progress, comparatively through the additional measures of financial growth, such as increased access or greater efficiency (Sankoh 2017).

Kumar et al 2017 studied the existence of a non-linear relationship among the total factor productivity (TFP) development and remittances as percentage of GDP between additional variables in both of Bangladesh and India the major receiving nations in South Asia. Additionally, Bangladesh has a U-shaped link while India shows an inverted U-shaped association by using total factor productivity (TFP) progress. It is also important to explore that some hostile belongings can rise cause of receiving large amount of remittances and discover an undesirable result on

productivity. Pakistan is also largest remittances receiving country like India and Bangladesh. So we are interested to discover the non-liner influence of foreign worker's earnings on labor productivity in Pakistan, it is also interested to explore the threshold level of financial enlargement on labor productivity.

After a vast literature analysis related to remittances, financial development and labor productivity, there are some questions arises that what is influence of financial expansion and remittances on labor output or productivity? And in Pakistan what will be the threshold level of financial growth and foreign worker's earnings? The contribution of our research is to find out the impact of financial improvement with foreign remittances on domestic labor output or productivity in Pakistan. This study has been explored the threshold level of financial growth and remittances in Pakistan. This study used the production function approach by using latest data in the time period of 1973 to 2018.

1.3   Objectives of the study

1. To explore the influence of remittances and financial growth on domestic productivity of labor in Pakistan.
2. To examine the threshold level of foreign remittances and development in the financial sector of Pakistan.

1.4   Significance of the study

One of the main requirements of the supportable positive economic change of a domestic economy is the effective usage of production components like labor as well as capital. Agreeing with the economic systems, the character of labor in the production procedure has experienced major fluctuations over the previous years. These changes include the concept of workforce which on the one hand, assesses the physical abilities and on the other hand, evaluates the productivity caused

by the accumulation of knowledge skills and experience of the workforce. In addition, the issue of labor output and efficiency in the country has a growing significance in actual constancy. This issue is one of the reason for different nations to develop their economic competences so as to improve the output or productivity of the labor (Seifollahi & Hazeri 2016).

It is important to examine the inflow of remittances and the effects of worldwide migration on labor productivity. In the remittances receiving countries the economic development is significantly succeeded through the labor productivity growth with substantial workforce like China and India as well as Bangladesh and Pakistan (Al-Mamun et al (2015). One of the economic development policy or approach must have concentration on enhancing the native productivity of the labor in the Long-run.

The growth effects of remittances on development in a country is influenced by the way in which remittances used. (Barai, 2012). The remittance can increased occupation internally over the reinvestment of remittances-encouraged domestic reserves, capital buildup, and investment. So, there are straight and unintended benefits of remittances for numerous developing nations similar to Pakistan.

Financial organizations like banks and firms as well as financial markets including stock and bond markets exercise a dominant impact on economic improvement and economic constancy. A crucial step that supports to allot resources, magnifies economic prospects and raises growth is done when banks monitor borrowers and recognize organizations with the maximum encouraging prospects. So, a well-developed financial sector (markets and institutions) mobilizes savings and manages risks can help through channel of investment into most efficient sector of the economy of Pakistan.

Numerous researchers have observed the effects of numerous elements such as human capital, capital buildup, income and education on labor productivity. According to Seifollahi & Hazeri 2016 providing local credit to the private sector similar to the level of financial intermediaries and the development of the financial structure have an encouraging result on the productivity of labor in the Middle East as well as in North Africa. This argument suggest that we can discover the influence of financial development on labor productivity in case of Pakistan.

1.5   Organization of the study

In this research study the Chapter 1 is based on the background of the work and contains the motivation of this study also objectives and significance of this research work. Chapter 2 represents Literature review which consist of foreign studies as well as studies of Pakistan. Chapter 3 based on Data and Methodology which holds the conceptual framework, econometric model, data and sample selection and estimation procedure.

Chapter 2:   Literature review

A lot of theoretical and experimental literature evaluates the reaction of economic growth to the remittances and financial development separately. However very little research studies have observed the relationship of remittances and financial growth on labor productivity. In the chapter: 2 we talk over the theoretical and also about the practical literature linked with our research objectives to recognize the research gap and explain the mechanism to overcome the elevated research gap.

2.1   Labor productivity and financial development

Zakaria et al (2019) inspected the impression of financial development on agricultural productivity in South Asia by using the data for the period 1973–2015. The other variables included are physical capital, human capital, trade openness and income level. It is found that all variables have cross-section dependence and they are stationary at first differences. It is found that co-integration holds between the variables. The estimated outcomes shows that financial development has an inverted U-shaped impact on agricultural output, which implies that agricultural productivity first surges with the rise in financial development and then it declines when financial development further increases. Agricultural productivity surges with the rise in both physical and human capitals. Agricultural productivity also improves with trade openness and income level. The results of the robustness analysis show that relationships of trade has a negative influence on agricultural productivity. Further, industrialization has positive while carbon emission and rural labor force have negative effects on agricultural productivity in the region.

Matuzeviciute & Butkus (2016) observed the influence of remittances on economic development in long-run by using panel data of 116 countries for the period from 1990 to 2014. They observed the interaction among remittances and the level of economic growth and also inspected its influence economic progress in long-term for the reason that the influence of remittances might be increased by the development stage of the recipient countries. Similarly, they explored the assumption about weakening a country's capability to usage of remittances for encouraging long-run economic progression as the plenty of remittances growths. To control the endogeneity they used OLS with first differences transformation and FE (fixed effects) approaches. The results exposed that over-all remittances have an optimistic and positive influence on economic evolution in the long-run, but the effect is fluctuating when built on the country's economic development level and on the plenty of remittances in the economy.

Pagano et al (2012) measured a model that forecasts firstly financial development increases labor productivity and earnings, with a lesser effect on the balance wage and financial growth, secondly financial development may encourage also a reduced amount of reallocation of employments depending on shocks to profit chances cash flow lead and thirdly financial development increases the productivity and employment sufferers in crises. Firms that trust most on banks for liquidity being hit the hardest these expectations on global industry-level data for 1970-2003 that standard measures of financial development are certainly related larger employment development, while only in non-OECD countries connected with labor output or real wage progress. Furthermore, negatively with inter-industry spreading of employment development. Finally, some proof of dark side of financial growth, in that for the duration of crises employment raises fewer in the businesses that are further dependent on outside finance and those heated in the more financially advanced states.

Nik et al (2013) examined the impact of financial increase on human resources in Iran for the time period from 1977 to 2010 with the use of a VAR model. The outcomes of the estimation specify the cash stream in Iran has an undesirable influence on human capital, which is a key source of the in increases price. Education is a long-standing investment. When price increases, people control to substitute investments. Though, the services delivered by the banking structure has adverse result on human capital in the absence of the greatest financial reserve provision. Yet, maximum university former students in Iran almost have acceptable expertise and training, they are not ensure sufficient capital to build up a business. As long as financial support for the private segment can lead to a profession in which they can practice their services and learning in the direction of encouraging production. Financial growth could only a little donate to human improvements.

Norris et al (2010) examined the part of the financial zone in enabling advanced efficiency and productivity by using a firm-level and cross-industry and also cross-country data. They find indication that modernization which defined generally to contain the introduction of latest goods, enlargements in production procedures and embracing of present technologies which has a significant influence on firm performance. This outcome grips whether one observes the link between productivity per employee or one estimated the ordinary sum of TFP on the invention dummies. Furthermore. They also discover this result is facilitated over financial markets. That is the encouraging effect of modernization of productivity is considerably superior in countries with well-built financial markets.

Kumbhakar & Mavrotas (2005) studied the financial Sector growth and Productivity development. This study concentrated on a core economic association specifically on the influence of financial sector growth on output progression by a using a big dataset of 65 countries, changing

considerably in expressions of stage of growth and environmental position, covering the period of 1961 to 1999. They also establish that output progress depends significantly in the period of economic enlargement that is an undeveloped country is probable to get more benefit as output progress from growth of financial organizations compared to an established economy that has well-functioning and inclusive financial organizations.

Seifollahi & Hazeri (2016) examined the issue of labor productivity in the economy is of an increasing significance in achieving real stability. This issue is influenced by several financial as well as nonfinancial elements. In this research study after applying a partial modification model for the internalization of labor productivity, the straight influence of financial growth on output or productivity of labor was evaluated by using a dynamic panel, which was established on GMM in the Middle East and also for North Africa for time period of 2000 to 2014. The experimental outcomes of the existing research work confirmed in the first step, domestic credits of the private sector share of GDP certainly affect productivity of labor. Secondly, high stages of learning and education and also for health clue to an unlimited productivity of labor. In adding, growing trade freedom over and done with the transfer of technology and knowledge contributes to the improvement of labor productivity. Further results confirm the transfer of GDP performance per worker to the next period. In other words, they confirm the dynamics of labor productivity.

Abdul rauf & Jahfer (2016) examined the impact of the financial expansion and human capital development on economic evolution in Sri Lanka by using yearly data from the period 1961 to 2015 JC (Johansen Co-integration Technique) and VECM (Vector Error Correction Model) were used to explore the interactions. The consequences demonstrated that there is existence of a long-run stable link. Further, human capital development and financial expansion reasons of economic progress and economic growth causes human capital development. On the other hand

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no solid proof that financial expansion reasons of human capital growth Moreover, findings concludes that human capital development and financial improvements are matter for the economic progress of Sri Lanka.

2.2   Labor productivity and remittances

Ssozi & Asongu (2014) inspected the networks by which foreign worker's earning influenced productivity per employee in Sub-Saharan Africa (SSA) with a production function approach. They explored the straight and unintended effects of foreign worker's earnings on incomes via fixed effects method and two-step generalized method of moment on 31 Sub-Saharan African countries for time period 1980-2010. The shortest effects have been studied through a lengthy production function whereas the secondary effects through the factor contributions into a Cobb-Douglas production function. They discovery that remittances must few optimistic, but frequently unintended, effects on productivity per employee, particularly when lagged or accompanied with education. They moreover discover that remittances require augmented TFP total factor output in SSA while the outcomes are quiet sensitive to requirement.

Akter (2018) observed the long-run the impact of remittances on labor productivity in Bangladesh. This research study has found a substantial progressive influence of remittances to surge national labor productivity but no substantial encouraging link of government spending for education on labor productivity. Yet, the optimistic and important factor of remittances suggests that remittances certainly donate to national labor output. The consequence displayed the straight association among remittances and labor productivity with physical capital buildup.

Al Mamun et al (2016) investigates the part of remittance on domestic labor output. Migration of the work force from Bangladesh donates in two dissimilar behaviors – first migration decreases the stock of local supply of labor as long as much-needed assistance in the work force

market and remittance referred through migrant employees occupied as an overseas source of capital, both subsidize in enhancing the existing under-optimum, capital–labor share in Bangladesh. They hire numerous testing methodologies with standard Autoregressive Distributed Lag (ARDL) and nonlinear-ARDL for the time period from 1982 to 2013. The end results recommends that remittance instructs a encouraging and important influence on local labor output together in the short as well as long run in linear, structural breakdown and also in non-linear expectations. These results are vigorous and can subsidize to the general enhancement of national productivity of labor in Bangladesh.

Al Mamun et al (2015) offerings heterogeneous sort of modeling for expanding the long run influence of remittances on national labor output for most of the remittance receiver economies both in expressions of scope and in part of GDP. The assessed productivity is augmented by eliminating one of cross-sectional dependency and non-stationary issue in the error of the estimations. This research study discovers overall real exchange rate does not need any influence on national labor output all of countries included in the panel; though, the country-specific experiment mainly recommends that an overpowering most of the nation's practice as undesirable result of actual exchange rate. Furthermore, this research study also discovers a statistically substantial encouraging part of fixed capital formation and also foreign worker's earnings on native productivity of labor. The core powerful potency for this outcome might be lie in the detail that remittances do not surge leisureliness relatively it does disturb the current suboptimal group of labor and capital in these nations. Though for nation state with progressive remittance part of GDP, the result of remittance on the productivity of labor is encouraging but statistically irrelevant.

Yasmin et al 2016 studied Remittances are observed as the cash influxes to the country and are authoritative global cause of income for most of not as much of developed nations. For data

examination, the OLS estimation method was engaged for time series data for time period 1981 to 2010. This study comes with the inference the GDP is absolutely related with the employee's remittances and the results also backing the positive assessment of remittances. It is recommended that government should take thoughtful steps and appropriate procedures to develop the employees' remittances so, that the country will be on the exact road to the growth. A vast stream of foreign workers' earnings have been employed to stabilize the financial situation in the country and decrease the load of external debt. It is projected that foreign employees' remittances is key source of outside flow as equated to inside sources. This indicates that the GDP is certainly connected to employee's remittances and economic evolution is also certainly related with the government expenditures on education.

Chami et al 2018 calculated existing cross-country indication of the impression of remittances on labor output. Remittances seem to have a robust effect equally on supply and demand of labor in receiver nations. These belongings are greatly substantial and larger in scope than the external direct investment or authorized development relief. Remittances decrease labor potency for contribution in economic activates and rise informality by the supply side of the labor market and remittances diminish general unemployment in the demand side. As concern even though disparity drops as a outcome of higher remittances, usual wage and output growth drops, at the last it is further powerfully important to an rise in the labor earnings part. In insubstantial countries, in distinction, remittances execute an optimistic externality, maybe cause of the tradable zone tends to be weak. The findings designate that restructurings to foster wide-ranging development essential to take into explanation the part of remittances in direction to be effective.

Sharma 2016 studied the influence of financial growth, human capital and their contact with economic progress. This study using a panel of 66 countries and engaging panel data

methodology for 40 years from 1971 to 2010. This study use private credit by deposit money banks as a substitute of financial expansion as % of GDP. In turn, human capital is characterized by the % of population overhead 25 years' olds with the education to the secondary level. By preparing evidence and communication relations, this research also discovers the financial enlargement, and human capital are absolutely substantial in clarifying evolution while additional degree of financial improvement, liquid liabilities, is irrelevant to explanation of development. Furthermore, the interaction term is also irrelevant. When they present revenue dummies and area dummies, the consequences persist healthy. The degree of merging and the point of influence does diverge across-countries at changed income stages and in different areas. Additional motivating consequence is that human capital must have an optimistic substantial influence on development of nations that had an inferior early stage of human capital on the other hand irrelevant in nations that in progress with a developed stage of human capital.

Peprah et al 2019 examined the connections among financial enlargement, remittances and economic progression in Ghana. They evaluates a dynamic heterogeneous ARDL model. This research study inspected the connection among financial improvement and remittances. First, the emphasis of this research work was to control the combined result of financial enlargement and foreign worker's earnings on economic evolution empirically. Second, the research works projected the stages of financial advancement in Ghana further than the development can be vulnerable. This study determines that the combined influence of financial expansion and remittances is developed than their separate sound effects. In accumulation, the research accomplishes with the threshold consequence that growth of Ghana's financial zone over 70 % will struggle development depressed.

Sankoh 2017 investigated the relationship using a Panel Smooth Transition Regression (PSTR) method, employing data on a panel of 22 emerging markets economies spanning 1996-2014. The PSTR model allows time varying and heterogeneity in the parameter estimates. In doing so, this approach allows us to explore the nonlinearity among financial extending and output development, thereby determining the threshold level of financial expanding in the productivity growth of these economies. The results reveal a clear nonlinear link among financial deepening and productivity progress in emerging market economies. The outcomes display an overturned U-shaped association among financial deepening and productivity evolution in these economies. The evidence suggests that financial deepening accelerates productivity growth in emerging market economies up to a certain point. Increased financial deepening beyond the threshold dampens the productivity growth in such economies. The study finds the threshold of the private sector credit to GDP at 68 % beyond which increasing the credit provided to the private sector weakens productivity growth. This finding underlines the need for policy efforts to be directed towards improving the other mechanisms of financial development, like increasing access to financial services and improving competence in the distribution of financial facilities for a more sustainable growth of these economies. This work is inspired by the endogenous development literature which suggests that financial enlargement can influence economic evolution by increasing the TFP development. Secondly, this study allows the heterogeneous outcome of financial expansion on productivity progress using the PSTR approach.

Misati et al 2019 investigated the link concerning remittances with financial progress by consuming Kenyan quarterly data for time period 2006-2016. There are five kinds of variables of financial progress which are analyzed. The first is the credit to the private sector part of GDP, the second is the sum of mobile phone transactions the third one is the value of these transactions

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through mobile phone, the fourth one is the sum of mobile managers, and fifth one is the sum of bank accounts. The outcomes of ARDL (autoregressive distributed lag) establish a robust, encouraging link among remittances and financial expansion in long-run regression model. It recommends that advanced stages of remittances deliver chances for receivers to operate bank accounts, augment their reserves, and right to use financial organizations, in count to revealing the formerly unbanked to equally new and current financial goods. The outcomes also approve the possible benefit of acceptance recent and progressive technology to assist worldwide mobile transfers. By worldwide remittance transmissions with mobile technology decreases charges by removing the requirement for physical divisions and workers to join to walk-in clients. On the side from proposing ease and security for remittance performers, this technique also leads traditional remittance professional representations.

Kumar et al 2018 explored the influence of remittances on the TFP progress in view of Bangladesh and India, as mention nations for the time period of 1980 to 2012 and also for 1977 to 2012, correspondingly. They observe the occurrence of a long-run link among remittances and TFP by using a sum of experiments. The consequences designate that remittances ensure threshold impact on TFP evolution in both of nations. Regardless of the both nations receiving considerable quantity of remittances, they also found that Bangladesh ensures a U-shaped association while India ensures an upturned U-shaped association with TFP development. a lowest threshold of remittances percent of GDP is 5.3 percent for Bangladesh and for India, a sloping point of remittances percentage of GDP is at 1.8 percent . The interconnection experiments approve a bidirectional result, which suggests that foreign worker's earnings and TFP progress are equally supporting fascinatingly, whereas both of the economies have same remittances influence in respects of causality, this research work highlights double diverse sloping facts of remittances.

2.3   In case of Pakistan

Kumar (2011) examined the relationship of foreign worker's earnings and financial progress in Pakistan for the time era of 1980 to 2010 by the bounds test method contained by the augmented Solow-model methodology. This research study discovers that trade openness as well as foreign worker's earnings have substantial optimistic influence on earnings ranks in the long-run, whereas financial growth is statistically irrelevant. In the short term, overseas development aid (ODA) has subsidized certainly in the direction of income evolution though remittances, trade openness and financial progress have insulated, therefore emphasizing on to a certain degree unlike performances of aid and inflow of foreign worker's earnings. They have used the Autoregressive Distributed Lag Model and bounds method to investigate the efficiency of trade openness, aid, foreign worker's earnings, and financial progress by the augmented Solow model. The consequences provision aid, trade and foreign worker's earnings as compound for long-run progress of earnings.

Shahbaz and Rahman 2011 investigated the influence of financial expansion, imports and foreign direct investment (FDI) on productivity in Pakistan by using quarterly data from 1990 to 2008. ARDL bounds method is used to observe the long run association and also the route of causality is explored through VECM structure. The outcomes approve the presence of co-integration, displaying long run association among financial improvement, imports and also between FDI and GDP in real terms. Financial growth, imports and FDI must encouraging and substantial result on the productivity in the motherland. Causality investigation exposes bidirectional link between the indicators but then again robust causality is similarly running from

financial expansion, economic development and FDI to actual imports. The experimental indication directs co-integration among financial progress, imports, FDI (foreign direct investment) and economic progress that confirmed the presence of long run connection among the variables. The consequences informed that financial enlargement and imports perform their part to tolerate economic evolution. FDI also absolutely connected with economic development while its part is slight. The ganger causality examination presented that a bidirectional fundamental connection is establish among financial expansion and economic evolution.

Shahbaz & Rehman 2010 examined the parts of foreign capital influxes and local financial zone expansion on economic progress in Pakistan by using yearly data from 1971 to 2008. The estimation technique ARDL bounds test methodology are hired to long run and also co-integration and Error Correction Model applied to short run relations. Experimental indication exposes that foreign capital influxes must constructive result on economic progress. The development in the financial zone and public investment inspire economic development. Human capital and inflation similarly subsidize to economic progress completely. The unique involvement of this research is that it classifies the improvement of financial segment by means of human capital and public capital in the host kingdom are significant requirements for external capital influxes to have optimistic influence on economic development. It is then established financial organization boosts the technological circulation connected with foreign capital influxes. Experimental outcomes show that arrivals of foreign capital influence economic progress absolutely and expressively in the long run. Public capital and financial enlargement motivate the economic evolution over their inspiring networks in the long run. A surge in human capital enhance the economic progression.

Tahir et al 2015 found a link among outside factors and economic progress of Pakistan economy. Experimental investigations are approved with time series methods by using the data for

the time period from 1977 to 2013. The key finding is that outside determining factor like overseas remittances, external direct investment, and external imports substance from a development viewpoint. Foreign worker's earnings and external direct investment essential a substantial constructive character in the progress manner in Pakistan. Also, it is establish that external imports require unfavorably influenced the economic development in Pakistan. This research originate that outside factors matter for reaching the long-run economic evolution. Foreign worker's earnings and FDI ensure enhanced the economic progress of the economy of Pakistan. The consequences of this research are dependable on the former experimental exploration. Also, this research study establish an undesirable connection among imports and economic progression in the perspective of Pakistan economy.

Jalil & Feridun 2011 investigated the impact of financial region expansion on economic progression in Pakistan by using the data1975-2008. A combined financial deepness variable is constructed by using principal component analysis and also the Autoregressive Distributed Lag bounds testing methodology used to find out the co-integration. The outcomes recommend the existence of an encouraging and substantial connection among financial progress and economic evolution. The consequences must specified the occurrence of a progressive and important link among financial expansion and economic progression. The effects appeal consideration to the main purposes of financial structures in a developing country like Pakistan. For example, financial intermediation procedure perform as an actual network to build reserves from savers to borrowers by means of activating resources over an effective conversion of reserves into actual creative capital. In accumulation, financial expansion confirms the accessibility of liquidity in the financial structure and assistances in decrease of risk in the financial structure by growing the convenience of diversification opportunities.

Kumar 2011 explored that the foreign worker's earnings, exports and financial progress substance for economic evolution or not in the study of Pakistan by applying bounds test to find out the short-run as well as long-run sound effects of foreign worker's earnings, exports and financial expansion on per employee earnings through the yearly data 1980-2009 in case of Pakistan. The consequences displays that exports are substantial equally in the short-run as well as i9n the long-run although foreign worker's earnings is absolutely substantial in the long-run nevertheless requires an undesirable result comparable to financial expansion in the short-run. Conflicting to about current discoveries, the consequences demonstrate financial expansion does not obligate any substantial long-run outcome on per employee earnings.

2.4   summary of literature review:

The following table shows the summary of the existing related empirical literature:

Author's name	Trial period	Approach	Results
Zakaria et al (2019)	1973–2015	Production function approach	Agricultural productivity increases with the increase in both physical and human capitals. Agricultural productivity also improves with trade openness and income level.
Matuzeviciute & Butkus (2016)	1990-2014	OLS and fixed effect approach	Foreign worker's earnings have a optimistic influence on economic progress in the long-run however the influence varies according to the country's economic improvements.
Pagano et al (2012)	1970-2003	Production function approach	The inter-industry spreading occupation development is connected undesirably by the financial expansion then certainly related using its interaction by the diffusion in stocks revenues crossways to industries.
Nik et al (2013)	1977-2010	VAR Model	The currency stream in Iran obligates an undesirable influence on human capital, it is the key source of the rise in inflation. Education is a long-lasting asset, as soon as inflation climbs, individuals shift to substitute savings.

Norris et al (2010)	2005- 2007	Production function approach	Modernization is essential for firm presentation as it straight and significantly surges output. Furthermore, its sound effects on output are facilitated over the financial zone, firms gain the supreme profits after modernization in nations with well-built financial zones.
Kumbhakar & Mavrotas (2005)	1961-1999	Production function approach	Output progress rest significantly on the phase of economic expansion. That is why a fewer established nation is probable more to benefit from expansion of financial organizations as compared to an industrialized country that has well-functioning organizations.
Seifollahi & Hazeri (2016)	2000-2014	GMM	Domestic credits of the private region part of GDP absolutely affect labor output. And also high stages of education, learnings and well-being lead to a high stage of worker output and efficiency.
Abdul rauf & Jahfer (2016)	1961-2015	Johansen Co-integration Technique and VECM	The results of this research displays human capital progress and financial expansion origins to economic evolution. And also economic progress reasons to human capital enlargement.
Ssozi & Asongu (2014)	1980-2010.	Fixed effect Method & GMM	Remittances require several optimistic, but frequently unintended, sound effects on productivity per employee, especially when accompanied with education. Remittances also augmented the TFP in Sub-Saharan Africa (SSA) countries
S Akter (2018)	1976-2014	Johansen co-integration tests	A substantial optimistic influence of foreign worker's earnings to surge local labor productivity but then again no important encouraging connection of government spending for learning on LP.
Al Mamun et al (2016)	1982-2013.	ARDL and NARDL	Migration diminishes the standard of local supply of labor and foreign worker's earnings referred by migrant occupied as an external source of capital, both subsidize in enhancing the existing under-optimum, capital–labor proportion.
Al Mamun et al (2015)	1980-2012 include 21 top most	Panel Methodologies	Actual exchange ratio have no influence on local labor output. It also discovers a statistically substantial optimistic part of fixed capital formation and foreign worker's earnings on local labor output.

Yasmin et al 2016	1981-2010	OLS	An enormous stream of foreign workers' earnings have been employed to stabilize the financial situation of the state and diminish the load of external debt.
Chami et al 2018	Cross-Country Data		Foreign worker's earnings give the idea to have a robust influence equally on the supply and demand of labor in the receiver nations.
Sharma 2016	66 countries 1971-2010	Panel methodologies	Financial enlargement which is observed by using credit to the private sector as proxy for financial expansion. The human capital is also absolutely substantial to the clarifying development
Peprah et al 2019		(ARDL) model	The combined influence of financial expansion and remittances is greater than their single sound effects. In adding, the research accomplishes the threshold consequence that progress of Ghana's financial zone over 70 % will drag progress depressed.
Sankoh 2017	1996-2014 22 emerging markets economies	Panel Smooth Transition Regression approach	The outcomes display an upturned U-shaped connection among financial development and output progress in the sample countries. It also discovers the threshold of the share of private sector credit to the GDP which is 68 % has been calculated.
Misati et al 2019	Kenyan quarterly data 2006-2016	ARDL approach	The consequences displays a robust, optimistic connection among foreign worker's earnings and financial expansion in long-run calculations.
Kumar et al 2018	Bangladesh 1980–2012 and India 1977–2012		The consequences point out that foreign worker's earnings have threshold sound effects on TFP development. For Bangladesh, a lowest threshold of remittances as percentage of GDP is 5.3% and for India, a sloping point of remittances as percentage of GDP is at 1.8 %.
Kumar 2011	1980-2010	ARDL bounds method	The research discovers that trade openness and foreign worker's earnings have substantial encouraging influence on earnings stages in long-run, whereas financial expansion is statistically irrelevant in Pakistan.

Shahbaz & Rahman 2011	1990-2008	ARDL bounds method	Outcomes approve the presence of co-integration, presentation of long run connection among financial expansion, imports, actual GDP. Financial growth, imports and FDI have optimistic and substantial influence on productivity in Pakistan
Shahbaz & Rahman 2010	1971-2008	ARDL bounds method	Financial region's expansion and public investment inspire economic progress. Human capital standard and increases in price also subsidize to economic progress certainly in Pakistan.
Tahir et al 2015	1977-2013		External remittances and external straight investment have a substantial encouraging part in the advancement procedure in the economy of Pakistan.
Jalil & Feridun 2011	1975-2008	Principal components analysis (PCA) and ARDL	The consequences recommends that the existence of an encouraging and important connection among financial progress and economic development.
Kumar 2011	1980-2009	ARDL bounds testing approach	The consequences display exports are important in the short-run as well as in long-run whereas remittances is surely substantial individually in the long-run then has a covered undesirable result comparable to financial growth in the short-run in case of Pakistan.

2.5 Literature gap:

A lot of studies in the collected works examined the influence of financial growth on economic

progress as well as the influence of external earnings on economic progress. Despite the increasing

significance of remittances and financial progress in Pakistan, the relationship among remittances,

financial expansion and labor productivity evolution must not been considered effectively up till

now. Consequently, we have accompanied the study to perceive the influence of remittances and

financial development on labor productivity. We are using two measures the first is M2 to GDP

ratio and the second one is domestic credit to private sector as the proxies for financial expansion.

So, there is a gap to explore the influence of remittances and financial expansion on domestic labor

productivity in Pakistan. This study is also explore the threshold level of remittances and financial development in Pakistan. This research work employing the production function approach by using the latest data for a time period of 1973 to 2018.

Chapter 3: **Data and Methodology**

In this chapter we discuss about the data description and suitable methodology for the research work. Section 3.1 describe the conceptual frame work. Data and sample selection presented in 3.2. Models specification presented in 3.3 and detailed description of variables is given in 3.4

3.1 Conceptual framework:

To fulfil the objectives of my research work to examine the influence of remittances and financial progress on national labor output or productivity. We are using the Cobb-Douglas production function.

Basic production function equation:

Generally, productivity analysis uses traditional Cobb-Douglas production approach using two inputs with the assumption of constant returns to scale. The Cobb- Douglas production approach can be written in following form:

$$Y = AK^{\alpha}L^{\beta} \qquad\qquad (1)$$

Where Y is the total output, K stand for capital and L represent labor. The parameters α and β are marginal impacts of capital and labor on output and they lies between 0 and 1, i.e. $0 < \alpha < 1$ and $0 < \beta < 1$.

This research observes the influence of financial development on output of labor and also the influence of remittances on labor output by considering the significance of financial development and remittances in the country. The output from per unit of the employee or labor is given as:

$$\frac{Y}{L} = \frac{AK}{L} \qquad\qquad (2)$$

Where Y/L is used for the output per unit of employee or labor and K/L is used for the capital per unit of employee or labor. The labor productivity can be defined as;

$$y_t = A_t K_t^{\alpha} \tag{3}$$

Where, y_t = Y/L and K_t^{α} = K/L productivity for each unit of labor and capital for each unit of labor respectively.

Furthermore, productivity for each unit of labor Y/L relies the capital and labor ratio, it means production each unit of labor or worker rely on the capital consumed by that labor K/L. A_t is the store of technology and innovation and K_t^{α} is capital for every worker or labor at time t and α is the marginal share of capital (Kumar, 2011).

The solow model undertakes that the progress of technology is specified by

$$A_t = A0 e^{GT} \tag{4}$$

Where, Ao is the primary standard of knowledge and information while t is used for time in the equation 4 However, more factors of production can be included in the production function (Echevarria, 1998).

In this study we introduce two extensions in the above model, the first is the inclusion of remittances, and the second is the inclusion of financial development in the production function. With the survey of empirical literature many studies Qayyum & Nawaz (2014), Kumar et al (2018), Peprah et al (2019), Zakria et al (2019) argued that remittances and financial progress can be contained within the production function. Kumar (2011) also suggest that we can add remittances and financial development in A_t. While A_t looks for some exogenous elements disturbing development other than labor and capital. Established on theoretical and experimental confirmation, this research work retrieve few main features of A_t in Pakistan as:

$$A_t = f(T, REM_t, FD_t) \tag{5}$$

By rewriting the equation (3) and (4)

$$y_t = (T, \ REM_t^\beta, FD_t^\gamma)K_t^\alpha \tag{6}$$

Where y_t is the labor productivity t shows time , T is intercept , REM represents remittances inflows, FD shows financial development and K represents capital as the inputs of the production function (Kumar 2011).

After taking natural log, the above equation becomes:

$$lny_t = ln\alpha K_t, ln\beta REM_t, ln\gamma FD_t \tag{7}$$

3.2 Empirical model:

To discover the influence of financial progress and remittances on labor productivity, we can estimate y_t (labor productivity) as a dependent variable and others are independent variables by using this econometric model:

$$y_t = \alpha_0 + \alpha_1 K_t + \alpha_2 REM_t + \alpha_3 REM_t^2 + \mu_t \tag{8}$$

$$y_t = \alpha_0 + \alpha_1 K_t + \alpha_2 FD_t + \alpha_3 FD_t^2 + \mu_t \tag{9}$$

Where, **yt** = productivity of labor, which is expressed as the share of real GDP and working labor force in the country. A long-run development policy must emphasis on expanding the local labor output because economic progress is significantly succeeded by the labor output development Al-Mamun et al (2015). Here we used labor output or productivity in place of the dependent variable.

K_t= capital, the input of production function.

REM_t=the money sent by foreign workers to their home country for their families to meet the requirements of consumption is termed as remittances. Remittances inflows in a country for investment can help to attain the balanced growth of labor productivity in long run through labor-capital optimization Al-Mamun et al (2015). Remittance flows have an encouraging and significant effect on labor output or productivity growth (Ramirez 2017).

FD_t = The literature generally describes financial progress as the enhancement of quantity, quality and competence of financial intermediate facilities. The indicator we are using to estimate the financial development level in the country is the ratio of credits delivered by financial intermediaries to the private sector to GDP. This indicator separates credits distributed to the private zone, as disparate to credits delivered to the public zone, and it furthermore discounts credits delivered by the central bank (Calderón & Liu, 2002).

FD_t^2 And REM_t^2 = to discover the non-liner influence of remittances and financial progress on labor productivity in Pakistan we can use quadratic term of remittances (REM) as (REM_t^2) and for financial development (FD) we can use (FD_t^2). These quadratic terms also used by Hedberg, J. (2016), Kumar et al (2018), Peprah et al (2019) to regulate the threshold level of financial growth and also used for non-liner influence of remittances in the experimental literature.

List of the variables:

S.NO	Variables	Definition	Proxies
1	Kt	Physical capital	Capital stock
2	LP	Labor productivity	Real GDP in rupees / total employment
3	REM	Remittances	Remittances inflow in rupees / total employment
4	FD	Domestic credit to the private sector	The ratio of domestic credit to nominal GDP

3.4   Data and sample selection

The data which is used for estimation has been obtained from World Development Indicator (WDI), International Financial Statistics (IFS) and also from State Bank of Pakistan (SBP). This study utilize the data of different macroeconomic and financial variables for the time period 45 years from 1973-2018 in Pakistan.

3.5   Estimation Procedure:

In the estimation procedure we apply different test and techniques to discover the connection between variables under estimation through data. In this process by using time series data first we must to make the series stationary otherwise the results will not accurate. A time series data must be stationary, if there is a shift in time in the data then it doesn't source of adjustment in the shape of the distribution. The Straightforward properties of the spreading of the data corresponding the average value (mean), the spread of data as (variance) and the covariance should be constant for the end of selected time period. To check the stationarity of the series we can apply unit root test in this analysis.

Unit root analysis

It is essential that the stationarity of the time series data must be explored to guarantee for the usage of Ordinary Least square or not. This is an important step with the regards of the fact that most of the macroeconomic indicators are having a unit root or non-stationary, and therefore, the assessment of parameters by using OLS get hold of a very high R2, and the rise of false regression which can make difficulty in the accuracy of results produced by a non-stationary procedure Emmanuel et al (2019).

In econometric techniques and statistical experiment a unit root is a feature of some stochastic processes (such as random walks) that can make difficulties in statistical inference

involving time series models. A time series has stationarity if a shift in time doesn't cause a change in the shape of the distribution; unit roots are one cause for non-stationarity. There are some unit root test which can be used to test the unit root or non- stationarity in the series. A common test is Dickey Fuller test which is based on linear regression. The Augmented Dickey-Fuller test (ADF), or the Phillips-Perron test (PP) handles bigger, more complex models and used to test for that series which holds lagged value of dependent variable in model.

Estimation technique:

In this study we are interested to find out the long run relation relationship of the variables through the production function approach. In time series analysis it is important that the data should be stationary because with non-stationary data the estimation will make spurious results. After using the unit root test we can check the stationarity of the data. If variables are non-stationary then we will make them stationary by taking the first difference. If all variables have different order of integration I (0) and I (1) then we will use Autoregressive Distributed Lag Model (ARDL). We are using ARDL because of the long run relationship of the variables .Long run means the relationship of the variables in terms of potential not in terms of final out put(short run).

Autoregressive distributed lag (ARDL) Approach

The Autoregressive Distributed Lag technique forward by Pesaran, Shin, and Smith (2001). ARDL is a technique preferably used for dealing with variables that are integrated of different order, I(0), I(1) or combination of the both and, it can be use strongly when there is a single long run relationship between the underlying variables in a small sample size.

The ARDL equations are given as follows:

$$\Delta ly_t = \emptyset_0 + \delta lny_{t-1} + \alpha_1 lnk_{t-1} + \alpha_2 lnREM_{t-1} + \alpha_3 lnREM_{t-1}^2 + \sum_{i=1} \beta1\Delta lny_{t-i}$$

$$+ \sum_{i=1} \beta2\Delta lnk_{t-i} + \sum_{i=1} \beta3\Delta lnREM_{t-i} + \sum_{i=1} \beta4\Delta lnREM_{t-i}^2 + \varepsilon t$$

$$\Delta ly_t = \emptyset_0 + \delta lny_{t-1} + \alpha_1 lnk_{t-1} + \alpha_2 lnFD_{t-1} + \alpha_3 lnFD_{t-1}^2 + \sum_{i=1} \beta1\Delta lny_{t-i}$$

$$+ \sum_{i=1} \beta2\Delta lnk_{t-i} + \sum_{i=1} \beta3\Delta lnFD_{t-i} + \sum_{i=1} \beta4\Delta lnFD_{t-i}^2 + \varepsilon t$$

Chapter: 4 results and discussion

4.1   Descriptive Statistics

A useful starting point to empirically analyze the underlying relationship is to establish some patterns in the data. Table 4.1 displays the descriptive statistics of indicators of financial deepening (domestic credit to the private sector), labor productivity and remittances. This table displays the descriptive statistics of all the variables. For example, the average value of labor productivity in Pakistan is 9.45 (million) whereas the average value of financial development and remittances amounted to 13.6 and 7.96 respectively.

Table: 4.1   Descriptive Statistics

	Y	K	REM	FD
Mean	9.455325	5.936951	7.945349	13.63905
Median	9.495309	5.973386	7.967613	13.68690
Maximum	9.614820	6.235248	8.535857	14.81413
Minimum	9.244882	5.533285	7.337409	12.24904
Std. Dev.	0.116336	0.208769	0.329571	0.770965
Skewness	-0.663046	-0.325355	0.254576	-0.189134
Kurtosis	2.057850	1.921091	2.186566	1.827753
Jarque-Bera	5.071815	3.042647	1.765076	2.908061
Probability	0.079190	0.218423	0.413732	0.233627

Null hypothesis: residual are normal (favorable)

4.2   Unit root test

Unit roots of all the series included in the research are confirmed, earlier using the ARDL methodology to co-integration. Consequences of ADF at level and at first difference presented in this table all of the indicators are stationary at first difference according to Augmented Dickey Fuller test. We can put on ARDL bounds method in this condition to co-integration (Pesaran et al 2001)

Table: 4.2   Augmented dickey fuller test

Variables	p-value	p-value
	At level	At first difference
Y	0.5809	0.0000
K	0.9762	0.0367
Rem	0.9585	0.0000
Fd	0.3264	0.0001

Null hypothesis: data is not ststionary / variable has a unit root

Table 4.2 shows the probability values of all variable at level and at first difference. The p-value of Y (labor productivity) at level is greater than 5% level of significance, it means it is non-stationary at level but after taking first difference it will be stationary because the p-value of Y is 0.000 after first difference. Independent variables of our model (REM, FD) are also non-stationary at level and stationary at first difference and same is the case of variable K (capital).

4.3   Optimal lags (appropriate lag)

In the bounds testing methodology, the co-integration test embraces F-statistics counter to critical values. The value of the F-statistic is complex to the quantity of lag imposed individually on the differenced variables as suggested by Pesaran et al. (2001). We select the optimal command of lags of the model founded on the Akaike Information (AIC) information criteria.

Table: 4.3   optimal lags for remittances

Lag	LogL	LR	FPE	AIC	SC	HQ
0	107.7192	NA	0.000420	-4.939010	-4.773518	-4.878350
1	126.6479	33.35059*	0.000179*	-5.792758*	-5.585893*	-5.716934*
2	126.6488	0.001451	0.000188	-5.745180	-5.496941	-5.654190
3	126.7510	0.170424	0.000196	-5.702430	-5.412818	-5.596276
4	127.0523	0.487843	0.000203	-5.669159	-5.338174	-5.547840

VAR Lag Order Selection Criteria, Endogenous variables: Y, Exogenous variables: C K REM REM2 * indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

We are using lags 1 to 4 to our model for the selection of best and suitable lags which give us appropriate results by using this model in this study. The optimal number of lags for remittances is 1 which is specified over the consequences of the lag selection criteria. It means the suitable lags for our model is 1.

Table: 4.4   optimal lags for financial development

Lag	LogL	LR	FPE	AIC	SC	HQ
0	117.1120	NA	0.000268	-5.386284	-5.220791	-5.325624
1	128.3041	19.71944*	0.000165*	-5.871622*	-5.664757*	-5.795798*
2	128.5894	0.489068	0.000171	-5.837589	-5.589350	-5.746599
3	128.6219	0.054218	0.000179	-5.791519	-5.501907	-5.685365
4	129.3291	1.144987	0.000182	-5.777576	-5.446591	-5.656257

VAR Lag Order Selection Criteria, Endogenous variables: Y, Exogenous variables: C K FD FD2, * indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

The optimal number of lags for financial development is also 1 which is specified over the consequences of the lag selection criteria. Currently, the research will apply Bound test on the base of this test will follow order long run connection (co-integration) exists or not. Outcomes of long-

run association are sensitive to lag-length nominated in the model. Table shows the calculated F-statistic to select of the best lag-length in the model.

4.4   Bounds test:

In the procedure of ARDL we are going to check the co-integration relationship of the dependent variable (labor productivity) with the independent variable (remittances). To estimate the co-integration relationship in the model we are using the Long Run Form and Bound Test and focusing on the F-statistic value. The null-hypothesis in this model is that there is no long run relationship. The results shows that the f- statistic value is 4.96 which is greater than the I(1) bound, it suggest that we can reject the null-hypothesis and accept the alternative hypothesis that there is long run relationship exist between labor productivity and remittances.

Now we are going to check the co-integration relationship of the dependent variable (labor productivity) with the independent variable (financial development). To estimate the co-integration relationship in the model we are using the Long Run Form and Bound Test and focusing on the F-statistic value. The null-hypothesis in this model is that there is no long run relationship. The results shows that the f- statistic value is 6.24 which is greater than the I(1) bound, it suggest that we can reject the null-hypothesis and accept the alternative hypothesis that there is long run relationship exist between labor productivity and financial development.

Table: 4.5   Bounds test for Remittances

Test Statistic	Value	Significance level	Upper bound	Lower bound
			I(0)	I(1)
F-statistic	**4.960024**	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08

		1%	3.65	4.66

F-Bounds Test. Dependent Variable: D(Y), Selected Model: ARDL (1, 1, 2, 2), Null Hypothesis: No levels relationship.

Table: 4.6   Bounds test for Financial Development

Test Statistic	Value	Significant	Upper bound	Lower bound
			I(0)	I(1)
F-statistic	**6.246865**	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

F-Bounds Test, Dependent Variable: D(Y), Selected Model: ARDL (1, 0, 2, 2), Null Hypothesis: No levels relationship

4.5   ARDL Long run

We observe that k is physical capital used as capital stock has positive and statistically significant. The value of the coefficient indicate that capital is an important component of growth and increase labor productivity in the long run. Remittance are positive as expected and statistically significant, it is suggesting that if remittances increase by 1 percent, it boosts labor productivity by 2.37 percent in the long run.

Table: 4.7   Long run relationship for remittances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
K	0.520379	0.068895	7.553236	0.0000
REM	2.374341	0.894940	2.653074	0.0122
REM2	-0.149381	0.055959	-2.669453	0.0117
C	-2.990454	3.553359	-0.841585	0.4061

Levels Equation, Dependent Variable: D(Y), Selected Model: ARDL(1, 1, 2, 2), Restricted Constant and No Trend

On the other hand financial sector development has a significantly and statistically have positive affect on the labor productivity in the long run in case of Pakistan. Results suggests that when financial development increase 1 percent then labor productivity increases 0.69 percent

Table: 4.8   Long run relationship for Financial Development

Variable	Coefficient	Std. Error	t-Statistic	p-value
K	0.735597	0.226567	3.246710	0.0026
FD	0.697604	0.273362	2.551936	0.0154
FD2	-0.028741	0.008354	-3.440446	0.0016
C	0.928524	1.352065	0.686745	0.4969

Levels Equation, Dependent Variable: D(Y), Selected Model: ARDL (1, 0, 2, 2), Restricted Constant and No Trend

4.6   ARDL Short run and Error Correction Regression:

In the process of ARDL Error Correction Mechanism (ECM) we are going to find out the co-integration equation. The adjustment coefficient of regression equation must be negative if there is going to be long run equilibrium.

Table: 4.9   Short run relationship for remittances

Variable	Coefficient	Std. Error	t-Statistic	p-value
D(K)	0.554700	0.223672	-2.479969	0.0184
D(REM)	0.951901	0.613287	1.552129	0.1302
D(REM(-1))	1.236497	0.546526	2.262467	0.0304
D(REM2)	-0.062926	0.039873	-1.578138	0.1241
D(REM2(-1))	-0.081920	0.035573	-2.302908	0.0277
CointEq(-1)*	-0.321969	0.061058	-5.273158	0.0000

ARDL Error Correction Regression, Dependent Variable: D(Y), Selected Model: ARDL(1, 1, 2, 2), Restricted Constant and No Trend

The Table 4.9 shows that in our ECM equation with dependent variable (labor productivity) and independent variable (remittances), the value co-integration coefficient is -0.321 and also significantly show that the convergence of the equilibrium in the long run is with 0.321 speed of adjustment, It means that the previous period errors is corrected in current period with the 0.321 speed of adjustment. The results indicates that the capital has a significant and positive impact on labor productivity in the short run. The results also shows that a 1 percent increase in capital stimulates labor productivity by 0.55 percent and remittance have positive and statistically significant implying that a 1 percent increase in remittances increases labor productivity by 1.23 percent.

Table: 4.10   Short run relationship for Financial Development

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FD)	0.823191	0.713622	-2.153539	0.2567
D(FD(-1))	-3.164728	0.927867	-3.410755	0.0017
D(FD2)	0.033948	0.026470	1.282506	0.2083
D(FD2(-1))	0.117852	0.034515	3.414486	0.0017
DP1979	-0.035208	0.010476	-3.360713	0.0019
CointEq(-1)*	-0.577378	0.097722	-5.908380	0.0000

ARDL Error Correction Regression, Dependent Variable: D(Y), Selected Model: ARDL(1, 0, 2, 2), Restricted Constant and No Trend

The Table 4.10 shows that in our ECM equation with dependent variable (labor productivity) and independent variable (financial development), the value co-integration coefficient is -0.577 and also significantly show that the convergence of the equilibrium in the long run is with 0.577 speed

of adjustment, It means that the previous period errors is corrected in current period with the 0.577 speed of adjustment. Financial development is negative and statistically significant. The negative sign shows that if the financial sector develops by 1 percent, it decrease labor productivity by 3.16 percent in the short run.

4.7   Model stability test CUSUM test:

By using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability testing methods, this study confirmed the stability of the selected ARDL based on error correction model. CUSUM and CUSUMSQ plots have been presented in figures. We can say that the model is structurally stable because both of the plots in two different models persists inside the critical bounds at 5 percent level of significance.

Figure: 4.1   Cumulative sum of recursive residuals (CUSUM) for financial development
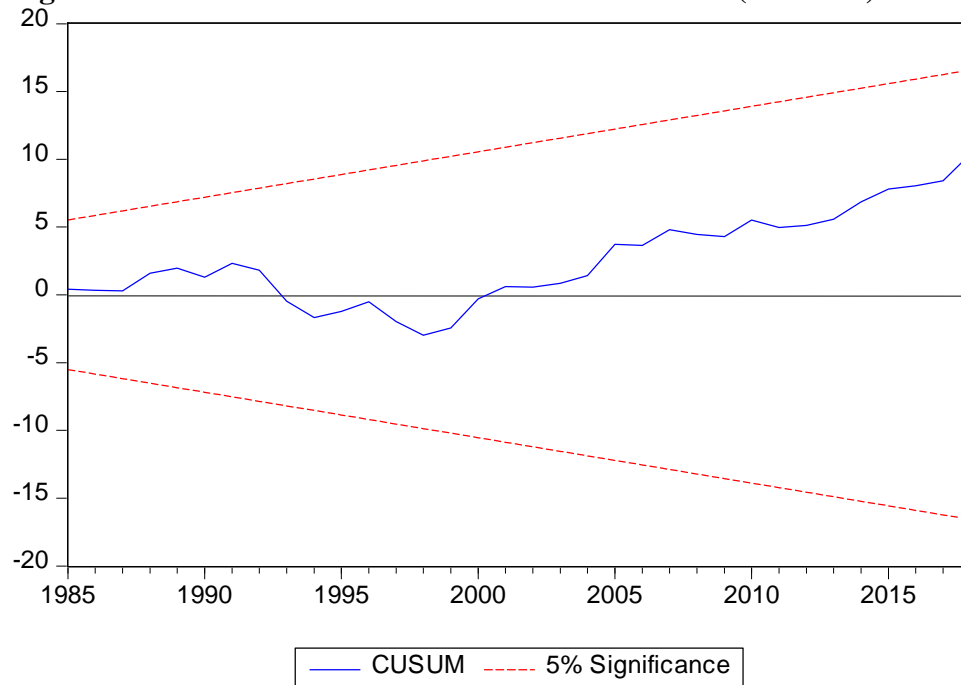
Figure: 4.2   Cumulative sum of square of recursive residuals (CUSUMQ) for financial development
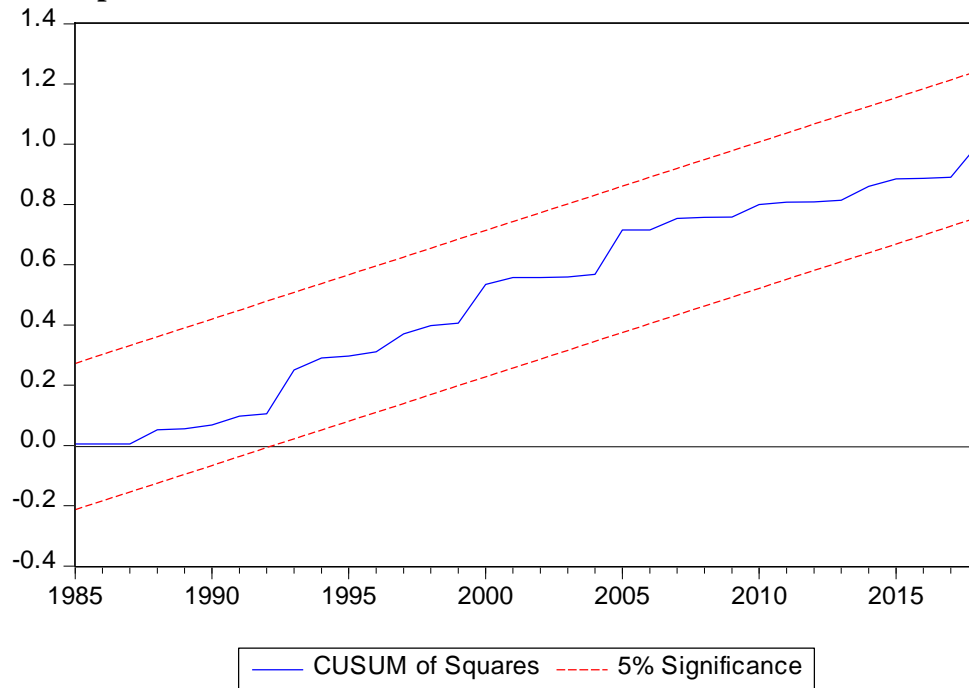

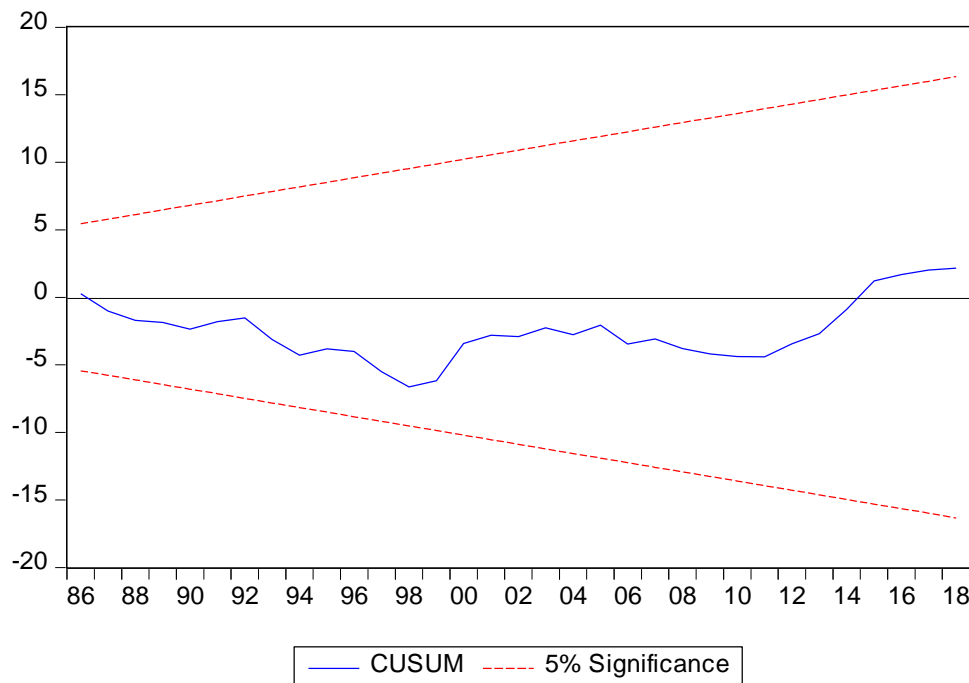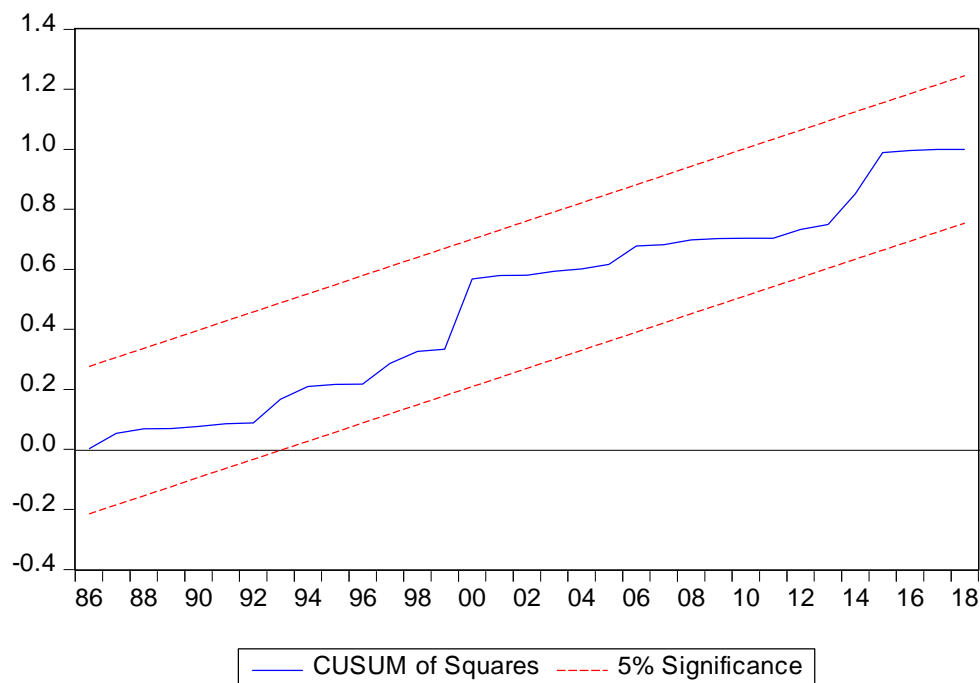**Figure: 4.3   Cumulative sum of recursive residuals (CUSUM) for remittances**

Figure: 4.4   Cumulative sum of square of recursive residuals (CUSUMQ) for remittances

4.8 Threshold effect of remittances and financial development on labor productivity

Table 4.10 and 4.11shows the coefficients for the analysis of the threshold effect of remittances and financial development on labor productivity in Pakistan. The results indicate the existence of a nonlinear relationship between financial development and economic growth as shown by the quadratic term of financial development, and also quadratic term of remittances used for non-linear relationship between labor productivity and remittances Thus, the presence of non-linear relationship between the variables is confirmed by the positive coefficient of financial development which has a statistically significant effect on labor productivity but up to a threshold level and the presence of non-linear relationship between the variables is confirmed by the positive coefficient of remittances which has a statistically significant effect on labor productivity but up

to a threshold, the effect declines eventually.(Peprah et al 2019). We note a non-linear relationship with the maximum threshold of remittances is 7.9 and 15.2% for financial development. We arrive at a similar conclusion as (Kumar et al 2017) but tend to differ in terms of the size of the threshold point to (Hedberg 2015). However a 7.9% threshold marks a tipping point and therefore implies that remittance incomes are not a major source of increase in labor productivity. Thus, in this regard, remittances have a more intermediary and indirect role in the growth of labor productivity. And also for financial development the threshold point 15.2 marks a tipping point and implies that the increase in financial development to the threshold point is favorable for the increase in labor productivity and after that point FD will not a major source of increase in labor productivity in case if Pakistan.

Table 4.10   Threshold level of remittances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM2	-0.093639	0.026130	-3.583575	0.0009
REM	1.435151	0.415561	3.453529	0.0013
K	0.616725	0.018891	32.64722	0.0000
C	0.312306	1.678711	0.186039	0.8533

Table 4.11   Threshold level of financial development

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FD2	-0.053424	0.007299	-7.318906	0.0000
FD	1.520174	0.231465	6.567631	0.0000
K	0.319335	0.179124	1.782759	0.0820
C	-3.209774	1.164277	-2.756881	0.0087

Figure: 4.5   threshold level of remittances

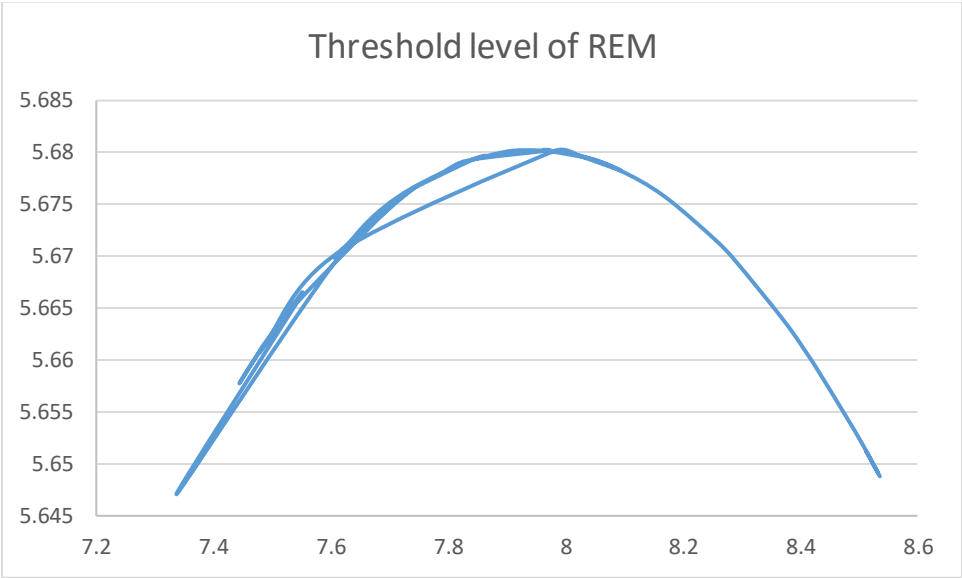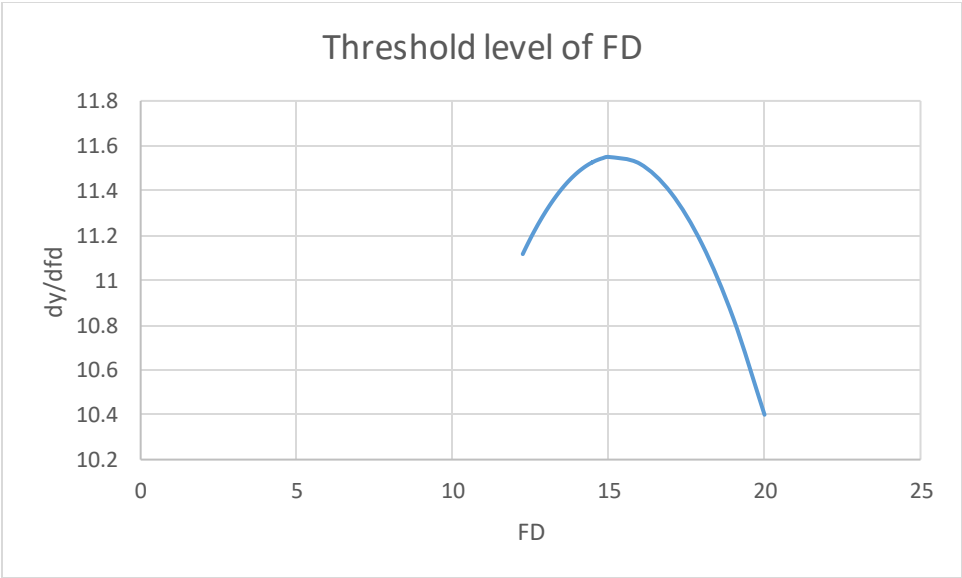Threshold level of REM

Figure 4.6   threshold level of financial development

Threshold level of FD

Chapter 5: Conclusion

This paper has examined the impact of remittances and financial development on labor productivity in Pakistan over the period 1973–2018, using Autoregressive Distributed Lag (ARDL) approach. To find out the co-integration relationship in the model we are using the Long Run Form and Bound Test and focusing on the F-statistic value. It suggest that we can reject the null-hypothesis and accept the alternative hypothesis that there is long run relationship exist between labor productivity and financial development and also there is long run relationship exist between labor productivity and remittances. The value of the coefficient indicate that capital is an important component of growth and increase labor productivity in the long run. Remittance are positive as expected and statistically significant. On the other hand financial sector development have a significant and statistically positive affect on the labor productivity in the long run in case of Pakistan.

The results indicates that the capital has a significant and positive impact on labor productivity in the short run. The results also shows that a 1 percent increase in capital stimulates labor productivity by 0.55 percent and remittance have positive and statistically significant implying that a 1 percent increase in remittances increases labor productivity by 1.23 percent. But financial development is negative and statistically significant. The negative sign shows that if the financial sector develops by 1 percent, it decrease labor productivity by 3.16 percent in the short run.

The results also indicates that the values of threshold level of remittances and financial development for labor productivity are 7.9 and 15.2 respectively. Both of remittances and financial development have non-linear relationship with labor productivity in case of Pakistan.

By using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability testing methods, this study confirmed the stability of the selected ARDL based on error correction model. CUSUM and CUSUMSQ plots have been presented in figures. We can say that the model is structurally stable because both of the plots in two different models persists inside the critical bounds at 5 percent level of significance. However, the positive and significant parameter of remittances implies that remittances contribute positively to domestic LP. The result showed the direct relationship between remittances and LP through physical capital accumulation. The result supported the view that migrant household saves a portion of remittances inflows to raise investment that facilitates productive assets accumulation (Adams, 1998; Chiodi et al, 2012).

Policy implication

If government want to increase labor productivity in the country, then attention should be focused on long run policies such as the labor productivity can be increased when initiatives such as government expenditures on skills and education on labor force can be increase the output per worker. Therefore, to increase the positive effect of remittances on labor productivity, efforts should be undertaken to increase remittances flows and channeled them to productive sectors, and also should focus on the enhancement of human capital by increasing the education level and skills of the workers.

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Flow chart of remittances, financial development and remittances
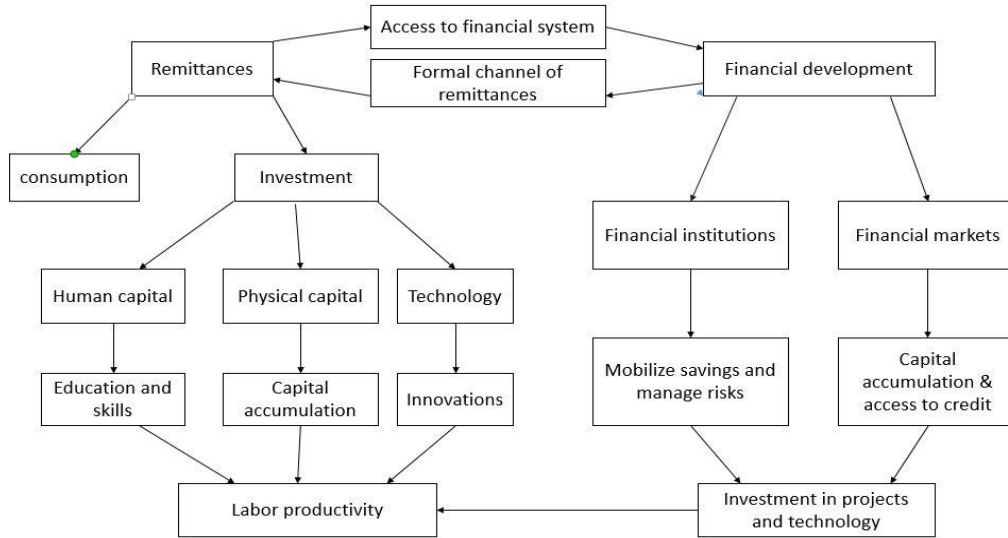
Threshold values for remittances and financial development

Threshold for remittances

Y= α+1.43REM+ -0.09REM2

First order condition

∂y/∂REM = 1.43 + 2(-0.09) REM

=1.43+ -0.18REM

-1.43 = -0.18REM

-1.43/-0.18 =REM

7.9= REM

Threshold for financial development

$$Y = \alpha + I.52FD + -0.05FD2$$

First order condition

$$\partial y/\partial FD = 1.52 + 2(-0.05) \ FD$$

$$=1.52 + -0.1FD$$

$$-1.52 = -0.1FD$$

$$-1.52/-0.1 = FD$$

$$15.2 = FD$$