RELATIONSHIP BETWEEN TRADE LIBERALIZATION AND SKILLED UNSKILLED WAGE-GAP NEXUS: EVIDENCE FROM PAKISTAN

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CERTIFICATE

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Author's Declaration

I, Muhammad Awais Jameel, hereby state that my M.Phil thesis titled Trade Liberalization and Skilled-Unskilled Wage-gap Nexus: Evidence from Pakistan is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world. At any time if my statement is found to be incorrect even my graduation the university has the right to withdraw my Mphil degree.

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Dedication

I dedicate my thesis to my mother, father, brothers, and sisters whom love, support, and encouragement make it possible to successfully completion of this research.

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ABSTRACT

This study explores the impact of trade liberalization on the wage gap of skilled-unskilled workers by using the micro-level data in the manufacturing sector and provinces of Pakistan. According to neoclassical standard trade theory, it is generally believed that when economies are open narrows the wage gap between skilled and unskilled especially in developing economies (Avalos & Savvides, 2006; Wood, 1997), and contrary to H-O/SS, it widens the skilled-unskilled wage gap in developed economies (Artecona & Cunningham, 2002; Ghose, 2000; Hanson & Harrison, 1999; Yasin, 2007). Our study used a two-step estimation methodology. For estimation purposes, by following Menon and Van der Meulen Rodgers (2009), our study takes into account two approaches to examining the association between trade liberalization and the skilled-unskilled wage gap such as the log wage gap and the residual wage gap. Also, to calculate provincial tariffs we used the indicator provincial liberalization index by following the Topalova (2007). Our study found that the relationship between trade liberalization and wage gap is negative and statistical significant during the period of trade liberalization regime (i.e., 1990-2005) of Pakistan by using all approaches in the manufacturing sector. Trade liberalization increased wage gap between skilled and unskilled workers in the manufacturing sector. Moreover, our core results are robust to various trade-related controls. Furthermore, we also find that lagged trade policy is negatively associated with the wage gap.

Further, we find a relationship between trade liberalization and the wage gap of skilled-unskilled in provinces of Pakistan. We find a negative influence of trade liberalization on the wage gap and statistically significant. Openness to trade increases the wage gap of skilled-unskilled in Pakistan. Our findings are robust and are not sensitive to the inclusion of other control variables such as urbanization, female labor force participation, gender disparity in education. There is also a statistically significant association between the lagged trade policy and the skilled-unskilled wage gap. Lagged police increase wage gap. Our lagged trade policy results are robust and statistically significant. Our findings provide guidelines for policymakers to open the economy because

as economy open competition increase and increase the wage gap among skilled-unskilled, this can reduce by providing technical pacakage to workers that will reduce wage gap.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
CMI	Census of Manufacturing Industry
CPEC	China-Pakistan Economic Corridor
EG	Engle-Granger
EPZs	Export Processing Zones
FBS	Federal Bureau of Statistics
FDI	Foreign Direct Investment
FOP	Factor of Production
FTA	Free Trade Agreements
FLFP	Female Labor Force Participation
FLFP/MLFP	Female Labor Force Participation/Male Labor Force Participation
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GDE	Gender Disparity in Education
HIES	Household Income and Expenditure Survey
H-O	Heckscher-Ohlin
IP	Import Penetration
ISIC	International Standard Industrial Classification
ILO	International Labor Organization
IMF	International Monetary Fund
LGDP	Log of Gross Domestic Product
LGFCF	Log of Gross Fixed Capital Formation

LF	Labor Force
LSF	Labor Force Survey
LM*NEER	Lagged Import*Nominal Effective Exchange Rate
LX*NEER	Lagged Exports*Nominal Effective Exchange Rate
MFA	Multifiber arrangements
NAFTA	North American Free Trade Agreement
NTBs	Non-Tariff Barriers
OLS	Ordinary Least Square
OECD	Organization for Economic Cooperation and Development
PCT	Pakistan Customs Tariffs
PLIB	Provincial Liberalization
RE	Random Effects
RLS	Restricted Least Squares
SAP	Structural Adjustment Program
SFLF	Share of Female in Labor Force
SS	Stolper-Samuelson
UK	United Kingdom
US	United States
WB	World Bank
WDI	World Development Indicators
WLS	Weighted Least Squares
WTO	World Trade Organization
XCR	Export Consumption Ratio

CHAPTER 1

INTRODUCTION

Over the last decade, Pakistan great emphasis is laid to open their economy in order to consolidate the industrial foundation in Pakistan. The trade policies of Pakistan remained limited because of the compromised infrastructure as well political unrest. Pakistan being an agricultural economy the major emphasis was laid on the agro-based industries. Although a little development was observed in the trade policy during the end of 80s and the beginning of 90s. At this time a considerable reduction in tariff slabs was observed such as from 17% (1985) to 10% (1993) and to 6% (2015). Moreover, the most substantial reduction in tariff was practiced from 225% (1986-87) to 70% (1994-95) to 45% (2005) and quota as well other tariff barriers were also reduced. To promote the manufacturing sector effectiveness average tariff from 77% (1985) to 17%-13% (2005) was introduced by the government. Also, vigorous steps to promote exports in terms of exempting duties were taken and there were only 251 items on which export duties were not excused. Subsequently, Pakistan possessed the comparative benefit in the international market for those specific goods. Free trade agreements (FTA) with Srilanka and Malaysia are also considered as powerful steps taken for the above-mentioned purpose (Bashir & Din, 2003). Moreover, becoming a WTO member in 1995 permitted Pakistan to sign in a trade agreement on textile and clothing (T. Anwar & Iqbal, 1996).

Since the 1970s openness to trade is regarded as a core factor of any development policy at the world level. Openness is better described as "trade liberalization", reduction of barriers for the transfer of goods and the services in the international trade. Trade liberalization regime indicates the elimination of whole trade distortions involving export subsidies and import tariffs (Edwards, 1993). The benefits of liberalization with other economies increase significantly, but the effectiveness of the liberalization policy can only be confirmed by the spread of its positive impacts on the economy. In this respect, generally, the argument is made in favor of liberalization leading the economy toward a higher growth rate at the international as well nation level.

Many developing countries reduced tariff and non-tariff barriers in the 1980s and 1990s resulting in the exposure of their economies to external competition. The world economies experienced economic growth as exposed their economies for trade (Ul-Haq, Khanum, & Raza Cheema, 2020). However, the trade liberalization have a different impact on the wages of labor due to contrasting skill levels (i.e. skilled and unskilled) and in turn affected the wage inequality too (Goldberg & Pavcnik, 2003; M. U.-H. Wu, Jabbar Zafar, Naeem Uz Sun, Huaping Jiang, Jingyu 2019).

The issue of the effect of trade liberalization on the wage gap have fascinated considerable attention see, (Anderson, 2005; Desjonqueres, Machin, & Van Reenen, 1999; J. Haskel & Slaughter, 2001; Katz & Murphy, 1992). The enhancement of the wage gap among the skilled-unskilled workers has been observed in several countries (especially Latin American countries) as exposed their economies during 1980s. A large body of research pointed out that openness to trade has contributed to an increase in the wage gap

(Arbache, Dickerson, & Green, 2004; Goldberg & Pavcnik, 2004a; Williamson, 1997). According to existing exploration in labor economics, trade liberalization is found to be a major influencing factor of the labor class. Trade liberalization differently affects the labor force because the access to resources as well activities depend on labor skill level (skilled & unskilled) (Sauré & Zoabi, 2014). Openness to trade also changes the income distribution pattern due to diverse skills of labor. Moreover, it also alters the goods relative price, and this variation alters the incentives and in turn, encourages the reallocation of a factor of production among the sectors. Consequently, this brings a change in employment and labor earnings which in turn influence the wage gap of skilled-unskilled workers (Aguayo-Tellez, 2012). Generally, it is predicted that trade liberalization might participate to enhance the gap between the low and high-income groups thus increasing the wage gap among the skilled-unskilled workers in an economy (Galiani & Sanguinetti, 2003; McNabb & Said, 2013).

Another possible explanation related to this phenomenon is that openness to trade has introduced higher and advanced level technology, which needs the use of more skilled workers. The cost of imported goods (capital) depends on the tariffs that are incurred by the purchaser of goods. Therefore, liberalization of trade may lead to the decrease of import tariffs, which reduces the cost of the capital goods and leads toward the more use of capital goods. As the high-level complementarity exists between the capital and skilled workers, as well as the high level of substitutability between the capital and unskilled labor. Thus, if both categories of labor supply are constant, the skilled labor demand would enhance and unskilled labor demand would decrease, which widens the skilled unskilled worker's

wage gap (Attanasio, Goldberg, & Pavcnik, 2004; Galiani & Sanguinetti, 2003; Li, 2009). All of these may transform into larger unemployment for the unskilled worker and worsened the income distribution and eventually worsen poverty (Beyer, Rojas, & Vergara, 1999).

A prominent examination of the impacts of openness to trade is presented by Krueger (1990) and argues that openness will commonly compress the skilled-unskilled wage gap in developing economies. This reasoning builds from the Hecksher-Ohlin Stolper-Samuelson theorems as the theoretical association between trade liberalization and wage gap based on Hecksher-Ohlin's (H-O) theory. The model assumes that the factor of production is the unskilled and skilled labor- two countries i.e. developed and less-developed and both are producing skilled-unskilled-labor intensive products. The extended Stolper-Samuelson (SS) theorem states that trade liberalization will benefit the relatively abundant factor of the country. In developing nations, the relatively abundant factor is unskilled labor. So, the developing nations have a comparative advantage in the production of abundant factors i.e. unskilled labor. Therefore, trade liberalization will enhance the unskilled labor demand and thereby its wage (Stolper & Samuelson, 1941). Consequently, this practice narrows the skilled-unskilled wage gap as well as income inequality (Meschi & Vivarelli, 2009). The East Asian in the 1960s-1970s have practiced the same with this prediction. But some Latin American nations have opposite practiced since the mid of 80s: liberalization looks to have enhanced wage inequality (see e.g. for Columbia, Attanasio et al. (2004); for Mexico, Hanson and Harrison (1999); for Argentina, Galiani and Sanguinetti (2003); and for East Asia, Wood (1997)). Many OECD nations have practiced an

increasing wage dispersion taking place in the US and UK during the last two decades. Specifically, in these economies, more increase in wage gap by the educational level is observed (Bound & Johnson, 1992; Katz & Murphy, 1992; Machin, 1996; Schmitt, 1993).

However, the existing studies reported the impact of trade liberalization on the skilled-unskilled wage gap is mixed (Murakami, 2021; Williamson, 1997), especially in the developing economies impact is puzzling (Arbache et al., 2004). On the one side, various developed and less-developed nations have practiced a significant increase in wage gap as a result of trade liberalization (S. Anwar & Sun, 2010; Durevall & Munshi, 2006; Kremer & Maskin, 2006; Marjit & Kar, 2005). The study of Betrán, Ferri, and Pons (2007) has contended that trade liberalization caused to increase in the wage gap of skilled-unskilled workers from 1880 to 1913. Several studies revealed the positive impact of tariffs on the wage inequality (e.g., (Attanasio et al., 2004) for Colombia; (Dutta, 2007) for India; (Falcone & Galeano, 2017) for Argentina; (Ferreira, Leite, & Wai-Poi, 2007) for Brazil; (Galiani & Porto, 2011) for Argentina; (Goldberg & Pavcnik, 2005) for Colombia; (Paz, 2014) for Colombia; and (Revenga, 1997) for Mexico). On the other side, other empirical studies found no significant association (Feliciano, 2001) for Mexico; (Pavcnik, Blom, Goldberg, & Schady, 2004) for Brazil; (Hasan & Jandoc, 2010) for the Philippines). Furthermore, other studies surprisingly found inverse relation for instance, by using the general equilibrium model the study of Mitchener and Yan (2010) studied the wage gap of skilled-unskilled in China in the 20th century. The study claim that in early period of 20th century, the exports of China became more unskilled-labour intensive and later during the 1920s, skilled-unskilled workers wage gap fell approximately 8% in China. Moreover,

some studies Amiti and Cameron (2012); Galiani and Porto (2011); Kumar and Mishra (2008) also found that trade liberalization resulted in reducing the wage gap of skilled-unskilled worker in manufacturing industries for Indonesia, Argentina, and India respectively. However, the conflicting empirical evidences has sparked a heated debate about the effect of trade liberalization on the wage gap of skilled-unskilled workers.

The main focus of this study is to identify the wage gap between skilled and unskilled workers in Pakistan. In previous studies of Pakistan, Salman and Javed (2011) and Yasmin (2009) studied the effect of trade liberalization on wage inequality among professional and unskilled people using two labor force surveys (LFS-1996 & LFS-2005) and (LFS 1990-1991 & 2005-2006), and these studies used import penetration ratio, export penetration ratio and comparative price for trade liberalization measures respectively. The following are the drawbacks of previous studies that used different proxies rather than import tariffs. According to M. Wu, Ul-Haq, Zafar, Sun, and Jiang (2019) first drawback of Salman and Javed (2011) is that they only used seven industries for the study and used that kind of data which is easily available in government publications. To calculate industry-level trade-related variables, they did not use product-level data. The second shortcoming is that they used exports and imports related measures of liberalization, it is demonstrated that there is the problem of over-invoicing and under-invoicing in exports and imports data of Pakistan specifically. Thirdly, they utilized only two data sets from the labor force survey. According to Goldberg and Pavcnik (2005), (imports, export, product prices when data on prices available, growth of exports and imports, price indices of imports and exports) these measures are extremely arguable because generally these

measures used in the empirical literature while using these measures as independent variables in regression models causes simultaneity biases and there are theoretical issues in explanation.

Moreover, Khalid (2019); Ullah et al. (2020) also used trade ratios and average weighted tariff as a proxy for trade liberalization. In Pakistan, as previously mentioned there is the problem of under-invoicing and over-invoicing. In Pakistan Mahmood (1997) investigated the problem of under-invoicing. Under invoicing is related to import problem and over-invoicing is related to exporter problem, Mahmood and Azhar (2001) used data to investigate over pricing problem and one study conducted by M. A. Sheikh (1974) in which used data of 1965-68 import data of Pakistan in which study addressed the problem of under-invoicing. So, due to the problem of under-invoicing and over-invoicing trade ratios and weighted average tariffs cannot show the true picture. We are using a reduction in import tariff proxy for trade liberalization that is a better proxy in comparison to preceding studies (Casabianca, 2016; Di Comite, Nocco, & Orefice, 2018; Goldberg & Pavcnik, 2005; Gonzaga, Menezes Filho, & Terra, 2006; Murakami, 2021; Ul-Haq et al., 2020; M. U.-H. Wu, Jabbar Zafar, Naeem Uz Sun, Huaping Jiang, Jingyu 2019).

Our research is notable because it contributes to the research era. It provides evidence about either wage gap of skilled-unskilled decreases or increases in response to liberalization by utilizing the proxy of reduction in import tariffs in the manufacturing sector (9 manufacturing industries) and in provinces of Pakistan (disaggregated level) during trade liberalization regime as a sample period 1990-2005.

In addition, openness to trade brings several benefits for the economies especially for the developing countries mainly for two reasons. The first reason is that the liberalization in trade in the developing countries has led to a decline in the price of inputs used by the producer as well as a decrease in the consumer goods prices. Secondly, a decline in tariffs in the markets of the developed countries has led to an increase in the demand for exports by a developing country. Though gain from trade liberalization in the case of developing countries is little or negligible because developed countries show biasness and give more market access to least developed countries (Siddiqui, 2009).

1.1   Research Gap of the Study

The prevailing literature recorded that to explore the relationship between the trade liberalization and wage gap among the skilled-unskilled workers no study exists in the case of Pakistan that used the better proxy of import tariffs to measure the core impacts of trade liberalization. Numerous proxies exist in the literature some of these are on outcome-based measures such as adjusted trade flows measures, trade ratios, and price-based measures. Whereas some are policy-based measures like tariffs measures, non-tariff barriers measures, and composite indices measures. All of these measures have their own advantages as well disadvantages such as trade ratio is the most commonly used proxy of openness which is computed as exports plus imports to GDP. But the problem of under-invoicing, as well as over-invoicing, exists in poor economies in which Pakistan is also included (Bhagwati, 1964; Mahmood, 1997; Mahmood & Azhar, 2001; M. A. Sheikh, 1974). Thus, the literature concludes that the proxy of trade ratio for openness to trade does not hold the true image. So, for openness to trade this study used the measure of import

tariffs that is deliberated as a better proxy in comparison to previous ones (Di Comite et al., 2018; Gonzaga et al., 2006; Ul-Haq et al., 2020; M. U.-H. Wu, Jabbar Zafar, Naeem Uz Sun, Huaping Jiang, Jingyu 2019).

The adoption of import tariffs gives extra benefits over the prevailing research in which other measures like import penetration, export consumption ratio, and relative prices are utilized. It measures a better picture in comparison to Sachs & Warner index (1995) as well trade adjusted ratio (which is residual gained by estimating the relationship of openness) as it is more direct. The key reason for choosing tariffs is that the possibility of measurement error is a little bit and also it denotes policy (Casabianca, 2016; Goldberg & Pavcnik, 2005; M. Wu et al., 2019).

1.2 Rationale of the Study

Our study added to the existing literature of Pakistan in the subsequent ways: First, this research takes the reduction in import tariff as a proxy for trade liberalization which is considered as a better indicator in comparison to existing studies (i.e., Khalid (2019); Ullah et al. (2020) that utilized the trade ratios proxy for trade liberalization) on Pakistan which examined the trade openness effect on the wage gap. Second, more disaggregated data (i.e., province-level and sector-level panel data) is used to clarify the existing inconclusive evidence among the trade openness and wage gap of skilled-unskilled workers in comparison to previous studies (used annual data) for investigation. Third, we explore the trade liberalization impact on the skilled-unskilled wage gap in the manufacturing sector[1]

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[1] See appendix for detail of manufacturing sectors.

and in provinces[2] of Pakistan. Fourth, we utilize the trade liberalization regime (1990-2005) for the estimation. Fifth, we use the two approaches for the estimation of the skilled-unskilled wage gap (i.e., the log wage gap and residual wage gap) in our study which has not been used in the case of Pakistan.

1.3   Objectives of the Study

The objective of our study is to empirically estimate the relationship between trade liberalization and the wage gap of skilled-unskilled.

The following are the sub-objectives.

➢ To examine the impact of trade liberalization on the skilled-unskilled wage gap in the manufacturing sector of Pakistan.

➢ To investigate the impact of trade liberalization on the skilled-unskilled wage gap in provinces of Pakistan.

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[2] Our study used the provincial tariffs data to study the nexus between trade liberalization and the skilled-unskilled wage gap at the province level. For provincial tariff data, following Castilho, Menéndez, and Sztulman (2012), we adopt the Topalova (2007); Topalova (2010) approach to calculate provincial tariffs from the sectoral tariffs. Topalova (2007); Topalova (2010) is a well-known approach to calculating provincial tariffs from the sectoral tariffs. Also, to calculate provincial tariffs we used the indicator PLIB by following Topalova (2007).

1.4   Research Questions

Research questions are the sub-objectives that must be answered. The following are the research questions of our study.

1. What is the impact of trade liberalization on the skilled-unskilled wage gap in the manufacturing sector of Pakistan?

2. What is the impact of trade liberalization on the skilled-unskilled wage gap in provinces of Pakistan?

3. What is the policy recommendation from this study?

1.5 Rationale for education as a proxy

Kumar and Mishra (2008) use education indicator to define skilled and unskilled labour. Based on completed years of schooling, workers are divided into three categories: (i) primary or less: at most 5 years of schooling, (ii) middle or secondary: 6–10 years of schooling, and (iii) higher secondary or more: at least 11 years of schooling.

Attanasio et al. (2004) identify three main channels through which the wage distribution was affected: increasing returns to college education, changes in industry wages that hurt sectors with initially lower wages and a higher fraction of unskilled workers, and shifts of the labor force toward the informal sector that typically pays lower wages and offers no benefits. we define four education indicators: no completed education, completed primary school, completed secondary school, completed college (university degree).

Katz and Murphy (1992) found results on base of education that services outsourcing created an increased demand for both men and women who were graduates from college.

Mamoon and Murshed (2013) define skill was computed by the initial level of skill proxies by the average years of schooling for 25 aged population in 1965. When better educated societies open up their economies, increased trade is likely to induce less inequality on impact because the supply of skills better match's demand. Clearly, the notion of 'skilled' and 'unskilled' workers differs across countries. In less developed economies, those at the top of the earning distribution often have no more than a secondary qualification. Yet, they have skills that will be enhanced by the arrival of new technologies, thus increasing their wage relative to that of uneducated workers.

Goldberg & Pavcnik, (2005) also using the information on the highest completed grade, we define four education indicators: no completed education, completed primary school, completed secondary school, completed college (university degree).

1.6   Layout of Thesis

Our research work is comprised of six chapters. Chapter one is about the introduction of our research work. Chapter two describes the literature review related to trade openness and the skilled-unskilled wage gap. Chapter three gives the theoretical framework. Chapter four provides the research dataset, trade policy, and methodology. Chapter five describes the empirical results. The last chapter concludes the research work and some suitable policy suggestions.

CHAPTER 2

LITERATURE REVIEW

This chapter comprehensively discusses the empirical literature review about the association between trade liberalization and the skilled-unskilled wage gap with diverse findings of the empirical literature. The chapter is comprised of three sections. 2.1 section discusses the literature review of international studies and 2.2 section about national studies. Section 2.3 about the literature review summary is at the end.

2.1   Literature Review

The potential and justifications for the wage effects of trade may be enhanced by exchange with average income or emerging nations who have very different factor properties from those of industrialised ones (Xu & Ouyang, 2015).

In previous literature, two leading explanations for the root reasons of wage inequality is increasing. First is a skilled-biased technological change increases the relative demand and income of skill workers. For both rich and developing nations, this wage impact of technology progress has been extensively studied. For instance, according to

Leamer (1998); Feenstra and Hanson (1999); J. E. Haskel and Slaughter (2002), skills-biased engineering development in the skill-intensive sector has been a major contributor to talent wages in the United States and other OECD countries (Acemoglu, 1998; Cragg & Epelbaum, 1996; Wood, 1994).

Trade-related variables, particularly freer global trade, are the second reason. The S-S theory is found to better fit the empirical findings for developed nations in many literatures that study the impact of global trade on skill premia. J. Haskel and Slaughter (2001) find change in price, not technological advancements, was the main factor contributing to increase the wage disparity in the UK in the 1980s , Borjas and Ramey (1994); Feenstra and Hanson (1999) found that increases international competition explain more of the increase in wage inequality in the United States.

However, experimentally data for growing nations is much erratic. If the S-S theory is accurate, then expanding trade with developed nations tend to increase the cost of goods produced using many plentiful resources i.e unskill labour in developing nations and further narrow wage gap (Esquivel & Rodrıguez-López, 2003; Gonzaga, Terra, & Menezes-Filho, 2001; Robertson, 2004). However, some research indicate that for some emerging nations, wage disparity had grown during the process of trade liberalisation. Their findings are the result of either the capital-skill complementarity that was accelerated by liberalisation, increasing the relative demand for skilled labour (D. J. Robbins, 1996), or the export-oriented development of skill-oriented technology that may have increased the relative demand for skilled workers and skill insurance premiums in developing countries (Arbache et al., 2004; Goldberg & Pavcnik, 2004b; Robertson, 2000). Or because

of the fact that changes in commercial policy, such as tariff cuts, can disproportionately harm low-skilled industries and widen the wage gap between skilled and unskilled workers.

The nexus on openness to trade and skilled-unskilled wage gap in empirical literature does not yield a clear image as suggested by Attanasio et al. (2004); Galiani and Sanguinetti (2003); Bigsten and Durevall (2006); Ullah et al. (2020); Murakami (2021); Wood (1997). Moreover, the study of Hanson and Harrison (1995) created a connection between the wage gap of skilled-unskilled workers and the trade liberalization. This study used data from 1984 to 1990 for Mexico country. The proxy of the tariffs utilized for openness to trade. The study showed that trade liberalization increased the wage gap of skilled-unskilled labor.

Hanson and Harrison (1999) explored the role of trade liberalization in affecting the wage gap of skilled-unskilled workers in Mexico during the period of 1984-90. Tariffs was taken as the proxy for openness to trade. The result showed that Mexico with the tariffs reduction leads towards the enhancement of wage gap of skilled and unskilled workers.

D. Robbins and Gindling (1999) shed light on the argument made by Krueger (1990), in less developed nations trade liberalization compresses the skilled-unskilled wage gap. This perceptive is generated from the HOS theorems. The study does not support the HOS hypothesis.

Gonzaga et al. (2001) analyzed does skilled-unskilled wage gap of workers reduce through liberalization by using data from 1988 and 1995 in Brazil. The Weighted Least

Squares Regressions approach was used to estimate the model s. For openness to trade used a proxy of tariffs. This study recorded that with the enhancement of openness to trade, the skilled-unskilled wage gap significantly increased.

D. J. Robbins (2003) explored the influence of liberalization of trade on Colombia's (seven principal cities) relative wages pattern. The research has taken the period of 1976 to 1999 by taking the Household survey dataset for the seven cities of Colombia that involve individual information characteristics as well the participation of labor force. Those characteristics involve sex, age, educational attainment, and for those working- their occupation, wages, codes of industrial activity. The study to measure the trade liberalization proxy of tariffs was utilized. Results showed that the enhancement of the openness in Colombia resulted in the increase of the relative wages or wage skill gap. These findings are matched with the author's prior work for Colombia and the other less-developed nations.

Galiani and Sanguinetti (2003) inspected the effect of openness on the wage inequality among employees in Argentina. The study used industry data, disaggregated at two digits SIC stage from 1991-1999 and workers is divided into skilled and unskilled groups. The import penetration ratio used as a proxy for trade openness. Thus, the study concludes that wage inequality increased due to the liberalization of trade.

Attanasio et al. (2004) shed light on trade liberalization's effect on the industry wage structure in Brazil by taking the period of 1984 to 1998. The study used second-level regression in first variations and weighted least squares to estimate the model. The study used various education indicators such as no complete the education, the primary school

completed, the secondary school completed, university degree completed. Results revealed no significant relationship between trade policy variation and industry wage premiums variation or between the specific industry skill premiums to the university graduates and the trade policy. Thus, openness to trade did not contribute to enhance skilled unskilled wage inequality of workers via the industry wage premium variations.

Akhmedov, Bessonova, Cherkashin, Denisova, and Grishina (2005) analyzed the effect of trade openness adjustment cost in Russia by scrutinizing the trade policy impact in the 90s on the volatility and level of employment and the wages. The research has studied the labor supply and demand links and addressed the three questions. (i) how the firm's labor demand respond to the trade shocks? (ii) trade development effect on the wage dispersion across the sector? (iii) impact of openness to trade on the skilled-unskilled wage gap.   This study utilized the Russian balance sheet of the medium and large enterprises during the period 1995 to 2001 to explore the equation of labor demand and to compute the employment change as a result of several shocks in tariffs and the output. The study sample comprised of enterprises of 53 thousand and is representative of industry level and nationally. Openness is expressed by the tariffs. The result founds little magnitudes of labor demand responsiveness to the openness shocks, both via the indirect influence of changes in output as well as directly via the effect of the import penetration and tariffs. This suggested that trade liberalization expected adjustment costs in terms of variation in labor industrial demand not high. Moreover, liberalized trade does not have a significant influence on wages. And the most concerned question related to our research this study finds that tariffs reduction leads to an increase in the skilled-unskilled wage gap.

Mishra and Kumar (2005) studied the impact of the liberalization of trade on wage differential in India by using tariff reductions. The study used the sample of 1980–81 to 1999–2000. The study find a negative as well robust association within trade liberalization and industry wage premium. Since reduction in tariff were proportionally greater in industries that employed a large number of unskilled workers, the enhancement of wage premium implies that less-skilled workers practiced the rise in their wages was higher as compared to the skilled labor. The results showed that larger reductions in tariffs leads toward the reduction of wage inequality.

Bigsten and Durevall (2006) used a cointegration econometric strategy to probe whether trade openness affects wage inequality in Kenya for the years 1964 to 2000. To measure wage inequality this study used the wage ratio in manufacturing to the wages in agriculture, which is the sectoral indicator of wage inequality or skilled-unskilled wages proxy. Results suggested international integration has decreased the wage gap.

Kijima (2006) studied the effect of liberalization of trade on the inequality in income and wages in India. The findings were that the wage gap started to increase even before the trade reforms of 1991. The main factor leading to an escalation in the wage gap was the rise in the revenues to different skills. The reason for the quickening profit to the skills was the increased demand for the labor that was skilled.

Aleman-Castilla (2006) analyzed the influence of openness on the informality as well as wage gap using data of the import tariffs of Mexico and the US combined with the survey period 1989 to 2002 (Mexican National urban Survey). The dynamic industry model used involving the heterogeneity of firms. The findings of the paper were that the

removal of import tariffs would lead to a decrease in informality as it would be more gainful and profitable for some firms to go to the formal sector. As a result of this, the firms in the informal sector which were not very productive will exit and this will, in turn, cause the formal firms that are most productive to involve in trade. The study concluded that the removal of import tariffs by Mexico led to a rise in real wages. The findings were that the removal of import tariffs by the US led to a rise in the wage differential in both the formal as well as informal sectors.

Glick and Roubaud (2006) explored that the Export Processing Zones (EPZs) employment raised the wages of women in Madagascar specifically those who were unskilled and would have been employed in the informal sector otherwise. The period used by them was from 1995-2002. The research concluded that even though wages in EPZs could be compared to the wages in the informal sector but in Madagascar's case, EPZs are represented by long working and large turnover, affecting the well-being of females considerably.

Durevall and Munshi (2006) studied the effect of liberalization in trade on the wage differential of skilled- unskilled workers in the textile industry of cotton in Bangladesh during 1973-2002. Augmented Dickey-Fuller (ADF) test was used to check the stationary of the variables. The study explained that the trade liberalization reforms did not increase the inequality in wages. The study included four measures for the estimation of this relationship which were the ratio of manufacturing prices (the USA to Bangladesh), imports + exports ratio to GDP, aggregate exports ratio to GDP as well as consumer goods

imports to consumption ratio. All the results concluded that the liberalization in trade caused a technical change that was positive but had no impact on the wage gap.

Chamarbagwala (2006) examined the rise in the wage differential according to skill and a decrease in the gender wage gap in India in two decades that also overlap with the trade and economic liberalization. The methodology used for the study is the nonparametric model by Katz and Murphy (1992). The findings of the study are that the shifts in demand led to shifts in relative wages. Skill promotion and up-gradation among industries led to an increase in the demand of skilled labor. In the manufacturing sector, international trade favored the men who were skilled whereas it hurt the skilled women. Also, services outsourcing created an increased demand for both men and women who were graduates from college.

Dutta (2007) examined that the reduction in tariffs negatively impacted the wages of unskilled workers as well as the inequality in wages overall. Moreover, the discrimination in living standards has existed according to different castes between Indian females in the initial years of trade liberalization, even though there was progress in the attainment of education (Deshpande, 2007).

Acosta and Gasparini (2007) examined the nexus among trade liberalization, capital accumulation, and wage inequality between the skilled-unskilled workers in Argentina. This paper used the sample of 1990-2001 to explore the correlation of the study variables. 2-digit ISIC classification was utilized to sector classified and this was matched to correspond to fourteen sectors utilized for the measure of capital accumulation. The analysis of the study found the skilled-unskilled wage gap has widened.

Abdi (2007) argued that technological variations, relative factor supplies, and trade liberalization have played a major role in bringing changes in the unskilled worker's relative wage. But the empirical studies remain to focus on industries countries and attention to less-developed nations is little. So, for that, this study used a special dataset to explore the behavior of relative wages for a large number of less-developed nations. As indicated by technology explanation, empirical analysis founds a negative significant association between the unskilled worker's relative wage and technology index. However, the study does not find a significant role for the trade liberalization or labor supplies in influencing the skilled-unskilled relative wages of workers.

Van Long, Riezman, and Soubeyran (2007) inspected the association between the wage gap, trade, and human capital accumulation. This study develops a new framework for analyzing the trade liberalization impacts on welfare and the wage structure. The study also explored the liberalization effect on the unskilled-skilled wage gap of the workers. The findings showed that trade liberalization raised the wage gap of skilled-unskilled laborers.

Ghazali (2009) inspected the trade reforms' impact on the Tunisia skilled-unskilled wage gap from 1975 to 2002. In this research three proxies are used such as the ratio of export relative to sector value-added, the ratio of import relative to sector value-added, and customs duties on imports for trade openness. Random Effects (RE) econometric technique used to consider the correlation of skilled-unskilled wage gap and trade liberalization. The

empirical evidence indicates that openness to trade contributes to enhancing the wage gap within the skilled-unskilled labor.

Örnek and Elveren (2010) aimed to explore the association between income inequality and trade liberalization in Turkey. The period of the study was taken 1980-2001. Total trade to GDP is used as an indicator of openness measure. Engle-Granger's (EG) cointegration test was used to analyze this relationship in Turkey. The study seemed to do not support the scene that trade openness has driven to improve the wage gap.

S. Anwar and Sun (2010) studied the effect of openness to trade on the wage gap of skilled- unskilled workers in China and used panel data of Chinese firms in 2003, 2006 & 2007. The study used Eintensity "(the average export intensity & its standard deviation)" proxy for trade openness within 4-digit enterprise classification. The effects confirmed that liberalization had contributed to growth in professionals in addition to the wage gap of unskilled in China. On the opposite side, elevated marketplace opposition had contributed to a lower in salary hole. In this paper, the empirical evaluation suggested that the results of company traits on salary hole in China is significant. A simple general equilibrium model was used in estimation. The empirical analysis given in this study revealed that the wage gap between unskilled-skilled workers increased as a result of openness.

Rahman (2011) considered trade liberalization's impact on the wage disparity by using the sample period of 1998 and 2006 in Egypt. The findings of this study indicate the positive effect on the wage groups and across all the sectors, but the magnitude of this effect differs relying on the wage level and industry. It shows that liberalization favors the

relatively high and small waged sectors to the loss of low and large waged ones, that way, escalating prevailing wage disparities.

Salman and Javed (2011) investigated the role played by trade liberalization in shaping the wage structure of Pakistan and used cross-sectional data set including the years 1996 and 1997, 2005 and 2006 from LFS. OLS regression used to estimate the model. The study used three measures import penetration ratio, export penetration ratio and comparative prices representing the introduction of trade reforms for the manufacturing sector, and used inter-sector and time variability, so one can look at the impact on wage rate primarily based totally on the extraordinary stage of skills. The study estimated that the effect of import penetration on wages of unskilled labor was negative and on skilled workers was positive while there has been no effect on the wage of semi-skilled people. They concluded that trade liberalization enlarges the inequality in wage which is conflicting to the Stolper-Samuelson theorem and also differ from the case of India as well Bangladesh.

Amiti and Cameron (2012) studied the association between the protection rate and the wage gap of the skilled-unskilled workers in manufacturing sector of Indonesia. The study utilized the tariffs to measure trade liberalization. The result indicate that wage gap of the skilled-unskilled workers reduced due to the reduction in the tariffs structure in Indonesia.

Munshi (2012) examined the relationship between trade openness and skilled-unskilled wage inequality by utilizing the panel data 1975-2002 from Bangladesh. The

study used price based measure for openness and fixed effect and 2SLS method. The research revealed the openness to trade contributed to decrease in wage gap.

Mehta and Hasan (2012) contended the importance of trade on the wage inequality of the skilled unskilled workers by an adopted dataset for this research comes for the years 1993 and 2004. Tariffs and non-tariff barriers are utilized as a trade liberalization proxy. A two-step estimation methodology was applied. The results seemed that wage inequality increased with the expansion of trade.

Chen, Yu, and Yu (2013) explored the influence of openness to trade on wage inequality among the skilled-unskilled workers in manufacturing sector of China. The study used firm level production data and OLS and 2SLS econometric technique. This research obtained the skilled-unskilled wage gap using the total profit of firm as its profitability proxy and profit-sales of firm used as an alternative proxy of wage inequality of firm and further take additional step to indicate the wage inequality as the ratio between the skilled-unskilled wages. Input and output tariffs is taken for the measurement of trade liberalization. The outcome show that openness widens the wage gap of the skilled and the unskilled workers in China.

The unique study of Mamoon and Murshed (2013) identified the correlation of trade openness and wage inequality by considering the unskilled-skilled worker's wage gap. The research covered the sample of 1963-1999 for the less developed economies. Skill65 was computed by the initial level of skill proxies by the average years of schooling for 25 aged population in 1965. The proxy for openness to trade is utilized based on the outcome as well policy-based measures and through Ordinary Least Squares and IV

econometric technique to estimate the trade effects on wage gap of skilled unskilled. The result showed that openness to trade exacerbated the wage gap between the skilled and unskilled.

McNabb and Said (2013) probed the nexus between wage inequality and trade openness in the case of Malaysia. To explore this relationship study take the sample of 1984, 1989, 1992, 1995, and 1997 and used individual data from the Household Income and Expenditure Survey (HIES) from Malaysia. Import and export penetration was utilized as an indicator of trade openness. The examiner determined that openness had an immoral impact on wages for the highly professional educated. The parameter predicted confirmed that the salary has been on average, 29 percentage lesser for people with the highest-stage qualifications as compared to people with no qualifications. Similarly, people with intermediate qualifications have been paid 17% less. The effects advised that there have been a marked shift in relative call for in the direction of a lesser professional corporation and an increment in salary equality in the countries maximum open to elevated opposition in worldwide markets. The result found that liberalization of trade was associated with the increase of wage inequality.

Hendy and Zaki (2013) calculated the effect of the policies of liberalization of trade on the disparity in wages in Egypt. Labour is broken down into eight parts including the dimensions such as skill, geography, and gender. The study concluded that the influence of trade liberalization policies is dependent on the features of individuals as well as the working sector. The growth in garments, services, and textiles led to a decrease in the inequality among the skilled men in both the rural and urban areas and also among the

unskilled and skilled women employed in urban parts. As opposed to this there was an increased inequality between the skilled females and unskilled males in rural zones.

Xu and Ouyang (2015) empirically examined the effect of openness to trade and technology on wage inequality for a panel of 28 production sectors in China over the sample 2002 to 2011 and the 2-stage least square approach used to evaluate. The outcomes found that the effect of modification of the percentage of SOEs changes into twofold. Firstly, the compression of SOE's advanced profitability development and the advancing effect was ability-biased which could in general increment the skill premium in China. Second, the fall of product costs coming about because of decreasing of SOEs percentage changed into highly brilliant in knowledge-focused businesses, that moderated wage disparity via product costs.

Ul-Haq (2016) studied the impact of trade liberalization on the industry wage premium in Pakistan. This study used the reduction in protection rate as a proxy for trade liberalization by following the trade liberalization regime of Pakistan. The study found that openness to trade reduced the industry wage premium in the case of Pakistan.

Di Comite et al. (2018) analyzed the trade liberalization influence on the skilled-unskilled wage gap in the existence of the vertical linkages in production fixed cost. The study panel data was taken that involved 17 OECD nations during the period of 1996 to 2005. The proxy for the measurement of openness is the tariffs and OLS and 2SLS methodology were taken. The study reported that it does not found a sign that the trade reforms funded to reducing the wage gap.

Lupindra (2019) investigated the impact of openness to trade on the wage inequality during the period of 2003 to 2013 in Indonesia. Protection rate reduction used as a proxy of openness. The upshot of the study is that reducing tariffs increased the wage inequality among the workers.

Khalid (2019) studied the relationship between workers earning and trade reforms in manufacturing sector of Pakistan using the 14 rounds of LFS during the sample period of 1995 to 2015. Output and input tariff used to measure trade liberalization by taking the trade weighted average. OLS econometric technique used to estimate the trade reforms effect on the workers earning. The result reveal that the tariff reduction increases the real wages of workers concerning to intermediate products while no effect found for final products of the manufacturing sector.

Ullah et al. (2020) analyzed the relationship between forecasting wage inequality and openness to trade in the case of Pakistan and expected that currently trade reforms to CPEC are projected to decrease the wage gap of skilled-unskilled workers. The proxy utilized for openness is the trade ratio. The study utilized the Artificial Neural Network approach to explore the relationship between the concerned variables of the study. Forecasting results from 2019 to 2026 revealed the dynamic trend of wage inequality due to trade openness.

Raheem (2020) examined the impact of trade liberalization on the gender wage gap in Pakistan by using micro-level data from 1990-2005. The study used the two-step estimation approach. Two approaches have been used for the gender wage gap. The first one consists of estimation of gender industry wage premium whereas the second one

comprises of real log weekly gender wage gap as the dependent variable. The results showed that trade liberalization (measured through import tariffs reduction) and the gender wage gap are associated. The results confirmed that trade openness reduced the gender wage gap and the results are in line with the findings of the Stolper-Samuelson Theorem. The findings of this study are robust to different trade-related measures. In order to lessen the gender wage-gap government should design certain policies that could contribute positively to increasing trade liberalization.

Cruz, Milet, and Olarreaga (2020) scrutinized the impact of online trade on the skilled-unskilled wage gap by taking the sample of 22 developing economies. The study used the sample of 1960-2014. The result indicates that 1% rise in online export share to GDP decrease the 0.01% of wage gap of skilled-unskilled workers.

Murakami (2021) probed the liberalization effects on the skilled-unskilled wage inequality in Chile. The data used in this study for the years 2000, 2003, 2006, and 2009. Trade openness is measured by using a proxy of tariffs. The upshot is that increasing the wage inequality of skilled-unskilled labor.

Aslam (2021) examined the effect of trade reform of the formal-informal wage gap in the case of Pakistan from 1996 to 2005 which considered the trade liberalized time period by using the two-step estimation on micro-level data. The study used three approaches to check the sensitivity of the findings. The study concluded that trade liberalization has an impact on the wage differential of a formal-informal sector on the observable characteristic and also on the unobservable characteristics. In Pakistan liberalization will increase the formal and casual wage difference of the explained part and

also increase the wage gap of an unexplained part which is commonly known as the discrimination part. After the inclusion of several trade-related variables, the effects are strong and intensive by using the different approaches.

Usman (2021) explored the effect of trade liberalization on residual wage gap across the region, as well as across sectors in Pakistan using micro-level from 1990-2005. Oaxaca and Blinder decomposition methodology used. The results show that trade liberalization increased the residual wage gap in both regions and sectors. An import tariff is used as a proxy for liberalization. Check for the robustness the study included control variable by using control variable result are statistically significant and robust. The finding of this study related to Menon and Van der Meulen Rodgers (2009) in the manufacturing sector and contradict to Rey (2013) across the region.

2.2   Literature Review Summary

As exposed by the exclusive researchers and authors in the above literature, there is passionate research on going over whether trade liberalization is destructive or beneficial for a skilled-unskilled wage gap of the worker. In the existing literature, the trade liberalization's effect on the skilled-unskilled wage gap is inconclusive (Murakami, 2021; Salman & Javed, 2011; Yasmin, 2009). The literature review concludes that several studies examined the nexus of trade liberalization and the unskilled-skilled wage gap of the workers by using as proxy exports plus imports to GDP for trade liberalization (Salman & Javed, 2011; M. R. Sheikh, Rauf, Hussain, & Abbas, 2021; Yasmin, 2009). And few studies are available on the proxy of import tariffs with mixed findings. The literature about trade liberalization and the unskilled-skilled wage gap that used import tariffs as a proxy for

trade liberalization (Attanasio et al., 2004; Di Comite et al., 2018; Gonzaga et al., 2006; Kumar & Mishra, 2008; Murakami, 2021; Rahman, 2011; Ul-Haq et al., 2020; M. Wu et al., 2019). However, the core proxy for trade liberalization is neglect in the current literature of Pakistan that is import tariffs. Our study used import tariffs (as a proxy for trade liberalization) is not used in Pakistan as yet in the context of the skilled-unskilled wage gap. Moreover, in the existing literature, no one study explores the nexus between trade liberalization and skilled-unskilled in the manufacturing sector and across provinces in the context of Pakistan. Concerning to this literature only time series studies are available in the case of Pakistan. This gap fills our study by investigating the impact of trade liberalization on the skilled-unskilled wage gap both at the sectoral level and across provinces. Moreover, concerning to estimation method time series econometric technique such as ARDL, etc. has been used in the literature of Pakistan. So, to the best of our knowledge, our study is the first one that uses the two approaches for the estimation of the skilled-unskilled wage gap (i.e., the log wage gap and residual wage gap) in our study which has not been used in the case of Pakistan.

CHAPTER 3

THEORETICAL FRAMEWORK

This chapter presents the theoretical association of trade liberalization and the wage gap of skilled-unskilled, which is section-wise allocated as section 3.1 describes the theoretical framework of the study and section 3.2 describes the theoretical background of trade liberalization.

3.1   Theoretical Framework

The theoretical relationship between trade liberalization and wage gap exists based on the standard Heckscher-Ohlin (H-O) theory, which describes that a nation exports those products in which an economy used the abundant factor intensively and imports those products in which its scare factor is used intensively (Leamer, 1995; Wood, 1997). Although, in two nations, two factors i.e. unskilled and skilled labor, two product model, trade barriers among nations derive wedges within the two goods prices. The unskilled labor-intensive exportable prices may be low in developing nations and vice-versa for developed nations. The change from autarky to free trade or the reduction of tariffs from high tariffs (openness of an economy) can increase the unskilled labor-intensive exportable production in the developing nation (poor economy), which in turn increased the unskilled labor demand and decreased the skilled labor demand. Regarding Stolper-Samuelson (SS)

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theorem, the wages of unskilled labor will increase in response to trade liberalization (Wood, 1997).

The influence of introducing the non-traded products in the model will rely on the consumption pattern substitution between the non-traded and traded products. If a poor nation produces the non-traded product which utilizes intensively the unskilled labor, and demand of this product is a close substitute for the highly skill-intensive of the two traded products, thus opening up will decrease price and enhance the skill-intensive tradable sales. Consequently, reducing the unskilled-labor demand in the production of the non-tradable could be greater than the unskilled labor-intensive demand increase in the tradable sector that is labor-intensive. Thus, theoretically possible that there would be a decrease in the wages of unskilled labor.

Furthermore, the other factor of production (FOP) to the model might be puzzling (complicate matters). If a poor nation's land abundant so it might have comparative advantages in producing the land-intensive tradable. The openness of the economy would enhance land-intensive tradable production. If land in production is a complement to skilled workers, this would enhance the skilled-labor demand. This might lead toward an unexpected upshot in terms of the relative wages. In poor economies, the land is possibly complementary to unskilled workers.

In addition, if included the capital factor in the model it would be highly sensible to suppose that it is complementary to the skilled labor. Supposing the developing nation does not have a comparative advantage in the production of the skill-intensive goods, this

might not affect the wage gap prediction as expected in the above original model. So, we anticipate that the wages of unskilled enhance as a result of greater openness.

There is a large number of evidence that in less-developed economies exporting sectors are usually less-skill intensive as compared to import-competing sectors (Wood, 1997). Regarding the above-mentioned and Stolper-Samuelson theorem, Wages of unskilled should enhance relative to the wages of skilled when opening up the economy.

The Stolper-Samuelson theorem impact is not only possible in one way that can affect wage inequality. Another channel that can also be possible through which openness to trade affects the wage gap is through the variation of the industry wage premiums.

Goldberg and Pavcnik (2004a) note that in poor economies industrial wage premiums account for the major portion of the wage inequality. However, if there exist labor market rigidities impeding smooth reallocation of the labor across the sectors, this link might be crucial. The sectoral adjustment due to the tariff variations might come through the wages change instead of employment changes. Therefore, reducing tariffs might also translate into the fall of wage premiums in the manufacturing sector.

Moreover, there exists imperfect competition in the labor markets and products, protected profitable industries have shared their own rents with their own employees due to the union power. For instance, if the tariff reduction force the firms to admit (accept) the lesser mark–ups, wages of manufacturing will be forced down, through these lesser industrial rents. However, there exists evidence that the mark-ups have decreased as a result of trade liberalization (Harrison, 1994).

Additionally, the pattern of technological availability and improvement of productivity in the industries exposed competition. If externally technological induced variations are skill-biased or if the productivity gains are shared with the workers, then the lesser tariffs lead toward greater wage premium, and reducing tariff could enhance relative wages of the skilled labor. Brazil has practiced this and does not seem to happen in Kenya as found in the studies (Arbache et al., 2004; Bigsten & Kimuyu, 2001).

To sum, as the tariffs were reduced in the regions and manufacturing sector of Pakistan, our study expects that wage gap reduced in either way of Stolper-Samuelson or if lesser tariffs decrease rents in the previously existing protected sector. However, there could be a contrary impact, if tariffs reduction induced the productivity improvements in the previously existing protected sector. As expected lower tariffs reduced the skilled-unskilled wage gap.

Finally, in prevailing theoretical theory about the openness to trade and wage gap of the skilled-unskilled is ambiguous. Impacts of trade liberalization on the skilled-unskilled wage gap are different, somewhere it reduces the skilled-unskilled wage gap and somewhere it increases the skilled-unskilled wage gap due to different factors. Now this calls for empirical analysis to clear this ambiguity.

3.2   Theoretical Background of Trade Liberalization

In the 1980s the economic growth of an economy does not disturb due to external shocks. Though, during 1988 economy suffers to an economic crisis as a result of the enhancement of external as well internal imbalances, and become a cause to the execution of Structural Adjustment Programs (SAP) is subsisting of loans with the structure of IMF

and World. IMF and WB offer loans to nations that experienced economic crises (Lensink, 1996). So, come to be a member of SAP there were several conditions the one is that countries to liberalize their economy. So for that, Pakistan fulfilled some conditions during 1990-2005 for the adoption and implementation of SAP of IMF & World Bank.

The condition are the accession to World Trade Organization (WTO) (an economy having complete liberty (or autonomy) in conduct of its trade policy may become the WTO member), introduction of the uniform tax (same taxes for all the person in particular region or area), delinking of Pakistan rupee (PKR) from the US dollar (during 1970, Pakistani currency (rupee) was peg (linked) with the US Dollar so that it rises and falls along with the dollar. So, in 80s (1982) it was delinked from US Dollar), Adoption of flexible exchange rate system (the exchange rate that varies with the variation in market forces), Maximum tariff (also called bound tariff rate) was reduced from 225% to 45.71 % by 2005 (The bound tariff rates vary across countries and across the products: generally, developing nations have greater bound tariff rates as compared to developed nations, indicating their perception that they required more protection from competition in comparison to the more highly developed industries in the developed markets), Tariff slabs (like a tariff) were reduced from 17 (1985) to 10 (1993) to 6 (2015), and Average tariff (applied tariff) rate was decreased from 77% (1985) to about 13% (2005) (applied tariff different from the bound rate that is a fixed tariff rate for all cross border transactions).

These essential variations in Pakistan's trade policy caused liberalization. Concerning Robertson (2009), there are three liberalization aspects such as trading partners decreasing their barriers (i.e., phasing out multifiber arrangements (MFA), countries

liberalizing their economy (i.e., reduction in tariffs & NTBs), the reduction in the cost of transportation "Country's natural isolation". Our study link with the second type of liberalization i.e. countries liberalizes their economy by reducing tariffs.

CHAPTER 4

DATA AND METHODOLOGY

This chapter is section-wise structured as Section 4.1 presents the Pakistan trade policy. Section 4.2 explains the data and data sources. Section 4.3 enlightens the empirical framework and 4.4 presents the provincial model. Section 4.5 about the econometric technique.

4.1   Pakistan's Trade Policy

1988-2005 was the era where huge progression was made with respect to the trade policy of Pakistan. During Zia Ul Haq's tenure, under the Structural Adjustment Program, substantial changes were planned and practiced in 1988. Significant differences in protection levels occurred amongst sectors. The imports of the three most protected industries like furniture, wood products, and wood, handicrafts, textile, and related goods came across average tariffs of 106%, 94%, and 96% correspondingly. Facilitating manufacturing sectors suggests that Pakistan had to cope with the same circumstances like Brazil and Columbia due to protecting intensively the industries which promoted comparatively unskilled labor (Pavcnik, Blom, Goldberg, & Schady, 2003). A descriptive statistics of import tariffs summary is given in Figure 4.1 during the sample period 1990-2005. It depicts the evolution of the average rate of protection over time. It shows that the average rate of protection in 1990 reduced from 62% to 13% and 63.22% to 13.76% in 2005 in overall sectors and manufacturing sectors respectively.

Import Tariffs Over Time 1990-2005
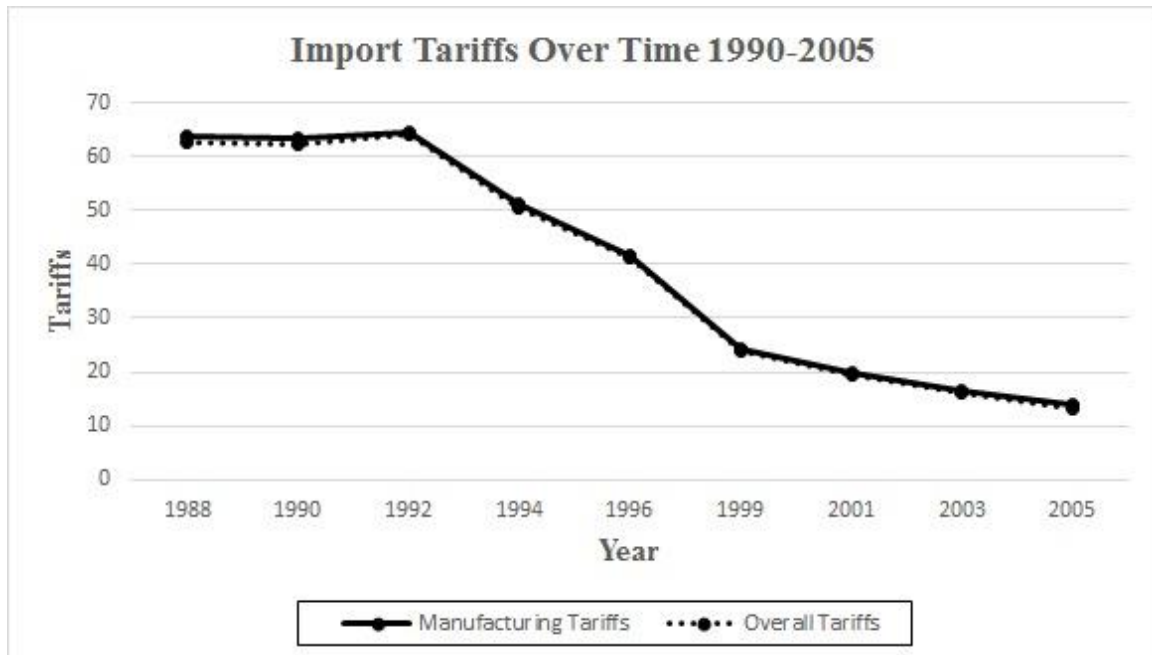
Note. Borrowed from the study of (M. U.-H. Wu, Jabbar Zafar, Naeem Uz Sun, Huaping Jiang, Jingyu 2019)

Figure 4.1: Import Tariffs Over 1990-2005

4.2 Data and Data Sources

Our research aims to explore the impact of trade liberalization on the wage gap of skilled-unskilled in the manufacturing sector and in provinces of Pakistan utilizing two digits micro-level datasets from 1990-2005. The manufacturing sector and provinces are given importance in the study. We choose the sample period of our study that is 1990-2005 because it is the trade liberalization regime of Pakistan for the analysis by following M. Wu et al. (2019); Ul-Haq et al. (2020); Ul-Haq, Wajid, Visas, Cheema, and Abbas (2022); Ul-Haq, Khanum, and Imran (2021); Ul-Haq, Nazeer, and Khanum (2021); Ul-Haq, Nazeer, and Rahim (2022). In the labor market, no new regulations have been implemented during the study period, which provides a unique case about the association of trade liberalization and the skilled-unskilled wage gap. So, it is believed that this is a unique

period that captures the pure impact of trade liberalization (M. Wu et al., 2019). The data sources of the study are the Labor Force Survey (LFS), Census of Manufacturing Industries (CMI), Pakistan Custom Tariffs (PCT), M. Wu et al. (2019); Ul-Haq et al. (2020); Ul-Haq (2016). The LFS are used for the years 1990, 1991, 1992, 1993, 1994, 1996, 1997, 1999, 2001, 2003, and 2005, which is conducted by the FBS. The sectoral level import tariffs data has been taken from Ul-Haq (2016) and M. Wu et al. (2019) based on PCT over the period 1990-2005 that is the liberalization regime of Pakistan. To compute the provincial tariffs we used the indicator PLIB by utilizing Topalova (2007)which is described in detail in the methodology section. The variables description in Table 4.1.

Table 4.1: Variable Description

Skilled-unskilled	SUS	Skilled-unskilled based on education; people below or equal to middle education are considered as unskilled and above considered as skilled and we used the age bracket of 15-64 years.
Trade liberalization	PLIB	Reduction in import tariffs.
Nominal tariffs	Nominal tariffs	Reduction in import tariffs (2-digit sectoral tariffs).
For Sectoral Study		
Gross domestic product	LGDP	log of gross domestic product
Gross fixed capital formation	LGFCF	log of gross fixed capital formation
Exports	LX	log of exports
Imports	LM	log of imports

Import penetration	IP	Import penetration is computed by utilizing the industry import to industry GDP plus net export and import consumption ratio of industry.
Export consumption ratio	XCR	The export consumption ratio is computed by taking the industry export to industry GDP plus the net import of the industry.
Lagged exports*nominal effective exchange rate	LX*NEER	Interactive of lagged exports and nominal effective exchange rate.
Lagged imports*nominal effective exchange rate	LM*NEER	Interactive of lagged imports and nominal effective exchange rate.
For Provincial Study		
Urbanization	URB	Share of urban population
Gender disparity in education	GDE	The difference in female and male access to education resources
Female labor force participation	FLFP	For the FLFP we used two proxies such as share of female in the labor force (SFLF) and female LFP to male LFP (FLFP/MLFP).

4.3   Empirical Framework

Our study explores the trade liberalization impacts on the skilled-unskilled wage gap in the manufacturing sector and provinces of Pakistan. The reduction of sectoral tariffs is used as a measure of trade liberalization to investigate the association between the skilled-unskilled wage gap and trade policy during the period 1990-2005 for sectoral study.

For the estimation purpose, our study used the two approaches for the wage gap of skilled-unskilled. Our study used a two-step estimation methodology. For the wage gap by following Menon & Rodgers, (2009) we used the residual wage gap methodology and log wage gap methodology. For the log wage gap, we used the ratio of skilled log wages to unskilled log wages in our study.

Furthermore, the residual wage gap is used regarding Oaxaca-Blinder decomposition. The extend in which overall the wage gap is illustrated by observable characteristics within two groups (i.e. gender, formal-informal, skilled-unskilled) is indicated by Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973). This process is divided in two parts the first one is explained by product characteristics and the second one is an unexplained part of the residual wage gap, which is usually recognized as discrimination part in skilled and unskilled groups. Wage gap of the skilled unskilled group can decompose through natural log of the real wage (w) for the skilled workers (i=S) and unskilled workers (i=U) as follows:

$$w_i = X_i \beta_i + \varepsilon_i \qquad (4.1)$$

The workers characteristics set is represent by x either in the skilled or unskilled group that influence the wage. X utilized the set of dummy variables for the age, education, experienced and the error term is the ε supposed to be normally distributed with varianceσ^2. Thus we illustrate the skilled and unskilled wage gap as:

$$w_S - w_U = (X_S \beta_S - X_U \beta_U) + (\varepsilon_S - \varepsilon_U) \qquad (4.2)$$

If the regression is evaluate on mean of the log wage then the end term become zero. After mathematical operations of subtracting and adding on X_U and β_S we extract (derive) workers attributes "in term of skilled workers prices" gives

$$w_S - w_U = (x_S - x_U)\beta_S + X_U(\beta_S - \beta_U) + (\varepsilon_S - \varepsilon_U) \qquad (4.3)$$

Total log wage gap in skilled and unskilled groups is revealed by the left-hand side of Equation 4.3 and in right-hand side, the first term indicates the explained wage gap portion and the next term indicate residual gap in skilled and unskilled group (difference in productive characteristics of skilled groups' worker based on the market returns). The final term is usually ignored due to decomposition conducted on means, otherwise known as residual wage gap the sum of last two terms (Menon & Van der Meulen Rodgers, 2009). For the wage gap discrimination part in the skilled-unskilled group, we use the proxy of residual wage gap.

4.4   Model

The focus on the issue of skilled-unskilled wage gap in developing nations is prevailing to a high extent. Also, theoretically mechanism on this relationship is ambiguous, to explain this ambiguity on how trade liberalization affects skilled-unskilled wage gap through the larger tariffs cuts. To begin with, the empirical analysis of the central question of this study is based on the evaluation of Equation (4.4) for sectoral model and Equation (4.5) for provincial model. The variable of skilled-unskilled wage gap as a regressand variable and trade liberalization as a regressor variable in our core model. Following Attanasio et al. (2004); Kumar and Mishra (2008) our study measures the variable of skilled-unskilled based on education; people below or equal to middle education

considered as unskilled and above considered as skilled and we used the age bracket of 15-64 year. Moreover the study of Attanasio et al. (2004)) used people below or equal to primary education considered as unskilled and above to primary education considered as skilled. Kumar and Mishra (2008) used people below to intermidiate considered as unskilled and equal or above to intermidiate education considered as skilled. Before the liberalization period of the Pakistan economy, the import tariffs were very high. After liberalization import tariffs were reduced gradually from 1990 to 2005 epoch. This reduction in import tariff affects the skilled-unskilled wage gap either increase or decrease the wage gap. To empirically evaluate the impact of trade liberalization on the skilled-unskilled wage gap we used the following empirical strategy;

$$SUSWG_{jt} = \beta_0 + \beta_1 Tariffs_{jt} + \beta_2 X_{jt} + \varepsilon_{jt} \qquad 4.4$$

$$SUSWG_{pt} = \beta_0 + \beta_1 PLIB_{pt} + \beta_2 X_{pt} + \varepsilon_{pt} \qquad 4.5$$

J indicate sector

P indicate province

T indicate time

Whereas, SUSWG indicates the skilled-unskilled wage gap. The coefficient of trade liberalization β_1 captures the change in the skilled-unskilled wage gap. The key variable of our study is the trade liberalization(i.e., tariffs (sectoral indicator) and PLIB (provincial indicator)). If the association between trade liberalization and skilled-unskilled wage gap is perceive to be negative, this is possible by the reduction in protection rate reduces the prices of imported inputs this will induce producers to upgrade the quality of exports by

hiring skilled labor. So, the producer upgrades their product quality by importing the lower prices inputs and to upgrade quality demand for skilled labor. Thus, the demand for skilled employment increase and export prices increases. Consequently, the domestic industry profit will increase as such, firms that face the largest tariff cut are observed to increase the price of their exports. On the other hand, the demand for unskilled labor will decreases and wage fall. So the skilled-unskilled wage gap increases (Fan, Li, & Yeaple, 2014).

The vector X_{pt} shows the set of control variables for sectoral level such as import penetration (IP), log of gross domestic product (LGDP), log of gross fixed capital formation (LGFCF), export consumption ratio (XCR), lagged exports* nominal effective exchange rate (LX*NEER) and lagged imports*nominal effective exchange rate (LM*NEER) and for province level such as urbanization (urban) gender disparity in education (GDE), and female labor force participation (FLFP). For the FLFP we used two proxies such as share of female in labor force (SFLF) and female LFP to male LFP (FLFP/MLFP). ε_{pt} is the error term. For sake of robustness check, we add more trade-related variables. The inclusion of these additional variables in regression models are not guided by some trade theory. These additional explanatory variables do not alter the magnitude or significance of the protection coefficient (M. Wu et al., 2019).

4.4.1 Provincial Liberalization Index

Following Castilho et al. (2012), we adopt the Topalova (2007) approach to calculate provincial tariffs from sectoral tariffs. Topalova (2007) is a well-known approach to calculate provincial tariffs from sectoral tariffs (Castilho et al., 2012; McCaig, 2011; Ul-Haq et al., 2020).The PLIB is a weighted average of national sector-level protection rates,

where weights correspond to the workers within each province employed into different sectors as a share of all workers in the province at the initial year (i.e., 1990 in our case) in the current study.

Provincial liberalization index figures out as:

$$PLIB_{pt} = \frac{\sum_k \left(L_{pk\,1990} \times Tariff_{kt}\right)}{L_{p1990}}$$

$PLIB_{pt}$ is the liberalization index in province p at time t. $Tariff_{kt}$ refers to the tariff in industry k at time t. L_{pk1990} represents the workers employed in industry k in 1990 in the unit of analysis (i.e., a province). Lp_{1990} refers to the total workers in the unit of analysis p for the year 1990. Our study explores the effect of trade liberalization on skilled-unskilled wage gap in provinces of Pakistan by utilizing provincial import tariffs as a proxy for trade openness.

4.5   Econometric Technique

To empirically investigate the association between trade liberalization and the skilled-unskilled wage gap, we are utilizing the Fixed Effect (FE), Random Effect (RE), techniques based on our panel diagnostics.

Modified Wald test is an F test of the GLS model it tells the overall significance of the model. The null indicates homoscedasticity and the alternate indicates heteroscedasticity. We test the issue of heteroscedasticity by typing the command xttest3 (Modified Wald test). Moreover, Wooldridge is applied to test the problem of serial correlation by xtserial. The null indicates no autocorrelation and the alternate indicates

autocorrelation. Further, Pesaran's Cross-Sectional Dependence (CD) test used by using the command xtcsd to test the issue of cross sectional dependence in Stata. These tests indicates the presence of heteroscedasticity, serial correlation, and cross sectional dependence in our data. To overcome these issues the preferred model is Driscoll-Kraay Standard Errors (DKSEs) as recommended by Hoechle (2007), because we have N=9 and T=8 (N is greater than T) in manufacturing sector and FGLS is preferred model in provincial study because here we have N=4 and T=11 (T is greater than N) as suggested by the Parks-Kmenta method. Further, Panel Corrected standard errors (PCSEs), and DKSEs are used to robustness checks.

CHAPTER 5

RESULTS AND DISCUSSION

This chapter of the study describes the empirical findings of our research work on the association of trade liberalization and the skilled unskilled wage gap. This chapter is organized as a 5.1 section describes the sectoral descriptive statistics. 5.2 section gives results about the trade liberalization and wage gap of skilled-unskilled worker in manufacturing sector of Pakistan. 5.2.1 it gives robustness checks of trade openness and wage gap. 5.2.2 section about the lagged analysis and 5.2.3 section lagged robustness checks. Section 5.3 present the provincial descriptive statistics. Section 5.4 offers an empirical analysis of the association of liberalized trade and the skilled-unskilled wage gap in provinces of Pakistan. 5.4.1 comprises on the robustness checks of provincial study. 5.4.2 part deals with the effect of the lagged trade policy on skilled-unskilled wage gap into the provinces of Pakistan and 5.4.3 about the lagged robustness checks.

5.1 Sectoral Descriptive Statistics

The basic features of the dataset are characterized in descriptive statistics. It gives a comprehensive summary about the data. Table 5.1 illustrate the descriptive statistics of the variables that are utilized in manufacturing sector.

Table 5.1: Sectoral Descriptive Statistics

Variables	N	Mean	S.D	Min	Max
SUSWG1	72	1.0834	0.0466	1.0127	1.2466
SUSWG2	72	0.3689	0.1979	0.0023	0.8484
Tariffs	72	39.9669	22.8891	10.18	95.67
LGDP	72	17.6716	1.6467	14.1187	20.6138
LGFCF	72	16.6411	1.7351	12.7292	19.9435
LX	63	3.27e+07	6.75e+07	34100.1	3.40e+08
LM	63	3.12e+07	3.37e+07	1400000	1.50e+08
IP	72	0.4989	0.3962	0.0386	1.7931
XCR	72	0.3671	0.4029	0.0007	1.6118

Note: author calculation. SUSWG1 for the log wage gap and SUSWG2 for the residual wage gap.

Descriptive statistics describe the features of a specific dataset by giving short summaries about the sample data. Table 5.1 show the sectoral descriptive statistics. Column 1 shows the sectoral variables, N is the number of observations. Mean shows average of the data values. S.D is the most common measure of dispersion. Minimum is the lowest data value and Maximum is the largest data value.

5.2 Log Wage Gap and Residual Wage Gap Results in Manufacturing Sector

In this sections, we describe the results about the trade liberalization and skilled-unskilled wage gap of the workers by using the log wage gap and residual wage gap methodology. We used the wage gap of skilled-unskilled workers as an explained variable. Nominal tariffs is used as the core explanatory variable of our study. We regress a panel

Table 5.2: TL and SUSWG in Manufacturing Sector

Variables	Log Wage Gap			Residual Wage Gap		
	FE	**RE**	**DKSE**	**FE**	**RE**	**DKSE**
Nominal Tariffs	-0.000803***	-0.000799***	-0.000798*	-0.00318***	-0.00336***	-0.00336**
	(0.000172)	(0.000140)	(0.000421)	(0.000695)	(0.000591)	(0.00108)
Constant	1.116***	1.115***	1.115***	0.496***	0.503***	0.503***
	(0.00689)	(0.00959)	(0.0268)	(0.0278)	(0.0322)	(0.0634)
F/Wald-statistics	21.70	32.57	3.60	20.98	32.36	9.76
P-value	0.001	0.000	0.094	0.001	0.000	0.014
N	72	72	72	72	72	72

Note: SUSWG is dependent variable in Fixed Effect (FE), Random Effect (RE), and Driscoll-kraay standard errors (DKSEs) models. Column 1-3 for the log wage gap and column 4-6 for the residual wage gap. Indus = industries. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e. '***' for 1%, '**' for 5%, and '*' for 10%).

regression model utilizing the RE, FE, and DKSEs method to explore the trade liberalization impact on the skilled-unskilled wage gap. The coefficient and their standard errors about the association between trade liberalization and wage gap in manufacturing sector are given in Table 5.2.

Table 5.2 shows the relationship between the wage gap of skilled-unskilled workers and trade liberalization in manufacturing sector of Pakistan. The core variable of the nominal tariffs indicates the negative and statistical significant association with the wage gap of skilled-unskilled workers in column (1,4) of Fixed Effect. Column (2,5) also reveals the inverse relation between trade liberalization and the wage gap and statistical significant in Random Effect. Moreover, in column (3,6) we used our desired DKSEs method. Column (3,6) also reveals the negative sign for the wage gap as well as statistical significant. Our study used the proxy of reduction in import tariffs for trade liberalization. If import tariffs reduced and the skilled-unskilled wage gap reduced, so the relation comes to be positive between them (positive coefficient (because of both decreases)), and if import tariffs are reduced and the skilled-unskilled wage gap increases (as in our case), so the relation comes to be negative between them (negative coefficient (because tariffs reduce and wage gap increases)), this is the basic logic behind the negative coefficient of nominal tariffs. The reduction of tariffs enhanced the wage gap of skilled-unskilled workers. The 1 percent reduction in tariffs lead toward the 0.08,0.31; 0.079,0.33; 0.079,0.33 percentage point (i.e., 0.00080, 0.0031 (FE); 0.00079, 0.0033 (RE); 0.00079,0.0033 (DKSEs)) increase in wage gap of skilled-unskilled workers. However, our findings are same by applying the FE, RE, and DKSEs methods. In prevailing research,

the study of Ghose (2000); Goldar (2002) found that skilled- unskilled inequalities increased in the industrialized economies. Since seventies, skilled-unskilled gaps in term of unemployment or wages have been increasing in these economies. This has also been the period during which the international barriers have been declining. Moreover, the study by Yasin (2007) also support this phenomina by revealing that the wage gap between skilled unskilled increased in their study (Artecona & Cunningham, 2002; Hanson & Harrison, 1999; McNabb & Said, 2013). On the other hand, according to Wood (1997), the practice of the East Asia during 1960s-1970s indicates that trade liberalization narrow the skilled-unskilled wage gap in developing nations (Avalos & Savvides, 2006), which is opposite to our study findings.

5.2.1 Robustness Checks

To robustness checks of our major findings of FE, RE, and DKSEs method, we include numerous trade related control variables in the study main model such as the IP, XCR, LGDP, LGFCF, LX*NEER, and LM*NEER. In order to check robustness, our study used DKSEs method in all models of Table 5.3.

<div align="center">**Table 5.3:** Robustness Checks</div>

Variables	Log Wage Gap				Residual Wage Gap			
	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE
Nominal	-0.000798*	-0.000806*	-0.000864*	-0.000914*	-0.00336**	-0.00338**	-0.00326***	-0.00332**
Tariffs	(0.000421)	(0.000409)	(0.000413)	(0.000485)	(0.00108)	(0.00106)	(0.000956)	(0.00140)
IP		-0.0112	-0.0173*			0.0137	0.0244	
		(0.00798)	(0.00930)			(0.0538)	(0.0749)	
XCR		-0.0131*	-0.0125*			-0.0447	-0.0583	
		(0.00684)	(0.00638)			(0.0368)	(0.0382)	
LGDP			0.00210	0.00498			0.0351**	0.0252
			(0.00455)	(0.00445)			(0.0149)	(0.0337)
LGFCF			-0.00385	-0.00114			-0.0309	-0.0193
			(0.00556)	(0.00634)			(0.0170)	(0.0207)
LXNEER				-0				-0*
				(0)				(0)
LMNEER				-0				0
				(0)				(0)
Constant	1.115***	1.126***	1.158***	1.056***	0.503***	0.513***	0.403*	0.381
	(0.0268)	(0.0291)	(0.0651)	(0.0317)	(0.0634)	(0.0751)	(0.204)	(0.295)
F/Wald-statistics	3.60	3.34	26.61	5.64	9.76	3.59	63.99	8.42
P-value	0.095	0.077	0.000	0.016	0.014	0.066	0.000	0.005
N	72	72	72	63	72	72	72	63

Note: SUSWG is dependent variable in DKSEs models. Column 1-4 for the log wage gap and column 5-8 for the residual wage gap. Indus = industries. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e. ,'***' for 1%, '**' for 5%, and '*' for 10%).

In Table 5.3 the key variable of nominal tariffs show the relation between the tariffs and the wage gap is negative and significant in column (1,4). Further, we add the control of import penetration and export consumption ratio in column (2,5), which also show that protection rate negatively associated to the wage gap of the skilled-unskilled workers as well statistical significant. Including import penetration and export consumption ratio, log of the gross domestic product, and log of the gross fixed capital formation in column (3,6), and log of the GDP and log of the GFCF, lagged exports*nominal effective exchange rate, and lagged imports*nominal effective exchange rate in column (4,8), also illustrates that wage gap between the skilled and unskilled workers increased due to the decline of protection rate in manufacturing industry. However, all robustness models of Table 5.3 by using the both approaches gives a robust result and does not alter the sign of our major findings as well as statistical significant.

5.2.2 Lagged Analysis

Here, we explores the modification of the skilled-unskilled wage gap as a result of tariffs reduction that might take time to appear by inspecting the relationship within the lagged tariffs and skilled-unskilled wage gap at sectoral level by taking both approaches (i.e., log wage gap and residual wage gap). In both approaches, lagged tariffs is the independent and skilled-unskilled wage gap is the dependent for all models of Table 5.4.

Table 5.4: Lagged Trade Policy and SUSWG

Methodology	Log Wage Gap			Residual Wage Gap		
Variables	**FE**	**RE**	**DKSE**	**FE**	**RE**	**DKSE**
Lagged Tariffs	-0.00102***	-0.000980***	-0.000966*	-0.00302***	-0.00317***	-0.00317**
	(0.000121)	(0.000113)	(0.000451)	(0.000988)	(0.000952)	(0.00125)
Constant	1.129***	1.128***	1.127***	0.513***	0.519***	0.519***
	(0.00526)	(0.00813)	(0.0288)	(0.0429)	(0.0302)	(0.0770)
F/Wald-statistics	70.78	74.94	4.59	9.35	11.11	6.44
P-value	0.000	0.000	0.064	0.016	0.000	0.035
N	63	63	63	63	63	63

Note: SUSWG is dependent variable in FE, RE, & DKSEs models. Indus = industries. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e. ,'***' for 1%, '**' for 5%, and '*' for 10%).

Table 5.4 reveal the impact of lagged tariffs on the wage gap of the skilled and unskilled workers in manufacturing sector. The results are shown in table 5.4 that is evaluated similarly as we evaluated table 5.2 but except the core variable of trade liberalization (i.e., nominal tariffs). There is also indirect correlation between the lagged trade policy and the wage gap as shown in Table 5.4. Such as, column (1,4) of FE show the negative influence of lagged tariffs on the wage gap, means that lagged trade policy contribute to the increase in the skilled-unskilled wage gap at sectoral level of Pakistan. Moreover, column (2,5) of RE and column (3,6) of DKSEs reveal that the coefficient is negative and significant on the lagged tariffs. The impact of lagged tariffs is the same on skilled-unskilled wage gap. In other words, we can say that the lagged trade policy affected wage gap in the same way as the nominal tariffs affects skilled-unskilled wage gap.

5.2.3 Lagged Robustness Checks

To robustness check of our major findings of lagged tariffs and the wage gap of the skilled-unskilled workers we incorporate the various controls variables like IP, XCR, LGDP, LGFCF, LX*NEER, and LX*NEER. In Table 5.5, after incorporating these controls we find that our results are robust as well significant to various controls. The addition of these variables does not change the major findings of lagged tariffs and the wage gap in manufacturing sector. To sum, in all cases our findings negatively associated to trade liberalization and wage gap and statistical significant.

Table 5.5: Lagged Robustness Checks

Methodology	Log Wage Gap				Residual Wage Gap			
Variables	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE	DKSE
Lagged Tariffs	-0.000966* (0.000451)	-0.000951* (0.000435)	-0.00116** (0.000455)	-0.000973* (0.000466)	-0.00317** (0.00125)	-0.00315** (0.00121)	-0.00316** (0.00110)	-0.00301* (0.00136)
IP		-0.0118 (0.00820)	-0.0355*** (0.00836)			0.0156 (0.0574)	0.0103 (0.0767	
XCR		-0.00839 (0.00719)	-0.00198 (0.00521)			-0.0391 (0.0401)	-0.0480 (0.0376)	
LGDP			-0.00171 (0.00547)	0.00435 (0.00532)			0.0330 (0.0197)	0.0258 (0.0357)
LGFCF			-0.00536 (0.00676)	-0.00199 (0.00649)			-0.0335 (0.0220)	-0.0218 (0.0216)
LXNEER				-0 (0)				-0 (0)
LMNEER				-0 (0)				0 (0)
Constant	1.127*** (0.0288)	1.136*** (0.0307)	1.275*** (0.0697)	1.090*** (0.0373)	0.519*** (0.0770)	0.525*** (0.0861)	0.505** (0.175)	0.421 (0.296)
F/Wald-statistics	4.59	2.29	81.65	3.65	6.44	2.30	113.45	8.13
P-value	0.064	0.155	0.000	0.051	0.035	0.154	0.000	0.005
N	63	63	63	63	63	63	63	63

Note: SUSWG is dependent variable in DKSEs models. Indus = industries. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e. ,'***' for 1%, '**' for 5%, and '*' for 10%).

5.3. Provincial Descriptive Statistics

The basic features of the dataset are characterized in descriptive statistics. It gives a comprehensive summary about the data. Table 5.6 illustrate the descriptive statistics of the variables that are utilized in provinces of Pakistan.

Table 5.6: Provincial Descriptive Statistics

Variables	N	Mean	S.D	Min	Max
SUSWG1	44	1.095333	0.0554893	1.044408	1.299833
SUSWG2	44	0.4203607	0.1870491	0.223958	1.039424
PLIB	44	19.19382	9.893685	4.91412	35.0443
GDE	44	0.5314945	0.0692859	0.4346812	0.6592047
SFLF	44	0.0851414	0.0526386	0.0146461	0.2239864
FLFP/MLFP	44	0.0968099	0.0667361	0.0148637	0.2886373
Urban	44	0.4140125	0.042608	0.341463	0.465241

Note: author calculation. SUSWG1 for the log wage gap and SUSWG2 for the residual wage gap. SFLF for the share of female in labor force and FLFP/MLFP for the female labor force participation to male labor force participation.

Descriptive statistics describe the features of a specific dataset by giving short summaries about the sample data. Table 5.6 show the sectoral descriptive statistics. Column 1 shows the provincial variables, N is the number of observations. Mean shows average of the data values. S.D is the most common measure of dispersion. Minimum is the lowest data value and Maximum is the largest data value.

5.4 Log Wage Gap and Residual Wage Gap Results in Provincial Study

Utilizing a micro-level dataset from Pakistan, our research explores the effect of

Provincial Study

Table 5.7: TL and SUSWG in Provinces of Pakistan

Methodology	Log Wage Gap				Residual Wage Gap			
Variables	**FE**	**RE**	**FGLS**	**PCSE**	**FE**	**RE**	**FGLS**	**PCSE**
PLIB	-0.00163*	-0.00146*	-0.00215***	-0.00146*	-0.00770***	-0.00768***	-0.00619***	-0.00782***
	(0.000842)	(0.000835)	(0.000458)	(0.000821)	(0.00228)	(0.00225)	(0.00102)	(0.00186)
Constant	1.127***	1.123***	1.135***	1.123***	0.568***	0.568***	0.535***	0.576***
	(0.0181)	(0.0180)	(0.0126)	(0.0176)	(0.0490)	(0.0812)	(0.0232)	(0.0335)
F/Wald-statistics	3.76	3.07	21.98	3.18	11.40	11.66	36.55	17.69
P-value	0.059	0.079	0.000	0.075	0.002	0.000	0.000	0.000
N	44	44	44	44	44	44	44	44

Note: SUSWG is dependent variable in FE, RE, FGLS, & PCSE models. Prov. = provinces. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e.,'***' for 1%, '**' for 5%, and '*' for 10%).

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trade liberalization on the wage gap of skilled-unskilled workers with the especially emphasis on the provinces of Pakistan. We now elucidate the association of trade liberalization with the wage gap of the skilled-unskilled workers in labor force. The estimation of the Equation of (4.6) regarding provinces of Pakistan is in Table 5.7. The coefficient and their standard errors are interpreted on the key variable of provincial trade liberalization (i.e., PLIB) and the other controls.

In Table 5.7, we used the FE, RE, desired FGLS, and PCSEs methods to study the link between wage gap and the trade liberalization. The key explanatory variable of the provincial study is the provincial trade liberalization (PLIB). The coefficient of provincial tariffs indicate that trade liberalization enhance the wage gap among the unskilled and skilled workers in provinces of Pakistan. The influence of tariffs on the wage gap is negative and significant in all models through utilizing all approaches in above table. Protection rate and wage gap is inversely associated in Pakistan. The protection rate reduction larger the wage gap between the skilled and unskilled workers.

5.4.1 Robustness Checks

In this section, we check the robustness of empirical results for the trust that whether our findings are robust or not. For the robustness checks, we include various control variables in our main model. The estimates of our robustness check are presented in Tables 5.8. The variables of urbanization (urban), share of female in labor force (SFLF), female labor force participation to male labor force participation (FLFP/MLFP), and gender disparity in education are used in table 5.8.

<p style="text-align:center;">Table 5.8: Robustness Checks</p>

Methodology	Log Wage Gap					
Variables	**FGLS**	**FGLS**	**FGLS**	**FGLS**	**PCSE**	**PCSE**
PLIB	-0.00136*	-0.00148*	-0.00122*	-0.00120*	-0.00146*	-0.00142*
	(0.000789)	(0.000759)	(0.000716)	(0.000720)	(0.000771)	(0.000772)
Urban		-0.289	-0.141	-0.155	-0.167	-0.175
		(0.177)	(0.175)	(0.175)	(0.181)	(0.181)
SFLF			0.414**		0.376**	
			(0.174)		(0.180)	
GDE			-0.000153	-0.0143	0.0217	0.00928
			(0.143)	(0.146)	(0.149)	(0.152)
FLFP/MLFP				0.336**		0.308**
				(0.141)		(0.146)
Constant	1.117***	1.241***	1.144***	1.160***	1.149***	1.160***
	(0.0169)	(0.0787)	(0.109)	(0.110)	(0.113)	(0.114)
F/Wald-statistics	2.98	5.76	16.59	16.67	15.41	15.61
P-value	0.085	0.056	0.002	0.002	0.004	0.004
	Residual Wage Gap					
PLIB	-0.00619***	-0.00494***	-0.00492***	-0.00495***	-0.00755***	-0.00758***
	(0.00102)	(0.00101)	(0.00116)	(0.00115)	(0.00201)	(0.00200)
Urban		0.951***	0.983***	0.992***	1.348*	1.350*
		(0.246)	(0.242)	(0.249)	(0.760)	(0.776)
SFLF			-0.592***		-1.304*	
			(0.160)		(0.681)	
GDE			0.290*	0.290*	0.122	0.106
			(0.164)	(0.166)	(0.527)	(0.537)
FLFP/MLFP				-0.464***		-0.965*
				(0.128)		(0.516)
Constant	0.535***	0.123	-4.26e-06	-0.00869	0.0591	0.0496
	(0.0232)	(0.0996)	(0.138)	(0.143)	(0.512)	(0.530)
F/Wald-statistics	36.55	30.37	35.17	33.94	26.59	27.31
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Note: SUSWG is dependent variable in FGLS, & PCSE models. N is 44 in all models. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e.,'***' for 1%, '**' for 5%, and '*' for 10%).

Table 5.8 show that in provinces (column 1) of Pakistan, the negative impact of trade liberalization on the skilled-unskilled wage gap is statistically significant, regarding the use of liberalization measure that is PLIB. The results show that after involving the control variables our results are same. The inclusion of these controls does not alter the coefficient of PLIB, it remain negative and statistical significant by using both FGLS and PCSEs methods in log wage gap and the residual wage gap.

5.4.2 Lagged Analysis

In this section, we regress the lagged trade policy on the skilled-unskilled wage gap in Pakistan. We investigate the decline in tariffs might take time to appear by examining the association within the lagged tariffs (protection rate) and wage gap. The results are shown in Table 5.9 that is evaluated similarly as we evaluated Table 5.7 but except the core variable of trade liberalization (i.e., PLIB). The coefficient is negative and statistically significant on the lagged tariffs. The impact of lagged tariffs is the same on wage gap as in Table 5.7 the impact of tariffs on skilled-unskilled wage gap.

5.4.3 Lagged Robustness Checks

The coefficient on the lagged tariffs is robust after the inclusion of other control variables and suggests the association between lagged tariffs and wage gap is negative. The sign with the lagged tariffs coefficient has the same as we evaluated in Table 5.9. To end, we evaluate a significant relationship within liberalization and the wage gap in case of Pakistan that is import tariffs reduction are negatively related along with skilled-unskilled wage gap. Our findings are robust after the addition of several variables in all models as shown in Table 5.10.

Table 5.9: Lagged Trade Policy and SUSWG

Methodology	Log Wage Gap				Residual Wage Gap			
Variables	FE	RE	FGLS	PCSE	FE	RE	FGLS	PCSE
Lagged Tariffs	-0.00188*	-0.00166*	-0.00175***	-0.00166*	-0.00813***	-0.00812***	-0.00573***	-0.00834***
	(0.000987)	(0.000972)	(0.000413)	(0.000954)	(0.00263)	(0.00259)	(0.00143)	(0.00226)
Constant	1.135***	1.131***	1.131***	1.131***	0.593***	0.592***	0.538***	0.601***
	(0.0222)	(0.0219)	(0.0120)	(0.0213)	(0.0591)	(0.0928)	(0.0336)	(0.0438)
F/Wald-statistics	3.65	2.93	17.88	3.04	9.57	9.82	16.01	13.68
P-value	0.064	0.087	0.000	0.081	0.004	0.002	0.000	0.000
N	40	40	40	40	40	40	40	40

Note: SUSWG is dependent variable in FE, RE, FGLS, & PCSE models. Prov. = provinces. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e.,'***' for 1%, '**' for 5%, and '*' for 10%).

Table 5.10: Lagged Robustness Checks

Methodology	Log Wage Gap					
Variables	**FGLS**	**FGLS**	**FGLS**	**FGLS**	**PCSE**	**PCSE**
Lagged Tariffs	-0.00136*	-0.00148*	-0.00122*	-0.00120*	-0.00146*	-0.00142*
	(0.000789)	(0.000759)	(0.000716)	(0.000720)	(0.000771)	(0.000772)
Urban		-0.289	-0.141	-0.155	-0.167	-0.175
		(0.177)	(0.175)	(0.175)	(0.181)	(0.181)
SFLF			0.414**		0.376**	
			(0.174)		(0.180)	
GDE			-0.000153	-0.0143	0.0217	0.00928
			(0.143)	(0.146)	(0.149)	(0.152)
FLFP/MLFP				0.336**		0.308**
				(0.141)		(0.146)
Constant	1.117***	1.241***	1.144***	1.160***	1.149***	1.160***
	(0.0169)	(0.0787)	(0.109)	(0.110)	(0.113)	(0.114)
F/Wald-statistics	2.71	5.06	14.18	14.30	13.83	14.01
P-value	0.099	0.079	0.006	0.006	0.008	0.007
	Residual Wage Gap					
Lagged Tariffs	-0.00573***	-0.00422***	-0.00451***	-0.00452***	-0.00782***	-0.00784***
	(0.00143)	(0.00135)	(0.00151)	(0.00150)	(0.00266)	(0.00264)
Urban		1.010***	0.950***	0.962***	1.428*	1.427*
		(0.244)	(0.271)	(0.277)	(0.743)	(0.762)
SFLF			-0.539***		-1.461**	
			(0.201)		(0.717)	
GDE			0.322*	0.317*	0.232	0.210
			(0.173)	(0.176)	(0.540)	(0.551)
FLFP/MLFP				-0.425***		-1.074**
				(0.158)		(0.543)
Constant	0.538***	0.0921	-0.00991	-0.0163	0.00239	-0.00520
	(0.0336)	(0.0992)	(0.158)	(0.163)	(0.507)	(0.527)
F/Wald-statistics	16.01	21.64	21.17	20.71	21.93	22.50
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Note: SUSWG is dependent variable in FGLS, & PCSE models. Prov. = provinces. N is 44 and prov. is 4 in all models. In parenthesis, presents the standard errors. Asterisks denotes significance level (i.e.,'***' for 1%, '**' for 5%, and '*' for 10%).

Our study also evaluates a significant relation within lagged tariffs and skilled-unskilled wage gap. These findings are also robust after the inclusion of other control variables.

5.5 The Functional Form Test

Ramsey reset test is a test of whether the functional form of the regression is appropriate. We can say that, we test whether the relationship between the dependent and independent variables really should be linear or whether a non-linear form would be more appropriate. Further, the ramsey reset test indicates whether the model is correctly specified or not. The results of the ramsey reset test is in Table 5.11.

Table 5.11: The Functional Form Test

Test	Statistics	P-value
Sectoral Diagnostics		
Ramsey Reset test (SUSWG1)	2.35	0.30
Ramsey Reset test (SUSWG2)	1.37	0.50
Provincial Diagnostics		
Ramsey RESET test (SUSWG1)	5.47	0.06
Ramsey RESET test (SUSWG2)	2.28	0.31

Note: Ramsey Reset test (SUSWG1) for the log wage gap and Ramsey Reset test (SUSWG2) for the residual wage gap. Concerning to probability value, we accept the null hypothesis. The significance level at 5%.

The ramsey reset results reveals that p-values is greater than 0.05 at 5% significance level for our coefficient. This recommends that we accept the null hypothesis that the

coefficient is equal to zero. This finding that the $\hat{y}$ is insignificant in our test regression suggests that our model does not suffer from omitted variables and our model is correctly specified.

To sum, our study find that the impact of trade liberalization on the skilled-unskilled wage gap is negative and statistical significant in manufacturing sector and provinces of Pakistan. The values of skilled-unskilled wage gap are in decimal point and the tariffs values are in percentage, therefore the coefficient of nominal tariff are small. Moreover, our findings are robust to various controls in all cases and lagged trade policy analysis also show negative relationship within trade liberalization and wage gap of the skilled-unskilled workers as well robust after incorporating various control. Our findings are consistent with the existing studies of Hanson and Harrison (1999); Ghazali (2009); S. Anwar and Sun (2010); Galiani and Sanguinetti (2003) and contrast with the prevailing studies of Artecona and Cunningham (2002); Ghose (2000); Hanson and Harrison (1999); Yasin (2007).

CHAPTER 6

CONCLUSION AND POLICY IMPLICATIONS

6.1   Conclusion

In 1990s, Pakistan exposed its economy for the trading atmosphere as a part of SAPs of international monetary fund (IMF), during this period drastically reduction in tariffs rate. This reduction in tariffs becomes the contribution of this research. The core objective of this study was to empirically investigate the impact of trade liberalization on the wage gap among the skilled and unskilled workers in the manufacturing sector and provinces of Pakistan. This study used the 2-digit sectoral level data for the manufacturing sector as well as dis-aggregated data for province-level from Pakistan over the period of trade liberalization regime 1990-2005. For the measurement of trade liberalization, we used sectoral tariffs for manufacturing and provincial tariffs for provincial study. Provincial tariffs is calculated by utilizing the indicator PLIB by following Topalova (2007). Modified Wald, Wooldridge, and Pesaran test are employed to test the problem of heteroscedasticity, serial correlation and panel corrected cross-sectional dependence in data. In this study, two approaches are used for the estimation purpose; log wage gap and residual wage gap in the manufacturing sector and for the province-level study.

The key outcome of this study indicated a negative association between trade liberalization and the wage gap of skilled and unskilled workers. Our study found that the reduction of protection rate increased the skilled-unskilled wage gap in sectoral level and

statistical significant utilizing all approaches. Moreover, after the robustness checks our results are robust to numerous trade-related controls. Furthermore, we also find that lagged trade policy negatively associated to wage gap.

Further, we also found negative and significant relationships among the wage gap of skilled-unskilled workers and openness to trade in our provincial study. The result shows that reduction of protection rate exerts negative pressure on the wage gap which means that reduction in protection rate is a sign of increased skilled-unskilled wage gap in provinces of Pakistan. However, our core findings are robust after including several controls in our main model and statistical significant. Moreover, we also find that lagged trade policy negatively associated to wage gap as well robust to numerous controls.

6.2   Policy Implications

Some important policy suggestions have been proposed on the basis of the findings of this study. These suggestions will be helpful in making future policies for the government of Pakistan.

- The government should make policies to open the economy because as economies open competition increase, so the domestic producers improve the quality by hiring educated as well as skilled and trained labor force employed and result in decrease the demand for the unskilled labor. In this way, wage gap among the skilled-unskilled workers increased. So, in order to reduce wage gap among the skilled and unskilled workers the government should provide facilated, educational, and technical pacakages to the less skilled labor to enhance their skill level. Thus, this will reduce the wage gap among the skilled-unskilled workers.

- The government should make policies to open the economy because trade liberalization for unskilled and cheap labor may generate employment opportunities, In developing countries where unskilled labor is abundant, the demand for unskilled workers increases with rising trade, since exports of goods that use this factor more intensively increase while imports of products that use skilled labor more intensively increase. Developing countries specialize in the production of (unskilled) labor-intensive goods such as light manufacturing and, consequently, create jobs for unskilled workers. Thus, the relative demand increases for skilled labor in developed countries and for unskilled labor in

developing countries and will narrow the gap in Wages (and in unemployment rates) between unskilled and skilled workers.

CHAPTER 7

QUALITATIVE WORK

This chapter offers the analysis and results of the data collected from the interviews conducted with the respondents as part of the qualitative study. To find the relationship between trade liberalization and skilled unskilled wage-gap nexus: evidence from Pakistan. The qualitative method used in our study is non standardized interviews (i.e. face to face interviews and emails) and discussions with trade experts. The interview was arranged with Sanaullah Handicraft, Yamen Handicraft, Ansari Handicraft, Azka Tex, Klash Pvt Limited, A.M Knitwear, and MTM Textile. The average interview duration was approximately 20 minutes. The interview core objectives and scope of the study were firstly described to every respondent before interview to capture the pure picture of results.

For Qualitative work I have conducted some interviews in my local area Sillanwali, district Sargodha, which is a famous city regarding exports of handicraft and conduct some interviews in Faisalabad city which famous for exporting of textile sector. I developed a questionnaire for them and conducted interviews face to face and some interviews by sending email.

The table below indicates the respondent profiles including name, associated company, exported country and domestic production city.

Supervisor Name	Manufacturing company name	Export country	Domestic production City
Sanaullah & Brothers	Sanaullah Handicraft	China	Sillanwali Sargodha
Yamen and Sons	Yamen Handicraft	China	Sillanwali Sargodha
Idrees Ansari	Ansari Handicraft	China	Sillanwali Sargodha
Muhammad Jameel	Azka Tex	USA, UK	Faisalabad
Muhammad Ashfaq	Klash Pvt Limited	USA, China, UK	Faisalabad
Abdul Haseeb Ijaz	A.M Knitwear	USA, China, UK	Faisalabad
Taveer Bashir	MTM Textile	USA, China, UK	Faisalabad

7.1 Interview Questions and Answers

Q1. The number of products increased over time?

Yes, every person responds with the passage of time number of product increased as demand increases with but in local area of Sillanwali demand for unskilled labour increases, because it is cheap and old traditional methods apply here, but in Faisalabad demand for skilled as well as unskilled both increases.

Q2. Export variety increased as trade liberalized?

Small units of Faisalabad did not know very well about trade liberalized, but big units of production respond in that when Govt reduce tariffs it give benefits to us in term of cost, but with new innovation and technology demand for skilled labour increases. In Sillanwali exporter themselves was not educated they ask we prefer people who in cheap in cost mean

they are talking about unskilled people, and I asked worker themselves about their qualification most of them was below primary.

Q3. After trade liberalization as trade increased, it enhanced the demand for skilled labour or not?

As I mentioned in previous question demand for skilled labour increases due to technology and innovation but they when I visited their industries unskilled labour, I found who are daily wager because they do finish and packaging and they are cheap in term of wage. In Sillanwali they unskilled demand increases.

Q4. Trade liberalization increased the wages of labor? For skilled or unskilled

Increased wage of skilled labour but did not increase of unskilled. But as inflation increasing now a days minimum wage of unskilled worker is 1000 Rs. one of tell them.

Q5. When trade liberalized as the price of raw material decreased, what impact on the import of raw material whether import more raw material?

It did not influence as so much to textile sector, as Pakistan is an agrarian economy, they produce cotton and export cotton demand for cotton fulfilled domestically, as well as concern to handicraft wood demand also fulfilled domestically.

Q6. Now you are exporting more high valued products (semi-final or final goods) over time or previous ones (raw material)? High valued additions mean if you previously export cotton and now exporting manufactured products by making shirts or pants through the use

of cotton. If increased in high valued products it indicates skilled-unskilled wage gap increased.

Q7. Almost all industrialist producing final product and exporting and all have fix number of workers if demand increase of export they adopt local unskilled people on daily wages, but maximum industries have skilled labour due to innovation and technology this gap is winding.

Q8. Using the traditional method of production or adopting new technologies? If adopted new technological method of production it's mean skilled-unskilled wage gap increases.

Yes, it has great influence, modern way of production new innovation and technology new machinery have great influence who have no skilled and losing their jobs. Gap is winding too much

Q9. Demand for skilled labour increased after trade liberalized?

Yes, when govt reduce its tariffs, it has great edge to exporter to export and demand increases due to short time and new technology they tried to adopt skilled worker who have field experience.

Q10. Value addition increased in exports?

Yes, value added increases new variety of products and attract to customer demand increases Pakistan made products leather jackets under garments knitwear are so beautiful and attract customer of abroad and quality also too good and also in the field of handicraft

beautiful hand made products are famous among abroad people In China it is more popular and people like it as a decoration piece.

7.2 Conclusion

Pakistani people and worker are talented, they need attention and support of Govt. as Pakistan has big sector of textile if some attention paid it grow fast and generate revenue. Govt should established training centre so that with the innovation people who have lack knowledge and losing their jobs can save themselves. And gap between skilled and skilled became less. Business of handicraft also emerging but govt has less attention to it. Sillanwali also a less develop area people did not know to much about new technology, they are unskilled mostly govt should also focus on it.

Appendix

Code	2-digit manufacturing industry
31	Manuf. of Food, beverage and Tobacco
32	Manuf. of Textile wearing, Apparel and Leather Industry
33	Manuf. of Wood, Wood Products, Furniture
34	Manuf. of Paper, Paper Product, Printing, Publishing
35	Manuf. of Chemical Petroleum, Coal Rubber and Plastic Product
36	Manuf. Non-Metallic Product except Petroleum and Coal
37	Basic metal industries
38	Manuf. fabricated metal products, machinery and equipment
39	Other Manuf. industries and handicraft

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