PDR

The Pakistan Development Review

ISSN 0030 - 9729

Volume 62 - Number 2 - 2023

thepdr.pk

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

PDR The PAKISTAN DEVELOPMENT REVIEW

Volume 62 Number 2
2023

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62:2 (2023) pp. 145–166
DOI: 10.30541/v62i2pp.145-166

Strategic Trade Policy for Pakistan's Textile Sector in 2018: Enhancing High Value-Added Exports through Low-Priced Intermediate Input

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We examine the relationship between low-priced intermediate inputs (via input tariff reductions) and export performance indicators using panel data from 166 countries from the years 2000-2015. Employing an instrumental variable approach, we show that export performance indicators improve as better quality; low-priced intermediate inputs are made available to the local manufacturer. We further propose a new methodology based upon a conservative approach to identify a list of intermediate inputs (with their exact HS codes) on which tariffs should be lowered. Using the average unit value of the intermediate input as a proxy for input quality, this methodology is based on comparing intermediate input quality available domestically with that available in the foreign market. Taking Pakistan's textile sector as an example, we list the intermediate inputs for tariff reductions based on their importance ranging from a scale being extremely important to less important to promote high-value-added exports. We reason that reducing tariffs on a selective range of inputs will lead to improved quality exports of the final product while protecting the domestic input manufacturers. Finally, we conduct a cross-country comparison of tariff rates between Pakistan, India, and Sri Lanka to identify the intermediate inputs where potential tariff reductions exist for Pakistan.

JEL Classifications: F13, F61, L67
Keywords: Trade Policy, Intermediate Input Tariffs, Export Promotion, Textiles

1. INTRODUCTION

Numerous strategies have been proposed in the literature to enhance exports, including currency devaluation (Nicita, 2013; Krugman & Obstfeld, 2003; Feenstra & Taylor, 2008) and providing direct loans to entrepreneurs for business expansion including reinvestment purposes (Bach, 2013; Banerjee & Duflo, 2004). However, there remains a need to explore additional avenues for improving export performance. This paper aims to address this gap through a two-fold approach. Firstly, using a panel data set covering 166 countries over a span of 16 years, we examine the impact of reducing intermediate input tariffs on the import value of intermediate inputs. We then examine how this subsequently influences various export performance indicators. Secondly, leveraging a historical dataset of Pakistan's textile sector in 2018, this paper proposes a

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strategic methodology of reducing tariff rates on a select range of intermediate inputs, thereby facilitating upward movement along the export value chain. This methodology helps us generate multiple lists of intermediate inputs based on Pakistan's need to reduce tariffs while protecting the domestic input suppliers. In addition to the textile sector, this methodology can also be extended to other sectors to generate similar intermediate input lists for tariff reductions.

Much of the new emerging literature stresses the importance of intermediate input tariff reductions. Bigsten, et al. (2016) studied the effect of both input and output tariff reductions on firms in Ethiopia. They conclude that for exporting firms, there are large productivity gains from input tariff reductions. In fact, this gain outweighs the benefits from the output tariff reductions. Likewise, according to Topalova and Khandelwal (2011), reduction in import tariffs is important for developing countries, especially those that came out of the import substitution phase under which they faced technological constraints, simply because of the lack of availability of imported inputs.

Tariff reductions on intermediate goods may have opposing effects on the economy. On the one hand, it can provide low-priced better quality intermediate inputs to the manufacturers of final goods. While, on the other hand, it can pose a challenge to the existing local manufacturer of these intermediate inputs by creating a more competitive market for them. Therefore, we recommend a *conservative approach* and suggest a methodology to create a list of intermediate inputs from a scale of being extremely important to insignificantly important for tariff reductions. We also extend the analysis to identify the input categories where the tariff rates can be maintained, which may have two constructive effects on the economy; first, it may protect the local manufacturer of high-quality intermediate inputs (protectionism)[1] and second, it may oppose any decline in fiscal revenues due to tariff reductions proposed earlier.

Initially, under this methodology, we generated a list of intermediate inputs that have high correlations between intermediate tariff rates and the export value of the final product at the sector level identified at the HS-2 Digit Code. This input list is further extended to suggest a tariff reduction at the HS-6 Digit Code level, for only those specific inputs, which have a high import unit value as compared to the average unit value available to the local exporter. Thus, our methodology allows us to strategically recommend tariff reductions in a sequence from being extremely important to insignificantly important as indicated by the quality of the intermediate inputs available locally.

This analysis is further extended to identify the input categories where the tariff rates can be maintained based on a sequence from being extremely important to insignificantly important. To do that, we list the locally produced high-quality intermediate inputs that may require protection. They are listed based upon the average unit value available to the local manufacturer being significantly higher than the import unit value. The government can push the tariff rates high or at least maintain the old tariff rate for these input categories to counter the impact on revenues generated by the government due to the tariff reductions proposed on other input categories.

[1]Inputs listed in Appendix are based on their relevance for tariff protection from a scale of being extremely important to insignificantly important, that has been identified on the basis of high quality available in Pakistan as compared to that imported from abroad.

Pakistan's economy fits well with the two requirements listed by Topalova and Khandelwal (2011) for tariff reductions. During the 50s and 60s, the country experienced an import substitution phase mainly to encourage the local manufacturers and enhance its industrial base. Later in the 70s, the policy shifted towards export promotion schemes that became more profound, specifically after Pakistan joined the World Trade Organisation (WTO) (Tobin & Busch, 2019). We propose that for Pakistan to climb up the export ladder, and follow India, it should focus on negotiating with other countries on a similar kind of input list. Pakistan holds significant relevance as a strategic trade partner in the world for several reasons: first, due to its geopolitical location, second, it has a sizeable consumer market that provides lucrative opportunities for international business, third its natural resources can be leveraged for trade and investment opportunities. In addition, it has a young and growing workforce together with an untapped potential for economic growth.

Therefore, in this paper, we argue that given the technological constraints and policy shifts to boost exports and improve export unit value, a strategic approach needs to be devised by developing countries. Hence, Pakistan makes a good case for applying this methodology proposed in the paper. As a case study, we lastly apply this methodology to Pakistan's textile sector to list down the sequence of intermediate inputs based on their relevance for tariff reduction.

Over the past decade, Pakistan has substantially reduced the tariff rates, especially after entering into a Free Trade Agreement (FTA) with various countries [2] and most importantly with China. While the FTA is mainly bilateral, and hence tariffs have been lowered on both sides, Pakistan still needs to be very thoughtful about the inputs it is lowering its tariffs upon, which should be based on long-term growth prospects. An important channel, through which these FTAs can benefit Pakistan, is if it lowers the tariffs on the intermediate inputs so that high-quality, low-priced intermediate inputs are made available to the local manufacturer. This will help Pakistan boost its exports in the world market.

The main problem for Pakistan in terms of exports has been its dependence on low-value-added agricultural and manufacturing goods. We look at some lessons that Pakistan can learn from India in an attempt to climb up the export ladder. We select the textile sector based on its relevance to Pakistan, for this analysis. The textile sector is the biggest exporting sector of Pakistan, with a value of approximately equivalent to US $ 3.8 billion in 2016.

The remainder of the paper is organised as follows. Section 2 establishes the relationship between the import of intermediate inputs and the export performance indicators. Section 3 comprehensively explains the proposed methodology for strategic tariff reductions. In Section 4, we apply this methodology to the case of Pakistan by identifying a sequence in terms of a list of intermediate inputs, based upon the preference for tariff reductions to achieve high-value addition in exports, specifically for the textile sector in Pakistan. Concluding remarks are presented in Section 5.

[2]To the best of our knowledge based upon information provided till September 2021 Pakistan signed free trade agreements with China, Sri Lanka, Malaysia, Iran, Mauritius, Indonesia, Turkey, Bangladesh, Afghanistan and Gulf countries.

2. DETERMINING THE IMPACT OF THE IMPORTED AVERAGE INTERMEDIATE INPUTS ON THE EXPORT PERFORMANCE INDICATORS VIA THE CHANNEL OF TARIFF REDUCTIONS

In this section, we establish the relation between the increase in the import of intermediate inputs ($ US) on the export performance indicators across the globe over time. We argue that export performance indicators improve with an increase in imports of the intermediate inputs through tariff reductions on these intermediate inputs.

2.1. Data

We use the World Integrated Trade Solution (WITS) database that has been developed by the World Bank, in collaboration with the United Nations Conference on Trade and Development (UNCTAD) and with the help of organisations such as the International Trade Center, United Nations Statistical Division (UNSD) and the World Trade Organisation (WTO). This database includes information on more than 170 countries since 1962 as reported to the United Nations.

The statistics and data continue to be recorded for detailed information on tariffs and non-tariff measures, for the National Tariff Line level, at the comprehensive Harmonised Commodity Description and Coding System (HS). Using this database, a panel is created for 166 countries from the year 2000-2015.

2.2. Methodology

An instrumental variable (IV) approach has been used to estimate the impact of the imports of the intermediate inputs on the export performance indicators. Along with this approach, we take advantage of this panel data set and use country-fixed effects to account for any time-invariant unobservable variation at the country level. Average intermediate input tariff has been used as an instrument for the imported intermediate inputs value (measured in $ US), for each respective country over time. Combing the fixed effects with the IV approach increases the precision of the results.

The first stage is estimated as follows:

$$Log\ (Intermediate\ input(\$\ US))_{it} = \propto_0 + \propto_1 Average\ Intermediate\ Input\ tariff_{it} + \in_{it} \quad \ldots \quad \ldots \quad (1)$$

The left-hand side variable is the log of the intermediate input (measured in $US), and the right-hand side variable is the average intermediate input tariff across countries over time. The fitted values from the first stage (variation in intermediate input explained by the intermediate input tariff alone i.e., exogenously determined intermediate input), are used in the second stage, where the export performance indicators are taken as the dependent variable.

$$Export\ Performance\ Indicator_{\ it} = \beta_0 + \beta_1 \widehat{Intermediate\ Input\ US\ \$}_{it} + C_i + u_{it} \quad (2)$$

We take various measures of export performance for each respective country over time as mentioned below:

(1) Export Value: The net value of the exports for a country over time measured in US thousands of dollars.

(2) Export Value Index: Export values are the current value of exports converted to U.S. dollars and expressed as a percentage of the average for the base period. The year 2000 is taken as the base year.[3]

(3) Export Volume Index: Export volume indexes are derived from UNCTAD's volume index series and are the ratio of the export value indexes to the corresponding unit value indexes (the year 2000 is taken as the base year).

(4) Herfindahl-Hirschman Market Concentration Index: This indicator is a measure of the dispersion of trade value across an exporter's partners. A country with a preponderance of trade value concentrated in very few markets will have an index value close to 1. Thus, it is an indicator of the exporter's dependency on its trading partners and the danger it could face should its partners increase trade barriers. Measured over time, a fall in the index may be an indication of diversification in the exporter's trading partnerships.

(5) Export Unit Value: This is the ratio of the Export Value Index to the Export Volume Index[4].

(6) Index of Export Market Penetration: This indicator measures the extent to which a country's exports reach already proven markets. It is calculated as the number of countries to which the reporter exports a particular product divided by the number of countries that report importing the product that year[5].

2.3. Results

The first stage results (Table 1A) are significant and negative for all the specifications, indicating that a rise in the tariff on the imported intermediate input leads to a fall in their total imports (measured in $US). F statistics reveal that the instrument passes the exogeneity test. Hence, a strong instrument explains the variation in the import of the intermediate inputs.

Table 1A

First Stage: Determining the Impact of Average Intermediate Input Tariff on the Average Import Value of the Intermediate Inputs

Dependent Variable: Log (Intermediate Input)	Log Export Value	Export Value Index (Base year 2000)	Export Volume Index (Base Year 2000)	Herfindahl-Hirschman Market Concentration Index	Export Unit Value	Index of Export Market Penetration
Average Tariff Rate of Intermediate Goods	-0.0896*** (-0.0044)	-0.0892*** (-0.0044)	-0.0892*** (-0.0044)	-0.0891*** (-0.0044)	-0.0893*** (-0.0044)	-0.0894*** (-0.0044)
F-Value of the excluded Instruments	416.88	408.20	408.2	410.24	408.20	415.45
Number of Observations	1,732	1,687	1,687	1,714	1,687	1,727
Number of Countries	166	157	157	165	157	165

Data Source: World Integrated Trade Solution (WITS). Results are based on author's own calculation.
*** p<0.01, ** p<0.05, * p<0.1. Standard Errors in parenthesis.
Log Intermediate Inputs instrumented by Average Tariff Rate on Intermediate goods varying by country and time. Country Fixed effects have been applied as well. Number of Countries: 166, Time Period: 2000-2015.

[3]In the year 2000, the index equals to 100.

[4]Note since both the numerator and denominator were normalised by the base year 2000, the export unit value index is not normalised by the base year.

[5]A low export penetration may signal the presence of barriers to trade that are preventing firms from expanding the number of markets to which they export.

The second stage results (Table 1B) indicate that the import of intermediate inputs has a significant impact on most of the export performance measures. Import of intermediate inputs has a positive and significant impact on the total export value. The estimates show that a one percent increase in the value of the imported intermediate input increases the total export value by 0.985 percent ceteris paribus. Likewise, in column 2, the estimates show that on average if the import of intermediate inputs goes up by 1 percent, the total value of the export index goes up by 243.6. In addition, the import of intermediate inputs has a positive and significant impact on the export volume index. If the import of intermediate inputs goes up by 1 percent, the total value of the export volume index goes up by 85.25.

Table 1B

Second Stage: Determining the impact of Import of Average Intermediate Input Value on the Export Performance Indicators

Dependent Variables	Log Export Value	Export Value Index (Base year 2000)	Export Volume Index (Base Year 2000)	Herfindahl-Hirschman Market Concentration Index	Export Unit Value	Index of Export Market Penetration
Log of intermediate input import	0.985***	243.6***	85.25***	688.4	0.814***	1.711***
	(-0.0287)	(-11.86)	(-7.133)	(-2,206)	(-0.0369)	(-0.113)
Constant	1.317***	-3.262***	-1.070***	-8,847	-10.22***	-18.97***
	(-0.419)	(-172.1)	(-103.4)	(-32,022)	(-0.535)	(-1.645)
Instrumental Variable	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of years	16	16	16	16	16	16
Observations	1,732	1,687	1,687	1,714	1,687	1,727
Number of countries	166	157	157	165	157	165

Data Source: World Integrated Trade Solution (WITS). Results are based on author's own calculation.

*** p<0.01, ** p<0.05, * p<0.1. Standard Errors in parenthesis.

Log Intermediate Inputs instrumented by Average Tariff Rate on Intermediate goods varying by country and time. Country Fixed effects have been applied as well. Number of Countries: 166, Time Period: 2000-2015.

Import of intermediate inputs has a positive and significant impact on the export unit value index. On average, if the import of intermediate inputs goes up by 1 percent, the total value index goes up by 0.33 units. On the contrary, the Herfindahl Index has been affected insignificantly by the increase in the import of intermediate inputs.

Whereas, the import of intermediate inputs still has a positive and significant impact on the export unit value, a 1 percent increase in the import of intermediate inputs export unit value increases by US$ 0.814. Lastly, the results show a positive and significant effect of the import of intermediate inputs on market penetration.

3. PROPOSED METHODOLOGY FOR A STRATEGIC DECREASE IN TARIFF RATES ON THE INTERMEDIATE INPUTS

As the first step, we identify the intermediate inputs based on their relevance for each respective sector. For any country, such information can be gathered from a detailed firm-level data set at the micro level that gives comprehensive information

on the inputs used by firms within a sector[6] for that country at HS 2-Digit Code.[7] We argue that climbing up the export ladder for the local manufacturer would mean making available the intermediate inputs that are used by the other progressive countries in the world for each respective sector. Therefore, we select a country based on our sector of interest that has two characteristics; firstly, it should be similar to the country for which the analysis is conducted and secondly, it should be outperforming in the world market for that respective sector. Following this rationale, after identifying the sector-level intermediate inputs and the progressive country, we identify the list of the most important intermediate inputs (at HS 2-digit code) using the correlations between tariff rates[8] of these intermediate inputs and the sector-level export value. From this entire list, we select only the top eight intermediate inputs that have the highest correlations. This HS-2 Digit Code list is extended to a detailed list of intermediate input categories at HS-6 Digit Code.

Since the quality of the intermediate inputs available in the local market determines the value addition of the exports, therefore, quality of the intermediate inputs available to the local manufacturer plays a vital role in our methodology. The average unit value can be considered as a close proxy for the quality of the intermediate inputs available in the local market. Consequently, we calculate the export unit value and the import unit value for all the HS-6 Digit categories based on their HS codes[9]. Then, using this data, we calculate the average unit value for each respective HS-6 Digit category[10]. This average unit value for each respective category is compared to the import unit value to identify a sequence of lists where the tariffs can be reduced strategically. We refer to these as the Tariff Reduction Zones (TRZs).

To create the TRZs we take a *conservative approach*. We do not propose to reduce tariffs on the entire HS-6 Digit code categories identified above. Rather, in this methodology we divide the intermediate inputs into four different TRZs:

(1) *Extremely Important for Tariff Reductions:* These are the intermediate inputs for which the import unit value is 3 standard deviations or greater than what is available to the local manufacturer. The inputs that fall in this category have a high import unit value compared to the goods available in the local market on average and hence, should be imported. For these products, there is an urgent need to reduce tariffs.

(2) *Important for Tariff Reductions*: These are the products for which the import unit value is between 2 and 3 standard deviations greater than the average unit value available to the local manufacturer.

[6]We used the Census of Manufacturing Industries for Punjab (CMI), 2005 to identify the intermediate inputs as an example for Pakistan in textile sector. Then out of those Intermediate inputs, we identified India's top eight imported intermediate Inputs, based upon the high correlations between these intermediate inputs and the export value of the textile sector in India.

[7]The information on the firm level data set (CMI) for Pakistan was disintegrated at HS 6 digit code but the chances of having a missing input used by other countries and not Pakistan were high, therefore we identified the inputs at HS -2 digit code.

[8]The World Trade Organisation (WTO) gathered data from Tariff Analysis Online.

[9]This information was taken from UN Comtrade Data Base.

[10]The average unit value is the average of the export unit value and the import unit value available to the Pakistani manufacturer.

(3) *Moderately Important for Tariff Reductions*: These are the intermediate inputs for which the import unit value is between 1 and 2 standard deviations better than what is available to the local manufacturer.

(4) *Insignificantly Important for Tariff Reductions*: These are the intermediate products for which the import unit value is better than the average unit value, but it only exceeds by less than 1 standard deviation.

Fig. 1. Categorisation of the Intermediate Inputs According to the TRZs

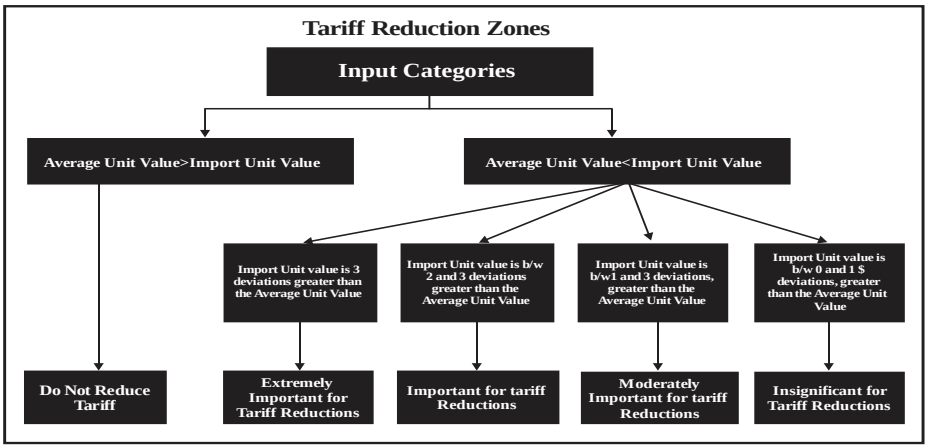


Figure 1 summarises the Intermediate Inputs being classified according to the TRZs.

Finally, we use this information to generate a list of HS-8 Digit product code to identify the list of the names of the specific intermediate inputs that fall within each respective TRZ.

4. IDENTIFYING INTERMEDIATE INPUTS FOR BOOSTING THE EXPORTS IN THE TEXTILE SECTOR

In this section, we narrow down our focus only to the textile sector and identify intermediate inputs for India, which have a strong correlation with its textile export value. We argue that climbing up the export ladder for Pakistan would mean that it has to follow the footsteps of India. Therefore, making these inputs available to the Pakistani textile exporter may result in the manufacturing of better and improved quality final products. Finally, we narrow down the list of the intermediate inputs identified earlier by suggesting a strategic tariff reduction, on only those intermediate inputs that have a higher unit value as compared to what is available to the Pakistani manufacturer. The argument is that for such inputs, which have a higher unit value, their quality is better than what is currently available to the Pakistani manufacturer; hence we should focus on reducing the tariff on these intermediate inputs so that we can increase their import. For the imported inputs, which have a lower unit value, we do not suggest a tariff reduction on these inputs, since better quality is being produced locally. Therefore, reducing tariffs for the latter type of intermediate inputs would mean hurting the domestic input suppliers.

4.1. Learning from India

We select India for two reasons (i) the similarity between the two countries in terms of the correlation between input tariff and export value as mentioned in section 2 (ii) India has outperformed many countries in the world market in terms of its exports in the textile sector. India is a growing economy, with a projected growth rate of 6.75 percent for FY 2017-1. The relevance of the textile sector for India is similar to that of Pakistan since the textile sector is a major contributor to its GDP and is the second largest sector in terms of employment after agriculture. It is interesting to note that in FY 2003 the Export value of Textile and Clothing (in $US) for India was fairly near to that of Pakistan (Figure 2) but over time, the gap between both countries has widened. This implies a need for Pakistan to revisit its policies to regain momentum in the export market.

Fig. 2. Country Wise Export of Textile and Clothing (US$) over time (2003-2013)

Source: World Integrated Trade Solutions (WITS).

Table 3 shows the top eight textile products exported by all the countries in 2012-2016, as a proportion of the total world exports (at HS- 4 Digit Code). This list of products is compared across Pakistan, India, Sri Lanka, and Turkey to see the position of Pakistan in the world market.

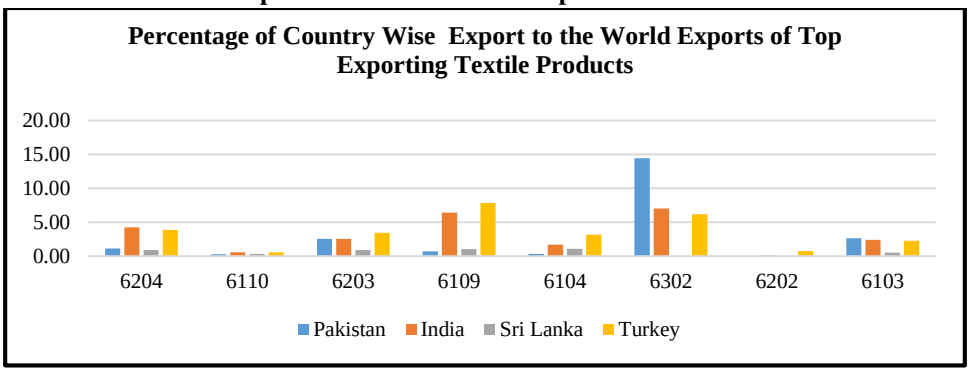
Table 3

Top Eight Exporting Textile Products of the World (2012-2016)

Top Eight Textile Exporting Textile Products of the World between 2012-2016	
HS Code	Product
6204	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear), not knitted or crocheted.
6110	Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted.
6203	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts (other than swimwear), not knitted or crocheted.
6109	T-shirts, singlet's and other vests, knitted or crocheted.
6104	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear), knitted or crocheted.
6302	Bed linen, table linen, toilet linen and kitchen linen.
6202	Women's or girls' overcoats, car-coats, capes, cloaks, anoraks, ski-jackets, wind-cheaters, wind-jackets and similar articles, other than those of heading 6204.
6103	Men's or boy's suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts (other than swimwear), knitted or crocheted.

Amongst these eight categories, Pakistan is the top exporter of Bed linen, table linen, toilet linen, and kitchen linen (HS-4 Digit Code: 6302) amongst other comparable countries like India, Sri Lanka, Turkey, and Bangladesh. As shown in Figure 3A, for this category Pakistan caters to 15 percent of the total exports to the world.

Fig. 3A. Percentage of Top Eight Textile Products Exported by Countries as a Proportion of Total World Exports

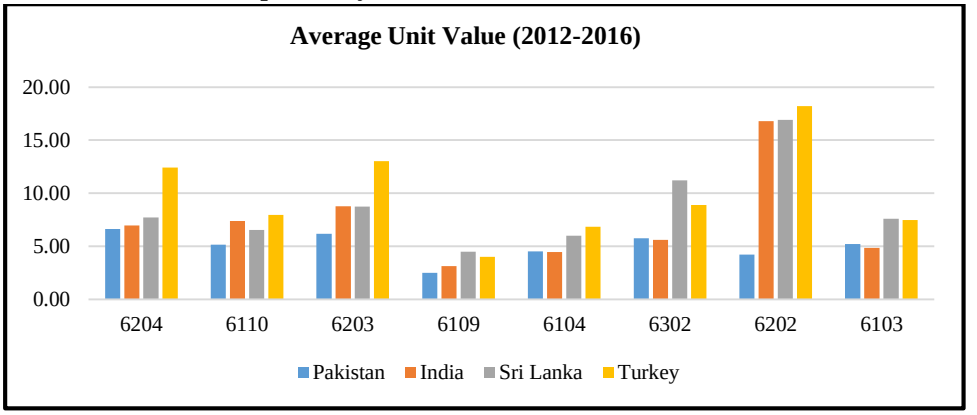


Source: UN Comtrade database.

As we analyse the average unit value (a proxy for the quality of the product) of all these categories across these countries, the situation becomes alarming. The average unit value of bed linens in Sri Lanka is much higher than in Pakistan and quite similar to the unit value in India. Figure 3B shows that on average the quality of the product where Pakistan takes the lead in the world market (i.e., HS-4 Digit Code: 6302) is low, which can easily be replaced by India, Turkey, and Sri Lanka in the near future.

We also see that India has upgraded its unit value in other product categories, especially in stitched women's and girls' clothing (HS-4 Digit Code: 6202), due to which it is making its position stronger in the world market over time. Pakistan, on the other hand, is quite low in terms of the unit value for all the top eight categories when compared to its competitors.

Fig. 3B. Average Unit Value of the Top Eight Textile Products Exported by Countries



Source: UN Comtrade database.

4.2. Data and Methodology

To identify the intermediate inputs used by the textile sector in Pakistan, we use the Census of Manufacturing Industries for Punjab (CMI), 2005. Then out of those intermediate inputs, we list India's top eight imported intermediate inputs, based on their high correlations between intermediate inputs and the export value in the textile sector of India. The inputs in the CMI were coded based on ISIC 3.1, which were converted into comparable HS-2 Digit Codes. We extend this list to HS-6 Digit Code to identify detailed input categories within each HS-2 Digit Category. We then identify the tariff rates for all these HS-6 Digit categories for Pakistan, India, and Sri Lanka for the year 2014 from Tariff Analysis Online by the World Trade Organisation (WTO). Next, we create a unique ID, identifying each country, sector, input, and year, using it to merge the inputs with their respective tariff rates and import values for all three countries for that respective year. Next, we calculate the export unit value and the import unit value for all the HS-6 Digit categories based on their HS codes using the UN Comtrade database. Then using this data, we calculated the average unit value at HS-6 Digit Code. The average unit value is used as a close proxy for the quality of the intermediate inputs available in the local market[11]. Next, the average unit value is compared to the import unit value to identify the Tariff Reduction Zones (TRZs). Finally, we use this information to generate a list of HS-8 Digit Codes to identify the name of the specific intermediate inputs that fall within each respective TRZ.

The list of inputs at HS-2 Digit Code important for India is summarised in Table 4 below.

Table 4

Top Intermediate Inputs for India's Textile Sector

HS Code (2 digit)	Intermediate Inputs
50	Silk
51	Wool, fine or coarse animal hair: horsehair yarn and woven fabric
52	Cotton
54	Man- Made Filaments
56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles of thereof
58	Special Woven Fabrics; tufted textile fabrics; lace ; tapestries; trimmings; embroidery
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use
60	Knitted or Crocheted Fabrics

Source: Author's own calculation.

[11] The average unit value is the average of the export unit value and the import unit value available to the Pakistani manufacturer.

We further classify the above intermediate inputs into the HS-6 Digit[12] for all of these categories to suggest tariff reductions. However, we take a *conservative approach* to this. We do not propose to reduce tariffs on the entire HS-6 Digit code categories, which fall within each HS-2 Digit category listed above in Table 4. Rather, we narrow down our list by comparing the unit value of the imported input with the average unit value of the intermediate inputs available to the Pakistani textile manufacturer of all the HS 6- Digit categories.

4.3. Identifying the Intermediate Inputs Based on their Relevance in Tariff Reduction Zones (TRZs); Textile Sector

We generate a list of intermediate inputs based on the conservative approach discussed in the previous subsection. Figures 4A until 4H show a graphical representation of our main results. The x-axis marks all different inputs at the HS-6 Digit code for each respective HS-2 Digit Code category mentioned in Table 4. The y-axis measures the difference between the average unit value available to a Pakistani manufacturer and the import unit value for each respective HS-6 Digit input.

For example, figure 4A shows a diagrammatic representation of each HS-6 Digit Code for Silk. Zero is kept as a benchmark where the average unit value of the intermediate input available to the local manufacturer is equal to the import unit value of the same input. This implies that for this category, the quality of the locally available input, on average, and the quality of the imported input are equal. A negative value means that the imported inputs are of high quality and hence should be imported[13]. The maroon horizontal lines show the standard deviation (which takes a value from -3 to +3) of the import unit value from the average unit value.

We can see that two categories fall within the bounds of –1 and +1 (500500 and 500600). Therefore, they qualify in the insignificant zone where tariff reductions nor protections should be proposed. Two categories 500300 and 500400 fall more than three deviations below the average unit value, which emphasises that the quality available to the local manufacturer on average in Pakistan is much lower than the quality of these imported inputs. Therefore, we propose that they qualify in the extremely important zone where tariff reductions should be made. 500700, 500710, and 500790 are the HS-6 Digit Code categories for which the import unit value is significantly lower than the average unit value implying that the average quality available to the local manufacturer is significantly higher than the imported intermediate input quality. Therefore, we recommend observing the existing tariff rates or even pushing up the tariff rates to counter the impact of reductions in tariffs on the revenues generated by the government. We extend this analysis to HS- 6 Digit Code categories for other intermediate inputs within the textile sector as listed in Table 4.

Similarly, in Figure 4B for Wool, Fine or Coarse Hair (HS Code 51), inputs with the HS-6 Digit Code of 510820 and 511119 lie in the extremely important tariff reduction zone. Only one input, i.e., 510529, lies in the important tariff reduction zone as the deviation is between -2 and -3 standard deviations. Four input categories fall under the

[12] This can further be classified into 8-digit HS code to identify the specific input.

[13] A positive value means that the average unit value available to a Pakistani manufacturer is more than the import unit value; hence, there is no need to import more.

moderately important zone for tariff reduction, i.e., 510220, and 510510. 510990 and 511219. Using these graphs, we identify the list of all the intermediate inputs at HS-6 Digit Code that falls under each respective tariff reduction zone (TRZ), for each of the categories listed in Table 4.

As a next step in Table 5A, we provide a tabular representation of the intermediate inputs at the HS-6 Digit Code that qualifies under the category of being extremely important for the tariff reduction zone amongst all the categories mentioned in Table 4. For cross-country comparisons, the Table also shows the tariff rates applied by India, Pakistan, and Sri Lanka on these inputs to identify where the scope of tariff reduction in Pakistan exists. For instance, in the first three input categories, India's Tariffs are higher than those of Pakistan. This is mainly because, in these categories, India itself has a high export unit value (i.e., good quality of inputs is being produced within India). Whereas, for the remaining categories, Pakistan has a higher tariff rate than India, implying that the margin of tariff reduction exists for these inputs. On the contrary, Sri Lanka, as a special case, has a consistent zero tariff rate for all these inputs. Finally, we extend the list of the intermediate inputs to the HS-8 Digit Code (and in some cases to the HS-10 Digit Code) in Table 5B to give specific intermediate inputs.

Table 5 is a tabular representation of all the inputs under the HS-6 Digit Code category that falls under the extremely important tariff reduction zone. The list of tariff rates applied by Pakistan, India, and Sri Lanka on these input categories is also stated in the table for comparison. Again, we extend their description to the HS-8 Digit code in Appendix 1 (Table A1).

Appendix 2 lists the intermediate inputs at the HS-2 Digit code and HS-6 Digit code that fall under the zone of being moderately important for tariff reduction in Pakistan. We also provide the tariff rates imposed by Pakistan, India, and Sri Lanka[14].

Fig. 4: Graphical Representation of the Intermediate Textile Inputs based Upon Their Relevance in Different Tariff Zones (HS 6 Digit Code)

Fig. 4A: Classification of Silk at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

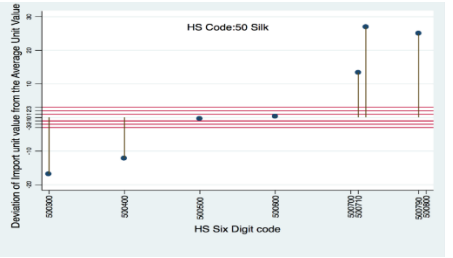
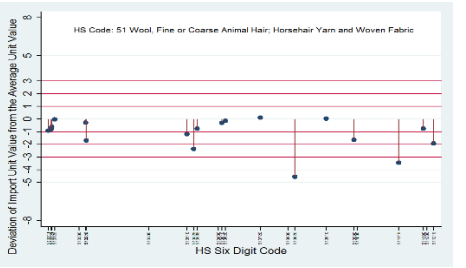


Fig. 4B: Classification of Wool, fine or Coarse Animal hair at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value



[14] Using similar methodology we generated a list of intermediate inputs at the HS-2 Digit and HS-6 Digit Code that are insignificantly important and irrelevant for tariff reductions that can be made available.

Fig. 4C: Classification of Cotton at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

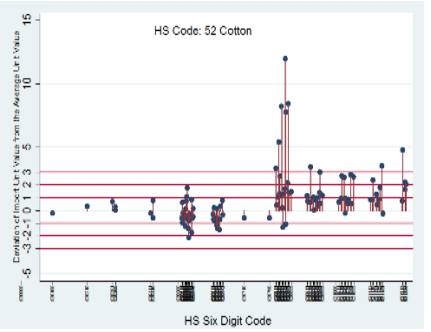


Fig. 4D: Classification of Man-made filaments; strips and the like of man-made textile at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

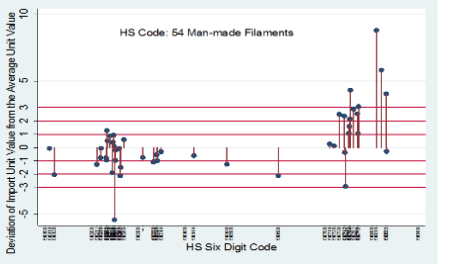


Fig. 4E: Classification of Wadding, Felt and Nonwovens at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

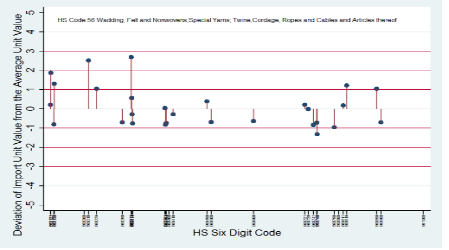


Fig. 4F: Classification of Special Woven Fabrics at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

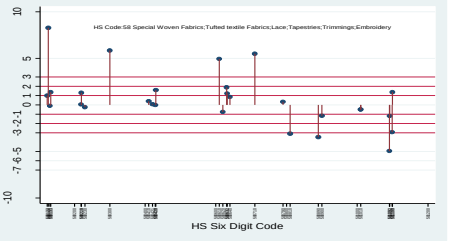


Fig. 4G: Classification of Impregnated or Laminated Textile fabrics at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

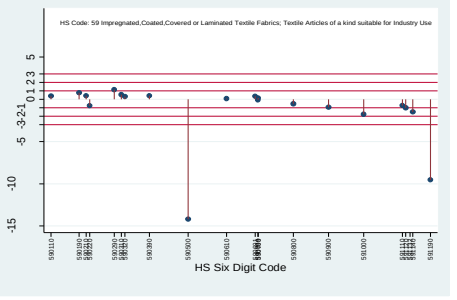


Fig. 4H: Classification of Knitted or Crocheted Fabrics at the 6-digit HS Code level; Deviation of Import Unit Value from the Average Unit Value

Source: Author's Own Calculations

Table 5

Inputs, Classified as Being Extremely Important for Tariff Reduction

Tariffs Applied by Pakistan, India and Sri Lanka on tariff category classified as EXTREMELY IMPORTANT for Pakistan					
HS 2 Digit Code	HS 6 Digit Code	Product Description	Pakistan's Tariff	India's Tariff	Sri Lanka's Tariff
50	500300	Silk waste (including cocoons unsuitable for reeling, yarn waste and garneted stock)	3	15	0
50	500400	Silk; yarn (other than yarn spun from silk waste), not put up for retail sale	3	10	0
51	510820	Yarn; of fine animal hair, combed, not put up for retail sale	3	10	0
51	511119****	Fabrics, woven; of carded wool or of carded fine animal hair, containing 85% or more by weight of wool or of fine animal hair, of a weight exceeding 300g/m2	16	0	0
54	540249*	Yarn, synthetic; filament, monofilament (less than 67 decitex), other than high tenacity or textured yarn, single, untwisted or twisted 50 turns or less per meter, n.e.c. in heading no. 5402, not for retail sale, not sewing thread	11	10	0
58	580810**	Braids; in the piece	20	10	0
58	580890**	Ornamental trimmings; tassels, pompons and similar articles; ornamental trimmings in the piece, without embroidery, other than knitted or crocheted	20	10	0
58	581091**	Embroidery; with visible ground, of cotton, in the piece, in strips or in motifs	20	10	0
59	590500**	Textile wall coverings of fabrics impregnated, coated, covered or laminated	20	10	0
59	591190	Textile products and articles for technical uses; n.e.c. in heading no. 5911	7	10	0

Source: Author's Own Calculation.

*Indicates that Pakistan's Tariffs are higher than India by less than or equal to 5 percent.

** Indicates that Pakistan's Tariffs are higher than India by more than 5 percent but less than or equal to 10 percent.

*** Indicate that Pakistan's Tariffs are higher than India by more than 10 percent but less than or equal to 15 percent.

**** Indicate that Pakistan's Tariffs are higher than India's by more than 15 percent.

Table 6 is a tabular representation of all the inputs under the HS-6 Digit Code category that fall under the important tariff reduction zone. The list of tariff rates applied by Pakistan, India and Sri Lanka on these input categories are also stated in the table for comparisons. Again, we extend their description to the HS-8 Digit code in Appendix1. Table A2.

Table 6

Inputs, Classified as being Extremely Important for Tariff Reduction

Tariffs Applied by Pakistan, India and Sri Lanka on tariff category classified as IMPORTANT for Pakistan					
HS 2 Digit Code	HS 6 Digit Code	Product Description	Pakistan's Tariff	India's Tariff	Sri Lanka's Tariff
51	510529	Wool; wool tops and other combed wool, other than in fragments	3	7.5	0
52	520533*	Cotton yarn; (not sewing thread), multiple or cabled, of uncombed fibers, 85% or more by weight of cotton, 232.55 to 192.31 decitex (44 to 52 metric number) per single yarn, not for retail sale	11	10	0
54	540120	Sewing thread; of artificial filaments, whether or not put up for retail sale	3	10	0
54	540261*	Yarn, synthetic; filament, monofilament (less than 67 decitex), of nylon or other polyamides (not high tenacity or textured), multiple (folded) or cabled, not for retail sale, not sewing thread	11	10	0
54	540600*	Man-made filament yarn (other than sewing thread), put up for retail sale	11	10	0
54	540744****	Fabrics, woven; containing 85% or more by weight of filaments of nylon or other polyamides, printed	16	0	0
58	581099**	Embroidery; with visible ground, of textile materials (other than cotton and man-made fibres), in the piece, in strips or in motifs	20	10	0
60	600610**	Fabrics; knitted or crocheted fabrics, other than those of headings 60.01 to 60.04, of wool or fine animal hair	20	10	0

Source: Author's Own Calculations.

*Indicates that Pakistan's Tariffs are higher than India by less or equal to 5 percent.

** Indicates that Pakistan's Tariffs are higher than India by more than 5 percent but less than or equal to 10 percent.

*** Indicate that Pakistan's Tariffs are higher than India by more than 10 percent but less than or equal to 15 percent.

**** Indicate that Pakistan's Tariffs are higher than India's by more than 15 percent.

5. CONCLUSION AND RECOMMENDATIONS

Intermediate input tariff reductions can make higher-quality inputs available to local manufacturers, allowing them to move up the export ladder. Tariff reductions on imported intermediate inputs can boost Pakistan's exports on the one hand, but they can also have a negative impact on government revenue, and this may potentially mean more competition for local manufacturers of these intermediate inputs. Therefore, a more careful analysis is needed to identify the inputs that are not available in high quality in technologically constrained countries, particularly those transitioning from import substitution to export promotion. As a result, we propose a methodology that follows a conservative approach to generate a specific list of intermediate inputs on the assumption that if they are provided to local exporting firms at a lower cost, they will help them produce a higher unit value final product to export.

Our first set of results establishes a direct and significant relationship between the import of intermediate inputs and the export performance indicators via the channel of intermediate input tariffs. The estimates are based on an instrumental variable approach combined with country fixed effects using the data from more than 160 countries from the time period 2000 to 2015. The results show that any reduction in input tariffs considerably increases imports of intermediate inputs, which eventually increases export performance indicators. Results indicate a strong correlation between tariff reductions and increases in export value across major exporting sectors for five countries: Pakistan, India, Sri Lanka, Turkey, and Bangladesh.

As a next step, based upon the *conservative approach*, we propose a new methodology to identify the intermediate input product categories where the tariff cuts should be made significantly and where they should be reduced marginally. We examine this methodology by using the case of Pakistan's textile sector. Applying this methodology helps us generate the list of intermediate inputs in each respective Tariff Reduction Zones (TRZs) and Tariff Protection Zones (TPZs). We argue that for Pakistan to learn, India is a classic example of drastic tariff reductions on intermediate inputs and export growth. Therefore, we use the case of India to identify the inputs used in their textile sector which have a high correlation with their export value, so that if Pakistan follows suit, it can also upgrade the quality of the products they manufacture in the textile sector to export. Finally, we compare Pakistan's average tariff rates for each input to that of India to identify the categories where the potential for tariff reduction exists. This methodology can also be extended to the other sectors of Pakistan where there is high export potential.

APPENDIX1

Table A1

Inputs, Classified as being Extremely Important for Tariff Reduction at HS-8 Digit Category

TARIFF CATEGORY: EXTREMELY IMPORTANT		
500300	**Silk Waste (Including Cocoons Unsuitable for Reeling Yarn Waste and Garneted Stock)**	
	50030010	Mulberry Silk Waste
	50030020	Tussar Silk Waste
	50030030	Eri Waste
	50030040	Munga Waste
	50030090	Others
	50030011	Spailed cocoon, husk, frison, frigon, not carded or combed
	50030012	Garneted Stock, not carded or combed
500400	**Silk Yarn (other than yarn spun from silk waste), not put up for retail sale)**	
	50040010	100% Mulberry Dupion Silk Yarn
	50040090	Others
510820	**Yarn, of fine animal hair, combed, not put up for retail sale**	
		Carded containing 85% or more by weight of fine animal hair
	51081011	Yarn fine hair of goats carded, not put up for retail sale containing 85% or more by weight of goats hair
	51081019	Non-retain carded other animal hair yarn
		5108101910 Yarn of fine hair of endangered animals carded not put up for retail sale containing 80% or more by weight of other animal hair
		5108101990 Yarn of fine hair of animal, carded not put up for retail sale containing 85% or more by weight of other animal hair
	51081090	Other
		5108109010 Yarn of fine hair of other endangered animal, carded not put up for retail sale, containing less than 85% by weight of other animal hair
		5108109090 Yarn of fine hair of other animal, carded not put up for retail sale, containing less than 85% by weight of other animal hair
511119	**Fabrics, Wovers of carded wool or of carded fine animal hair, containing 85% or more by weight of wool or of fine animal hair, of a weight exceeding 300g/m^2**	
	51111910	Unbleached woven fabrics
	51111920	Bleached woven fabrics
	51111930	Dyed woven fabrics
	51111940	Printed woven fabrics
	51111990	Other of fine animal hair
540249	**Yarn synthetic filament, monofilament (less than 67 decitex), other than high tenacity or textured yarn, single, untwisted or twisted 50 turns or less per metre, n.e.c. in heading no. 5402, not for retail sale, not sewingthread**	
	54024910	Filament single yarn of polyethylene (the rupture strength is bigger than or equal to 22Cn/dtex, and the initial modulusis bigger than or equal to 750cN/dtex, untwisted or with a twist not exceeding 50 turns/m, not put up for retail sale)
	54024990	Other polyethylene yarn
580810	**Braids, in the piece; ornamental trimmings in the piece, without embroidery other than knitted or crocheted; tassels, pompons and similar articles**	
	58081000	Braids in the piece
		5808100020 Braids of abaca or ramie, in pieces (suitable for manufacturer or decoration of headgear)
		5808100090 Braids of other textile materials in pieces
580890	**Ornamental trimmings tassels, pompons and similar articles ornamental trimmings in the piece, without embroidery, other than knitted or crocheted**	
	58089000	Ornamental trimmings strips not emproided in pieces other than knitted or crocheted tassels pompons and similar articles
581091	**Embroidery, with visible ground of cotton, in the piece, in strips or in motifs**	
	58109100	Embroidery of cotton, with visible ground, in pieces in strips or in motifs
590500	**Textile well coverings of fabrics impreonated coated covered or laminated**	
	59050000	Textile Wall Coverings
591190	**Textile products and articles for technical used n.e.c. in heading no. 5911**	
	59119000	Other specialised technical uses textile products and articles (see not 7 in chapter 59)
		5911900010 The self-achieve circular polishing pad for semiconductor wafer fabrication, specified in Note 7 to this chapter
		5911900090 Other textile products and articles for technical used specified in Note 7 to this chapter

Table A2

Inputs, Classified as being Important for Tariff Reductions at HS-8 Digit Category

TARIFF CATEGORY: IMPORTANT	
510529	Wool; Wool Tops and Other Combed Wool, Other than in fragments
51052910	Other wool tops
51052990	Others
520533	Measuring per single yarn less than 232.56 decitex but not less than 192.31 decitex (exceeding 43 me
	Measuring per single yarn less than 232.56 decitex but not less than 192.31 decitex (exceeding 43 metric number but not exceeding 52 metric number per single yarn): Grey
52053320	Measuring per single yarn less than 232.56 decitex but not less than 192.31 decitex (exceeding 43 metric number but not exceeding 52 metric number per single yarn): Bleached
52053330	Measuring per single yarn less than 232.56 decitex but not less than 192.31 decitex (exceeding 43 metric number but not exceeding 52 metric number per single yarn): Dyed
52053390	Measuring per single yarn less than 232.56 decitex but not less than 192.31 decitex (exceeding 43 metric number but not exceeding 52 metric number per single yarn): Other
540120	Sewing thread of man-made filaments, whether or not put up for retail sale
54012000	Of paper yarn: Of artificial filaments
540261	Yarn, synthetic; filament, monofilament (less than 67 decitex), of nylon or other polyamides (not high tenacity or textured), multiple (folded) or cabled, not for retail sale, not sewing thread
54026100	Other yarn, multiple (folded) or cabled: Of nylon or other polyamides
540600	Man-made filament yarn (other than sewing thread), put up for retail sale
54060010	Other: Man-made filament yarn (other than sewing thread), put up for retail sale: Synthetic filament yarn
54060020	Other: Man-made filament yarn (other than sewing thread), put up for retail sale: Artificial filament yarn
54061000	Synthetic filament yarn
54062000	Artificial Filament yarn
540744	Printed Woven Fabrics Of Synthetic Filament Yarn, Including Woven Fabrics Obtained From Materials Of Heading 5404
54074410	Printed: Nylon brasso
54074420	Printed: Nylon georgette
54074430	Printed: Nylon Taffeta
54074440	Printed Nylon Sarees
54074490	Printed other
581099	Embroidery in the piece, in strips or in motifs
58109900	Of man-made fibers: Of other textile materials
600610	Other knitted or crocheted fabrics
60061000	of artificial fibers: of wool or fine animal hair

Source: Author's own Calculation

APPENDIX 2

Table A1

Inputs, Classified as being Moderately Important for Tariff Reductions at HS 8 Digit Category

TARIFF CATEGORY: MODERATELY IMPORTANT					
HS 2 Digit Code	HS 6 Digit Code	Product Description	Pakistan's Tariff	India's Tariff	Sri Lanka's Tariff
51	510220	Hair; coarse animal hair, not carded or combed	3	5	0
51	510510	Wool; carded	3	10	0
51	510990	Yarn; of wool or of fine animal hair, containing less than 85% by weight of wool or fine animal hair, put up for retail sale	11	10	0
51	511219	Fabrics, woven; of combed wool or combed fine animal hair, containing 85% or more by weight of wool or fine animal hair, of a weight exceeding 200g/m2	16	0	0
52	520522	Cotton yarn; (not sewing thread), single, of combed fibers, 85% or more by weight of cotton, less than 714.29 but not less than 232.56 decitex (exceeding 14 but not exceeding 43 metric number), not for retail sale	11	10	0
52	520532	Cotton yarn; (not sewing thread), multiple or cabled, of uncombed fibers, 85% or more by weight of cotton, 714.28 to 232.56 decitex (15 to 43 metric number) per single yarn, not for retail sale	11	10	0
52	520542	Cotton yarn; (not sewing thread), multiple or cabled, of combed fibers, 85% or more by weight of cotton, 714.28 to 232.56 decitex (15 to 43 metric number) per single yarn, not for retail sale	11	10	0
52	520621	Cotton yarn; (not sewing thread), single, of combed fibers, less than 85% by weight of cotton, measuring 714.29 decitex or more, (not exceeding 14 metric number), not for retail sale	11	10	0
52	520624	Cotton yarn; (not sewing thread), single, of combed fibers, less than 85% by weight of cotton, less than 192.31 but not less than 125 decitex (exceeding 52 but not exceeding 80 metric number), not for retail sale	11	10	0
52	520625	Cotton yarn; (not sewing thread), single, of combed fibers, less than 85% by weight of cotton, measuring less than 125 decitex (exceeding 80 metric number), not for retail sale	11	10	0
52	520631	Cotton yarn; (not sewing thread), multiple or cabled, of uncombed fibers, less than 85% by weight of cotton, 714.29 decitex or more (not exceeding 14 metric number) per single yarn, not for retail sale	11	10	0
52	520833	Fabrics, woven; containing 85% or more by weight of cotton, dyed, 3-thread or 4-thread twill, including cross twill, weighing not more than 200g/m2	20	10	0

Continued—

Table A1—(*Continued*)

52	**520842**	**Fabrics, woven; containing 85% or more by weight of cotton, of yarns of different colors, weighing more than 100g/m2 but not more than 200g/m2**	**20**	**0**	**0**
54	540211	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity nylon or other polyamides, of aramids, not for retail sale, not sewing thread	11	10	0
54	540244	Yarn, synthetic; filament, monofilament (less than 67 decitex), other than high tenacity or textured yarn, elastomeric, single, untwisted or twisted 50 turns or less per meter, not for retail sale, not sewing thread	7	10	0
54	540262	Yarn, synthetic; filament, monofilament (less than 67 decitex), of polyesters (not high tenacity or textured), multiple (folded) or cabled, not for retail sale, not sewing thread	11	10	0
54	540332	Yarn, artificial; filament, monofilament (less than 67 decitex), of viscose rayon (not high tenacity), single, twisted more than 120 turns per meter, not for retail sale, not sewing thread	3	10	0
54	540333	Yarn, artificial; filament, monofilament (less than 67 decitex), of cellulose acetate, single, not for retail sale, not sewing thread	11	10	0
54	540490	Filament, synthetic; strip and the like (e.g.. artificial straw), of synthetic textile materials of an apparent width not exceeding 5mm	11	10	0
56	560750	Twine, cordage, ropes, cables; of synthetic fibers other than polyethylene or polypropylene, whether or not plaited, braided or impregnated, coated, covered or sheathed with rubber or plastics	20	10	20
58	580900	Fabrics, woven; of metal thread and metallised yarn of heading no. 5605, of a kind used in apparel, as furnishing fabrics or similar purposes; n.e.c. or included	20	10	0
58	581092	Embroidery; with visible ground, of man-made fibers, in the piece, in strips or in motifs	20	10	0
59	591000	Textiles; transmission or conveyor belts or belting, of textile material, whether or not impregnated, coated, covered or laminated with plastics, or reinforced with metal or other material	20	10	0
59	591120	Textile products and articles for technical uses; bolting cloth, whether or not made up	11	10	0
59	591140	Textile products and articles for technical uses; straining cloth of a kind used in oil presses and the like, including that of human hair	11	10	0
60	600122	Fabrics; looped pile fabrics, of man-made fibers, knitted or crocheted	20	10	0
60	600240	Fabrics; knitted or crocheted, other than those of heading 60.01, of a width not exceeding 30 cm, containing by weight 5% or more of elastomeric yarn but not containing rubber thread	20	10	0

Note: Products where the Pakistani tariff is high and extremely different than Indian's tariff rate has been highlighted.

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© *The Pakistan Development Review*
62:2 (2023) pp. 167–197
DOI: 10.30541/v62i2pp.167-198

Political Economy of Discretionary Allocation of Annual Development Programmes: Theory and Evidence from Balochistan

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This article discusses and analyses the presence of discretionary allocations of annual development programmes (ADP)—the annual development budget—in the Balochistan province of Pakistan. The paper builds a strong theory and uses robust empirical techniques to assess how the political and bureaucratic elite discretionarily and disproportionally allocates the development funds to meet two central objectives: First, to allow misappropriation of the development funds to their benefit; and second, to make constituency/district-specific allocations to buy political allegiance, indulge in pork-barrel and promote patronage politics—clientelism. For empirical assessment, the article applies an unbalanced panel dataset for districts from the provincial level sources. The theoretical propositions and the empirical results show a presence of discretion and clientelism in the process of budget making and projects' allocation to districts/constituencies, for incumbent politicians and senior career officials in charge of the budgetary-making process make disproportionate budgetary allocations in ADP to their home districts or constituencies or the projects with leverage of extraction and kickbacks in the process of allocations, bidding, and execution. It is evident that constituencies or districts, without representation in the government/cabinet and/or senior bureaucracy in the ministries that make public policy, receive far lesser budgetary allocations than their proportionate share, notwithstanding their prevailing poor social and economic landscape. Such discretionary allocations suffice personal interests and support clientelism in resource sharing, creating inter-regions and inter-districts/constituencies disparity in terms of economic and social development within the province.

*Keywords: A*nnual Development Programmes; Discretionary Allocation Clientelism; Distribution of Resources; Disparity; Deprivation; Balochistan

1. INTRODUCTION

The article discusses the political economy of Annual Development Programmes (ADP) in Balochistan, Pakistan, during the budget-making process. The article mainly discusses the discretionary power and clientelist approach of the political and bureaucratic elite in project selection and allocations to the districts/constituencies during annual budget-making in Balochistan. After presenting a logical political-economic model of budget allocation on bargaining game principles, the article provides a logical and strong empirical insight on how the political and bureaucratic elite—mainly those who are involved in fiscal policymaking—make a discretionary allocation in ADP to

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suffice mainly two purposes: (1) to allow misappropriation of projects that fit best their personal benefits and bargain power; and (2) to make constituency/district-specific allocations to buy political allegiance and to promote patronage politics. In the process, the article argues that the political and bureaucratic elite in the province would not consider the developmental needs and socio-economic profile of the districts or constituencies in the project selection and allocation decision-making process.

It is worth noting that no criteria-based and systematic mechanism is followed in project selection and resource sharing among districts in the province. Therefore, the ADP allocation during the annual budget is largely made arbitrarily and at the discretion of the Chief Minister and his (CMs are always men) key cabinet members, coalition partners, and senior bureaucrats to give disproportionate priority to their home districts/constituencies to mollify two very conspicuous interests as earlier alluded. Indicators like poverty, backwardness, illiteracy, unemployment, and lack of basic amenities are not kept into consideration while allocating the development funds that are presumed to be the top priority in any normal and transparent resource-sharing process (Bardhan & Mookerjee, 2005).

The bargaining game theoretical model presented in the article includes some of the underlying factors affecting the selection and allocation of the projects in the ADP in the politico-economic setting of Balochistan. The article empirically examines the theoretical preposition using a provincial-level dataset on district/constituency-level projects. The rest of the article is organised as follows: while section two discusses the socio-economic and political landscape of Balochistan, section three describes elite capture and institutional aspects of corruption. Section four discusses the political economy of project allocation, and section five presents a budget allocation model. Section six presents the methodology, while Section 7 discusses the empirical results. Section 8 concludes the article, and Section 9 gives policy recommendations.

2. THE SOCIOECONOMIC AND POLITICAL LANDSCAPE OF BALOCHISTAN

Balochistan is the largest province of the country with 44 percent of its total geography. Balochistan has a huge natural resource endowment. However, the province is sparsely populated, where only 6 percent of the nation resides in it (Census, 2017). The provincial economy is vastly undeveloped, relying dominantly on primary modes of production. The mainstay of its economy are natural resources—the majority of them still untapped –, fruits and crops, livestock, fisheries, and illegal border trade and commerce with neighbouring Afghanistan and Iran.

The agriculture sector in Balochistan notwithstanding consists of high-value and non-staple produce, favourable for the water-scarce high-altitude atmosphere in central, northern, and southern regions of the province. However, the sector has invariably remained at a subsistence level with no striking potential for further growth, owing largely to water scarcity, long spills of droughts, and rug and mountain terrains, not suitable for agriculture. Though crop cultivation in the canal-irrigated region in the northeast of Balochistan, falling on the west bank of the Indus River, follows the general trends of agricultural growth in the Canal irrigated area of Pakistan (Khan & Nawaz, 1995).

Whereas the provincial economy is least diversified at the local level, the distinct ecological systems in different areas—flood plains, uplands, and deserts to the coastal area—give a considerable variety at the provincial level. As the northern region specialises in horticulture, the central and western regions employ primarily in livestock rearing, the southern region relies on (il)licit border trade with Iran, subsistence agriculture based on perennial water sources (*Kahn* & *Kareez*[1]), fisheries, and service provisions to the public sector in Pakistan and elsewhere in the Middle East (Bengali, 2018). Rich mineral deposits, such as coal, copper, gold, and natural gas, are found in several regions of Balochistan. However, ironically few influential tribal notables *(Sardars, Nawabs*) with the strong support of state institutions not only control these resources, but they also rudimentarily exploit them without any tangle support to the provincial economy and socioeconomic impacts on the people of Balochistan (Ahmed, 2022). The economic and social development of Balochistan faces daunting challenges. It lags far behind other provinces of Pakistan in all socioeconomic and development indicators such as basic healthcare, education (primary and secondary) and gender equity, economic, social, and physical infrastructure (Ahmed & Hassan, 2020).

For budgetary support and meeting fiscal needs, Balochistan relies heavily on transfers through the National Finance Commission (NFC) Award[2] and other straight transfers, and given that the horizontal distribution of the NFC Award had historically been entirely on a single criterion of population, the Balochistan received less than 5 percent of the total horizontal distribution (Jaffery & Sadaqat, 2006). The historic underdevelopment of the province has squarely been placed on the lack of available resources with a certain degree of justification. However, the 7th NFC Award, which was constituted and implemented in 2009 and 2010 respectively, has changed the fiscal landscape of Balochistan. Under new resource-sharing arrangements, the share of the provinces has increased from 54 percent to 57 percent in the total divisible pool (Ahmed & Baloch, 2014). On the horizontal front, more criteria such as backwardness/poverty, revenue generations and collections, and inverse population density were included besides population—the latter with 82 percent weight still takes far greater a share.[3] The share of Balochistan, therefore, has increased up to 9.09 percent (Iqbal, et al. 2012). However, this somewhat consolidated fiscal position of the province owing to the 7th

[1]For more information about Kahn & Kareez, see Fazle K. & Nawaz (1995).

[2]The inter-governmental resource transfer, which is a significant feature of provincial governments' finances in Pakistan, takes place under the fiscal arrangement of the National Finance Commission (NFC) Award. As mandated by the Constitution of Pakistan, after every five years the President of Pakistan constitutes the NFC Award that prescribes a formula-based fiscal resource distribution and sharing of taxes and non-taxes revenues between the federation and the provinces and among the provinces (for more discussion on NFC and resources sharing arrangement between the federal government and provincial governments and among the latter, see Ahmed & Baloch, 2014).

[3]From the national resources divisible pool, which comprises 82 percent of the population share, 10.3 percent of Poverty and backwardness, 5 percent of revenue collection share, and 2.7 percent of inverse populations density in horizontal distribution criteria as it was up to 5 percent with 100 percent population-based criteria in horizontal distribution (Iqbal, et al. 2012). Although since 2009 a greater number of criteria—like backwardness and revenue collections—have been included in the horizontal resource mechanism, the population retains an 82 percent weight. This criterion preserves Punjab's domination over resources (Jaffery & Sadaqat, 2006; Ahmed, et al. 2007; Ahmed & Baloch, 2014).

NFC Award and the 18th Constitutional Amendment[4] in 2010 has so far failed to bring a visible and meaningful change to its social and economic landscape, which has further pushed the province backward to other provinces of the country. Resultantly most districts in Balochistan are multidimensional poor (Naveed, et al. 2016) and their status has further worsened since 2009.

At the provincial level, the Provincial Finance Commission (PFC) was established in 2001 with the advent of the Devolution Plan[5] to distribute the provincial share of resources among the districts. Besides allocations through the PFC, the districts received resources (funds, grants, etc.) from the federal government on discretionary bases.[6] However, in 2008 the PFC was discontinued, as the Devolution Plan was abandoned. So, in the absence of criteria-based PFC public finance distribution in Balochistan is unbalanced (not considering the developmental and social needs of the respective districts/regions) and biased allocations to districts beyond their just share based on any judicious criteria that could potentially lead to creating a significant intra-provincial disparity in Balochistan as well as a sheer wastage of project allocations and executions through misappropriations, kicks back and pork-barrel by public officials and politicians.

Such lopsided and distorted project allocation and executions to districts/ constituencies appear to be on politico-bureaucratic considerations that warrant a sound theoretical insight and empirical inquiry to understand the underlying political economy behind such practices. This paper therefore is an attempt to investigate and explain this issue to try in contributing to the existing literature on public finance and political economy. The article postulates the presence of a phenomenon of preponderance elite capture and clientelism on the public finances of the province, particularly the annual budgetary share allocated for Public Sector Development (Annual Development Plan) in which the discretionary powers and manipulations of public officials and politicians are instrumental.

Two oft-repeated portrayals of Balochistan for many decades are that ‘the province is rich in all resources’, and that the 'province is the least underdeveloped in Pakistan’. This is indeed very contradictory, though it is very true in every account. In the early decades of Pakistan as an independent country, Balochistan did not reflect meaningfully in any national economic plans or budget documents of Pakistan, except for the discovery and extraction of natural gas at Sui, Dera Bugti region, and other sites of natural resource explorations and extractions. An analysis of growth in Balochistan during the 1970s,

[4]Pakistan took a major shift towards federalism through the 18th Amendment to the Constitution passed in April 2010, which was billed as the most comprehensive reform package in the constitutional history of Pakistan. The 18th Amendment arguably has a profound impact on the governance and economic management of Pakistan. The provinces have received additional powers because of the abolition of the Concurrent List, which ensures the transfer of large amounts of economic authority to the provinces. The 18th Amendment is by and large conceived formally along provincial lines but substantially along ethnic lines. Federalism in Pakistan remains ethnic in both substance and style. The 18th Amendment has invariably given Balochistan a far wider space and autonomy to make an indigenous administrative and fiscal arrangement. Yet for Balochistan, the 18th Amendment has barely been effective in addressing the decades-old grievances. While it provided a constitutional and fiscal space for the province, it could hardly help to address the persistent economic and political issues in Balochistan. For the Baloch to coexist and be part of the Pakistani federation, the federal project of the country needs to be restructured (Ahmed, 2010).

[5]In 2001, Pakistan embarked on reforms through which sizeable powers were shifted to the third tier (i.e., local governments,) mainly from the provincial governments (Ahmed, M., 2016)

[6]For More discussion see, Ahmed, M.

1980s, and 1990s, shows the economic and political neglect of Balochistan in national mainstream policy mechanism (Bengali, 2018).

Key economic indicators in Balochistan portray a depressing picture. For instance, during the 1970s average gross regional product (GRP) growth rate was a mere 2 percent in the province. Although the average growth rate during the 1980s[7] increased to 5.9 percent, but the same fell to 3.5 percent during the 1990s and further to 2.8 percent over 2000-11. Likewise, per capita income growth was 2.2 percent in the 1980s, sliding to 1.6 percent during the 1990s. Over the three-decades period of the 1970s to 1990s, per capita growth was mere 0.3 percent implying zero growth and stagnancy. As a result, the average share of the province to national income has shrunk from 4.5 percent in the 1970s to 4 percent in the 1980s and 1990s. The decrease in provincial share to the national income shows a sharp drift of the provincial economy to the national economy of the country (table 1). The situation somewhat remained the same post-2000s, as the GRP growth over the decade of 2000-11 with 2.8 percent was less than 60 percent of the average combined GRP growth of the other three provinces (Bengali, 1918). Thus, it shows that Balochistan in terms of its economic performance is not only lagging behind other provinces but also drifting away from the mainstream economy of Pakistan.

Table 1

Balochistan: Gross Regional Product Growth by 'Material" Sectors and by Decades

Material Sectors	1970s	1980s	1990s	1947-2000
Major Crops	10.2	14.0	4.3	9.2
Minor Crops	9.5	6.5	1.2	5.0
Livestock	–5.2	6.8	6.0	3.8
Fishing	–4.9	3.1	4.9	2.1
Mining and Quarrying	1.4	4.8	3.2	3.4
Manufacturing	19.0	19.5	5.9	13.9
Construction	2.0	2.3	5.4	3.5
Electricity and Gas	29.1	8.5	2.8	10.8
Transport	–0.4	9.7	4.4	5.3
Communication	22.2	10.5	6.9	11.6
Trade	4.5	8.0	3.8	2.8
Finance	12.4	8.4	6.0	8.3
Overall GRP Growth	2.0	5.9	3.5	4.3
Per Capita Income Growth	–5.2	2.2	1.6	0.3
Share of Balochistan GRP in National GDP	4.5	3.9	4.0	4.1

Source: Bengali and Sadaqat, Provincial Accounts of Pakistan: Methodology and Estimates 1973-2000, Social Policy and Development Centre, Working Paper No. 5, 2005.

[7]The robust 5.9 percent average growth during the 1980s is attributable to the small base effect. The first steps to development in Balochistan commenced with its formation as a province in 1970, with the provision/up-gradation of some essential services – electricity, telephone, official housing, etc. – yet that also only in the provincial capital, Quetta. Banks brought under public domain in the early 1970s, established/expanded their branch network in Quetta and other cities. Banks brought under public domain in the early 1970s, established/expanded their branch network in Quetta and other cities (Bengali, 2018).

The above investments served to boost the growth rate in the 1980s. However, in the two subsequent decades, the 1990s and 200s, no major investment initiatives were undertaken. As a result, growth across almost all sectors was stagnant.

Table 2

Gross Regional Productivity by Province: Average Growth Rate 2000-11

Province	Overall	Rural	Urban
Punjab	4.5	4.02	4.8
Sindh	4.7	5.7	4.1
Khyber Pakhtunkhwa	5.5	5.6	5.3
Balochistan	2.5	2.5	2.5

Source: Social Policy Development Centre, Social Development in Pakistan Annual Review 2014, State of Social Development in Rural Pakistan.

Table 2 shows the average gross regional productivity of all four provinces of Pakistan from 2000 to 2011. Balochistan with 2.5 overall productivity features the lowest gross regional productivity compared to other provinces—Khyber Pakhtunkhwa, for instance, has the highest gross regional productivity among all provinces.

3. ELITE CAPTURE AND INSTITUTIONAL ASPECTS OF DISCRETIONARY ALLOCATIONS

Scholars are cynical about the motivations of politicians and public officials regarding the projects' selection and allocation in most countries. When encountering politicians or bureaucrats, the tendency is to think not about the leadership skills and competence that allowed them to obtain these positions, but rather to imagine all the myriad ways that they are scheming to extract from public resources. The common belief the political and bureaucratic elites stealthily capture resources has deep roots in almost all underdeveloped societies (Hamilton, et al. 1787; in the development context, see also Wade, 1982; Dreze & Sen, 1989). More recently, the phenomenon of elite capture has been further explored and developed in such works as Bardhan and Mookherjee (2000), Acemoglu (2006), and Acemoglu, et al. (2012). Rumbul, et al. (2018) define elite capture as the dominance of political elites in all stages of the budgeting process, often resulting in budget policies that fail to promote the public good provision.

Elite capture is a phenomenon where a few, usually politically and/or economically powerful groups usurp public resources, which are created for the benefit of the masses, at the expense of the economically weaker groups. The elite can be defined along a variety of lines including income, professional, social, power, education attainment, and gender.

According to Laffont and Tirole (1991), the origin of the elite capture phenomenon can be traced to the 'interest group capture' paradigm in the works of Marx, Stigler, and Peltzman. The interest group capture happens because of information asymmetry, inefficient or lack of regulation, and allocation of public resources.

The two main ways of bringing about capture are bribes and collusion. This has significance for elite capture. If elite capture means the capture of government decision-making or resources and has the means to influence public decision-makers, then we

must know under what attributes or quality will it be brought about. Collusion is one such quality, which is easier to notice at lower levels where public officials invariably collude with local politicians or their loyalists. Public officials and politicians are more prone to elite capture than higher/central government agencies (Platteau & Gaspart 2003; Bardhan & Mookerjee, 2005).

Looking at elite capture in terms of access to power, then Bardhan and Mookherjee's (2002) work is much suggestive in the consideration of the idea of 'relative' capture. They investigate the greater vulnerability of subnational governments to relative capture through an extended version of the Baron (1994) and Grossman and Helpman (1996) models of the electoral process, which are subject to the influence and lobbying of special interest groups. The basic presumption of why subnational governments and electoral processes are more prone to elite capture in these models is like the Laffont and Tirole (1991) and Plateau and Gaspart (2004) premise, that is, information asymmetry and collusion. Lieten (1996) mentions that the extent of information asymmetry will depend upon the economic base of the political structure and the robustness of the administrative structure of the state.

The existence of vested interests that come in the way of establishing a more equitable system, by local and national elites, has been discussed by Acemoglu and Robinson (2002). In countries like Chad and Niger in Sub-Saharan Africa, they note that the existence of powerful "interest groups" blocks the introduction of new technologies, or any other vehicle of development to protect their economic rents. Their analysis tries to differentiate and identify which type of elites is most likely to feel threatened and block the development. In the case of Sub-Saharan Africa and the case for the introduction of new technology and beneficial economic changes, Acemoglu and Robinson (2002) argue that elite groups whose power and economic rents are eroded will block technological advances. Similarly, it is perhaps a useful exercise to differentiate various local elite groups and identify who stands to lose most if elite capture of public resources is eliminated.

Elite capture often takes place and nurtures in an institutional framework. Thus, a brief understanding of institutional nature is imperative to grasp the nature of elite capture. Douglass North (1990: p. 3) offers the following definition of institutions: "… are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction." Three important features of institutions are apparent in this definition: (1) that they are "humanly devised," which contrasts with other potential fundamental causes, like geographic factors, which are outside human control; (2) that they are "the rules of the game" setting "constraints" on human behaviour; (3) that their major effect will be through incentives (see also Acemoglu, Robinson, 2010).

Corruption is very much shaped by the nature of institutions, and if someone looks around the world at different societies they have different levels of corruption, and part of that is very much shaped by the kind of institutions they have. Theoretical insight into Political Clientelism (see Bardhan & Mookherjee, 2012) explains that with weak and unaccountable governance and power structure the political elite tends to capture the public services not only for themselves and their immediate families and friends but also use them for clientelistic purposes: to reciprocate the favours to their voters. The absence

of different mechanisms necessary for making politicians and public officials accountable to the people promotes corruption, clientelism, and capture, which leads to the inefficiency of institutional structure and encourages elite capture through institutional corruption (Jayal, 2008).

Thus, the extent of relative elite capture (possible) of government in Balochistan is crucial to understand the likely impacts of unconstrained elites and their captures of public resources elsewhere in similar societies in the developing world.

4. POLITICAL ECONOMY OF PROJECTS ALLOCATION

It is fair to argue that politics and the political process are essential and play an important role not only in the distribution of national resources but also a crucial factor in devising public policies, planning, and development at the provincial/sub-national level. In the majority of underdeveloped societies, the political or social/local elite and the officials who run state apparatus (both civil and military bureaucracy) tend to have an overriding influence in the entire process of politics and political culture. The public resources and their policy planning, budgeting, distribution, and execution are consistently influenced and shaped by the prevailing political and social culture and institutional structure of that society. In a region like Balochistan, where politics is very much patronage-based and project selection and allocation are undertaken largely on political priorities and considerations than socioeconomic grounds, the overall allocation of public funds is driven largely by political economy dynamics (Finan, 2004).

In an ideal situation, it is the prime responsibility of the state and its incumbent government(s) to ensure a just distribution, considering their needs for public resources among all different segments of society, regions, provinces/units, districts, and constituencies so that all communities or individuals of a nation are treated fairly and equally.

Resource sharing plays a key role in increasing the overall living standard of society—mainly of a developing society/economy—helping reduce poverty and inequality, and generating opportunities for jobs, employment, and social and economic well-being. Such a utopian distributional mechanism does not take place voluntarily or through market forces, hence it is imperative and essential for the incumbent government(s) to guarantee a distributional mechanism in which those segments of society lagging are enabled to become effective partners in the overall social and economic growth process. It is fair to argue that the prevailing socio-political culture with inherent political incentives tends to define the general pattern and trend of the public resources distribution of that society. Hence, government(s)—be it federal, provincial, or local—tends to do it, considering the political motives. In a nutshell, for a somewhat fair mechanism of resource distribution, a justly inclusive and representative government needs to be in place.

However, in Pakistan—and particularly in Balochistan province[8]—the political process has consistently been selective and unrepresentative. Some of the historical trends show that (see for example, Khan, 2012; Ahmed & Khan, 2014) during both political dispensations or military regimes, the representation and the resources sharing

[8]For more discussion on this see, Ahmed, M. (2020).

mechanism, determined purely on population bases, has disproportionately favoured the bigger federating unit(s)/province(s), which cost Balochistan (with just 6 percent of the population) heavily in terms of deficiencies in all socioeconomic and political dimensions, creating a huge developmental gap.

In more democratic societies, the political process intrinsically is a key driving force through which the resources and wealth of the nations may reach across all segments of society. Yet in less developed and less-democratic countries like Pakistan, politics is the vehicle through which patronage is used to flatter and buy off loyalties and allegiance, which would create entrench public resources capture of the conventional elite as well as produce local interest groups that will lead to culminate their political influence for further resources capture. This political ecology tends to pave the way and further facilitates favouritism, despotism, and corruption, which tends to support elite capture.

Pakistan is a federation of four federating units/provinces: Balochistan, Sindh, Punjab, and Khyber Pakhtunkhwa. The resources are shared between the federation and four provinces—the vertical distribution—and among the four provinces—the horizontal distribution based on a systematic mechanism of the NFC Award. Looking at the historical processes of the NFC, one can notice an extremely uneven resource sharing in Pakistan.[9] As discussed earlier, the population had remained the sole criterion for resource sharing among provinces, which inherently harmed smaller provinces. Since the decision to resource sharing is done mainly by governments where politics plays a remarkable role, therefore it is fair to argue that the process of resource sharing has its political economy. While, the political economy of resource sharing has endowed the Punjab and Sindh, the bigger provinces, it adversely affected Balochistan and KPK, the smaller ones, leading the country to a course of unconformable politics of discontent and disenchantment.

It can be argued that the tension between the federation and Balochistan province was historically explained through the mechanism of resource sharing in Pakistan. The development literature[10] shows that any conflicts seemingly with political contour are fundamentally triggered by the underlying discontent caused by the resources sharing mechanism. Such conflicts primarily on resource distribution are not uncommon in many developing countries. For instance, in many African, Middle Eastern, and Latin American countries, resource distribution is a great source of political conflict.[11] Thus, the resource distribution mechanism of any country is a major cause of political conflicts, limited not only to Pakistan. However, the centrality of resource distribution in political conflicts is challenged by some scholars including Haggard and Kaufman (2012). Yet evidence from Pakistan-Balochistan, where we notice a centrality of resource sharing in political conflict shows that the latter argument is weak.

According to Ahmed and Baloch (2017), resource distribution in Pakistan follows a principle of a typical game theoretic bargain, where the province with more political and bureaucratic clouts at the federal level has far greater leverage to get a disproportionate size of resources—far in excess to its size and justly share. Such political leverage normally leads to a situation where the economic interests of the dominant provinces or regions/districts are reflected in public finance distribution of the

[9]For a thorough debate on NFC Awards, see Ahmed and Baloch (2014).

[10]See for discussion Harvey, David (2003).

[11]See, Acemoglu and Robinson (2012).

country/province, while weaker provinces/districts/constituencies with lesser political influences on manoeuvre, end up receiving far lesser resources than their just share.

Ahmed and Khan (2015) show that the budget deficit in Pakistan has been much higher during civilian regimes. This phenomenon is best explained by Alesina and Tabellini (1990). Their politico-economic theoretical framework defines that government spending invariably remains higher with a chronic budget deficit, as the civilian elected governments tend to allocate more resources to people-centric social and economic services. In addition to this, political dispensation often finances unproductive projects—sometimes out of their patronage policies—to buy loyalty and allegiance in the prospects of garnering alliances in elections.

The resource distribution pattern—both at federal and provincial levels—is driven largely by politics and the vested interests of a political and bureaucratic elite with significant bargaining power. The apparent preferences of politicians for their constituencies in resource allocation are, as explained earlier, driven by patronage and resource extraction through bribes and kickbacks. This may not necessarily reflect the economic needs of regions or constituencies in which the funds are allocated national/provincial exchequer. Looking at budgetary documents in Pakistan, it is conspicuously illustrative that the political and bureaucratic elite and its preferences always influence project and scheme selection and resource distribution. And such an uneven distribution tends to create a huge and chronic disparity among the regions, provinces, districts, and constituencies in terms of development and social and economic status of those communities.

Milanović (2010) using panel data from many developing countries explains that the economic policies adopted and pursued by many states play a significant role in explaining the inequality across classes and regions. The policies pursued by the state are somewhat egalitarian and enable to wider scale to all segments, it could, in the longer run, converge the groups and regions on similar paths of social and economic trajectory. China in this case provides a classic example of the state's role in economic policies and their impinging impact on poverty reduction. For three decades, China has succeeded in reducing poverty by more than 25 percentage points, where more than 300 million have been lifted out of poverty.[12]

A Budget Allocation Model

Consider a provincial economy where there are two districts, A and B; additionally, there are two constituencies (provincial assembly seats), $i = \{1,2\}$, within each district. Individuals differ in their inherent labour productivity, denoted by s_i, which is distributed according to the density function $\gamma_i(s)$. An individual's wage rate, $w_i s_i$, is linear in the productivity parameter. An individual of type s_i, residing in constituency i of district A, receives utility from private consumption $c_i(s_i)$ and a constituency-specific public good, G_i; conversely, that individual receives disutility from the labour supply $\ell_i(s_i)$. For simplicity, we assume Cobb–Douglas preferences.

$$\ln u_i(s_i) = \ln\left(c_i(s_i)\right) + \ln\left(1 - \ell_i(s_i)\right) + \ln(G_i) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

[12]For more discussion on Chinese strategies for growth and poverty reduction, see, Pei (2018).

We denote the B constituency with ~. In other words, the utility of a type-*s* individual in district *i* of District B is:

$$\ln \tilde{u}_i(\tilde{s}_i) = \ln(\tilde{c}_i(\tilde{s}_i)) + \ln\left(1 - \tilde{\ell}_i(\tilde{s}_i)\right) + \ln\left(\tilde{G}_i\right) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1')$$

An individual of type s_i in constituency *i* of district A receives an after-tax wage income, as well as a provincial budget allocation, *b*; both are assumed to be used for consumption or/and on durable goods with no saving.

$$c_i(s_i) = (1-\tau) w_i s_i \ell_i(s_i) + b \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

where τ is the income tax rate. Consequently, in District B:

$$\tilde{c}_i(\tilde{s}_i) = (1-\tau) \tilde{w}_i \tilde{s}_i \ell_i(\tilde{s}_i) + b \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2')$$

We will suppress the ~ when there is no ambiguity (i.e., when we calculate the derivations for district A, and can always obtain the corresponding quantities for district B by adding ~). We assume the constituency-specific wage rate to be linear in that constituency's development expenditure, D_i, and that the "base wage" *w* is the same across constituencies[13]—namely:

$$w_i = wD_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

$$\tilde{w}_i = w\tilde{D}_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3')$$

4.1. Economic Equilibrium

Maximising (1) s. t. (2) derives the labour supply function and the corresponding indirect utility:

$$\ell_i(s) = \frac{1}{2} - \frac{\theta}{2wsD_i} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

$$U(\tau, ws, \theta, D_i, G_i) \equiv \max_{c_i(s), \ell_i(s)} U_i(s) = \left((1-\tau)ws\right)\left(D_i + \frac{\theta}{ws}\right)^2 \frac{G_i}{D_i} 2^{-2} \quad \ldots \quad (5)$$

where

$$\theta \equiv \frac{b}{1-\tau} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

4.2. Government Budgets

Each district is given a budget, *R* and $\tilde{R}$, by the provincial government, to use on development expenditure and the public good in each of the two constituencies:

$$R = D_1 + D_2 + G_1 + G_2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

[13]For a detailed discussion on the institutional structure where it's shown that in underdeveloped regions the wage rate is linear to the public sector investment/expenditure, see Marsiliani & Renstrom (2007).

$$\tilde{R} = \tilde{D}_1 + \tilde{D}_2 + \tilde{G}_1 + \tilde{G}_2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7')$$

The government collects tax revenue from wage income and distributes it to the provinces/districts, in addition to providing the federal/provincial subsidy/transfer.

$$R + \tilde{R} + Nb + \tilde{N}b = \tau\left(Y_1 + Y_2 + \tilde{Y}_1 + \tilde{Y}_2\right) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

N and $\bar{N}$ are the representative individuals in both districts/constituencies.

$$Y_i = \int_s wD_i s\ell_i(s)\gamma_i(s)ds \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

4.3. The Bargaining Game

We assume a simple alternating-offer bargaining game principle in the provincial budget-making process, as in Marsiliani and Renström (2007). Take District A, with two elected representatives (types s_1^* and s_2^*). If the Constituency 1 representative is the senior minister/finance minister/planning and development minister of the two constituencies, we assume that the elected representative from Constituency 1 makes and presents the budget. Representatives of Constituency 2 can accept or reject budgetary proposals. In case the representative of Constituency 2 rejects the proposals, the provincial budget may undergo another round of proposals and deliberations till the final offer. (The game could be extended to several rounds, without altering the qualitative properties.) In the final round, representative 1 of constituency *i* is to make the final offer, he/she will maximise the utility of his/her constituency subject to (7), thus implying the setting $D_j = G_j = 0$. Maximising (5) subject to (7) provides the optimal level of development expenditure and the public good when a major part of the budget is used in constituency *i*, and the resulting indirect utility is as follows, provided that constituency *i* does not receive any share above its annual development grant:

$$D_i = R\frac{1+m_i(R)}{4} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

$$G_i = R\frac{3-m_i(R)}{4} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (11)$$

$$V\left(\tau, ws_i^*, \theta, R\right) \equiv \max_{D_i, G_i} U_i(s_i^*) = R^2\left(3-m_i(R)\right)^3\left(1+m_i(R)\right)\left((1-\tau)ws_i^*\right)16^{-2} \quad \ldots \quad (12)$$

where

$$m_i(R) \equiv \sqrt{1-8\frac{\theta}{ws_i^* R}} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (13)$$

If constituency 2 is not chosen in the final round, then since $G_2 = 0$, it follows that $V_2 = 0$. If constituency 2 is chosen in the final round, the utility is given by (13). If we denote the probability that constituency 1 is chosen as *p*, then the expected utility of constituency 2 in entering the final round is:

$$E[V_2(R)] = (1-p)R^2\left(3-m_2(R)\right)^3\left(1+m_2(R)\right)\left((1-\tau)ws_2^*\right)16^{-2} \quad \ldots \quad (14)$$

Thus, constituency 2 accepts any proposal that satisfies.

$$\left((1-\tau)ws_2^*\right)\left(D_2+\frac{\theta}{ws}\right)^2\frac{G_2}{D_2}2^{-2}\geq(1-p)R^2\left(3-m_2(R)\right)^3(1+m_2(R))\left((1-\tau)ws_2^*\right)16^{-2} \quad (15)$$

When the representative of constituency 1 makes the first offer, it maximises its utility, subject to both (15) and (7).

Note that this problem can be written as

$$\max_{D_1,D_2,R_2}\left((1-\tau)ws_1^*\right)\left(D_1+\frac{\theta}{ws_1^*}\right)^2\frac{R-R_2-D_1}{D_1}2^{-2} \quad \ldots \quad \ldots \quad \ldots \quad (16)$$

subject to

$$\left((1-\tau)ws_2^*\right)\left(D_2+\frac{\theta}{ws_2^*}\right)^2\frac{R_2-D_2}{D_2}2^{-2}\geq(1-p)R^2\left(3-m_2(R)\right)^3(1+m_2(R))\left((1-\tau)ws_2^*\right)16^{-2} \quad (17)$$

The first-order conditions imply that (9), (10), and (11) hold for the respective constituency evaluated at R_1 and R_2, respectively. R_2 is chosen at the level where (17) holds with equality—that is:

$$D_i=R_i\frac{1+m_i(R_i)}{4} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (18)$$

$$G_i=R_i\frac{3-m_i(R_i)}{4} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (19)$$

$$V\left(\tau,ws_i^*,\theta,R_i\right)=R_i^{\,2}\left(3-m_i(R_i)\right)^3(1+m_2(R_i))\left((1-\tau)ws_i^*\right)16^{-2} \quad \ldots \quad \ldots \quad (20)$$

for i = 1,2 and

$$R_2^{\,2}\left(3-m_2(R_2)\right)^3(1+m_2(R_2))=(1-p)R^2\left(3-m_2(R)\right)^3(1+m_2(R)) \quad \ldots \quad \ldots \quad (21)$$

Equations (18)—(21) completely characterise the bargaining equilibrium as a function of the district budget R, the federal tax rate τ, and the benefit rate/welfare transfer, θ. The same equations are obtained for district B, using the ~ notation.

4.4. Provincial Level Decision-Making

We characterise the situation where one constituency within one district dominates at the provincial level. That situation can occur when the chief minister/finance minister/head of the planning and development department comes from one of the districts. The finance minister decides the allocation to the districts, R, and $\tilde{R}$, considering the bargaining game at the provincial level, maximises its utility. At first, it could look as if the finance minister would set R for the other district to zero. This is not the case, as production there would then stop, and no taxes could be collected from that district, and certain other pre-emptive political economy compulsions would stop the finance minister from zero allocation. Instead, it is optimal to maximise the net tax revenue from the other

district on one hand and to avoid any stalemate in politics. Suppose the finance minister comes from constituency A; then, $\tilde{R}$ is chosen so that:

$$\max_{\tilde{R}} \tau\left(\tilde{Y}_1 + \tilde{Y}_2\right) - \tilde{N}b - \tilde{R} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (22)$$

subject to (4), (9), (18), and (21).

The first-order condition to (22) give $\tilde{R}_s$ a function of τ, θ, w, etc.

$$\tilde{R} = \tilde{R}\ (\tau, \theta, w) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (23)$$

Differentiating (23), and evaluating within a symmetric equilibrium (where the two districts within a province are equal), we obtain:

$$\frac{\partial \tilde{R}}{\partial \theta} = \frac{\tilde{R}}{\theta} \frac{1}{\left(1-\phi_{\tilde{R}}\right)^2 + \phi_{\tilde{R}}{}^2} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (24)$$

Notice that by (6), $b = (1—\tau)\ \theta$; then,

$$\frac{\partial}{\partial b}\left(\frac{\tilde{R}}{\tilde{R}+b}\right) = \frac{b}{(\tilde{R}+b)^2}\frac{\partial \tilde{R}}{\partial b} - \frac{\tilde{R}}{(\tilde{R}+b)^2} = \frac{\theta}{(\tilde{R}+b)^2}\left(\frac{\partial \tilde{R}}{\partial \theta} - \frac{\tilde{R}}{\theta}\right) = \frac{\tilde{R}}{(\tilde{R}+b)^2}\frac{2\phi_{\tilde{R}}\left(1-\phi_{\tilde{R}}\right)}{\left(1-\phi_{\tilde{R}}\right)^2 + \phi_{\tilde{R}}{}^2} > 0 \quad \ldots \quad (25)$$

Where the second equality follows from (6)—i.e., from $b = (1—\tau)\ \theta$—and the last equality from Equation (24). Then, we have:

Proposition: *In the bargaining equilibrium, the ratio of the local expenditure to the total expenditure is increasing in the provincial budget allocation in the Annual Development Plan.*

The proposition implies that if the provincial budgetary allocation, *b*, to that specific constituency, is larger, then the overall resource availability to the constituency is greater. Since a larger provincial budgetary allocation in the shape of projects through the ADP to one constituency comes at the cost of another constituencies/districts, we would expect total funds/projects allocations and the total number of schemes to have a positive impact on the developmental and economic profile of the districts/constituencies.

The elite capture and discretionary allocations by the political and bureaucratic elite are conspicuous in the resource sharing at the provincial level, whereas, unlike social and economic indicators, the political representation in the provincial cabinet and top-ranked bureaucracy determines the project allocations and resource share to districts and constituencies. The “influence” or “capture” of the chief minister/finance minister, key cabinet members, or bureaucracy (that includes the head of the Planning and Development Department—additional chief secretary development, finance minister, chief secretary, etc.) defines the disproportionate allocations of development budgets to the districts/constituencies. We postulate that those constituencies/districts to which the political and bureaucratic elite belong, gain a disproportional development budgetary allocation in the provincial budget. The bureaucratic corruption would not be clientelistic, as bureaucrats would not engage in reciprocity or exchange any favour, however, their discretion in project allocation in the ADP entails personal gains.

The main proposition and theoretical argument are that the project allocation takes place more on political considerations and less on economic and social grounds. The politically-driven public policies that invariably drive the funds and resources distribution, therefore, jeopardise the key economic considerations. The districts or constituencies with extreme poverty, deprivation, and economic underdevelopment are unlike to get any priority in resource distribution based on their poor socioeconomic profile given the incumbent political economy of resource sharing at the provincial level where political and bureaucratic portfolios of political and bureaucratic elite matter more than social and economic conditions of the districts/constituencies.

The incentive of getting re-elected from the same constituency/district induces the politicians favouring their constituencies in project allocation. The optimal level of benefit drawn from the projects, allocated to the districts/constituencies through ADP is determined by the given cost of taxation. However, in a discretionary environment with disproportionate project allocation to certain districts/constituencies, as postulated and predicted in the bargaining model, the benefits gained from the projects outweigh the costs, determined by the taxation.

The study assumes that if the Chief Minister or member of his/her cabinet belongs to constituency/district *i*, during his/her tenure the constituency/district invariably has disproportionate resource allocation. Since the cabinet minister for finance or senior minister plays an important role in budget making and funds allocation like the Chief Minister (CM), the finance minister is inclined to allocate more resources to his/her home district/locality. (In Balochistan because of low population density in many districts a provincial constituency composes entire districts—Awaran, Washook, Kharan, Panjgur, and Gwadar are cases in point). Another key player in budget-making and public resource sharing is the Additional Chief Secretary (ACS). The ACS is a top-ranked bureaucrat who hails from one of the districts/constituencies (if he is a local of Balochistan). We assume that the incumbent ACS allocates more funds to his home district/constituency.

5. METHODOLOGY FOR EMPIRICAL INVESTIGATION

Our primary objective is to assess the discretionary allocation of projects and clientelist politics, and the strong influence of politicians and public officials in ADP during the budget-making process. We operationalise this empirically by using total fund allocations and the number of schemes/projects in absolute terms to each district as outcomes and as measures of political and bureaucratic discretionary power and clientelism. The models, variables, data, and estimation procedures are explained as follows.

5.1. The Empirical Models

For the empirical model, following the predictions of the theoretical framework developed in Section 6, the empirical models of Barankay and Lockwood (2007), Faguet

and Sánchez (2014), and Faguet, et al. (2020) our strategy for empirical inquiry proceeds as under:

$$Y_{it} = \alpha_i + \emptyset X_{it} + \gamma P_{it} + \delta K_{it} + \beta_1 \mathrm{D}1 + \beta_2 D2 + \beta_3 D3 + \beta_4 \mathrm{D}4 + \beta_5 \mathrm{D}5\mu_{it} \quad \ldots \quad (26)$$

Where outcomes *Y* are total yearly funds allocations (TFA) in absolute terms and share of the district to the total number of schemes/projects (Share) to total provincial level schemes/projects and developmental funds. This captures the effects of districts/constituencies with political and bureaucratic clouts disproportionately credited with developmental schemes/projects. 'α' captures the regional/district fixed effects. *X* is the Index of multiple deprivations. Multiple deprivations are made up of separate dimensions or 'sectors' of deprivation. Four key dimensions are used to construct the index: Education, housing quality, and employment. These sectors reflect different aspects of deprivation. Each sector is made up of several indicators, which cover aspects of the deprivation as comprehensively as possible (for more discussion, see, Jamal, et al. 2003). Data on the deprivation index show Jafarabad, Harnai, and Awaran as the most deprived districts in Balochistan, while Quetta, the capital city, is the least deprived district. The index ranges from a maximum of 96 percent and a minimum of 13 percent.

'P' is the population of each district according to current and previous Census reports that capture the per capita expenditure. Poor data even affects regional population estimates, which are entirely based on three censuses thirteen years apart (1981, 1998, 2017), with no annual population data other than projections derived from these. Following Faguet, et al. (2020), to address potential inaccuracies in regional population data, we instead use each region's population share. We assume that even if absolute population estimates are inaccurate, population shares will be more accurately estimated. This measure is likely to mask rural-urban migration within a region, unfortunately. But it seems a reasonable second-best option for dealing with poor data availability. $'K'$ is the area of the district, which allows the capture of the developmental funds needed for physical infrastructure. All subscripted by year *t*, and district index *i*. Quetta is the largest district of Balochistan in terms of population and the smallest in terms of area after Ziarat. Chagai is the largest district in terms of area and if development funds/resources were allocated considering areas/inverse population density maximum share would go to Chagai.

D1, D2, D3, D4, and D5 are the dummy variables that capture the effect of the chief minister (CM) of the province, the senior minister or P&D minister (SM), the finance minister (FM), the additional chief secretary (ACS) and members of the provincial assembly who are the coalition partners of the incumbent government (CG). ACS heads, the P&D Department undertakes the entire budget-making process and constitutes the Annual Development Plan. His influence in diverting funds and schemes to his home district is remarkable. Dummy variables with Zeros (0s) show the official(s) and politicians are not from that district/constituency and Ones (1s) show them from that specific district(s).

The time series of the panel dataset ranges from 2008-09 to 2021-22, and in total 29 districts are included in the analysis.

5.2. Variables and Data Sources

Table 3

Variables and Data Sources

Variable	Symbol	Sources	Measurement
Total Yearly Funds Allocations to Each District[14]	TFAs	Budget documents, Finance Dept. Govt. Balochistan	Expressed in absolute terms, in Millions of Rupees
Yearly Share of Each District to Total Projects in the Province	Share	Budget documents, Finance Dept. Govt. Balochistan	Expressed in Percentage share
Total Number of Schemes in Each District	TS	Budget documents, Finance Dept. Govt. Balochistan	In absolute numbers, in Millions of Rupees
Index of Multiple Deprivation of the Districts	IMD	SDPI, OPHI[15], UNDP	1= least deprived 100= Most Deprived
Chief Minister	CM		a dummy variable (0,1)
Senior Minister/P&D Minister/Finance Minister	SM		a dummy variable (0,1)
Additional Chief Secretary	ACS		a dummy variable (0,1)
Finance Minister	FM		a dummy variable (0,1)
Members of Provincial Assembly in Coalition Government	CG		a dummy variable (0,1)
Population of District	Pop	Census reports, Govt. of Pakistan	Expressed In millions
Area/Inverse Population Density of District	Area	Govt. of Pakistan	In Square Km

5.3. Panel Estimations

Given the nature and heterogeneity of the data, panel estimation is the best method to assess the prevalence of political and bureaucratic capture in overall resources/ development funds distribution/allocations to districts or constituencies. Our panel is

[14]The data are available only for 29 districts; hence, we restrict to 29 that include, Districts Awaran, Barkhan, Bela, Chagai, Dera Bugti, Gwadar, Harnai, Jaffarabad, Jhal Magsi, Kachhi. Kalat, Kech, Kharan, Khuzdar, Kohlu, Loralai, Mastung, Musa Khail, Nasirabad, Nushki, Panjgur, Pishin, Qilla Abdullah, Qilla Saifullah, Quetta, Sibi, Washuk, Zhob, Ziarat.

[15]Oxford Poverty and Human Development Index.

sufficiently long and (un)balanced. Panel estimations enable us to control for time-invariant characteristics (e.g., geography) and statistically unobserved phenomena (e.g. culture, social structure, etc.), especially when results are clustered at the level of districts. Given our postulation and theoretical predictions, we expect a positive relationship, and hence statistically significant coefficients with positive (negative for X) signs of any effects of these variables on outcome variables. We use a fixed effects (FE) model to address omitted variable bias and endogeneity issues. A Hausman [16] test confirms that the fixed effects strategy is correct, yet we report both fixed and random effect (RE) models. Hausman's (1978) test compares the FE with the RE test where the null hypothesis is that the coefficients of the RE model are the same as that of FE.

FE model removes the time-variant characteristics from explanatory variables and enables us to assess the predictor's net effects. In the FE model, it is assumed that the time-invariant characteristics distinctive to one entity may not be correlated with other included entities' characteristics (Baum, 2006). Using the FE model comes at the cost of loss of a considerable degree of freedom, which consequently increases the estimators' standard error and reduces the effectiveness of the model to test coefficients. The FE model controls for all time-invariant differences between the individuals/entities so the estimated coefficients of the FE model cannot be biased because of omitted time-invariant characteristics like culture, religion, gender, race, etc.[17]

6. RESULTS AND DISCUSSIONS

The empirical results obtained using the model specification portray a clear and sharp presence of discretionary power of the political and bureaucratic elite in the process of budgetary allocations for the development schemes to districts and constituencies. The salient statistics of variables are described in Table 4 to show a clear picture of the dataset used. Using a panel dataset, in the following we present and discuss descriptive statistics to get prior information on the subject matter. The results obtained from both models of the FE and the RE are discussed and analysed correspondingly.

Table 4

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Total Fund Transfer to District (TFA)	435	930.2168	1440.348	0	14206.57
Total Number of Schemes District (TS)	435	52.5799	67.1033	0	652
Percentage Share of the District to Total Projects/Schemes (Share)	435	1.9531	2.3722	0	23.39
Index of Multiple Deprivation (IMD)	434	52.1509	12.0604	13	96
Chief Minister (CM)	429	0.0288	0.1674	0	1
SM/FM (Senior Minister/Finance Minister)	430	0.0350	0.1842	0	1
Geographical Area of District (Area)	430	1.2803	1.3480	0.15	5.055
The Population of District (Pop)	435	0.3591	0.3269	0.03	2.54
Member of Provincial Assembly in a Coalition Government (CG)	428	0.6025	0.4902	0	1
Additional Chief Secretary (ACS/SM)	390	0.0328	0.1786	0	1
Finance Minister (MF)	390	0.0328	0.1786	0	1

[16]Hausman, Jerry A. 1978. 'Specification Tests in Econometrics'. *Econometrics 46*(6):1251–71.

[17]For more discussion, see, Baum, C., E. (2006) An Introduction to Modern Econometrics Using Stata, A Stata Press Publication, Stata Corp LP, College Station, Texas.

The second row of Table 4 shows the total funds allocation of the last 13 years' development budget. A third row is a yearly number of schemes for each district for the last ten years from the provincial budget. As we see for some given years some of the districts have virtually zero allocation from the provincial budget. The statistics further show that resources are not distributed on the bases of area, weak social and economic profile, poverty, and backwardness. The footprint of ACS and the senior/planning and development minister is conspicuous in the overall projects' allocation to districts.

The results using FE and RE models are reported in Tables 5 and 6, showing significant political considerations and other vested interests in the project allocation process. More pressing indicators like poverty, socioeconomic backwardness (captured by IMD), and poor physical infrastructure (captured by the geographical size of the district) are *not* considered. The regression results are presented with the sign and level of significance of the coefficient of all included variables, which follow rigorous analytical discussions.

Table 5

The determinants of total fund allocations to districts (TFA)

	Fixed Effects		Random Effects	
Variables	Coefficient	t-statistics	Coefficient	z-statistics
Cons	–1232.31	–0.48	–523.226**	–3.30
	(2563.13)		(158.58)	
IMD	–1.3702	00.45	–2.105622	–0.001
	(3.022)		(2.63)	
CM	789.2422***	4.05	633.4927***	3.68
	(194.90)		(172.0)	
PDM/FM	129.1641**	2.64	165.942***	3.05
	(201.59)		(157.7)	
Area			43.19005**	1.88
			(22.92)	
Pop	2036.975***	6.25	1147.993***	7.53
	(326.16)		(152.55)	
CG	178.052*	2.44	93.5656**	3.41
	(73.076)		(66.391)	
ACS	675.536**	2.77	34.45721***	2.17
	(243.67)		(199.52)	
FM	543.112**	3.1	27.56801***	3.12
	(432.04)		(201.12)	
F-test	117.96***			
Wald χ^2			1990.88***	
Fixed Effect (F-test)	F (24, 232) = 2.36***			
No. of observations/ groups		265/25		265/25
Hasuamn Test Result	Chi2 (10) [P. Value]	19.31 (0.0133)		

Note: Values are in million Rs, Panel regressions robust standard error in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Table 6

The Determinants of 'Share of Each District to Total Projects (Share)'

	Fixed Effects		Random Effects	
Variable	Coefficient	t-statistics	Coefficient	z-statistics
Cons	3.087	0.68	1.078***	2.88
	(4.57)		(0.374)	
TS	0.0094**	6.68	0.0073***	4.97
	(0.0014)		(0.001)	
DP	–0.012	–0.26	–0.021167	00.65
	(0.0053)		(0.0058)	
CM	0.899**	2.59	0.5730***	2.50
	(0.347)		(0.3811)	
PDM/SM	0.286**	0280	0.19124**	2.51
	(0.35)		(0.376)	
Area			-0.00714	–0.09
			(0.082)	
PP	0.120	0.21	3.1743***	7.61
	(0.581)		(0.412)	
CG	0.518***	3.98	0.6544***	4.58
	(0.130)		(0.142)	
ACS	1.93***	4.46	0.239***	4.53
	(0.434)		(0.451)	
FM	2.66**	5.22	0.155***	5.13
	(.5440)		(0.342)	
F-test	17.99***			
Wald χ^2			341.14***	
Fixed effect (F-test)	F(24, 232) = 9.21***			
No. of observations/ groups	265/25		265/25	
Hasuamn Test Result	Chi2 (10) [P. Value]	23.45 (0.0038)		

Note: Values are in million Rs, Panel regressions robust standard error in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

Table 5 shows the empirical result by using FE and RE Models correspondingly. The results explain that the IMD, an important variable in capturing the socioeconomic landscape of districts is *insignificant*, showing that the socioeconomic conditions of districts may not reflect in the overall consideration of the planners at the provincial level while devising the developmental budget. The 'area' or geographical length of the district also has a weak correlation with the total fund allocations. The coefficient of deprivation index is negative (i.e., –1.37), which suggests the fact that deprivation and poverty of any district are not reflected in total project allocations, no matter how deprived the district may be. It doesn't get the least footprint and reflection in overall budgetary allocation. In a normal scenario, however, the most deprived districts should have attracted more allocation/projects to address the deprivation level.

Likewise, the Chief Minister coefficient is positive (i.e., 789.24) and statistically significant, showing the fact that the home district of the CM would receive disproportionately more projects/schemes from the provincial developmental budget. Also, high-level significance for the finance minister and P&D minister shows the relevance and predictive power of this variable in the model. The variable is positively correlated with the total fund allocation, which means like the CM, the minister also grabs more funds and schemes for his constituency/district. The variable, CG (part of coalition government) is statistically significant, illustrating the fact that the minister/MPA being part of the collation also influences the budgetary allocation and therefore allocates more projects to the district that he belongs. The population variable of all districts is also positive and statistically significant, with a clear illustration that more populous districts, like Kech and Quetta, attract more schemes, irrespective of their representatives being in the incumbent government. The Additional Chief Secretary (ACS) variable is also significant and shows the hypothesised sign, exhibiting that the ACS disproportionally allocates more projects and schemes to the district to which he belongs.

Table 5 also reports the empirical results using the RE model. Like the FE model, the RE model results also show a similar trend where one can notice the presence of political and bureaucratic capture, clientelism, and pork barrel in overall fund distributions during the Annual Development Plan. The concerned variables that would potentially indicate any possible existence of elite capture and pork barrel in the budgetary allocation process show the expected signs and are also statistically significant. While the empirical results not only support our main hypothesis of the strong presence of political and bureaucratic capture and discretionary allocations to districts and constituencies, it also corroborates the prepositions discussed in the theoretical model of the paper.

Table 6 shows the results where the 'share of districts to the total annual development budget of the province' is the dependent variable. Like the previous models on total fund transfers, the share of total projects or schemes variable is significant with all expected signs vis-à-vis dummy variables detecting the presence of 'elite capture' (the influence of CM, senior cabinet members, powerful coalition partners, and senior bureaucrats like ACS and CS). Whereas the wrong signs of coefficients of the variables included in the model to capture the social and economic landscape of the province (what they should have theoretically been) or the statistical insignificance of the variables that show the social and economic status of the districts are the clear manifestation of the fact that the planners are least interested taking such determinants into account during budgetary allocations for developmental schemes. In other words, political considerations and vested interests are key in this entire process of public finance allocation for development schemes, where influential politicians and bureaucrats tend to prefer their home districts/constituencies at the very cost of the developmental needs of many other regions and districts. Such a practice is bound to lead to more uneven social and economic development and create acute inequality and economic and social disparity among districts and constituencies.

Like the earlier results and discussions, using the RE model and regressing the Share of schemes/projects of districts/constituencies to total developmental schemes of

the province gives identical results where virtually all variables with a certain degree of statistical significance suggest a strong discretionary power of the political and bureaucratic elite in the process of budget making and funds allocations to various districts and constituencies in Annual Development Plan. With a certain degree of confidence, we, therefore, can argue in line with basic postulations and theoretical prediction(s) in the article, that the allocations of public-funded schemes and projects are allocated mainly on political and vested interests' considerations than social and economic needs of the districts and constituencies. This suggests a strong elite capture and discretionary power in the entire process of ADP making in Balochistan.

6. CONCLUSION

It is commonly understood that public resources, particularly the development budget, in Balochistan, are *not* distributed among districts and constituencies considering largely the social and economic landscape, and physical infrastructural needs of the districts/constituencies. In a normal scenario, nevertheless, weak socioeconomic indicators should catch the attention of the planners during the budget-making process and Annual Development Plan allocations. In such an ideal case, the political and bureaucratic considerations would play a minuscule role in the overall resource distribution to the districts/constituencies in Balochistan. Yet, nothing of sorts exists during the projects' allocation in the annual budget, where, on the contrary, political and bureaucratic elite favours excessively their home districts/constituencies during the development budget-making process. Thus, the evidence of this warrants a systematic and robust study of the political economy of ADP making in Balochistan. This paper was an attempt towards that direction.

The empirical evidence shows that politics and bureaucratic considerations have significant influence and intervention in the ADP-making process and allocation of projects to the districts and constituencies. The political elites and top-ranked bureaucrats/ administration are more cognizant of their interests and clientelistic considerations in the projects' allocation process in a way that their districts/constituencies get the major share at the cost of other poor districts. Better-represented districts in the incumbency get a larger share of funds/projects and create in the process a huge disparity in the shape of development.

Both the theoretical prepositions and empirical evidence of the paper suggest a strong presence and prevalence of political and bureaucratic capture, the discretionary power of the policy-making circles, and clientelist behaviour in resource/project sharing/allocation in Balochistan. The main argument of the paper is in line with some of the profound theoretical and empirical work in the existing literature. Scholars (see, for example, Bardhan, 2006; Laffont & Tirole. 1991; Zaidi 2005; Bardhan, 2002) believe that the discretionary power of the incumbent elite makes resources allocation ineffective in addressing some of the important social and economic challenges, because it may increase the chances of some districts or constituencies to usurp the rightful shares and allocations of their counterparts (Dellinger, 1994; Krishna, 2003). Bardhan and Mookherjee's (2005) work in this regard provides a fine insight to understand more of the elite capture phenomenon in projects' allocation during the budget-making process. They propose that in the absence of a transparent electoral process, the lack of political

awareness, and the presence of strong and rich lobbies to influence political parties and representatives through their finances, project allocation processes tend to be discretionary and much more prone to elite capture and clientelism.

The scale of capture and clientelism is high in those countries or provinces where institutions are weak and dysfunctional. Balochistan is not only the poorest province of Pakistan lagging other regions and provinces on almost all social and economic fronts, but its public institutions are also abysmally weak with virtually no checks and balances, and accountability. The weak institutional setup coupled with undemocratic culture defined largely by tribal allegiances and kinship not only supports pork barrel and patronage-based politics but also encourages unrestrained corruption and misappropriation of public resources. In such a situation politicians and bureaucrats are less likely to be accountable for any possible lack of transparency and political retributions to weaker and poorer districts or constituencies. Bardhan and Mookherjee (2005) further highlight that under the central budget-making process, given the "bureaucratic corruption" the stronger and more representative districts/localities may receive better allocation provided that aggregate supply is greater than the black-market demand, which comes from the rich.

An important caveat of provincial/local autonomy and devolution is indeed the elite capture, discretionary power of the incumbent elite, and clientelism (Bardhan and Mookherjee, 2012) in the process of budgetary allocation at the provincial/local level, particularly in those subnational units where the institutional structure is weak and without any robust system of accountability (Bardhan and Mokeerjee, 2005, 2012 showed elite capture in relation of decentralisation in India). The political economy literature (see, Laffont an&d Tirole, 1991; Bardhan & Mookherjee, 2000; Persson & Tabillini, 2000; Pranab, 1996) point out that the fruits of devolution and fiscal autonomy are likely to be jeopardised because of the presence of the 'elite capture' and clientelism on the public resources once they are devolved. Therefore, the essence of devolution may fail to produce any tangible outcomes due to such practices.

Balochistan is a kind of society where strong chieftains, tribal elders, and a few well-connected families or kin have a high stake to explain the trend and nature of the political economy of public resource sharing and expenditure/consumption, as they normally ascend to capture political and administrative control. The influence of these individuals or families is conspicuous in rural areas. In the case of decentralisation and devolution, they potentially have the power to divert the public resources to their interest as well as indulge in clientelist belabour at the expense of public benefits at large at the provincial level.

Our theory indicates the extent of discretionary power in project allocations: the disproportionate allocations to the projects of their own choice as well as clientelistic transfers. The empirical evidence in Tables 5 and 6 supports our theoretical prepositions of elite capture and the institutionalised nature of corruption. The kind of capture and clientelism that we witnessed in our empirical investigation is a form of institutional corruption. Weak governance and lack of institutional checks and balances provide unbridled leverage to the political and bureaucratic elite to capture resources in the form of disproportionate allocation and political clientelism. Our analysis is aligned with existing literature, see for example Kitschelt and Wilkinson (2007) as these studies

provide an overview of studies from Africa, India, Latin America, and South Asia documenting the pervasiveness of patronage-based clientelism and capture. Additionally, our research adds a new dimension to the understanding of capture and clientelism. Our research implies that in weak governance and poor accountability framework, as we witnessed in the case of Balochistan, public resources are captured and diverted to suffice the interests of politicians and senior bureaucrats, not necessarily reflecting the developmental and social needs of the districts or constituencies to which disproportionate funds are allocated, as we know that there are much poorer districts in Balochistan (see MPI in Pakistan, 2016; Naveed, et al. 2016).

8. RECOMMENDATIONS

Based on the theoretical forecasts and empirical evidence, the following policy recommendations may be considered by policy circles:

(i) The government of Balochistan should establish transparent criteria for project selection in the Annual Development Plan. These criteria should be based on objective factors such as development priorities, socioeconomic indicators, needs assessment, and technical feasibility in districts. By clearly defining the criteria, the decision-making process becomes more accountable and less susceptible to discretionary allocations.

(ii) Involve stakeholders, including local communities, community-based organisations, and representatives from relevant sectors at the district and tehsil level, in the project allocation process. Conduct consultations, public hearings, and forums to gather feedback and insights from the public. This participatory approach helps ensure that projects address genuine needs and get broad-based support, reducing the discretion of a few individuals.

(iii) Strengthen the role and authority of local government bodies, such as district councils or local councils, in project selection and implementation. By decentralising the decision-making process, there is a greater likelihood of projects being allocated based on local needs and priorities, rather than centralised discretion.

(iv) Through a World Bank-funded project, Balochistan Government has established the "PSDP Automation" programme, in which the entire process of ADP is to be automated. The Government of Balochistan must implement the PSDP Automation programme to ensure the use of technology to increase transparency and efficiency in project allocation. This will enable the implementation of online portals or platforms where project proposals, evaluations, and progress reports can be accessed by the public. Technology-driven systems can help reduce manual interventions, enhance accountability, and provide a streamlined process for project allocation.

(v) Strengthen the auditing process to ensure strict financial accountability. Regular and independent audits of project expenditures help identify any irregularities, misuse of funds, or deviations from approved plans. Auditing serves as a deterrent to discretionary allocations and encourages adherence to established rules and procedures.

(vi) The influence of politics and the political elite in the reflection and allocation of projects and funds to their districts/constituencies may be abandoned by discontinuing the MPAs-based selection and allocation of projects.

(vii) A comprehensive annual or five years development plan for the province may be devised through a robust group of relevant experts, and stakeholders so that the project could be allocated to those sectors and districts which are in dire need of resources to come at par with other districts and constituencies of the province if not the country.

(viii) Sectoral criteria for the allocation of funds should be strictly followed to avoid wastage of resources.

(ix) The budget calendar may be strictly followed up so that the projects should be processed and complete timely.

(x) For proper implementation of the schemes and projects, the monitoring and evaluation wing of the Planning and Development Department must be staffed with relevant experts and made fully functional and autonomous.

(xi) Routine planning may be carried out by taking on board the experts, economists, social scientists, educationists, etc.—in close consultation with district-level think tanks and universities, whereas the bureaucrats should be restricted only to the implementation of the planned projects and schemes.

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© *The Pakistan Development Review*
62:2 (2023) pp. 199–222
DOI: 10.30541/v62i2pp.199-222

Is Economic Growth Inclusive in Punjab, Pakistan? A District Level Assessment Using the Composite Index

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This paper aims to develop a composite Inclusive Growth Index (IGI) for 36 districts of Punjab, incorporating six overarching dimensions including (i) economic, (ii) amenities, (iii) gender equity and financial inclusion, (iv) human development (v) governance and (vi) sustainability. Following the OECD's Handbook of Composite Indices, the study uses a min-max approach for the normalisation of indicators followed by the weighted aggregation using Principal Component Analysis (PCA) for assigning weights to indicators in each dimension in the composite index. The study ranks the districts as out-performing, average-performing, and lagging districts in terms of social inclusion. According to the ranking, the central and northern districts of Punjab such as Lahore, Gujrat, and Rawalpindi, etc. are scoring high on IGI, while districts falling in South Punjab such as Rajanpur, Dera Ghazi Khan, and Muzaffargarh, etc. are lagging. The result of the study highlights the areas and dimensions of social inclusion where the districts are lacking and, consequently, the policymakers and planners need to focus on these.

JEL Classifications: D63; O11, O47.
Keywords: Inclusive Growth, Composite Index, Principal Component Analysis, Punjab–Pakistan

1. INTRODUCTION

Despite advancement in technological solutions and progress in industrial and agricultural sectors in Punjab, regional disparities and inequalities persist which hinders the process of poverty eradication. The variation in poverty level, Human Development Index (HDI) scores, and the variation in other social development indicators between districts are indicative of unequal growth and regional disparities. This has led to a call for a deeper understanding of the determinants of growth to ensure a higher degree of inclusiveness. Globally, Pakistan is positioned at 47th place, out of seventy-four

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Authors' Note: An earlier version of the paper was presented in the 35th AGM and Conference of PSDE/PIDE. Authors are thankful to the discussants and panellists of the technical session for their valuable comments/feedback on the draft version. Moreover, authors are grateful to the Team Lead (Economics) and the CEO, The Urban Sector Planning and Management Services Unit (the Urban Unit), Lahore Pakistan for their overall support and patronage of research work at the Urban Unit.

countries, which were ranked as per Inclusive Development Index 2018 (World Economic Forum, 2018). However, there is an absence of a comprehensive tool for tracking inequalities and social exclusion at provincial and/or sub-regional levels in Pakistan. Measuring inclusive growth at lower levels offers the potential for a holistic approach for addressing inequality challenges, by highlighting the links between economic and social policy. For instance, investing in employment policies will not only improve the living standard of an individual but will also help in increasing aggregate economic growth (Lee, 2018). Existing measures of economic growth including Gross Domestic Product (GDP) fail to recognise the contribution of other social factor which triggers the growth process (Prada & Sánchez-Fernández, 2019). In these circumstances, scholars have directed their attention towards the inclusive growth concept of development as it builds links across policy areas to reduce poverty and inequality.

The urban areas and metropolitan cities are driving growth in a country, however, most of the inequalities are visible in those areas. This has led the policymakers to deliberate on cities' inclusive growth, whether they are meeting the demand of the wider population or not. Focusing on lower levels offers the advantage of developing and testing new approaches for a specific local context, with the successful ones then scaled up to other areas (Lee & Sissons, 2016). Structural changes and devolution programs have led to the emergence of different tiers of provincial government, i.e., division, district, tehsil, and union council, as important economic actors who are given new powers and responsibilities to undertake the challenges of poverty alleviation at lower levels.

Although local policymakers often have limited powers to directly address growth, a country needs all its key political actors to contribute to the efforts of achieving the inclusive growth outcome. Globally, the Inclusive Growth (IG) agenda has already started to impact urban and regional policy areas. The most developed province of Pakistan, Punjab has also developed its Punjab Growth Strategy 2018 in line with the vision of inclusive growth (Planning & Development Board, 2015). However, the main challenge here is to make sure that Inclusive Growth does not become a buzzword, which implies that although many pre-existing policies have adopted the IG agenda, it is not translated into outcomes and does not have an impact (Lee , 2018). Thus, the creation of a statistical framework to measure inclusive growth is necessary at the Punjab district level to compare the extent of inclusive growth and to assess the impact of the measures undertaken for social inclusion.

With this background in mind, the paper aims to measure if the economic growth in Punjab is inclusive or not by constructing a composite Inclusive Growth Index (IGI) for its thirty-six districts. The study will be consistent with the definition and measurement approach of the Composite Index for Inclusive Growth adopted by Vellala & Chattopadhyay (2016), which integrates economic, amenities, gender equity and financial inclusion, human development governance and sustainability factors into one single measure. It also aims to conduct an inter-regional comparison between Punjab districts, by ranking them as out-performing, average-performing, and lagging districts, in order to determine which districts are high-priority areas for government intervention. The estimation of IGI will also demonstrate which particular dimension of inclusive growth is driving the index in any district.

The rest of the paper is arranged into four sections, where Section II will review the existing approaches to measure inclusive growth and show how this has informed the selection of dimensions of the inclusive growth index. Section III details the design of the inclusive growth index and outlines the selected indicators within the index. Section IV will present the results and discussion of this research, followed by concluding remarks and policy implications in Section V.

2. LITERATURE REVIEW

The initial debates on the concept of inclusive growth and its relationship with poverty and inequality have been dominated by the works of Kuznets (1995) who highlighted the inverted "U' function between inequality and growth. He argued that the trickle-down effect of development and growth can lead to poverty reduction. However, considering the prevalence situation, inequalities continue to persist in advanced countries despite their strong economic growth (Vellala & Chattopadhyay, 2016). As a result, another significant concept 'Pro-Poor Growth' appeared later on, which is defined as 'the difference between the poverty reduction associated with any particular growth spell and the poverty reduction.', and it focuses on the conditions under which the poorest benefit (Lee, 2018) However, from the beginning of the 1990s, countries around the world are facing increasing challenges of income inequality, poverty accumulation, and other intra-regional disparities, despite the increase in economic development and urbanisation. The critiques argued that the pro-growth concept was relatively narrow, and it focuses on the poor while ignoring the population just above the poverty line (Lee, 2018). As a result, there has been a shift in debates from 'pro-poor growth' to an alternative approach termed as the 'inclusive growth', where the former mainly focuses on poor segments of the population gaining from growth, while the latter incorporates greater equity concept across a broader segment of the population (Vellala & Chattopadhyay, 2016). The concept was incorporated into the globally recognised Sustainable Development Goals (UN, 2016). The Organisation for Economic Co-operation and Development (OECD) also launched an "Inclusive Growth in Cities" programme in 2016 for promoting a higher degree of inclusive economic growth. However, despite its popularity, this concept does not have a universal definition.

The Asian Development Bank (ADB) defines inclusive growth as the growth which ensures equal access to new economic opportunities for all segments of society, thus emphasising the social welfare component (Ali & Son, 2007). While IMF argues that inclusive growth promotes gender equality and sustainable development, along with reducing corruption, improving governance, and promoting the use of financial instruments by less wealthy households (Loungani, 2017). According to OECD, inclusive growth "creates opportunities for all segments of the population and distributes the dividends of this growing prosperity, in both monetary and non-monetary terms, fairly among the whole society" (Organisation for Economic Co-operation and Development (OECD), 2014). Different definitions of inclusive growth exist in the literature.

Numerous scholars have also tried to measure Inclusive Growth using various models, approaches, theories, and strategies for development. The major three main approaches are (1) the single indicator approach, (2) the dashboard indicators approach, and (3) the composite index approach. LSE Growth Commission uses a single indicator

approach, where median household income is taken as the indicator to explain GDP growth (Aghion, et al. 2013). On the other hand, ADB's Framework of Inclusive Growth follows the dashboard indicator approach, thus covering both income and non-income indicators (McKinley, 2010). The study includes 35 indicators that fall under five dimensions. These are (i) growth, productive employment, and economic infrastructure; (ii) income poverty and equity, including gender equity; (iii) human capabilities; and (iv) social protection. The study has also identified some of the indicators for the governance dimension such as the public expenditure-GDP ratio.

Most of the literature is based on the third approach i.e. construction of a composite index for measuring inclusive growth. Shearer et al (2016) created a composite index, based on three dimensions which are: (i) growth, (ii) prosperity, and iii) inclusion to monitor 100 US metropolitan cities' performance. Aggarwal (2021) examined the inclusive growth of various states in India, based on Inclusive Development Index (IDI), which is divided into two dimensions i.e. (i) process of growth, and (ii) outcome of growth. Similarly, another study measures the level of inclusive growth across 15 Indian states, based on six dimensions which are (i) economic, (ii) amenities, (iii) human development, (iv) gender equity and financial inclusion, (v) sustainability, and (vi) governance (Vellala & Chattopadhyay, 2016). Principal Component Analysis (PCA) was employed for the weighting and aggregation of all the indicators.

For Pakistan, there has been relatively little work done on developing frameworks to measure the Inclusive Growth Index (IGI) for the districts of Punjab, which gives enough scope for further investigation. Pakistan has been ranked at 47th position by World Economic Forum (World Economic Forum, 2018) against other countries to measure global progress in inclusive growth. The global dashboard monitors twelve indicators, based on three overarching dimensions i.e. (i) growth and development, (ii) inclusion, and (iii) intergenerational equity and sustainability. However, the dashboard includes a very broad range of factors, and the data for some of these factors are not measured at the regional or local level in Pakistan, which makes it difficult to be used for the purpose of this study. In addition to this, other studies also focused on measuring inclusive growth at the country level. Mushtaq and Zaman (2021) used the single indicator approach to measure the inclusive growth of Pakistan, where the poverty headcount ratio was used as a proxy and per capita Gross Domestic Product (GDP), Foreign Direct Investment (FDI) inflows, agriculture value added, health expenditures, income inequality, and education expenditures were used as explanatory variables which have an impact on inclusive growth. On the other hand, Kiani, et al. (2015) used a composite index approach to measure Pakistan's inclusive growth for a period of five years from 2008 to 2012. The limitation of this study is that it includes indicators that are not measured at the district level in Pakistan. However, the review of all the previous literature provides some guidance to a range of factors that can be included in the inclusive growth index in Punjab.

3. DATA AND METHODOLOGY

3.1. A Conceptual Framework

The concept of an inclusive growth index is understood as a measure of economic growth that considers the distribution of the benefits of growth across different segments

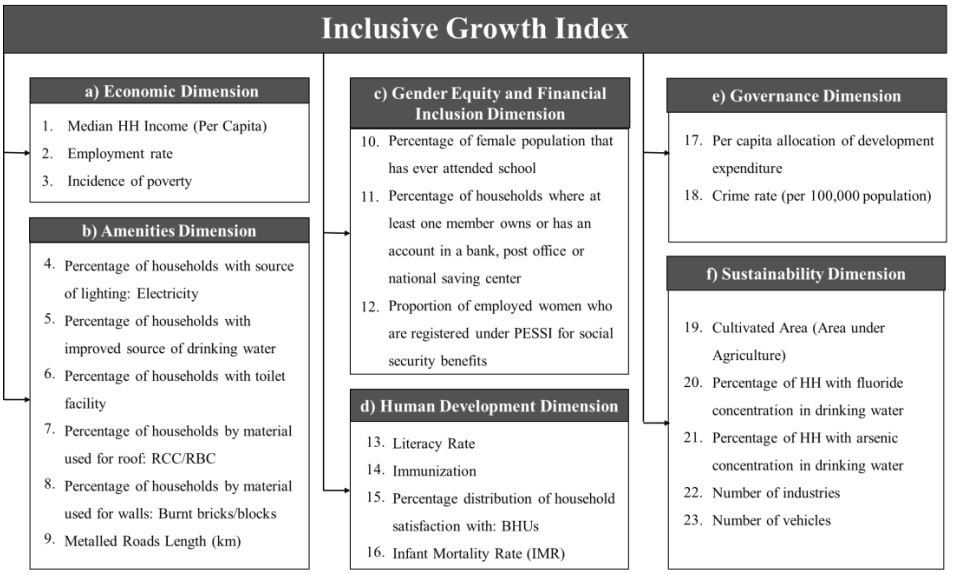
of society. The index is to ensure that the benefits of economic growth are widely shared and that growth is sustainable over the long term. It aims to provide a more comprehensive picture of economic performance than traditional measures such as GDP growth alone, and to inform policy-making that promotes inclusive and sustainable economic growth.

An inclusive growth framework is a set of policies and strategies aimed at promoting inclusive and sustainable economic growth. Based on the literature on inclusive growth index, the framework typically includes a range of policies areas aimed at addressing the key dimensions of inclusive growth, including economic growth, gender equity, environmental sustainability, promoting good governance and tackling corruption, investment in human capital, such as education and skills training, investment in infrastructure, such as transportation and energy, social protection and other programs to support the most vulnerable. This study has adopted the comprehensive framework used in Vellala & Chattopadhyay (2016), which is based on six dimensions including:

(i) Economic dimension: This dimension focuses on the overall level of economic activity and output, measured by indicators such as per capita median household income and employment, etc.
(ii) Amenities dimension: This dimension focuses on improving the living standards of society.
(iii) Gender equity and financial inclusion dimension: This dimension focuses on ensuring that all members of society can participate fully in economic and social life
(iv) Human development dimension: This dimension focuses on ensuring that all members of society have access to basic services such as education, healthcare, etc.
(v) Governance dimension: This dimension focuses on the role of good governance, effective institutions, and the rule of law in promoting inclusive growth.
(vi) Sustainability dimension: This dimension focuses on ensuring that economic growth is sustainable over the long term and does not come at the expense of the environment.

An inclusive growth framework also often involves a multi-sectorial and multi-stakeholder approach, bringing together different government agencies, private sector actors, civil society organisations, and international partners to work together to achieve inclusive and sustainable growth. It is important to note that the specific policies and strategies included in an inclusive growth framework will vary depending on the context and the specific needs and challenges of a country or region. In this study, these above-mentioned six dimensions consist of a list of 23 indicators, which were based on the requirement of the aforementioned framework, as well as the availability and reliability of local data sources, to ensure that the framework is suitable for measuring the level of inclusive growth within the context of this study. All these indicators together encompass different important aspects which lead to inclusive growth in Punjab. The conceptual framework of inclusive growth is depicted in Figure 1.

Fig. 1. Building Blocks of the Inclusive Growth Index (IGI)



The selected indicators had different connotations, meaning some have a positive relationship with IG and denotes a higher level of IG performance with a higher score and vice versa, while other display an opposite relationship where a higher value denotes a lower performance level in inclusive growth. Thus, a sign of positive and negative was given to each indicator to indicate hypothesised relation with inclusive growth. In the economic dimension of the index, medium HH Income and employment rate have a positive impact on inclusive growth as it increases the consumption capacity of the household. On the other hand, poverty negatively impacts inclusive growth, thus negative sign is associated with it.

3.2. Indicator Selection and Data Sources

The indicators for this dimension are slightly different from the indicators used in the original framework (2016) as they were suitably modified to incorporate those indicators which are collected at the district level in Punjab. Income-MPCE indicator in the original study (2016) was replaced by the estimated per capita Median HH Income indicator. Similarly, another variable i.e., GNI per capita is not reported at the district level in Pakistan. To cater to this problem, a proxy of the living standard dimension of the global Multidimensional Poverty Index (MPI) was used in the UNDP report (2017) for developing Pakistan Human Development Index. A similar proxy can be applied in this study. However, the indicators included in the living standard dimension of MPI are already being covered by the Amenities dimension of the selected framework, thus, this indicator has been dropped to avoid repetition. Lastly, the employment rate, which represents the participation of the labour force in the process of growth resulting in inclusive development (Aggarwal, 2021), is also added to the economic dimension.

Similarly, indicators of amenities and gender equity and financial inclusion dimensions have negative and positive impacts on inclusive growth. In the gender equity

and financial inclusion dimension, to replace the percentage of women in LWF used in the original study (2016), another suitable indicator was used which is calculated in Pakistan at the district level i.e. the proportion of employed women who are registered under Punjab Employees Social Security Institution (PESSI) for social security benefits. Moreover, health and education expenditures have a positive impact on inclusive growth (Mushtaq & Zaman, 2021). Thus, literacy rate, immunisation rate, and household satisfaction level with healthcare facilities (BHUs) are positively associated with inclusive growth, while the infant mortality rate indicator has a negative hypnotised relationship with inclusive growth. In this dimension, the life expectancy indicator was replaced by two indicators, which are 'child immunisation rates (aged 12 to 23 months)' and 'self-reported satisfaction with healthcare facility (BHUs)'. These were also used in the UNDP Report 2017 for Pakistan Human Development Index as a proxy for the life expectancy indicator, which is not measured in Pakistan at the district level. In addition to this, the crime rate indicator included in the sustainability dimension of the original framework was shifted to the Governance dimension, where it seemed more suitable. The incidence of major crimes is also identified as a major Pakistan-specific governance indicator (Pasha & Ghaus-Pasha, 2010).

District-level public sector 'per capita allocation of development expenditure' is another indicator added to measure the governance dimension, which is an indicator of the non-inclusive and inequitable distribution of development budget among districts (Naveed & Khan, 2018).

The former negatively affects inclusive growth. While the latter has a positive association with inclusive growth (Naveed & Khan, 2018). Lastly, for the sustainability dimension, the 'air quality' indicator is not measured regularly at the district level in Punjab. Thus, six proxy indicators are used in its place which were also used in a recent study for constructing an urban sustainability index for Punjab (Ghalib, Qadir, & Ahmad, 2017). These indicators are 'cultivated area (area under agriculture)', 'number of industries', and 'number of registered vehicles' to identify the negative impact of air quality on inclusive growth, as well as 'percentage of households with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' to identify the negative impact on human health, which in turn affect the overall inclusive growth.

All the selected indicators contribute to inclusive growth in one way or another. More government expenditure on education, health, and social security, improving the access of amenities to households, improved law and order situation, better environment would reduce inequalities and boost the growth and welfare of the people (Aggarwal, 2021). Moreover, all the proxies used in the study are already in use for the construction of global and regional indexes, thus ensuring the robustness to use these indicators. Data against the indicators was retrieved from secondary sources including national and provincial reports such as Pakistan Social and Living Standards Measurement (Pakistan Bureau of Statistics (PBS), 2019-20), Punjab Multiple Indicator Clusters Survey (Bureau of Statistics (BOS), 2017-18), Population Census 2017 and the Urban Unit database (The Urban Unit, 2015). A complete list of indicators along with their associated hypothesised relationship, data sources, and descriptions are listed in the Appendix (Table A1).

3.2. Methodology for Construction of Composite Index

Following the OECD's Handbook of Composite Indices (OECD, 2008), the study uses min-max approach for normalisations of indicators. This approach offers the advantage of using indicators with different metrics (e.g., mortality rates and length of roads) and with values of huge variation, to be put on the same scale for comparison purposes. For standardisation of data, the following formula was applied to obtain the normalised values of indicators lying between 0 and 1:

$$\text{Normalised Indicator} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}} \quad \ldots \quad \ldots \quad (1)$$

$$\text{Normalised Indicator} = \frac{\text{Actual Value} - \text{Maximum Value}}{\text{Minimum Value} - \text{Maximum Value}} \quad \ldots \quad \ldots \quad (2)$$

The variables, which were hypothesised to contribute positively to inclusive growth, were normalised using Equation 1 whereas those indicators which were on a negative scale, were normalised using Equation 2.

This step was followed by weighted aggregation using Principal Component Analysis (PCA), for assigning of weights to indicators and their corresponding dimensions in the composite index. While Kaiser-Meyer-Olkin (KMO) and Bartlett tests were applied to validate the factor analysis for statistical accuracy, using the following formulas:

$$\text{KMO} = \frac{\sum_{i \neq j} r_{ij}^2}{\sum_{i \neq j} r_{ij}^2 + \sum_{i \neq j} u_{ij}^2} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

where r_{ij} is simple correlation and u_{ij} is a partial correlation.

$$\text{Barlett test} = \frac{(\text{N}-\text{k}) \ln(\text{S}_\text{p}^2) - \sum_\text{i}^\text{k} (\text{n}_\text{i}-1) \ln(\text{S}_\text{i}^2)}{1 + \frac{1}{3(\text{k}-1)} \left(\sum_{\text{i}=1}^\text{k} \frac{1}{(\text{n}_\text{i}-1)} - \frac{1}{\text{N}-\text{k}} \right)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where s is the variance, N is the total sample size, k is the number of groups, and Sp is pooled variance.

Weighted aggregation using multi-stage PCA was used in the study where the weights for both the six dimensions, as well as the indicators or sub-indices of each dimension, was determined. In the first stage, the PCA was employed to develop sub-indices or dimensions, using the following formula:

$$\text{Dimension} = \sum(\text{w}_\text{i} \times \text{indicator}_\text{i}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Where w_i= weight of *ith* indicator, i = 1 … n and n = No. of Indicator in each (*i*th) dimension

For the second stage of PCA, the resulting scores of each dimension were aggregated and subsequently normalised using Equation 1, to derive the final composite Inclusive Growth Index (IGI). Normalisation was done to transform the final composite scores into a comparable index score, which ranges from zero to one, and where values closer to zero denote less inclusive growth whereas values closer to one represent high inclusive growth. Thereafter, data was processed in Geographical Information Systems (GIS) to prepare a map of the Punjab district to spatially highlight the level of inclusive growth.

4. RESULTS AND DISCUSSION

This section reports the main findings of the study and the resultant ranking of each district of Punjab as per the Inclusive Growth Index (IGI). Before employing the Principal Component Analysis (PCA), a correlation test was conducted and a high correlation was found between two indicators of the Amenities Dimension, which are the 'percentage of household with a source of lighting: Electricity' and 'percentage of household with materials used for the wall: Burnt bricks/blocks. Thus, the latter was dropped, and the remaining 22 indicators were finalised for the composite score. The matrix for the correlation test for each dimension is given in the Appendix.

Table 1 highlights the descriptive statistics including mean, median, standard deviation, and number of observations. The table shows that the 'number of vehicles' indicator has the highest mean value, while the 'per capita allocation of development expenditure' indicator has the lowest. The mean and median are almost the same. Moreover, almost all the variables have low standard deviation, with low variation and consistency in the data.

Table 1

Descriptive Statistics

	Dimensions and Sub-indices	Hypothesised Relationship	Obser-vations	Mean	Median	Standard Deviation
	Economic Dimension					
1	Median HH Income (Per Capita)	positive	36	0.49	0.56	0.28
2	Employment rate	positive	36	0.57	0.63	0.26
3	Multi-dimensional poverty index (MPI)	negative	36	0.63	0.63	0.25
	Amenities Dimension					
4	Percentage of households with source of lighting: Electricity	positive	36	0.29	0.15	0.31
5	Percentage of households with improved source of drinking water	positive	36	0.83	0.90	0.22
6	Percentage of households with toilet facility	positive	36	0.88	0.96	0.20
7	Percentage of HH by material used for roof: RCC/RBC	positive	36	0.82	0.92	0.25
8	Metalled Roads Length (kilometres)	positive	36	0.29	0.24	0.21
	Gender Equity & Financial Inclusion Dimension					
9	Percentage of female population that has ever attended school	positive	36	0.53	0.51	0.26
10	Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	positive	36	0.39	0.35	0.22
11	Proportion of employed women who are registered under PESSI for social security benefits	positive	36	0.22	0.11	0.24
	Human Development Dimension					
12	Literacy Ratio	positive	36	0.51	0.49	0.27
13	Immunisation	positive	36	0.53	0.56	0.27
14	Percentage distribution of household satisfaction with: health facilities (BHUs)	positive	36	0.65	0.72	0.28
15	Infant Mortality Rate (IMR)	negative	36	0.55	0.57	0.24
	Governance Dimension					
16	Per capita allocation of development expenditure	positive	36	0.09	0.06	0.16
17	Crime rate (per 100,000 population)	negative	36	0.78	0.79	0.17
	Sustainability Dimension					
18	Cultivated Area (Area under Agriculture)	positive	36	0.40	0.33	0.28
19	Percentage of HH with fluoride concentration in drinking water	negative	36	0.76	0.84	0.22
20	Percentage of HH with arsenic concentration in drinking water	negative	36	0.78	0.90	0.27
21	Number of industries	negative	36	0.91	0.97	0.19
22	Number of vehicles	negative	36	0.92	0.97	0.17

Then Principal Component Analysis (PCA) was conducted to determine the weights of indicators, followed by KMO and Bartlett's Test. KMO measures a value greater than 0.5 i.e. 0.75 for the composite index, ensuring sampling adequacy for PCA. Similarly, Bartlett's Test of Sphericity for composite index is significant at 0.00 level of significance showing that PCA can be applied to this dataset. Since the stated objective of the current analysis is to use the extracted factors to determine the weights of the indicators and not to reduce the choice of the indicators, and these indicators are important from a policy perspective, thus the study has applied both the tests and ensured that either the KMO is more than 0.5 or the Bartlett statistics is significant. The results of these tests satisfy the prerequisites which are considered acceptable within statistical literature (Sian Hoon Teoh, 2010; Fransena, 2019; Abraham Y. Owinoa, 2014).

Table 2

Results of KMO and Bartlett's test

	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity	
Test		Approx. Chi-Square	Sig.
Dimensional Sub-indices			
Economic Dimension	0.6	36.7	0.0
Amenities Dimension	0.6	107.3	0.0
Gender Equity and Financial Inclusion Dimension	0.6	26.6	0.0
Human Development Dimension	0.6	23.4	0.0
Governance Dimension	0.5	34.7	0.0
Sustainability Dimension	0.5	19.3	0.0
Composite Index	0.75	98.6	0.0

Source: Authors' calculation using PCA.

Stata 16.0, which is the standard statistical software, was used to run the PCA, which gives an option to the user to define the number of principal components which are to be extracted. As per the OECD handbook for composite index (OECD, 2008), all factors with eigenvalues below 1.0 (Kaiser criterion) were dropped to extract the components for assigning weights. The eigenvalue for each principal component indicates the percentage of variation in the total data explained. The Kaiser criterion was utilised for both stages of the PCA process. The table below shows the selection of eigen value for the weighting of dimensions or sub-indices to calculate the final composite score.

Table 3

Selection of Eigen Values

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.20479	2.16043	0.5341	0.5341
Comp2	1.04436	.216121	0.1741	0.7082
Comp3	.828237	.265358	0.1380	0.8462
Comp4	.562879	.333354	0.0938	0.9400
Comp5	.229525	.0993172	0.0383	0.9783
Comp6	.130208		0.0217	1.0000

Table 3 lists the finalised indicators and their respective weights calculated from the factor score generated through PCA analysis. Different weights to different dimensions highlight varying impacts on inclusive growth. It can be concluded that median HH income (per capita), employment rate, the incidence of poverty, per capita allocation of development expenditure, and crime rate (per 100,000 population) included in the Economic and Governance dimension will bring a greater change in inclusive growth of a district, as compared to other indicators. Apart from economic factors, other factors such as health and education which are represented in the human development dimension in this study, also contribute to improvement in living standards and inclusive growth of a region.

Table 4

Weightage as per Principal Component Analysis (PCA)

	Dimensions/Indicators	Weights
	Economic Dimension	20%
1.	Median HH Income (Per Capita)	7.2%
2.	Employment rate	4.9%
3.	Incidence of poverty	8.0%
	Amenities Dimension	19%
4.	Percentage of households with source of lighting: Electricity	3.3%
5.	Percentage of households with improved source of drinking water	3.1%
6.	Percentage of households with toilet facility	4.7%
7.	Percentage of HH by material used for roof: RCC/RBC	3.9%
8.	Metalled Roads Length (kilometers)	3.0%
	Gender Equity & Financial Inclusion Dimension	18%
9.	Percentage of female population. that has ever attended school	8.8%
10.	Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	8.7%
11.	Proportion of employed women who are registered under PESSI for social security benefits	0.4%
	Human Development Dimension	8%
12	Literacy Rate	1.2%
13	Immunisation	1.1%
14	Percentage distribution of household satisfaction with BHUs	4.7%
15	Infant Mortality Rate (IMR)	0.9%
	Governance Dimension	27%
16	Per capita allocation of development expenditure	13.7%
17	Crime rate (per 100,000 population)	13.7%
	Sustainability Dimension	8%
18	Cultivated Area (Area under Agriculture)	1.2%
19	Percentage of HH with fluoride concentration in drinking water	2.2%
20	Percentage of HH with arsenic concentration in drinking water	1.4%
21	Number of industries	1.1%
22	Number of vehicles	1.9%

After assigning weights, a composite index was constructed and the resultant ranking of each district of Punjab was established as per the Index. The study classified all 36 districts of Punjab into three quintiles to highlight different levels of inclusive growth, based on descending order of weighted factor scores. According to the ranking, the top 12 districts are rated as out-performing districts for inclusive growth, the middle 12 districts as average-performing districts and the last 12 as lagging districts. The ranking of districts as per the Inclusive Growth Index (IGI) is given in the table below. Rajanpur district having the least inclusive growth is assigned the score of 0.00, while the top performing district for inclusive growth, i.e. Lahore has been assigned the value of 1.00.

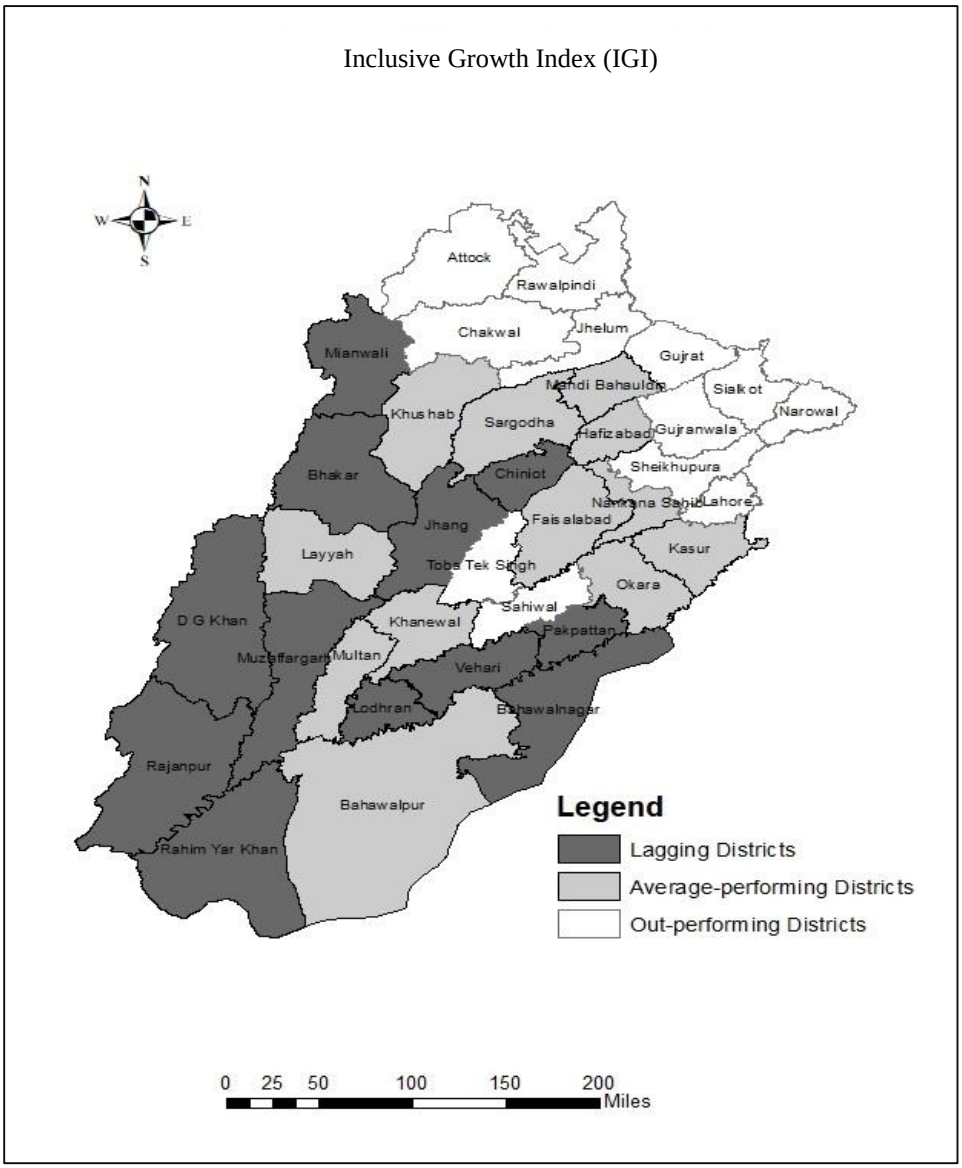
Table 5

District Ranking based on Inclusive Growth Index (IGI)

Districts	Composite Index Score	District Rank
Top quartile including out-performing districts		
Lahore	1.00	1
Rawalpindi	0.96	2
Chakwal	0.95	3
Gujrat	0.92	4
Attock	0.92	5
Gujranwala	0.85	6
Jhelum	0.81	7
Narowal	0.79	8
Sialkot	0.76	9
Toba Tek Singh	0.70	10
Sahiwal	0.69	11
Sheikhupura	0.66	12
Middle Quartile Including Average Performing Districts		
Sargodha	0.65	13
Mandi Bahauddin	0.64	14
Okara	0.62	15
Bahawalpur	0.61	16
Khanewal	0.58	17
Kasur	0.57	18
Khushab	0.56	19
Faisalabad	0.56	20
Multan	0.54	21
Nankana Sahib	0.53	22
Layyah	0.52	23
Hafizabad	0.51	24
Bottom Quartile Including Lagging Districts		
Jhang	0.49	25
Pakpattan	0.49	26
Rahim Yar Khan	0.46	27
Vehari	0.45	28
Bahawalnagar	0.45	29
Lodhran	0.42	30
Mianwali	0.41	31
Dera Ghazi Khan	0.39	32
Bhakkar	0.38	33
Chiniot	0.36	34
Muzaffargarh	0.23	35
Rajanpur	0.00	36

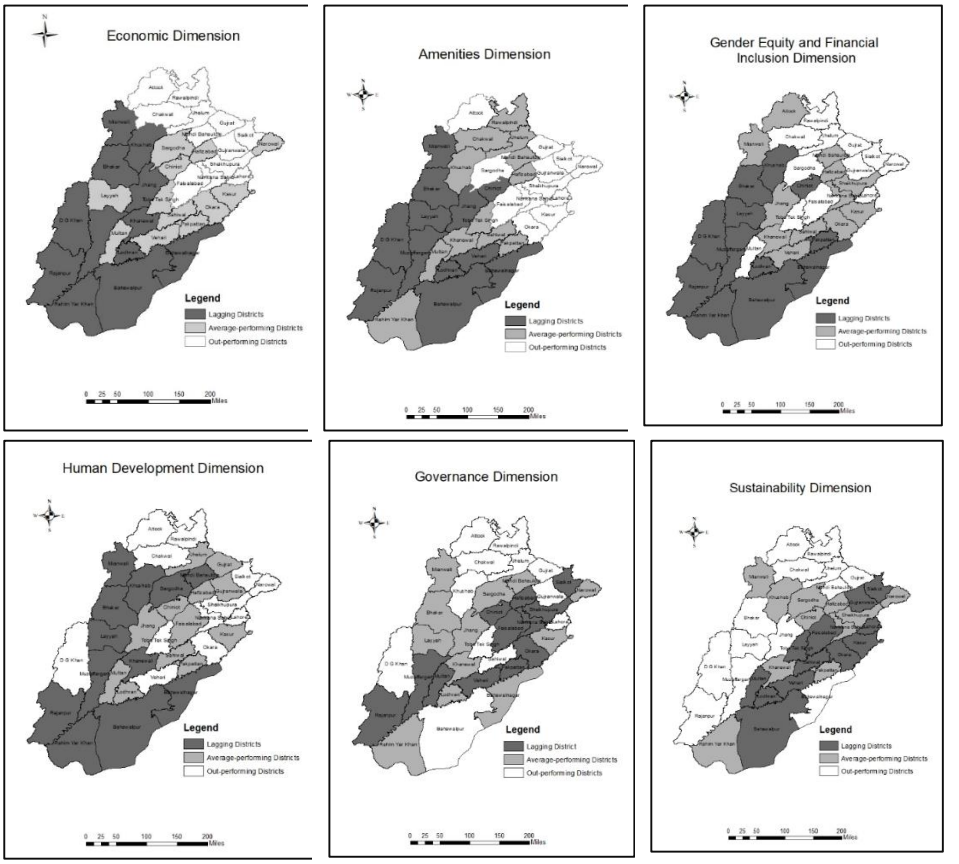
While the spatial dispersion of inclusive growth across 36 districts of Punjab is displayed in Figure 2. It can be observed that central and northern districts of Punjab such as Lahore, Gujrat, Rawalpindi, Attock, Chakwal, Sialkot, Jhelum, Sheikhupura, Narowal, Gujranwala, Gujrat, Toba Tek Singh and Sahiwal are scoring high on Inclusive Growth Index. Major determinants leading to a high level of inclusive growth in these districts are high median HH income (per capita), higher employment rate, lower incidence of poverty, and higher per capita allocation of development expenditure. The study also underpins the districts which lagging in terms of social inclusion such as Muzaffargarh, Bhakker, Mianwali, DG Khan, Rajanpur etc.

Fig. 2. Inclusive Growth Index and District Ranking



For a deeper analysis of districts' performances, separate maps of each dimension are also included to explain regional variations in inclusive growth in lower levels in Punjab (see Figure 3). According to the rankings established by the composite index, higher inclusive economic growth is generally observed in more advanced districts with a high level of literacy rate and participation of women in the labour force such as in Rawalpindi and Gujrat. On the other hand, a high incidence of poverty and a lower employment rate is causing less inclusive growth in lagging districts like Rajanpur and Muzaffargarh.

Fig. 3. District Performance in Each Dimension



The economic dimension of the index shows that there is a combination of higher employment rates, lower incidence of poverty, and higher medium HH income in the districts of Lahore, Attock, Rawalpindi, Chakwal, Jhelum, Mandi Bahauddin, Gujrat, Sialkot, Gujranwala, Sheikhupura, Nankana Sahib and Faisalabad, which are leading to higher inclusive growth. Similarly, the Amenities dimension shows that there is a combination of higher percentages of households with electricity, water and toilet, strong housing material, and metalled roads in Lahore, Gujrat, Sialkot, Gujranwala, Sheikhupura, Narowal, Sargodha, Kasur, Gujrat and Okara, which are leading to higher inclusive growth. The Gender Equity and Financial Inclusion Dimension identifies that there is a combination of a large number of literate women, a large number of women in the labour working force, and a higher number of

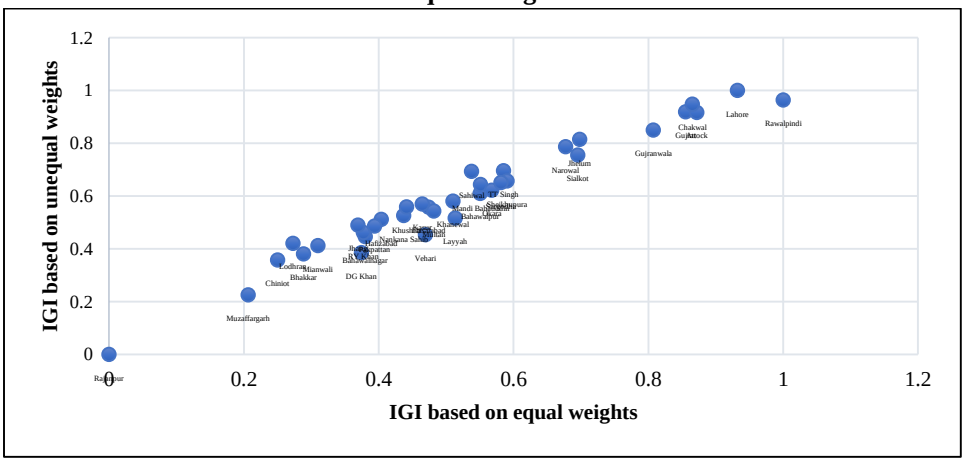
households with an account in a bank in Lahore, Rawalpindi, Chakwal, Jhelum, Gujrat, Gujranwala, Toba Tek Singh, Multan, Narowal, Sialkot, Sargodha and Faisalabad which are leading to higher inclusive growth. Similarly, the human development dimension shows that there is a combination of high literacy rate, immunisation, HH satisfied with Basic Health Units (BHUs), and low levels of infant mortality rates in the districts of Lahore, Attock, Rawalpindi, Chakwal, Sialkot, Narowal, Sheikhupura, Nankana Sahib, Okara, Pakpattan, Toba Tek Singh, Vehari and Dera Ghazi Khan, which are leading to higher inclusive growth. The governance dimension highlights that there is a combination of high per capita allocation of development budget and low crime rate in the districts of Lahore, Attock, Rawalpindi, Chakwal, Jhelum, Khushab, Gujrat, Gujranwala, Toba Tek Singh, Sahiwal, Bahawalpur, and Dera Ghazi Khan.

For the sustainability dimension, it can be seen that major districts, which include the largest cities of Punjab, such as Lahore, Faisalabad, Gujranwala, Multan, Bahawalpur, and Sialkot have lower performance. The rapid expansion of cities and the development of industries, communication, networks, and markets in these major economic hubs can lead to higher levels of air and water pollution. Since 'the air quality' indicator is not measured regularly at the district level in Punjab, 'number of industries', 'cultivated areas' and 'number of registered vehicles' are used to identify the impact of air quality on inclusive growth, as well as the 'percentage of household with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' are used to identify the impact on of water pollution. The sustainability dimension can have a significant impact on inclusive growth; thus these indicators are included. This dimension will be especially useful in emphasising that there should be a control of the growth of industries inside and outside of the urban areas, urbanisation and expansion of cities should be planned, reduction in vegetation cover surrounding the areas should be controlled and pollution from cars should be regulated to reduce air pollution. Efficient distribution of the development budget can play an important role in increasing inclusive growth in Punjab.

It is significant to point out that a high ranking of districts does not mean that there is no need for them to advance further in achieving a higher level of inclusive growth. The exercise of disaggregating the composite score shows that high-ranking districts do not necessarily indicate good performances in all the dimensions. For instance, Lahore is a top-ranked district for inclusive growth, however, it is performing poorly in the sustainability dimension, and thus targeted interventions should be introduced for improving the overall score of Lahore. Similarly, Multan is an economic center of Punjab, yet it is ranking relatively low on the index because of its governance and sustainability dimension.

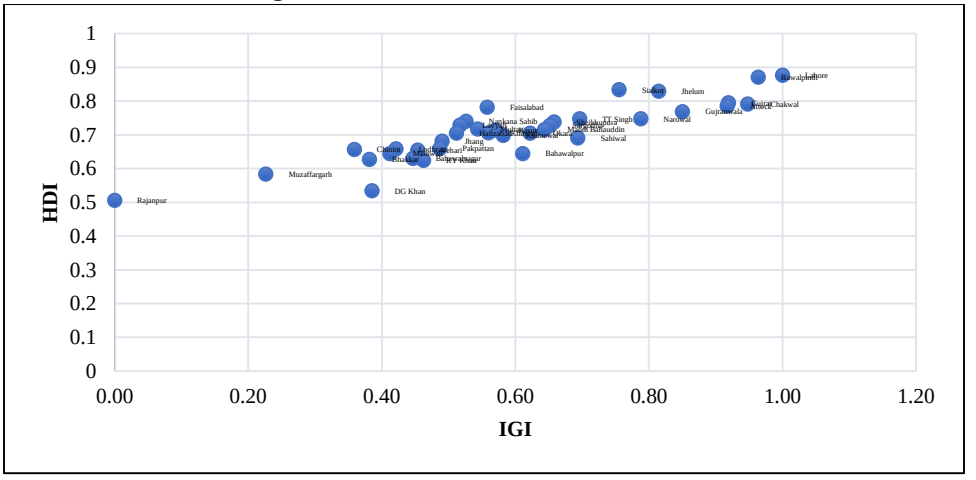
The robustness of the Inclusive Growth Index (IGI) has been tested using different weighting schemes, which is a common approach mentioned in the OECD handbook. For this purpose, an equal weightage scheme was used to construct the IGI, using 0.22 weights for each of the indicators and then comparing both indexes. From Figure 4 it can be seen that the composite index based on equal weights is strongly and positively correlated with the composite index based on unequal weights having a spearman's rank correlation coefficient of 0.98. The results indicate that IGI is not sensitive to the change in weighting pattern.

Fig. 4. Correlation Between IGI Based on Equal Weights and IGI Based on Unequal Weights



The findings of the composite index for inclusive growth have also been validated by the findings of other major studies conducted by the United Nations. As per the OECD handbook, the composite indicators can be linked to other well-known phenomenon to test the explanatory power of the composite index. For instance, the district with Inclusive Growth (IG) might have a good score on Human Development Index (HDI), thus correlating IGI and HDI. From Figure 5, it can be seen that the composite index for inclusive growth is strongly and positively correlated with Human Development Index (HDI) (United Nations, 2017) having a Spearman's rank correlation coefficient of 0.89. Most of the districts are close to the trend line while Dera Ghazi Khan district is an outlier. The best-performing and the worst-performing districts of Punjab districts in the Inclusive Growth Index (IGI) are also listed as the best and worst-performing districts in Human Development Index (United Nations, 2017), thus further validating the robustness of the composite index.

Fig. 5. Correlation between IGI and HDI



This correlation test indicates that the variation in the two data sets is similar, not necessarily casual. It should be emphasised here that the inclusive growth index is closely related to but still is distinct from HDI. Based on only three dimensions, the HDI does not capture the inequality dimension, environmental quality, poverty, human safety, empowerment, and other factors hence, it does not capture inclusive development in its full scope (Dörffel & Schuhmann, 2020). Thus, each index differs significantly and presents different policy recommendations.

Finally, the limitation of the study should be considered when generalising the validity of the scale. Since the study is limited to constructing an Inclusive Growth Index (IGI) for Punjab province, those variables are selected which are publicly available at the district level. Thus, to scale it up to other provinces of Pakistan, the selection of indicators might require adjustments as it will depend on the availability of data in other provinces. However, the index provides a comprehensive framework to identify major thematic areas contributing to inclusive growth.

5. CONCLUSION AND POLICY IMPLICATION

The study has developed a composite Inclusive Growth Index (IGI) for the thirty-six districts of Punjab, to measure the degree of inclusiveness of growth and to examine the main factors contributing to it. Out-performing districts are Lahore, Rawalpindi, Gujrat, Attock, Chakwal, Sialkot, Jhelum, Sheikhupura, Narowal, Gujranwala, Sahiwal, and Toba Tek Singh. Major determinants leading to a high level of inclusive growth in these districts are high median HH income (per capita), higher employment rate, lower incidence of poverty, and higher per capita allocation of development expenditure. The study also underpins various socioeconomic disparities among the districts which are keeping the districts lagging in terms of social inclusion. Thus, it helps identify the areas and indicators responsible for the lower position of a district in social inclusive raking.

Moreover, by disaggregating composite scores into its seven thematic dimensions, policymakers can learn about the differential performances of districts in different sectors. For instance, Rawalpindi has greater success in the human development dimension, hence the pattern of its education and health sectors should be investigated and applied to other districts. Differing experiences of each district can facilitate policymakers for spatial policy learning and can lead to the identification of factors leading to higher inequality so that targeted policies could be designed for the efficient allocation of resources. Furthermore, the best district like Lahore, despite being on top in the overall ranking, is among the worst districts in terms of sustainability. Thus, during the inter-district allocation of the development budget for the environment sector, Lahore must be given priority. It can be seen that districts including the largest cities of Punjab, such as Lahore, Faisalabad, Gujranwala, Multan, Bahawalpur, and Sialkot have lower performance in the sustainability dimension. The rapid expansion of cities and development of industries, communication, networks, and markets in these major economic hubs can lead to higher levels of air and water pollution, thus it can have a significant impact on inclusive growth. This dimension will be especially useful in emphasising that there should be a control of the growth of industries inside and outside of the urban

areas, urbanisation and expansion of cities should be planned, reduction in vegetation cover surrounding the areas should be controlled and pollution from cars should be regulated to reduce air pollution. Efficient distribution of the development budget can play an important role in increasing inclusive growth in Punjab

Globally, the Inclusive Growth (IG) agenda has already started to impact urban and regional policy areas. Although Inclusive Growth Agenda has been included in the Punjab Growth Strategy, there's a need for continuous economic reforms for a higher level of inclusive growth and integration of poverty strategies into the existing policy framework with measurable outcomes, so that the IG agenda does not become a buzzword. However, due to the limited availability of data at lower levels, it is difficult to monitor the inclusivity of growth at the local or district level. The framework for the Inclusive Growth Index (IGI) developed in this study can be replicated and updated every second year (after the release of updated PSLM/HIES) and can be used for the annual assessment of Punjab districts, that can measure the progress of districts against indicators of social inclusions and SDGs. It will help the policymakers and planners to work on those areas and dimensions, which are lacking, to make the districts and regions more socially inclusive. The development expenditures must be targeted towards the district lagging in ranking and on the sectors/dimensions which are poor in the particular region or district. For instance, those districts that are at the bottom in terms of social inclusion such as Bhakkar, Muzaffargarh, Mianwali, DG Khan, and Rajanpur, etc. need to be targeted for social sector expenditures.

Inclusive growth is achievable in Punjab, however efficient public policies would be required to push the country toward achieving a higher level of inclusive growth to mitigate poverty and inequality. Some of the major policy areas can be as below:

- Increasing focus on policies that deliver both economic and social benefits such as the provision of municipal services, improvement of existing health and educational facilities, etc. Investment in infrastructure and human capital will positively impact the level of inclusive growth in the region.
- Improving the social welfare system or introducing new and innovative forms of social protection interventions is an important measure for achieving inclusive growth, as it will mitigate the income and wealth inequalities in the region.
- Employment and literacy rate are important tools for inclusive growth for labour productivity and poverty alleviation. Reforms in the education system and efforts towards employment generation, especially promoting women empowerment, will surely benefit in helping inclusive growth.

Lastly, this paper contributes to the empirical literature on inclusive growth. For future research, the study can be scaled up to cover all districts of Pakistan, for developing a common framework and to align the outcomes with the measurable provincial targets for SDGs. Given the multidimensional nature of this phenomenon, other thematic areas contributing to inclusive growth should also be explored such as the impact of fiscal redistribution, inflation, technological advancement, and informal employment on inclusive growth. The indicator framework may require adjustments in the future as new research and indicators in the field of inclusiveness become available.

APPENDIX

Table A1
Indicator Description and Data Source

Dimension/ Indicators	Hypothesised Relationship	Data Source	Description and Justification of the Selected Variable
Economic Dimension			
Median HH Income (Per Capita)	positive	Est. from PSLM 2019-20	Income-MPCE indicator, used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by the estimated per capita Median HH Income indicator in this study. The district level data was extracted from the micro data available at the Pakistan Bureau of Statistics (PBS) website using the given processing code and weightages. It is the weighted median of average monthly HH income of each district.
Employment rate	positive	LFS 2020-21	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available. (SDG indicator 1.2.2)
Multi-dimensional poverty index (MPI)	negative	MICS 2017-18	In the latest MICS report, Multi-dimensional Poverty Index (MPI) for each district is given, which represents deprivation in health, education and amenities. MPI complements household-level consumption-based poverty.
Amenities Dimension			
Percentage of households with source of lighting: Electricity	positive	PSLM 2019-20	Per capita consumption of electricity indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by the percentage of households with the source of lighting: Electricity indicator in this study. District level data is available.
Percentage of households with improved source of drinking water	positive	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of households with toilet facility	positive	PSLM 2019-20	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of HH by material used for roof: RCC/RBC	positive	PSLM 2019-20	Pucca Houses indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by these two indciators in this study. District level data is available
Percentage of HH by material used for walls: Burnt bricks/blocks		PSLM 2019-20	
Metalled Roads Length (kilometres)	positive	Punjab PDS 2021	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available.

Continued—

Table A1—(*Continued*)

Gender Equity & Financial Inclusion Dimension			
Percentage of female population that has ever attended school	positive	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	positive	PSLM 2019-20	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Proportion of employed women who are registered under PESSI for social security benefits	positive	Women Economic and Social Wellbeing Survey Punjab 2018-19	% of women in LWF indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), was replaced by Proportion of employed women who are registered under PESSI for social security benefits which is more suitable. District level data is available.
Human Development Dimension			
Literacy Ratio	positive	PDS 2021	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Immunisation	positive	PSLM 2019-20	Life expectancy indicator was used in the IGI framework adopted by Vellala & Chattopadhyay (2016). Since it is not measured in Pakistan at district level, UNDP report 2017 for Pakistan Human Development Index used 'child immunisation rates (aged 12 to 23 months)' and 'self-reported satisfaction with healthcare facility (BHUs)' as a proxy for life expectancy indicator. Thus, same proxy is used in this study. District level data is available.
Percentage distribution of household satisfaction with: health facilities (BHUs)	positive	PSLM 2019-20	
Infant Mortality Rate (IMR)	negative	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Governance Dimension			
Per capita allocation of development expenditure	positive	Punjab ADP 2018	Percentage of development expenditure to total expenditure and percentage of tax revenue to GSDP use in the IGI framework adopted by Vellala & Chattopadhyay (2016), was replaced by estimated per capita allocation of the development expenditure. It is an indicator of non-inclusive and inequitable distribution of development budget among districts (Naveed & Khan, 2018). It was calculated by dividing the proportion of allocated development expenditure of each district by its population.

Continued—

Table A1—(*Continued*)

Crime rate (per 100,000 population)	negative	Est. from Punjab Provincial Development Statistics 2021	Crime rate indicator was included in sustainability dimension of the IGI framework adopted by Vellala & Chattopadhyay (2016), but it was shifted to Governance dimension in this study, where it seemed more suitable. The incidence of major crimes is also identified as a major Pakistan-specific governance indicator (Pasha & Ghaus-Pasha, 2010).
Sustainability Dimension			
Cultivated Area (Area under Agriculture)	positive	Punjab Provincial Development Statistics 2021	For sustainability dimension, 'air quality' indicator was used in the IGI framework adopted by Vellala & Chattopadhyay (2016). However, it is not measured regularly at district level in Punjab. Thus, six proxy indicators are used in its place which were also used in a recent study for constructing an urban sustainability index for Punjab (Ghalib, Qadir, & Ahmad, 2017). These indicators are 'cultivated area (area under agriculture)', 'number of industries' and 'number of registered vehicles' to identify the negative impact of air quality on inclusive growth, as well as 'percentage of household with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' to identify the negative impact on human health, which in turn have an effect on the overall inclusive growth. District level data is available for all these indicators.
Percentage of HH with fluoride concentration in drinking water	negative	National Nutrition Survey (2018)	
Percentage of HH with arsenic concentration in drinking water	negative	National Nutrition Survey (2018)	
Number of industries	negative	Census of Manufacturing Industries (2015-16)	
Number of vehicles	negative	Punjab Provincial Development Statistics 2021	

Inequalities (GNI coefficient) used in the economic dimension of the IGI framework adopted by Vellala & Chattopadhyay (2016), was dropped in this study. As GNI per capita indicator is not reported at the district level in Pakistan. To cater to this problem, a UNDP report (2017) has used a proxy of living standard dimension of the global Multidimensional Poverty Index (MPI) to construct Pakistan Human Development Index. Similar proxy can be applied in this study. However, the indicators included in living standard dimension of MPI are already being covered by the Amenities dimension of the selected framework, thus, this indicator has been dropped to avoid repetition.

Fig. A2. Correlation Test for All Indicators

a) Economic Dimension

```
. corr INC EMP MPI
(obs=36)
```

	INC	EMP	MPI
INC	1.0000		
EMP	-0.3823	1.0000	
MPI	-0.7455	0.5050	1.0000

b) Amenities Dimension

```
. corr ROOF WALL ELEC WAT TOI ROAD
(obs=36)
```

	ROOF	WALL	ELEC	WAT	TOI	ROAD
ROOF	1.0000					
WALL	0.5142	1.0000				
ELEC	0.4409	0.8809	1.0000			
WAT	-0.0072	0.4970	0.3387	1.0000		
TOI	0.7008	0.6587	0.5535	0.1144	1.0000	
ROAD	-0.0393	0.0638	0.0529	0.0488	-0.1117	1.0000

c) Gender Equity and Financial Inclusion Dimension

```
. corr SCH BANK SEC
(obs=36)
```

	SCH	BANK	SEC
SCH	1.0000		
BANK	0.7374	1.0000	
SEC	0.1101	0.0523	1.0000

d) Human Development Dimension

```
. global xlist LIT IMM SAT IMR

. corr $xlist
(obs=36)
```

	LIT	IMM	SAT	IMR
LIT	1.0000			
IMM	0.5401	1.0000		
SAT	0.1257	-0.1525	1.0000	
IMR	-0.4809	-0.3554	-0.0127	1.0000

e) Governance Dimension

```
. corr DEV CRI
(obs=36)
```

	DEV	CRI
DEV	1.0000	
CRI	-0.8029	1.0000

f) Sustainability Dimension

	CUL	FLO	ARS	IND	VEH
CUL	1.0000				
FLO	0.1407	1.0000			
ARS	-0.2409	-0.1854	1.0000		
IND	-0.1424	0.0173	0.0935	1.0000	
VEH	-0.1909	0.2135	0.3284	0.4589	1.0000

Where INC = Median HH Income (Per Capita), EMP = Employment rate, POV = Incidence of poverty, ROOF = Percentage of HH by material used for roof: RCC/RBC, WALL = Percentage of HH by material used for walls: Burnt bricks/blocks, ELEC = Percentage of households with source of lighting: Electricity, WAT: Percentage of households with improved source of drinking water, TOI: Percentage of households with toilet facility, ROAD: Metalled Roads Length (km), SCH: Percentage of female population that has ever attended school and BANK: Percentage of households where at least one member owns or has an account in a bank, post office or national saving center, SEC: Proportion of employed women who are registered under PESSI for social security benefits, LIT: Literacy Rate, IMM: Immunisation, SAT: Percentage distribution of household satisfaction with: BHUs and IMR: Infant Mortality Rate, DEV: Per capita allocation of development expenditure, CRI: Crime rate (per 100,000 population), CUL: Cultivated area (area under agriculture), FLO: Percentage of HH with fluoride concentration in drinking water, ARC: Percentage of Arsenic concentration in drinking water, IND: number of industries, VEH: number of registered vehicles.

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© *The Pakistan Development Review*
62:2 (2023) pp. 223–234
DOI: 10.30541/v62i2pp.223-234

Impact of Kitchen Structure and Cookstove Technology on Respiratory Health of Rural Women Exposed to Indoor Air Pollution in Khyber Pakhtunkhwa, Pakistan

ABEDULLAH and MUHAMMAD TANVIR

Incomplete combustion of polluting fuels (PF) is a major source of indoor pollution which poses severe risks of acute respiratory infections to women's health such as cough, phlegm, and breathing difficulties. This article investigates the net impact of kitchen structural factors including the location of the kitchen and number of windows in the kitchen and cookstove technology on acute respiratory symptoms of rural women involved in cooking practices. A household survey was conducted to collect primary data from 250 rural households in Khyber Pakhtunkhwa province. Around 66 percent of rural households exclusively used polluted fuel for cooking which caused 4 respiratory symptoms among poor women. The results of the Poisson regression model revealed that the use of polluted energy in the enclosed kitchen was four times more responsible for respiratory symptoms than in the open kitchen; while an improved cookstove in the enclosed kitchen was three times more effective in controlling respiratory involvements. Concerted efforts are required to adopt short-term mitigation strategies such as improved stoves and efficient kitchen design.

Keywords: Polluted Fuel, Indoor Air Pollution, Kitchen Structures, Improved Stove, Women's Respiratory Symptoms, Pakistan

INTRODUCTION

Indoor air pollution (IAP) is ranked among the top ten global threats to human health as it contributes 2.7 percent to the global burden of diseases. Incomplete combustion of polluting fuels (PF) such as wood, crop residues, and dung cake in inefficient cookstoves under poorly ventilated conditions is a major source of IAP (WHO, 2006). Almost 73 percent of rural and 11 percent of urban households are depending on PF for cooking (PDHS, 2017-18).

According to the World Health Organisation, more than half of the global burden of respiratory illnesses is borne by poor people in developing countries (WHO, 2011). More than 3 billion of the world's population, comprising approximately 90 percent of rural households in low- and middle-income countries, primarily depend on PF for

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Authors' Note: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. The author(s) received no financial support for the research, authorship, and/or publication of this article.

cooking and heating due to inaccessibility and unaffordability to cleaner sources of energy (CF) i.e., gas and electricity (WHO, 2007). IAP results in around 4 million deaths annually and 110 million disability-adjusted life years (DALYs) (Uzun, et al. 2003; WHO, 2009a) and it accounts for 28,000 deaths per year and 40 million cases of acute respiratory illnesses in Pakistan alone (World Bank, 2006).

IAP is considered a major source of morbidity and mortality among women due to their high levels of exposure during indoor activities particularly cooking. Therefore, there is a need to conduct a comprehensive health assessment of rural women's respiratory symptoms for designing sustainable intervention strategies.

Polluted indoor air contains multiple detrimental pollutants including particulate matter (PM), poisonous gases (e.g., carbon monoxide (CO), nitrogen oxides, and sulfur dioxide), polycyclic aromatic hydrocarbons (PAH), and volatile organic compounds (VOC). Though particulate matter ranging in size between PM_{10} and $PM_{2.5}$ is an invisible killer in the kitchen as it can easily pass through the nose and can penetrate lung tissues (Mondal and Chakraborty 2015; WHO 2006, 2007, 2009b). Prolonged exposure to harmful indoor pollutants causes several acute respiratory infections such as cough, phlegm, and breathing difficulties that lead to chronic respiratory diseases such as obstructive pulmonary diseases, pneumonia, tuberculosis, lung cancer, etc (WHO, 2006; 2011). Hence, IAP is a major contributor to respiratory involvement among rural households.

Among South Asian countries, Pakistan is the third largest user (81 percent) of PF after Bangladesh (89 percent) and India (82 percent) (WHO, 2009b). Furthermore, the country is ranked first in South Asia in terms of the highest DALYs (9/1000 capita per year) due to IAP (WHO, 2009a). Few studies have evaluated the influence of polluting sources of energy on poor women's health in Bangladesh, Cameron, India, Mexico, Nigeria, and Turkey (Uzun, et al. 2003; Alim, et al. 2014; Ngahane, et al. 2015; Mohapatra, et al. 2018; Desalu, et al. 2010; Regalado, et al. 2006). However, these studies have only assessed a positive association between PF and women's respiratory illnesses. Respiratory symptoms may also vary with various risk amplifying factors such as traditional mud cookstove (TCS), enclosed/indoor kitchen, long cooking hours, and risk-mitigating factors such as improved cookstove (ICS), open/outdoor kitchen or enclosed kitchen with windows, diversified household chores, women's education, and household income (Sota, et al. 2018; Deepthi, et al. 2019; Sharma and Jain, 2019; Semenya and Machete, 2020; Whitehouse, et al. 2018). Recent studies have observed that ICS and open/ventilated kitchens are found to be major factors in reducing concentrations of poisonous gases, PM, PAH, and VOC (Deepthi, et al. 2019; Sharma and Jain, 2019; Semenya and Machete, 2020; Whitehouse, et al. 2018). ICS and kitchen characteristics may greatly reduce the impact of IAP on women's respiratory symptoms.

Previous studies have extensively explored factors affecting cooking fuel choices and children's respiratory health risks in Pakistan. The literature review reveals that there are only three studies have assessed women's health impacts of IAP in Pakistan. Khushk, et al. (2005) have observed that ICS reduces IAP-related acute symptoms among exposed women in Sindh province but the results were not statistically significant due to the small sample. Akhtar, et al. (2007) have found a 7 percent higher risk of chronic bronchitis among PF-using women of Khyber Pakhtunkhwa province. Rabbani, et al. (2017) have documented a 41 percent higher prevalence of tuberculosis in biomass-using women in Sindh.

Comparing only a few respiratory symptoms between PF and CF-exposed women without controlling for confounding factors does not allow a conclusive statement about the net health effects of IAP. Moreover, net health assessment after including cook stove types (TCS vs ICS) and kitchen structural factors including the location of the kitchen (indoor vs outdoor) and the number of windows in the kitchen, among other confounders has received little attention in the scientific literature. In light of this background, this study unveils the net effects of cookstove type and kitchen structures, among other factors on respiratory symptoms of poor and vulnerable women exposed to IAP in the rural Khyber Pakhtunkhwa (KPK) province of Pakistan.

METHODS

Sampling Procedure

KPK is the third largest province of Pakistan, with 30.52 million inhabitants which is 15 percent of the total national population (GoP, 2017). This province was selected because it has the highest poverty incidence (41 percent), and approximately 93 percent of its rural households depend on PF for their cooking needs (Akhtar, et al. 2007; Rabbani, et al. 2017; GoP, 2017; Nasir, et al. 2015). A household survey was conducted in rural areas of KPK by employing a four-stage sampling technique. During the first stage, Abbottabad and Haripur districts were purposively selected as their rural population varies between 87-97 percent and firewood is the primary fuel because of free and easy access to forests (Jan, 2017). Some households also use CF including liquefied petroleum gas (LPG). Moreover, Sarhad Rural Support Programme (SRSP) and a few NGOs have initiated ICS dissemination programs in these districts. In the second stage, all three tehsils were selected in each district. In the third stage, 2 union councils (administrative units) were randomly selected from each tehsil. Finally, 21 households were randomly selected from each union council, making a random sample of 252 households. However, the final analysis includes 250 observations by dropping 2 outliers.

The Questionnaire, Variables, and Interviews

To obtain primary data from selected households, this study adapted a WHO household questionnaire (WHO, 2008) for the evaluation of household energy and socioeconomic information and a standard American Thoracic Society (ATS) questionnaire (American Thoracic Society, 1991) for self-reported respiratory symptoms. The final questionnaire comprises four sections: socioeconomic status such as age, gender, family size, education, and income; types of primary energy used for cooking (firewood, crop residues, animal dung, LPG, and kerosene oil) during the last one month; exposure factors including daily cooking duration (time spend in cooking three meals by all women of a household and is measured in hours per day), diversified household chores (number of women involved in cooking practices); environmental factors comprising of types of the kitchen (open/outdoor vs enclosed/indoor), number of windows in the enclosed kitchen, types of cookstove (TCS vs ICS); and five acute respiratory symptoms such as eye irritation, headache, dizziness, cough, and breathlessness experienced during the last month. Information

on socio-economic status was inquired from the household head, while information on the rest of the three sections was asked from all non-smoking females older than 15 years and involved in cooking practices. Women's health symptoms were aggregated at the household level as the household was considered a unit of analysis. Face-to-face interviews were conducted from November 2018 to January 2019 by a trained team of enumerators supervised by the second author. Due to the high level of illiteracy, verbal informed consent was taken from all respondents and was recorded before the survey.

Estimation Method

To evaluate the net impacts of ICS and kitchen structures on the prevalence of respiratory symptoms among rural women of KPK province, the Poisson regression estimator is used as it is more appropriate for a count outcome variable. The frequency of self-reported symptoms by women represents a count of respiratory symptoms. The Poisson distribution is illustrated as (Cameron, 1998):

$$Prob\ (Y_i = y_i/x_i) = \frac{e^{-\lambda_i}\,\lambda_i^{y_i}}{y_i\,!} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where, y_i is a count of five respiratory symptoms faced by all women of the *i-th* household during the last month and it varies across households $(i = 1, \ldots, 250)$. Poisson distribution is assumed to have a conditional mean (λ_i), which in turn depends on a vector of exogenous variables (x_i) aggregated at the household level. The most common functional form of λ_i used in the literature is a log-linear model, which can be expressed as:

$$ln\ \lambda_i = \beta_i x_i + \epsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where β_i is a vector of respective coefficients, x_i represents the household, women, exposure, and environmental characteristics, and ϵ_i stands for unobservable household-specific random effects.

RESULTS

Descriptive Statistics

For descriptive analysis, we divided our households into two groups (PF vs CF users) and compared their mean values using t- and chi-square tests for continuous and categorical variables, respectively. Mean values are reported with standard deviations in parentheses, as shown in Table 1. Out of 250 surveyed households, 166 (66.4 percent) households exclusively used firewood and 84 (33.6 percent) used an alternative CF such as LPG for cooking during the last month. Households using PF and CF had 34.80 percent and 20.00 percent enclosed kitchens, respectively. However, CF households had slightly more windows in their kitchen. Similarly, a larger proportion (5.2 percent) of CF households used ICS as their primary stove. The average daily exposure of women to IAP during cooking with PF was 4.81 hours/day, which is significantly higher than those using CF (3.84 hours/day). On average 2.18 women were involved in kitchen work in PF households than their counterparts (2.50).

Table 1

Characteristics of Polluted and Clean Fuel Using Households

Variables	Polluted fuel (PF) users (N=166)	Clean fuel (CF) users (N=84)
Enclosed kitchen (%)	34.80***	20.00
Windows in kitchen (No.)	1.08*	1.35
	(0.88)	(1.41)
Improved cookstove (ICS) (%)	3.40***	8.60
Cooking duration (hours per day)	4.81***	3.84
	(1.24)	(0.70)
Diversified household chores (No. of women involved in cooking practices)	2.18***	2.50
	(0.88)	(0.85)
Women education (years of schooling)	6.70***	5.25
	(3.86)	(3.30)
Household size (No.)	6.62***	5.09
	(2.27)	(1.87)
Household income (PKR/month)	34,398.29***	55,058.10
	(12541.24)	(30734.30)
Haripur district (%)	84.00***	16.00
Abbottabad district (%)	48.80**	51.20
Acute respiratory symptoms (No.)	4.26***	2.67
	(1.30)	(0.96)

***, **, and * represent significant differences in variables between polluted and clean fuel users at 1 percent, 5 percent, and 10 percent, respectively.

Notes: t-tests are used for continuous and chi-square tests for categorical variables to identify differences in mean values. Mean values are reported with standard deviations in parentheses.

The average schooling of females belonging to PF households was significantly higher (6.70) compared to their counterparts (5.25). Similarly, the average size of PF households was 6.62, which was significantly larger than that of CF households (5.09). However, the average monthly income of CF households was significantly higher (PKR 55,058) compared to their counterparts (PKR 34,398). The distribution of households across energy types and districts is given at the bottom of this table. On average, 84 percent and 16 percent of households in the Haripur district were using PF and CF, respectively. However, in Abbottabad, about 49 percent and 51 percent of households were using PF and CF, respectively.

The average frequency of short-term respiratory involvements was 4.26 symptoms for women exposed to wood smoke, which was 73 percent higher than that faced by their counterparts using CF (2.67 symptoms). Figure 1 further illustrates the distribution of respiratory symptoms across sources of energy. The majority of women using CF reported a count of 2, 3, and 4 respiratory symptoms, while women using PF reported a significantly higher frequency of 4, 5, 6, and 7 symptoms. Moreover, women in PF households reported more than the twofold prevalence of 3 symptoms than their counterparts. Figure 2 shows that a higher prevalence of respiratory symptoms was reported by women of PF households in both districts.

Fig. 1. Frequency of Incidence of Respiratory Symptoms Faced by Polluted and Cleaner Energy Using Women

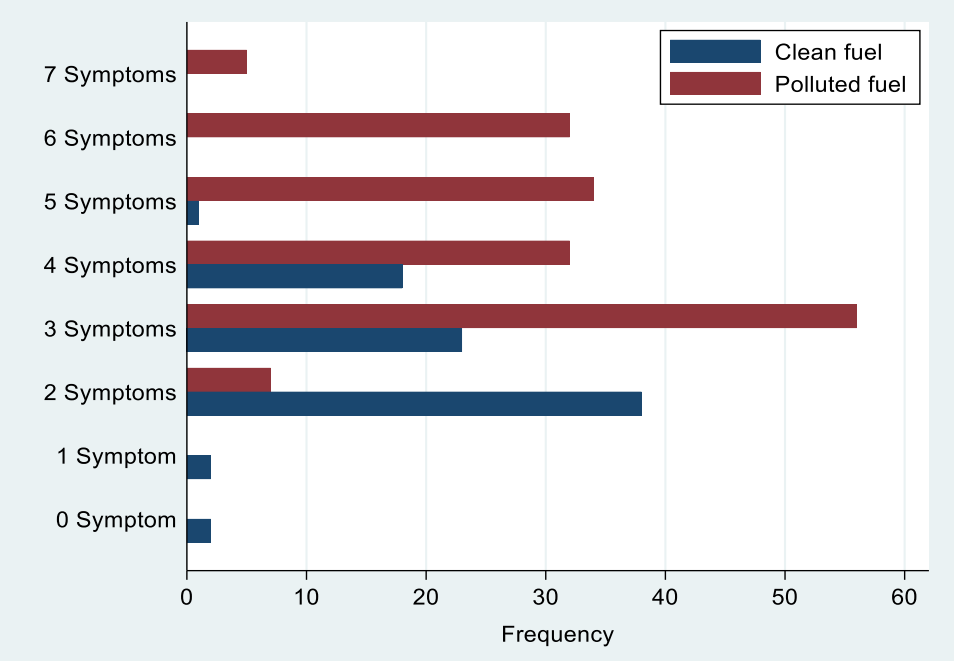
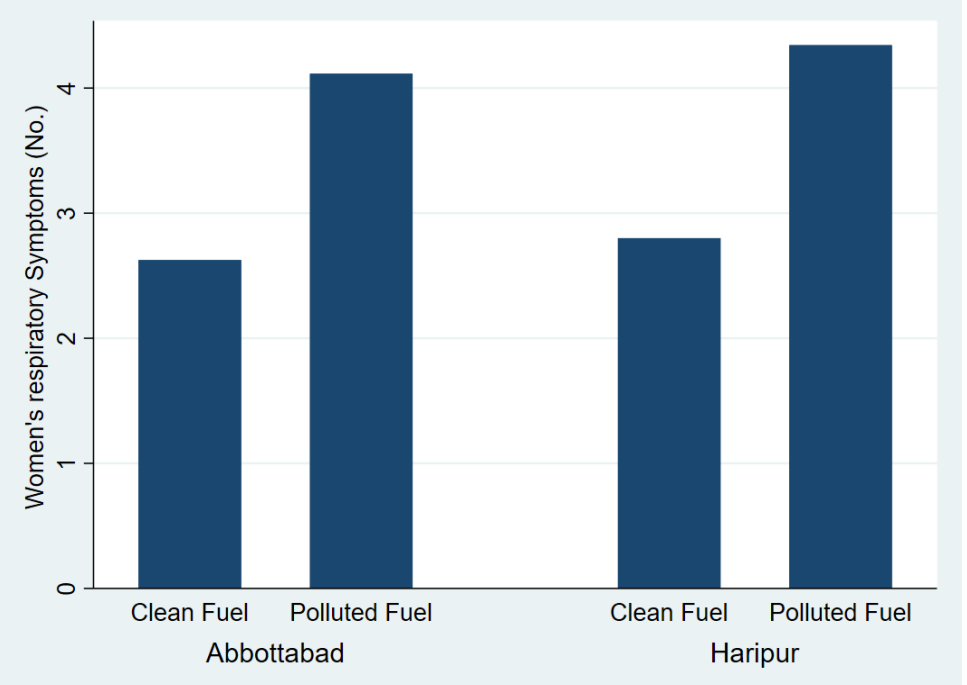


Fig. 2. Distribution of Women's Respiratory Symptoms across Energy Types and Districts



Regression Results

The results of the Poisson regression estimator are reported under Model I in Table 2. In column 1, the marginal effect of PF was positive and statistically significant, implying that women cooking with firewood were suffering from 1.721 more acute respiratory symptoms than their cleaner energy counterparts. Similarly, an enclosed kitchen was responsible to increase 1.146 respiratory symptoms among women compared to those cooking in an open kitchen. Nonetheless, an increase in the number of windows in the kitchen led to reducing respiratory involvement by 0.203 symptoms among poor women. ICS was also reducing acute health effects by 0.601 symptoms than TCS. Longer cooking hours were significantly increasing women's respiratory symptoms by 0.402, while diversified household chores were significantly decreasing symptoms by 0.132. Socioeconomic variables such as women's schooling years and household income significantly reduced the symptoms, while the district dummy was found to have insignificant impacts on women's health.

Table 2

Factors Affecting Women's Respiratory Symptoms

Variables	Model I		Model II	
	Marginal Effects	Scaled Coefficients[a]	Marginal Effects	Scaled Coefficients[a]
Polluted Fuel (PF) dummy	1.721*** (0.401)	0.190** (0.071)	–	–
Enclosed kitchen dummy	1.146*** (0.304)	0.601*** (0.103)	1.220* (0.554)	–0.032 (0.127)
Windows in kitchen	–0.203* (0.121)	–0.224*** (0.056)	–0.183* (0.110)	–0.081** (0.037)
Improved cookstove (ICS) dummy	–0.601** (0.311)	–0.763*** (0.123)	–	–
Cooking duration	0.402*** (0.120)	0.401*** (0.042)	0.504*** (0.150)	0.412*** (0.052)
Diversified household chores	–0.142* (0.101)	–0.203*** (0.032)	–0.313* (0.153)	–0.208*** (0.049)
Women education	–0.027* (0.015)	–0.143** (0.055)	–0.020 (0.040)	–0.135*** (0.043)
Household income	0.002** (0.001)	–0.003*** (0.001)	0.000 (0.000)	–0.001* (0.000)
Haripur district dummy[b]	0.134 (0.262)	0.000 (0.086)	0.101 (0.246)	0.063 (0.079)
Polluted fuels in enclosed kitchen	–	–	1.405*** (0.400)	0.715*** (0.106)
Polluted fuels in open kitchen	–	–	1.036** (0.503)	0.231** (0.114)
Improved stove in enclosed kitchen	–	–	–0.925** (0.412)	–0.787*** (0.121)
Improved stove in open kitchen	–	–	-0.401 (0.504)	-0.215* (0.123)
Intercept	–	–	–	–
Model Statistics				
Log likelihood	–408.06		–407.76	
LR χ^2 (9/10)	102.45***		103.05***	
Observations	250		250	

***, **, and * represent the significance levels at 1 percent, 5 percent, and 10 percent, respectively.

Note: Standard errors are given in parentheses.

[a]Scaled coefficients represent coefficients scaled by sample mean and standard deviation.

[b]Abbottabad district is a comparison category.

On the basis of marginal effects, it is hard to compare and conclude about major health risk amplifying and mitigating factors as they were measured on a different scale of measurements. To overcome this problem, we estimated standardised scale coefficients and reported them in column 2 of Table 2. Our results revealed that the enclosed kitchen was found to be the highest respiratory risk (0.601) intensifying factor, followed by cooking duration (0.401) and PF (0.190). Contrarily, ICS (–0.763) had the highest contribution to mitigating respiratory health symptoms, followed by diversified household chores (–0.203), windows in the kitchen (–0.224), and women's education (–0.143).

Further, to investigate the impacts of PF/ICS in connection with open and enclosed kitchens on women's respiratory symptoms, the respective interaction terms were generated and are reported in Model II of Table 2. According to standardised scale coefficients, PF burning in the enclosed kitchen was a major risk factor by increasing women's respiratory involvement (0.715 symptoms), followed by cooking duration (0.412), and use of PF in the open kitchen (0.231). Nonetheless, cooking with ICS in an enclosed kitchen was a major risk mitigating factor (–0.787), followed by diversified household chores (–0.208), women's education (–0.135), and the number of windows in the kitchen (–0.081).

DISCUSSION

This is the first study to evaluate the net health impacts of IAP after controlling for confounding factors such as kitchen structure, stove types, energy types, pollution exposure, socioeconomic, and geographical characteristics. In both districts of KPK, the majority (66.4 percent) of households are still using fuelwood due to its cheap and easy accessibility (Jan et al., 2017). IAP from PF burning induced about 2 additional acute respiratory symptoms among directly exposed women, aged between 15-55 years, compared with those cooking with alternative CF. This finding is consistent with earlier work from Bangladesh, Cameron, India, Guatemala, Malawi, Mexico, Mozambique, Nigeria, Pakistan, and Turkey (Uzun, et al. 2003; Alim, et al. 2014; Ngahane, et al. 2015; Mohapatra, et al. 2018; Desalu, et al. 2010; Regalado, et al. 2006; Deepthi, et al. 2019; Whitehouse, et al. 2018; Akhtar, et al. 2007; Rabbani, et al. 2017). These studies only showed a positive association between acute and chronic respiratory diseases and hazardous pollutants released due to incomplete combustion of PF. In contrast, our findings contributed by measuring the exact acute health effects of PF.

One of the major strengths of our study is the evaluation of kitchen structures and cookstove technology on IAP-related women's symptoms. Our study demonstrated that women, who cooked in an enclosed kitchen, were suffering from relatively 1 extra respiratory symptom than their counterparts. One possible explanation for this finding could be that an enclosed kitchen is attributed to intensifying concentrations of health-damaging indoor air pollutants. This finding is consistent with recent case-control studies conducted in India and South Africa (Deepthi, et al. 2019; Sharma & Jain, 2019; Semenya & Machete 2020). Deepthi, et al. (2019) and Sharma and Jain (2019) reported higher deposition of PM in the respiratory tract of women cooking in an enclosed kitchen in India. Another study from South Africa observed a higher prevalence of acute symptoms among households having cemented and roofed kitchens (Semenya &

Machete, 2020).[13] However, these studies did not control for confounding factors and failed to estimate the net impact of the enclosed kitchen on respiratory health.

Installation of windows in the kitchen may not only improve ventilation but may also mitigate exposure to IAP as recommended in previous studies (Sharma & Jain 2019; Semenya & Machete 2020). Our findings confirmed that an increase in the number of windows in the kitchen reduced the impacts of IAP on women's health. Similarly, women cooking with ICS technology observed a reduction in about 1 respiratory symptom compared with those cooking with TCS. Rosenthal, et al. (2018) highlighted that inefficient open-fire burning of PF increased the exposure of women during cooking. Moreover, other studies reported a 20–50 percent reduction in PM and CO concentrations due to ICS (Sota, et al. 2018; Sharma & Jain 2019; Whitehouse, et al. 2018; Khushk, et al. 2005; Estévez-García, et al. 2020). Hence, a conducive kitchen environment is necessary for women's health and productivity.

Another strength of our study is the measurement of women's exposure to IAP. For this, we asked about daily cooking duration and diversified household chores. We found that a one-hour increase in daily cooking of three meals increased women's respiratory involvement by 0.4 symptoms. Estévez-García, et al., (2020) explained that women substantially suffered from polluted smoke as they spent most of their time in the microenvironment of the kitchen. On the other hand, the involvement of more females in cooking practices leads to distributing their household chores that were observed to decrease health burden by reducing their exposure to IAP.

Our findings demonstrated that educated women could better understand the consequences of PF and could better adopt mitigating and preventive measures to lessen the burden of respiratory symptoms. However, the impact of household income was very negligible in our study. One possible explanation could be that an enclosed kitchen and the use of cleaner energy and ICS are also reflecting household economic status, as also pointed out by earlier studies (Rabbani, et al. 2017). The district variable was insignificant, implying that women's health status was almost the same in both districts.

Another major strength of our findings is the identification of major health risk amplifying and mitigating factors. On the basis of standardised scale coefficients in Model 1, we found that the enclosed kitchen was the major culprit for increasing IAP-related respiratory symptoms, while ICS was the major short-term remedy for reducing symptoms. Another important contribution of our study is the inclusion of unique interaction terms in Model II. We evaluated the use of PF in the enclosed or open kitchen and inferred from standardised scale coefficients that PF was three-fold more responsible for developing respiratory symptoms compared to when it was used in an open kitchen. This implies that the use of PF either in enclosed or open kitchens is perilous for women's health. Nonetheless, we found the use of ICS technology in an enclosed kitchen was about four-fold more effective in controlling respiratory involvement than that used in an open kitchen. It could be due to high level of IAP in the enclosed kitchen than that in the open kitchen (Deepthi, et al. 2019; Sharma & Jain 2019; Semenya & Machete 2020). Regalado, et al. (2006) found 27 percent higher production of phlegm among women cooking with PF in TCS.

These findings are not free from limitations as we only focused on a few acute symptoms and ignored chronic diseases associated with IAP. Future studies should measure real-time exposure to IAP and conduct medical examinations of women, cooking with PF, for rigorous policy formulation.

CONCLUSION

This study significantly contributes to global evidence by identifying major IAP-related health risk aggravating and mitigating factors. We concluded that enclosed kitchens mainly increased IAP-related respiratory symptoms among rural women of KPK, while ICS and ventilated kitchens significantly minimised symptoms in three possible ways: by reducing IAP generated due to incomplete fuelwood burning, by reducing IAP intensified due to enclosed kitchen, and by reducing women exposure to IAP. However, concerted efforts are required to adopt short-term mitigation strategies such as improved ICS and efficient kitchen design. Moreover, there is a need to be aware poor women of the health risks of biomass fuels. Shifting rural households to affordable and cleaner energy (sustainable development goal 7) is a long-term effective strategy but demands huge investment by developing countries.

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© *The Pakistan Development Review*
62:2 (2023) pp. 235–264
DOI: 10.30541/v62i2pp.235-264

Violent Conflict and Informal Institutions: Evidence from a Civil Conflict in Pakistan

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Conflicts have a variety of economic, social, and institutional consequences. In this study, we analyse the institutional legacies of violent conflicts by providing evidence from a civil conflict which occurred in the district Swat of Khyber-Pakhtunkhwa (KP), Pakistan. We consider three dimensions, i.e. Trust, Participation, and Cooperation, of informal institutions. District Buner—the neighboring district, is taken as the control district. A random sample of 500 households from each district is selected and Ordinary Least Squares (OLS) and Spatial Regression Discontinuity Design (SRDD) are employed for estimation. We find that exposure to violence undermines out-group trust and trust in governmental organisations; however, it promotes within-group trust and trust in Non-Governmental Organisations (NGOs). Likewise, conflicts stimulate participation in social organisations, political activities, and non-government structures but discourage participation in formal government structures. With regard to cooperation, conflicts have beneficial effects on within-group cooperation, collective problem solution, and cooperation with NGOs. However, they retard cooperation with formal government structures. The intensity of these effects is influenced by the location of the individuals as is shown by the results of SRDD. Alternatively, highly exposed areas exhibit comparatively higher changes in trust, participation, and cooperation as compared to the moderately and least affected areas.

JEL Classification: D74, D02, C1
Keywords: Violent Conflict, Informal Institutions, Trust, Participation, Cooperation

1. INTRODUCTION

Violent conflicts have a variety of adverse implications for the economic, political, and social aspects of life. In an economic sense, it deteriorates infrastructure or properties, creates chaos or uncertainty, deters investment and investors' confidence, and retard economic prosperity (Collier, et al. 2003; Collier, 1999; Besley, et al. 2011; Leon, 2012; Bircan, et al. 2017). In the political sense, conflicts and the associated atrocities lead to forced displacement, refugee crises, wars of secession, and mass political instability (Derouen & Bercovetich, 2008; Czaika & Kis-Katos, 2009; Staub, 2012). In the social sense, conflict creates long-term psychological trauma in the nation's youth, encourages gender discrimination, homicides, and crimes, and results in new forms of violence (Bromberg, 1943; Weidmann & Zurcher, 2013). Contrary to harmful effects, conflicts could drive pro-social transformation in the long run (Voors, et al. 2012; De

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Luca & Verpoorten, 2011).[1] For instance, it is perceived that conflicts affected individuals learn new skills and identities (Balcells, 2012); develop social networks (Parkinson, 2013); take profitable risks (Voors, et al. 2012); and behave more cooperatively and pro-socially (Bauer, et al. 2014; Bauer, et al. 2016). Likewise, individuals who are exposed to conflicts are usually more civic-minded and politically engaged (Blattman, 2009; Bellows & Miguel, 2009; Shewfelt, 2009; De Luca & Verpoorten, 2011; Voors, et al. 2012).

Violent conflicts have ubiquitous phenomenon; however, their burden falls disproportionately on the poorer countries (Jakiela & Ozier, 2015).[2] In particular, conflicts are labelled as symptoms of "Failed" or "Collapsed" States (Milliken & Krause, 2002; Lockhart & Ghani, 2008).[3] With inescapable impacts, the nature, duration, and intensity of conflicts could alter the prevailing structure of institutions. Institutions which are the humanly devised constraints that shape human interactions incorporate both informal rules (sanctions, taboos, customs, traditions, and codes of conduct) and formal rules (constitutions, laws, property rights) (North, 1990).[4] The informal institutions—the unwritten rules, are, self-enforcing, stable, learned through socialisation, and depict agents' best response to each other in a society. The state-formal institutions are the reflection or codification of the societies' informal institutions.[5] The analysis of violent conflicts' outset, duration, and termination have largely neglected institutional outcomes, which underpin the choices of different players in conflicts, such as state actors, non-state-armed groups, and common citizens (Gáfaro, et al. 2014).[6] Alternatively, how these agents (citizens in particular) form choices, i.e., establish a new set of institutions in war-affected zones (Arjona, 2014). In particular, such choices are considered interdependent among groups and determined by the expected payoffs and horizons of agents. The formation of a new set of institutions (informal in particular) resulting from violent conflicts ought not to be surprising at all. Conflicts interrupt the underlying social, political, and economic structure of a society, and impose a new social order. Perhaps, the conventional institutional wisdom believes that institutions are path dependent and are highly persistent over an extended period. Nevertheless, institutions are perceived as endogenous to different shocks (Austin, 2008).[7] Historically, the advent of wars has not only transformed states' formal institutions (Acemoglu & Robinson, 2012), but also created locally-based, socially embodied, and durable informal institutions (Bateson, 2012; 2015).

[1]In this way, conflicts can compensate for the costs and destruction, associated with them (Jennings & Sanchez-Pages, 2017).

[2]About 1.5 billion people suffer from violent conflict. One-third of which resides in the poor countries (Justino, 2012).

[3]However, systemically functional violence is considered important to maintain social order in the society (Olson, 1993).

[4]See also Olsson (1993) for the alternative version of the definition.

[5]For instance, social norms determine rules of participation, representation, methods of economic exchange and the inclusion of different groups in a society (Pateman, 1988).

[6]Usually, violent conflicts are theorised as "off the equilibrium path of political order", rather considering them catalyst to the emergence of a new set of institutions, see also Kalivas, et al. (2008).

[7]Though institutions are self-enforcing in nature, yet they are not purely exogenous. Institutional change in a society occur in response to changes in people expectations.

Institutional change, though a complex process, however, takes place in the war-affected zones when different armed groups (state and non-state) compete with each other to control the territories. This conflicting environment either destroys or transforms the structure of prevailing institutions in the region (Gáfaro, et al. 2014). The non-state armed groups largely influence the underlying institutional structure by imposing their norms, controlling the economic bustles, and presuming the state's power (Arjona, 2010; Gutierrez & Baron, 2005).[8] Usually, to promote their agenda, the non-state armed actors make coalitions with local people based on homogenous ideological preferences, because local structures are considered as important institutions, which can be used for political and economic motives during and after the war (Riley, 2005). Yet, to maintain their control, armed groups resort to violence (not in all cases, especially when they face more equipped state forces) against the local population (Kalyvas, 2006), and particularly against the local leaders to replace them with their own supporters (Kaplan, 2010). In this way, they transform the local informal structure in their favour which is necessary to rule the local population.[9]

Nevertheless, the inhabitants, while confronting the armed groups, have a variety of choices to reduce the risk of victimisation. The local people could either support state organisations against non-state groups,[10] or support and welcome non-state actors to ensure physical and economic protection, particularly, when they are ruled by an illegitimate authority or weak state prior to conflict (Justino, 2009; Kalyvas & Kocher, 2007; Wickham-Crowley, 1992). Among others, some inhabitants of the society might use and transform the local institutions to resist non-state armed groups (Arjona, 2010; Petersen, 2001). While, others could distance themselves from local organisations, avoid civic activities and keep themselves limited to the family networks (Kalyvas, 2006; Korf, 2004), in order to avoid the fear of target violence. The outbreak of warfare, therefore, has a profound impact on the social relations, organisational life, and collective actions of the individuals and societies that are directly exposed to violence. In particular, it results in the transformation of the structure of informal institutions, individual behaviours, and norms in the region (Whitt & Wilson, 2007; Blattman & Miguel, 2010; Blattman, et al. 2014; Voors & Bulte, 2014).

Though institutional legacies of conflicts are the most vital, unfortunately, the least comprehended part of warfare research (Bateson, 2015). We contribute to this strand by analysing the institutional legacy of violent conflict that surged in the District Swat of Khyber Pakhtunkhwa (KP) (formerly the North-West Frontier Province or NWFP), Pakistan. The district Swat witnessed a deadly conflict when non-state actors, under the leadership of 'Mullah Fazalullah' started an Islamic movement in the valley in 2004 (which soon turned into violent conflicts) to impose their so-called Islamic ideology in the region. The persistent hostility and conflict between the militants and state forces in

[8]In fact, when the state institutions are weak and inappropriate, various competing actors in the society try to cover the space by devising own institutions which could support their war objectives and help them in securing their future prospects (Arjona, 2010).

[9]The creation of Specific institutions allows the armed groups to shape the social, economic and political affairs of the area in such a way that benefit their organisation in terms of recruitment and creating rents.

[10]During the outbreak of warfare in the country, majority of the inhabitants tend to rally around the flag and provide strong support to the government and military. For detail discussion see Primoratz (2005).

the region for many years resulted in the destruction of physical infrastructure, civilian casualties, and the breakdown of social and institutional structure in the region. We consider three different forms of informal institutions, i.e. trust, participatory preferences, and cooperation, and see how the structure concerning these aspects changes when the status-quo is exposed to the shock of violent conflict. We contribute on two fronts in this regard. First, we want to see how the outburst of violent conflicts affects the social structure and set a new equilibrium path of the informal rules. Second, the existing literature on war and institutions considers narrow proxies of the informal institutions while we consider trust, participation, and cooperation in a more comprehensive setting as far as post-conflict life is concerned. Trust here incorporates trust in family members, relatives, neighborhoods, local community leaders, government agencies, the judicial system, and NGOs. Likewise, participation includes participation in social and governmental organisations combined with participation in political activities and the functioning of NGOs. Cooperation incorporates within-group cooperation, collective problem solution, cooperation with governmental organisations, and cooperation with NGOs. The rest of the study is organised into four sections. Section 2 gives a brief description of the conflict in Swat. We discuss the sampling technique, data, and identification strategy in Section 3. Section 4 provides the empirical findings while Section 5 concludes the paper.

2. VIOLENT CONFLICTS AND THE SWAT VALLEY

Swat Valley is an administrative district, sprawling on an area of 5337 sq. km in the province of Khyber Pakhtunkhwa (KP), Pakistan. The population of the district is around 2.3 million (Population Census, 2017). Moreover, it shares borders with districts of Malakand and Buner in the south, Upper and Lower Dir to the west, and Gilgit Baltistan and Chitral to the north. The inhabitants of the valley are mainly Pashtun (dominated by the Yousafzai tribe) and their social, political, and economic lives are significantly shaped by the Pashtuns' culture (Pashtunwali code of conduct) and Islamic principles.[11]

The history of conflict in Swat valley can be traced back to the Islamic movement '*Tehrik-e-Nifaz-e-Shariah-Mohammadi*' (TNSM) started by Sufi Mohammad Khan in 1992 (Orakzai, 2011). The TSNM gained national interest when the movement launched an armed movement '*Tor-Patki*' (black turban) and demanded to immediately impose Sharia's laws in the region. To establish a state writ, the government deployed the military (Kronstadt, 2010). However, the operation ended after a short time, and negotiations took place between the government and TNSM. As a consequence, the government established 'Sharia courts' through the '*Nezam-e-Shariat* Regulation'. Nevertheless, the TSNM urged that regulations carried out by the government were insufficient to resolve their grievances (Orakzai, 2011). Hence, their struggle continued even after the implementation of regulation, which often resulted in an irregular war in the region (Rome, 2009). When the US invaded Afghanistan, the Sufi Mohammad Khan, recruited more than 10000 people from the valley to fight NATO forces (Roggio, 2007). However, when Pakistan became a US ally in the war against terror,

[11]Pashtunwali is the traditional lifestyle and is best described as a code of honor of Pashtun people by which they live, including but not limited to social and cultural values, norms, forms of informal order, taboos etc.

the government banned the TNSM and apprehended Sufi Muhammad Khan. After his detention, his son-in-law Mullah Fazalullah led the movement and established a close association with militant groups across the country to suppress the state writ in the valley. To promote his ideas of opposing female education, the judicial system, and other informal social setups, Fazalullah initiated a radio campaign (Siddique, 2010). He operated more than 30 illegal FM radio stations throughout the Swat valley, which made him famous as the 'Radio Mullah'. The Fazalullah changed inhabitants' preferences by exploiting the deteriorated formal structure and providing quick rehabilitation assistance in the 2005 earthquake. However, in response to the 'Lal Masjid' operation of Islamabad in 2007, Fazalullah decided to a full violent struggle in the valley. To limit their power, the government launched a military operation; however, the operation failed to limit the power and presence of the militants (Siddique, 2010), the militants controlled the administration of Swat.

During 2007-09, the violent struggle of militants touched its highest point. They attacked security personnel, local leaders, and civil society, and destroyed hospitals and schools in the valley. Additionally, they formed an informal justice system to solve the indigenous disputes and challenged the local Jirgas system. During this period the militants captured 59 villages and seized nearly 70 percent area of the valley (Orakzai, 2011). Nevertheless, to bring back life to a normal state, the government initiated peace talks with militants. To facilitate negotiation, the government released Sufi Muhammad Khan in 2008 (Kronstadt, 2010). In April 2008, the government reached a 16-points peace agreement. However, the accord lived for a short time, and militants further accelerated their violent activities. The government attempted a new talk of peace in the presence of Sufi Muhammad, which led to the declaration of a short-term ceasefire in the valley. Subsequently, the government decided to implement the Sharia laws in the region. On February 15, 2009, the government implemented the Sharia laws in Swat via the religious courts system under a *Qazi*, which is commonly known as the *Nizam-e-Adl* Regulation 2009 (Hilali, 2009).

The peace process yet again remained an incomplete dream when Sufi Muhammad Khan refused to be part of the negotiation. In mid-2009, the militants escalated their activities. To encounter militancy, the government decided to launch the operation '*Rah-e-Rast*' (The Straight Way) in 2009. The operation removed the militancy and established government writ; however, it caused one of the world's largest internal migrations. About 141,582 families were displaced from the valley, and acquired asylum in the various parts of the country (Bangash, 2012). The conflict and the subsequent internal migration have substantially changed the informal structure and the preferences of society. In this study, we want to focus on this aspect.

3. METHODOLOGY

In this section, we provide a brief description of the sampling technique and data besides giving a glimpse of the identification strategy.

3.1. Sampling Technique, Data, and Construction of Variables

In this study, we collect primary data through questionnaires in two districts of KP, namely Swat, and Buner. Buner is kept as a reference category or the control group in our analysis. Each district is administratively divided into tehsil, and each tehsil is, further,

divided into village councils and neighborhood councils. Therefore, we resort to the approach of cluster sampling. We have seven tehsils in Swat, i.e. *Babozai*, *Bahrain*, *Barikot*, *Charbagh*, *Khwazakhela*, *Kabal*, *Matta*, and four tehsils in Buner, i.e. *Khudukhail*, *Mandnr*, *Gagra*, *Daggar*. Additionally, seven tehsils of Swat and four of Buner are divided into 165 and 105 villages councils, respectively. We treat each of the tehsils as a separate cluster and the village/neighborhood councils as sub-clusters. We perform a random selection among the sub-clusters which serve as the Primary Sampling Units (PSUs). Accordingly, 116 and 83 villages/neighborhood councils from districts Swat and Buner, respectively, are randomly selected. Onwards, we retrieve the identity list of the Secondary Sampling Units (SSUs), i.e., households of selected sub-clusters from the districts' local administration. Further, we randomly choose the desired sample of households from each tehsil on the basis of households' share. According to the population census of 2017, the total number of households in districts Swat and Buner are 274620 and 94095, respectively. Based on a 5 percent confidence level (95 percent confidence interval), the total number of households that we have to select from each district is around 384. However, to increase the accuracy of the sample, we raise the sample size to 500 households from each district. Finally, after conducting all the process, we collect the data on different variables of interest through the questionnaires.

We focus on different forms of informal institutional variables, i.e. trust, participation, and cooperation besides other households' characteristics. We take various forms of trust, i.e., within-group and out-group trust, and trust in governmental and non-governmental organisations. Additionally, we quantify the sub-elements of each trust by a Likert scale of 1 to 4, whereas 1 predicts no trust at all and 4 implies the highest level of trust. Within-group trust is the trust in family members, relatives, neighborhoods, known people from the same area, and local community leaders. This variable is constructed by averaging self-reported trust about its various dimensions. Out-group trust includes trust in strange people from one's own area and other places. It is constructed as the average value of both dimensions. Trust in governmental organisations is the average of the trust in the national government, provincial government, local administration, judicial system, and law enforcement agencies. Likewise, trust in NGOs is the trust in non-governmental organisations that work in the health and education sectors of the districts. Again, it is summed as the average level of trust in both organisations. The summary statistics on these dimensions are given in table A1 in the appendix. In 2010, which is the year right after the conflict, the average within-group trust and trust in NGOs is relatively higher in Swat as compared to Buner; however, the out-group trust and trust in governmental organisations are higher in Buner. The same pattern continues even in 2018.

Participation includes participation in social organisations, governmental organisations, political activities, and NGOs. Again, we measure the sub-elements of each participation by a Likert scale of 1 to 4, where 1 implies no participation at all and 4 implies the highest participation. Participation in social organisations is the sum of inhabitants' participation in community associations, work-related/trade unions, jirgas, and sports groups/youth organisations. It is indexed as the average of its mentioned parts. Similarly, participation is political activities is the average of inhabitants' political discussion, joining political meetings and demonstrations, listening to political debates, working voluntarily for a political party, financially supporting a party, and casting a

vote. Participation in governmental organisations includes inhabitants' participation in local government or local civil administrations and meetings with law enforcement agencies. It is calculated as the average of these dimensions. Participation in NGOs includes participation in the activities of NGOs working in the fields of education and health. Again, as is visible from table A1 in the appendix, the average participation in social organisations, political activities, and NGOs is relatively higher in Swat in both 2010 and 2018; however, participation in governmental organisations is higher in Buner.

Cooperation incorporates within-group cooperation, collective problem solution, cooperation with governmental organisations, and cooperation with NGOs. We measure it by a Likert scale of 1 to 4, where 1 implies no cooperation and 4 implies the highest level of cooperation. Within-group cooperation is the average of economic and social assistance from family, relatives, neighbors, known people, and local community leaders. Collective problem solution is the average of inhabitants' efforts to follow the guidelines of community associations, work-related/trade unions, jirgas, and sports groups/youth organisations to solve the common problems of society. Cooperation with the government is the logistic, and moral support, besides the level of social pressure from the inhabitants to the governmental organisations in the implementation of any social program. Cooperation with NGOs is the logistic, and moral support, besides the level of social pressure from the inhabitants to the non-government organisations in the implementation of any social program. It is calculated as the average of all the mentioned dimensions. Again, the within-group cooperation, the collective problem solution, and cooperation with NGOs is relatively better in Swat as compared to Buner; however, cooperation with the government is better in Buner.

In addition to the main variable of interest, i.e. conflict, we control for economic, demographic, and some other variables. Economic controls include the income and employment status of the head of households. Income is measured as the total monthly earnings of the household. The employment status is assessed by a dummy variable, which assumes 1 for the employed household head and 0 otherwise. The demographic controls include the age (in years), education (in years), marital status (the dummy variable, equal to 1 for married individuals and 0 otherwise) of the head of households, and the total household size. The other covariates include the location of residence, which is the dummy variable and takes the values of 1 for households in the urban zone and zero otherwise. We also control for the religiosity level of the respondents, which includes the recitation of the holy Quran, obeying the hadiths (both the variables measured on a Likert scale of 1 to 4), and offering prayers (1 to 5 times). Moreover, the distance from the border to the conflict zones, measured in kilometers, is also incorporated in order to capture the differences in exposure to conflict. The descriptive statistics show that the average values of education, income, and household size are higher in Swat as compared to Buner; however, the averages of age and religious preferences are higher in Buner. Additionally, on average, more respondents are employed, married, and living in urban areas in Buner as compared to Swat.

3.2. Identification Strategy

As stated earlier, Swat is the treated group while Buner is the corresponding control group. Buner remained part of the crown state of Swat from 1915-1969, where

the inhabitants' social political, and economic life was largely patterned by the state's formal institutions.[12] Even after the merger of Swat state into Pakistan in 1969, Buner remained part of the district Swat till 1991. Despite the shared history, district Buner is largely unaffected by the Swat conflict. Thus, the protracted history on both sides of the border and the unaffected structure of district Buner allow us to identify it as a control group.[13] However, before empirical analysis, it is important to apply the Covariate Balancing test to ensure that both districts are similar in the characteristics of controls. Table A2 in the appendix depicts the results of the Covariate Balancing test. Since the probability of Chi-Square is greater than 0.05, we have to accept the null hypothesis that the covariates are balanced across the two districts. Onwards, we employ the Ordinary Least Square (OLS) to estimate the institutional legacy of violent shock. OLS is flexible enough to capture the treatment effect of any intervention and, thus, is the mostly widely used approach in capturing the legacies of war-related violence (Angrist & Krueger, 1994; Collier, 1999; Hutchison & Johnson, 2011; Sacks & Larizza, 2012; Grosjean, 2014; Werner, 2016; De Juan & Pierskalla, 2016). Our model takes the following form:

$$Y_i = \beta_o + \beta_1 D_i + \theta^{\tau} \sum Z_i + U_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Y is the set of informal institutions, which includes different forms of trust, participation, and cooperation. We quantify the perception of households regarding these aspects and develop a composite index for each of the indicators. D_i, in the above equation, is a dummy variable, which takes the value 1 if the households are located in the treated zone, i.e., the households that are exposed to violent conflict, and 0 otherwise. β_1, thus, captures the intensity of change in institutional structure as a result of violent shock. Z_i is the set of control variables, which includes economic controls (employment and income), demographic controls (education, age, marital status, household size, and location of residence), and religious controls (offering prayers, following hadiths, and reciting the Quran)., U_i is the corresponding error term. We estimate equation 1 for the year 2010 (the period right after the conflict), and 2018 (a decade after the conflict). In this way, we want to assess institutional persistency, when the underlined structure of institutions is exposed to a violent shock.[14] However, there might be potential threats to the underlined causal relationship due to omitted variable bias, measurement error, and reverse causality. We attempt to control the omitted variable bias by including all the potential covariates in the model. Similarly, to overcome the measurement error, we ensure randomisation in the data to avoid a specific class of individuals.[15] Additionally, to overcome the problem of reverse causality, as weak institutions might lead to conflict, we resort to the Regression Discontinuity Design (RDD).

RDD is a quasi-experimental strategy that captures the causal effects of any intervention by determining a cutoff, below or above which an intervention is assigned. Unlike the OLS, the RDD allows us to capture the heterogeneity in exposure to violence

[12]For detail discussion see also Rome (2008).

[13]See the figure 1 in the appendix for detail.

[14]The institutional data of the 2010 is collected through recalling. Various surveys follow the same approach, for instance Life in Transition Survey (LITS) adopt the recalling approach for collecting various forms of data in post-war life.

[15]Measurement error might arise due to the reason that certain individuals might not reveal their true preferences.

for the treated group. Different studies have used RDD to capture the diverse effects of incentives on educational outcomes (Thistlethwaite & Campbell, 1960; Lavy, 1999; Van der Klaauw, 2002). A specific form of RDD is Spatial RDD (SRDD) which considers the location of areas, where the threshold is the boundary that demarcates two areas. In this study, we use the SRDD to capture the heterogeneity in terms of the effects on informal institutions due to conflict. A number of studies have used SRDD to assess various issues like quality compensation for teachers on students' performance in various districts of the US (Moor, 2005), labour market dynamics of the wage differential in different zones in Italy (de Blasio & Poy, 2014), and housing prices on both sides of school attendance boundaries (Black, 1999; Bayer, et al. 2007). In our case, the treated and control groups are separated by the formal boundary which is truly random in nature. We divide the treated district into three parts; the moderately affected, the highly exposed, and the least affected.[16] We estimate the following regressions for the treated and control groups respectively.

$$Y_t = \alpha_t + \beta_t (X - b) + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

$$Y_c = \alpha_c + \beta_c (X - b) + \varepsilon_c \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Again, Y is the set of informal institutions. Where, α_t and α_c are the intercepts of the regressions in the treated and control districts respectively. b is the border line, while $(X - b)$ is the distance from the border line to the districts' localities where the data is collected. By estimating the above regressions, the impact of violent conflict on informal institutions can be computed through the difference between the intercepts α_t and α_c of the two regression lines. However, to avoid complications, we use the pooled version of Equation (1) and (2), presented by Lee and Lemieux (2010). Let $\tau = \alpha_t - \alpha_c$ and the dummy variable D, which equals 1 for the treated entity and 0 for the control, the pooled equation is of the following form:

$$Y = \alpha_0 + \tau D + (\beta_t - \beta_c)(X - b) + (\beta_t - \beta_c) D (X - b) + \theta^{\tau} \sum Z_i + \varepsilon \quad \ldots (4)$$

Our parameter of interest is τ, which shows the average treatment effect on the treated district and can be interpreted as the jump between the two regression lines on the border. Z_i is the set of control variables in our regression as discussed earlier.

4. ESTIMATION RESULTS

This section provides the empirical findings of our study. First, we provide the impact of the violent shock on various forms of trust in society. Second, we discuss the response of different dimensions of households' participatory behaviour to such a shock. Finally, we explain changes in various forms of inhabitants' cooperation due to conflict.

[16]The division of the areas in the conflict affected district is based on the decision of the civil administration. The moderate affected zone which cover 10 to 44Km from border is the region where the individuals exposed to a modest level of violence. The highly exposed region covers the area from 45 to 60Km. This middle region remains under the strict control of non-state actors, where they established their headquarters and conducted various activities against the state and people who stand against them. The least affected zone includes the area from 61 to 93Km, this part of the district largely remains unaffected due to the negotiation power of the inhabitants with state actors and militants.

4.1. Trust

Tables 1 and 2 report the OLS and SRDD estimates, in the case of within-group trust, respectively. As can be seen, in both tables, the coefficient of conflict is significant in all of the specifications which implies that conflict enhances within group trust. For instance, panel A of Table 1, which controls for all potential covariates, predicts that right after the termination of the conflict, within-group trust among the victims increases on average by 0.531 points as compared to non-victims. The finding is robust across both the rural and urban regions as is shown by the dummy for the region. Similarly, after a decade of turmoil, though the magnitude of within-group trust decreases; however, still, such trust remains high on average by 0.351 points (see panel B of the table). With regard to heterogeneity across locations, Table 2 suggests that the effect on highly exposed locations is higher as compared to the moderately and least affected locations. For instance, the magnitude of within-group trust among the highly exposed individuals is 0.160 and 0.122 in 2010 and 2018, respectively as compared to 0.135 and 0.085 for moderately, and 0.133 and 0.076 for least affected individuals. This suggests that exposure to conflict develops a strong bond within groups which not only serves as a physical defense to the community but also helps in providing psychological support to each other during violent times. The finding is consistent with the evolutionary theories which account for the occurrence of violent events as a main source of within-group bonding (Choi & Bowles, 2007; Bowles, 2008). Likewise, prior empirical studies support the same view (Bellows & Miguel, 2009; Blattman, 2009; Voors, et al. 2012; Rohner, et al. 2013; Becchetti, et al. 2014; Gilligan, et al. 2014).

Table 1

Within Group Trust (OLS)

	(Panel A) Within Group Trust in 2010				(Panel B) Within Group Trust in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.540***	0.536***	0.531***	0.531***	0.323***	0.322***	0.324***	0.351***
	(0.0229)	(0.0231)	(0.0238)	(0.0245)	(0.0210)	(0.0212)	(0.0215)	(0.0218)
Region Dummy	0.0416**	0.0395**	0.0321	0.0321	0.0158	0.0165	0.0153	0.0114
	(0.0199)	(0.0199)	(0.0205)	(0.0205)	(0.0224)	(0.0224)	(0.0223)	(0.0219)
Constant	2.332***	2.168***	1.897***	1.899***	2.362***	2.267***	1.979***	1.747***
	(0.0258)	(0.137)	(0.174)	(0.191)	(0.0234)	(0.141)	(0.179)	(0.196)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.404	0.405	0.416	0.416	0.195	0.195	0.207	0.217
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 2

Within Group Trust (SRDD)

	(Panel A) Within Group Trust in 2010 Bandwidth			(Panel B) Within Group Trust in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.135***	0.160***	0.113***	0.0854***	0.122***	0.0762***
	(0.00875)	(0.0140)	(0.0102)	(0.00875)	(0.0137)	(0.0101)
Constant	2.060***	2.139***	2.112***	1.810***	2.202***	1.744***
	(0.285)	(0.512)	(0.386)	(0.302)	(0.481)	(0.389)
Observations	446	223	331	446	223	331
R-squared	0.395	0.500	0.418	0.191	0.370	0.219
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

With regard to out-group trust, Tables 3 and 4 depict the OLS and SRDD estimates, respectively. Unlike the within-group trust, violent shock significantly lowers out-group trust among the war-exposed individuals. For instance, as can be seen from panel A of Table 3, the conflict's coefficient in specification 4 shows a decline of 0.696 points in out-group trust among the war-exposed individuals. The region dummy appears insignificant which suggests that the reduction in out-group trust prevails across both the regions. A decade after the conflict shows improvement in out-group trust; however, still, the out-group trust in the treated district remains lower by 0.408 points. Panel A and B of Table 4 show that the effect on highly exposed locations is higher as compared to the moderately and least affected locations. For instance, as can be seen from the table, the reduction in out-group trust for highly exposed individuals is –0.211and –0.125 in 2010 and 2018, respectively as compared to –0.187 and -0.109 for moderately affected and -0.161 and –0.085 for least affected individuals. In general, individuals in war zones persistently experience shocks and violence which results in the reduction of social networks and a reduced sense of protection. Such an undesired situation leads to a general feeling of resentment and a state of distrust toward strangers which, further, escalates the social divide and induces distrust toward out-group members (Werner, 2016).[17]

Table 3

Out-group Trust (OLS)

	(Panel A) Out-group Trust in 2010				(Panel B) Out-group Trust in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	-0.725***	-0.719***	-0.700***	-0.696***	-0.358***	-0.371***	-0.377***	-0.408***
	(0.038)	(0.039)	(0.041)	(0.044)	(0.031)	(0.031)	(0.032)	(0.033)
Region Dummy	-0.003	-0.000	0.009	0.009	-0.016	-0.022	-0.026	-0.021
	(0.039)	(0.039)	(0.040)	(0.040)	(0.033)	(0.033)	(0.034)	(0.033)
Constant	2.817***	3.172***	3.106***	3.075***	2.482***	2.341***	2.058***	2.330***
	(0.046)	(0.239)	(0.307)	(0.331)	(0.038)	(0.204)	(0.273)	(0.286)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.312	0.314	0.322	0.322	0.126	0.136	0.142	0.149
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

[17]See Celebi, et al. (2014); Mironova &Witt (2018) for similar findings.

Table 4

Out-group Trust (SRDD)

	(Panel A) Out-group Trust in2010 Bandwidth			(Panel B) Out-group Trust in 2018 Bandwidth		
	[10-44km] (Model 1)	[45-60km] (Model 2)	[61-93km] (Model 3)	[10-44km] (Model 1)	[45-60km] (Model 2)	[61-93km] (Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	–0.187***	–0.211***	–0.161***	–0.109***	–0.125***	–0.085***
	(0.017)	(0.023)	(0.017)	(0.014)	(0.018)	(0.016)
Constant	3.455***	2.601***	2.903***	2.550***	1.075	1.948***
	(0.497)	(0.837)	(0.737)	(0.426)	(0.764)	(0.558)
Observations	446	223	331	446	223	331
R-squared	0.316	0.431	0.283	0.154	0.243	0.126
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Tables 5 and 6 report the OLS and SRDD estimates, in the case of trust in governmental organisations, respectively. Like the out-group trust, trust in government organisations reduces among the war-exposed individuals. The coefficient associated with conflict in specification 4 suggests that, right after the conflict, the trust in governmental organisations reduces on average by 0.727 points. Again, the region dummy appears insignificant which confirms that the reduction in trust is equally prevailed across both the urban and rural regions. After a decade, there has been some improvement in trust in governmental organisations; however, still, the trust in such organisations in the treated district remains lower by 0.450 points. Panel A and B of Table 6 shows that the effect on highly exposed locations is higher as compared to the moderately and least affected locations. For instance, the extent of reduction in trust in governmental organisations for highly exposed individuals is –0.222 and –0.158 points in 2010 and 2018, respectively as compared to –0.196 and –0.113 for moderately affected and –0.162 and –0.097 for least affected individuals. During the war, when inhabitants face high economic and physical costs, they relate it to the inability of government institutions to uphold the monopoly of violence. Alternatively, the state's inability to curb the rebellion is exposed to common individuals. Citizens, therefore, downgrade their assessment of the state institutions. Moreover, in wars, certain state organisations commit massive human rights abuse as a means to enforce local support, extract information or deter support of rebel movements (Kalyvas, 2006). Such happenings significantly lower trust in governmental organisations. The earlier studies report the same impacts of war violence (Newton & Norris, 2000; Grosjean, 2014).

Table 5

Trust in Government Organisations (OLS)

	(Panel A) Trust in Govt: Organisations in 2010				(Panel B) Trust in Govt: Organisations in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	–0.774***	–0.785***	–0.778***	–0.727***	–0.489***	–0.495***	–0.482***	–0.450***
	(0.030)	(0.031)	(0.031)	(0.030)	(0.028)	(0.029)	(0.029)	(0.029)
Region Dummy	0.005	–0.000	0.002	–0.005	–0.046	–0.045	–0.037	–0.042
	(0.027)	(0.027)	(0.028)	(0.027)	(0.030)	(0.030)	(0.030)	(0.030)
Constant	3.142***	2.700***	2.300***	1.829***	3.183***	2.806***	2.448***	2.167***
	(0.035)	(0.178)	(0.238)	(0.243)	(0.032)	(0.185)	(0.245)	(0.251)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.453	0.456	0.473	0.489	0.234	0.237	0.261	0.269
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6

Trust in Government Organisations (SRDD)

	(Panel A) Trust in Govt: Organisations in 2010 Bandwidth			(Panel B) Trust in Govt: Organisations in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	–0.196***	–0.222***	–0.162***	–0.113***	–0.158***	–0.097***
	(0.011)	(0.017)	(0.012)	(0.012)	(0.020)	(0.013)
Constant	1.835***	2.315***	1.307***	2.026***	2.630***	2.033***
	(0.358)	(0.651)	(0.500)	(0.368)	(0.630)	(0.533)
Observations	446	223	331	446	223	331
R-squared	0.488	0.544	0.473	0.247	0.350	0.252
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The transformation of a war-torn society requires a wide range of actors and organisations. In post-conflict societies, the NGOs efficiently extend their support to local groups to strengthen their capacity, empower the key actors, and promote organisational development and training programs (Parver & Wolf, 2008). In the post-conflict Swat, the NGOs remained involved largely in the rehabilitation of the health and education sectors of the district. Our finding suggests that trust in NGOs increases in the treated region.[18] The socio-economic rehabilitation programs develop a positive reputation of NGOs among the victimised individuals. Tables 7 and 8 report the OLS and SRDD estimates, respectively, in this regard. In panel A of table 7, the coefficient associated with conflict in the final model predicts that immediately after the war, trust among the war victims in NGOs increases on average by 0.602 points. Whereas, the

[18]This finding is compatible with the survey analysis of NGOs in Syria (Bosman, 2012).

region dummy appears insignificant which suggests that the trust equally increased among the urban and rural regions. Nevertheless, the positive magnitude of trust reduces over time. The estimates in Panel B of the table suggest that after a decade, the average trust of the war-exposed individuals in NGOs remained higher on average by 0.237 points as compared to the control group. Concerning the heterogeneity across different localities, we find that the effect on highly exposed locations is higher as compared to the moderately and least affected locations (see Panels A and B of Table 8). For instance, individuals who remained highly exposed to conflict exhibited slightly high average trust (0.167) in NGOs as compared to individuals in the moderately affected (0.159), and least affected (0.146) regions in the treated district. A similar trend prevails a decade after the conflict. For instance, in 2018, the individuals in the highly exposed region shows comparatively high trust (0.075) in NGOs as compared to the moderately affected (0.057), and least affected (0.061) individuals in the region.

Table 7

Trust in Non-Government Organisations (OLS)

	(Panel A) Trust in NGO in 2010				(Panel B) Trust in NGO in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.592***	0.604***	0.612***	0.602***	0.252***	0.260***	0.263***	0.237***
	(0.0392)	(0.0398)	(0.0417)	(0.0410)	(0.0290)	(0.0292)	(0.0307)	(0.0315)
Region Dummy	0.0469	0.0527	0.0556	0.0569	–0.0307	–0.0304	–0.0271	–0.0233
	(0.0379)	(0.0383)	(0.0385)	(0.0386)	(0.0297)	(0.0299)	(0.0305)	(0.0305)
Constant	1.665***	2.058***	1.894***	1.986***	1.737***	2.116***	1.966***	2.192***
	(0.0450)	(0.235)	(0.329)	(0.339)	(0.0332)	(0.197)	(0.285)	(0.290)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.217	0.220	0.224	0.224	0.074	0.078	0.084	0.090
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8

Trust in Non-Government Organisations (SRDD)

	(Panel A) Trust in NGO in 2010 Bandwidth			(Panel B) Trust in NGO in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.159***	0.167***	0.146***	0.0577***	0.0754***	0.0615***
	(0.0150)	(0.0242)	(0.0162)	(0.0134)	(0.0178)	(0.0147)
Constant	1.574***	2.385***	1.135*	2.046***	2.725***	1.229**
	(0.517)	(0.859)	(0.631)	(0.439)	(0.756)	(0.538)
Observations	446	223	331	446	223	331
R-squared	0.205	0.325	0.235	0.085	0.198	0.082
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4.2. Participation

Tables 9 and 10 depict the findings of the participatory behaviour of the individuals in various social organisations in post-conflict life. The first table reports the OLS estimates, while the later depicts the SRDD estimates. The overall findings predict that exposure to violent conflict stimulates participation in social organisations. Panel A of Table 9 shows that, right after the conflict, the participation of war-exposed individuals in social organisations increases on average by 0.532 points. This effect is persistent even after a decade of the conflict, i.e. after a decade of violence, the average participation of the exposed individuals remains high by 0.322 points. Such effect is robust across both the urban and rural areas of the treated district. With regard to heterogeneity across locations, the findings show that the average preferences of individuals for participation in social organisations in the highly exposed locations are relatively higher as compared to those of the moderately exposed and least exposed locations (see Panel A of Table 10). The same trend continues even after a decade of the conflict. For instance, the increase in participatory behaviour in social organisations for highly exposed individuals is 0.167 and 0.115 in 2010 and 2018, respectively as compared to 0.146 and 0.087 for moderately affected and 0.112 and 0.078 for least affected individuals. This is justified by the fact that exposure to violence raises the level of prosocial behaviour towards within-group social organisations, which, in turn, minimise the likelihood of the risk of victimisation in the conflict zone (Gáfaro, 2014). Bellows & Miguel (2009), Blattman (2009), and Cassar, et al. (2013) observe the elevated participation in local groups and associations in the war-exposed case of Sierra Leone, Uganda, and Tajikistan respectively.

Table 9

Participation in Social Organisations (OLS)

	(Panel A) Participation in Social Orgs: in 2010				(Panel B) Participation in Social Orgs: in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.539***	0.520***	0.526***	0.532***	0.330***	0.312***	0.315***	0.322***
	(0.027)	(0.027)	(0.029)	(0.029)	(0.025)	(0.025)	(0.026)	(0.027)
Region Dummy	0.024	0.015	0.009	0.009	0.026	0.021	0.017	0.016
	(0.024)	(0.024)	(0.024)	(0.025)	(0.026)	(0.026)	(0.026)	(0.026)
Constant	1.888***	1.520***	1.294***	1.241***	1.891***	1.453***	1.165***	1.103***
	(0.031)	(0.167)	(0.215)	(0.228)	(0.029)	(0.171)	(0.224)	(0.238)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.336	0.348	0.350	0.351	0.155	0.173	0.178	0.179
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10

Participation in Social Organisations (SRDD)

	(Panel A) Participation in Social Orgs: in 2010 Bandwidth			(Panel B) Participation in Social Orgs: in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.146***	0.167***	0.122***	0.087***	0.115***	0.078***
	(0.012)	(0.016)	(0.011)	(0.012)	(0.016)	(0.012)
Constant	1.278***	2.653***	1.662***	1.058***	2.941***	1.368***
	(0.348)	(0.613)	(0.457)	(0.372)	(0.610)	(0.450)
Observations	446	223	331	446	223	331
R-squared	0.334	0.492	0.377	0.175	0.374	0.202
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Similar to the participation in social organisations, the political participation of individuals also increases in post-conflict life. These findings are shown in Tables 11 and 12 for OLS, and SRDD, respectively. In Panel A of Table 11, the coefficient associated with conflict shows that immediately after the violence, the participation of individuals in political activities increases on average by 0.532 points. Additionally, after a decade of the termination of violence, the positive trend of participation in political activities continues. For instance, as is evident from Panel B of the same table, the political participation of the individuals on average remains high by 0.355 points as compared to the controlled group. Whereas, the regional dummy appears insignificant, which shows that the effect of violence on political behaviour is equally transferred to the urban and rural regions. Similarly, Table 12 shows the findings with respect to the heterogeneity across locations. In this regard, the increase in political participation for highly exposed individuals is 0.179 and 0.142 in 2010 and 2018, respectively as compared to 0.144 and 0.094 for moderately affected and 0.114 and 0.077 for least affected individuals. In general, victimisation during the conflict enhances political participation among conflict-exposed individuals (Carmil & Breznitz, 1991; Bellows & Miguel, 2006, 2009; Blattman, 2009; Gáfaro, 2014). There are three justifications in this regard. First, the extraordinarily unsafe environment enhances the frequency of interactions between individuals to coordinate actions to protect the region and adopt political strategies to solve urgent local needs (De Luca & Verpoorten, 2011). Second, the concentration of the population in Internally Displaced Persons (IDP) camps in the affected areas may have involved in new administrative procedures such as “compulsory” meetings for the organisation of daily life in the camps, etc. Third, the presence of NGOs potentially enhances political participation. For instance, the activities of NGOs encourage individuals to engage in participatory meetings to take advantage of public services.

Table 11

Participation in Political Activities (OLS)

	(Panel A) Participation in Political Activities in 2010				(Panel B) Participation in Political Activities in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.579***	0.557***	0.531***	0.532***	0.370***	0.354***	0.331***	0.355***
	(0.029)	(0.029)	(0.031)	(0.033)	(0.026)	(0.026)	(0.028)	(0.030)
Region Dummy	0.043	0.032	0.019	0.019	–0.014	–0.015	–0.016	–0.020
	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)	(0.028)	(0.028)
Constant	1.673***	0.936***	0.442*	0.427	1.728***	1.018***	0.530**	0.326
	(0.035)	(0.169)	(0.242)	(0.260)	(0.031)	(0.172)	(0.246)	(0.263)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.332	0.346	0.359	0.359	0.178	0.193	0.212	0.218
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 12

Political Participation (SRDD)

	(Panel A) Participation in Political Activities in 2010 Bandwidth			(Panel B) Participation in Political Activities in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.144***	0.179***	0.114***	0.094***	0.142***	0.077***
	(0.012)	(0.015)	(0.013)	(0.012)	(0.016)	(0.013)
Constant	0.383	1.401*	1.065**	0.104	1.762**	0.802*
	(0.368)	(0.782)	(0.429)	(0.368)	(0.804)	(0.410)
Observations	446	223	331	446	223	331
R-squared	0.376	0.503	0.388	0.227	0.412	0.257
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

With regard to participation in governmental organisations; Tables 13 and 14 report the OLS and SRDD results, respectively. The findings suggest that the occurrence of violent shock adversely affects individuals' participation in governmental organisations. Panel A in Table 13 shows that exposure to violence reduces participation of individuals in governmental organisations on average by 0.834 points. The result is robust with respect to the rural and urban regions. Moreover, the intensity of the decline in participation reduces over time; however, the preference for non-participation in governmental activities remains persistent. For instance, Panel B in Table 13 shows that the average participation of individuals in governmental activities remains lower on average by 0.584 points. With respect to robustness across different locations, the SRDD results in Table 14 show that right after the cessation of conflict, the highly exposed individuals exhibited lower average

participation in governmental activities (see the coefficient –0.332 as compared to –0.213 for moderately affected, and –0.189 for least affected locations). Panel B of the same table shows similar trends even after a decade of the conflict. Victimisation in war leads to the erosion of expectations in state institutions (Grosjean, 2014). Likewise, the aftermath of violent conflict is marked by a period of volatility, transition, and uncertainty. Alternatively, the warring parties' motives and strategies are unknown, and the reliability of the government's promises is hard to assess. Thus, in post-conflict life, people keep high expectations with regard to improvement in their living conditions; however, they do worry about the potential economic disadvantages and physical security (De Juan & Pierskalla, 2016). These reservations, accordingly, result in less participation in governmental activities.

Table 13

Participation in Government Organisations (OLS)

	(Panel A) Participation in Govt Orgs: in 2010				(Panel B) Participation in Govt Orgs: in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	–0.875***	–0.873***	–0.898***	–0.834***	–0.627***	–0.623***	–0.643***	–0.584***
	(0.037)	(0.038)	(0.041)	(0.041)	(0.033)	(0.034)	(0.036)	(0.037)
Region Dummy	0.034	0.035	0.025	0.016	0.036	0.039	0.042	0.033
	(0.032)	(0.032)	(0.034)	(0.033)	(0.034)	(0.034)	(0.034)	(0.033)
Constant	2.676***	2.490***	1.914***	1.328***	2.682***	2.582***	2.038***	1.522***
	(0.044)	(0.226)	(0.293)	(0.305)	(0.040)	(0.220)	(0.286)	(0.300)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.424	0.427	0.437	0.455	0.277	0.279	0.294	0.313
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 14

Participation in Government Organisations (SRDD)

	(Panel A) Participation in Govt Orgs: in 2010 Bandwidth			(Panel B) Participation in Govt Orgs: in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	–0.213***	–0.332***	–0.189***	–0.140***	–0.261***	–0.128***
	(0.0148)	(0.0247)	(0.0151)	(0.015)	(0.024)	(0.015)
Constant	1.161***	1.142	0.972*	1.410***	1.319	0.941*
	(0.429)	(0.969)	(0.545)	(0.423)	(0.946)	(0.521)
Observations	446	223	331	446	223	331
R-squared	0.464	0.595	0.450	0.308	0.480	0.304
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

With regard to the participation in NGOs, Tables 15 and 16 depict the OLS and SRDD results, respectively. We find that exposure to violent conflict stimulates participation in the activities of NGOs. For instance, Panel A in Table 15 shows that, immediately after the conflict, participation of the individuals in NGOs increased on average by 0.675 points as compared to the non-victims. Likewise, Panel B of the same table depicts that such an effect remains persistent even a decade after the conflict (see the coefficient of 0.499 in specification 4 in Panel B). With regard to heterogeneity across locations, the SRDD results in Table 16 show that the preference for participation in the activities of NGOs is higher for highly exposed individuals as compared to moderately and least affected individuals. For instance, the increase in participation in NGOs for highly exposed individuals is 0.237 and 0.170 in 2010 and 2018, respectively as compared to 0.184 and 0.135 for moderately affected and 0.150 and 0.113 for least affected individuals. Rebuilding conflict-exposed societies or conflict transformations requires a wide range of organisations. Above all, the NGOs in post-conflict societies efficiently support local groups in their activities with regard to reconstruction. Since, the NGOs' actions in the conflict-affected zone increase in response to the humanitarian crises, the NGOs in the internally displaced camps (IDPs) and later in conflict-affected zones, motivate the individuals to engage in their participatory meetings to take advantage of their services (De Luca & Verpoorten, 2011).

Table 15

Participation in Non-Government Organisations (OLS)

	(Panel A) Participation in NGOs in 2010				(Panel B) Participation in NGOs in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.693***	0.693***	0.674***	0.675***	0.517***	0.515***	0.512***	0.499***
	(0.025)	(0.025)	(0.026)	(0.027)	(0.020)	(0.020)	(0.022)	(0.023)
Region Dummy	0.012	0.012	0.010	0.010	0.026	0.025	0.025	0.027
	(0.026)	(0.026)	(0.026)	(0.026)	(0.023)	(0.023)	(0.023)	(0.023)
Constant	1.860***	1.900***	1.850***	1.846***	1.852***	1.922***	1.996***	2.106***
	(0.029)	(0.144)	(0.195)	(0.203)	(0.022)	(0.138)	(0.184)	(0.191)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.525	0.525	0.528	0.528	0.397	0.398	0.400	0.402
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 16

Participation in Non-Government Organisations (SRDD)

	(Panel A) Participation in NGOs in 2010 Bandwidth			(Panel B) Participation in NGOs in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.184***	0.237***	0.150***	0.135***	0.170***	0.113***
	(0.010)	(0.015)	(0.010)	(0.009)	(0.016)	(0.010)
Constant	1.918***	2.541***	1.442***	1.981***	2.510***	2.143***
	(0.312)	(0.477)	(0.433)	(0.284)	(0.572)	(0.399)
Observations	446	223	331	446	223	331
R-squared	0.505	0.739	0.519	0.390	0.556	0.400
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4.3. Cooperation

Tables 17 and 18 report the OLS and SRDD results of within-group cooperation, respectively. The findings suggest that exposure to violent conflict stimulates within-group cooperation in society. As is visible from Panel A of Table 17, the coefficient associated with conflict in the final specification show that, right after the conflict, the within-group cooperation among the victims increases on average by 0.881 points. Likewise, a decade after the conflict exhibits similar trends. For instance, Panel B of the same table shows that the level of cooperation among the war-exposed individuals remained high on average by 0.653 points as compared to non-exposed. Moreover, such an effect is exhibited in both the rural and urban areas as is shown by the regional dummy. The SRDD results in Table 18 show that highly exposed individuals exhibit higher within-group cooperation (0.287) as compared to the moderately (0.236) and least affected (0.185) individuals. A similar pattern exists even a decade after the conflict (see Panel B of Table 18). This is justified by the fact that the eruption of war results in the destruction of household assets and makes the sufferers more reliant on the existing informal setup of risk sharing and insurance (Bauer, et al. 2016). In particular, the clans and neighbors become important which makes investment in social capital more productive. Alternatively, during the conflict, investment in human and physical capital becomes risky, expensive, and constrained as compared to the investment in social capital. This, in turn, enhances group memberships and other forms of community support. Moreover, the attitude of cooperative behaviour serves as motive for personal safety and protection (Silva & Mace, 2015).

Table 17

Within Group Cooperation (OLS)

	(Panel A) Within Group Cooperation in 2010				(Panel B) Within Group Cooperation in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.917***	0.898***	0.887***	0.881***	0.697***	0.683***	0.675***	0.653***
	(0.026)	(0.027)	(0.029)	(0.030)	(0.022)	(0.023)	(0.024)	(0.026)
Region Dummy	0.037	0.028	0.021	0.022	0.004	0.001	–0.001	0.002
	(0.027)	(0.027)	(0.028)	(0.028)	(0.023)	(0.023)	(0.023)	(0.023)
Constant	1.653***	1.152***	1.199***	1.259***	1.687***	1.203***	1.224***	1.410***
	(0.033)	(0.162)	(0.213)	(0.234)	(0.026)	(0.155)	(0.208)	(0.228)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.612	0.618	0.621	0.621	0.505	0.513	0.517	0.520
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 18

Within Group Cooperation (SRDD)

	(Panel A) Within Group Cooperation in 2010 Bandwidth			(Panel B) Within Group Cooperation in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.236***	0.287***	0.185***	0.179***	0.231***	0.133***
	(0.0114)	(0.0154)	(0.0125)	(0.0110)	(0.0151)	(0.0119)
Constant	1.498***	2.042***	1.774***	1.524***	2.342***	1.815***
	(0.356)	(0.654)	(0.436)	(0.343)	(0.647)	(0.400)
Observations	446	223	331	446	223	331
R-squared	0.586	0.746	0.630	0.492	0.703	0.515
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Tables 19 and 20 depict the OLS and SRDD results for the solution of collective problems, respectively. Panel A of Table 19 shows that, right after the conflict, the average efforts of individuals for the collective problem solution increases by 1.001 points. Likewise, even a decade after the conflict, the efforts level remains high by 0.814 points (see Panel B of the same table). Again, the finding is robust across both the urban and rural areas. The SRDD results in Table 20 show that such effects are different across different locations. For instance, the efforts levels of the highly exposed individuals are 0.332 and 0.247 in 2010 and 2018, respectively as compared to 0.256 and 0.221 for moderately affected and 0.245 and 0.187 for least affected individuals. In general, exposure to violence induces changes in the belief structure of the victims which, in turn, makes them more prosocial, especially for within-group individuals (Bauer, et al. 2016). Such prosocial behaviour at the community level motivates individuals for the solution of actual problems in the community (Bellows & Miguel (2006).[19]

[19]In general, voting in elections and joining the social and political groups enhances after the conflict.

Table 19

Collective Problem Solution (OLS)

	(Panel A) Collective Problem Solution in 2010				(Panel B) Collective Problem Solution in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	1.004***	0.989***	0.980***	1.001***	0.801***	0.792***	0.800***	0.814***
	(0.030)	(0.030)	(0.032)	(0.033)	(0.024)	(0.024)	(0.025)	(0.026)
Region Dummy	0.039	0.033	0.020	0.017	0.013	0.009	0.001	–0.001
	(0.032)	(0.032)	(0.033)	(0.033)	(0.026)	(0.026)	(0.026)	(0.026)
Constant	1.799***	1.578***	1.412***	1.218***	1.829***	1.752***	1.628***	1.506***
	(0.038)	(0.159)	(0.223)	(0.233)	(0.028)	(0.160)	(0.224)	(0.233)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.620	0.625	0.630	0.633	0.536	0.540	0.547	0.548
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 20

Collective Problem Solution (SRDD)

	(Panel A) Collective Problem Solution in 2010			(Panel B) Collective Problem Solution in 2018		
	Bandwidth			Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.256***	0.332***	0.245***	0.221***	0.247***	0.187***
	(0.012)	(0.014)	(0.012)	(0.012)	(0.014)	(0.012)
Constant	1.180***	0.959*	2.061***	1.473***	1.666***	2.144***
	(0.347)	(0.503)	(0.503)	(0.358)	(0.547)	(0.463)
Observations	446	223	331	446	223	331
R-squared	0.597	0.777	0.659	0.504	0.674	0.553
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

As far as the cooperation with governmental organisations is concerned; Tables 21 and 22 depict the OLS and SRDD results, respectively, in this regard. We find that the occurrence of violent shock reduces cooperation with governmental organisations in society. Panel A in Table 21 shows that the level of cooperation with governmental organisations among the victims reduces by 0.892 points as compared to the non-victims. Such effect is persistent even after a decade of the conflict, i.e. the level of cooperation remains lower by on average by 0.633 points in 2018. Moreover, the effect is robust across both the rural and urban areas. The SRDD results in Table 22 confirm that the effect is heterogenous across different locations. For instance, the level of cooperation is lower among the highly exposed individuals by 0.393 and 0.223 points in 2010 and 2018, respectively as compared to 0.222 and 0.166 for moderately affected and 0.163 and 0.120 for least affected individuals. The victimisation in the conflict adversely affects individuals' expectations about the state organisations (Grosjean, 2014). Second, since

post-conflict life is volatile, uncertain, and transitionary, individuals are fearful for physical security in case armed conflict recurs (De Juan & Pierskalla, 2016). Thus, people instead of extending their support to any warring group, avoid civic activities and keep themselves limited to the family networks (Kalyvas, 2006; Korf, 2004). This reduces cooperation with governmental organisations.

Table 21

Cooperation with Government Organisations (OLS)

	(Panel A) Cooperation with Govt Orgs: in 2010				(Panel B) Cooperation with Govt Orgs: in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	–0.913***	–0.907***	–0.902***	–0.892***	–0.656***	–0.657***	–0.652***	–0.633***
	(0.0341)	(0.034)	(0.036)	(0.038)	(0.0264)	(0.027)	(0.028)	(0.029)
Region Dummy	-0.0294	–0.026	–0.021	–0.022	–0.0255	–0.027	–0.019	–0.022
	(0.0327)	(0.033)	(0.034)	(0.033)	(0.0277)	(0.028)	(0.028)	(0.028)
Constant	3.217***	3.453***	3.421***	3.328***	3.207***	3.311***	3.297***	3.138***
	(0.0400)	(0.187)	(0.279)	(0.293)	(0.0306)	(0.167)	(0.246)	(0.259)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.474	0.475	0.477	0.477	0.389	0.390	0.398	0.400
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 22

Cooperation with Government Organisations (SRDD)

	(Panel A) Cooperation with Govt Orgs: in 2010 Bandwidth			(Panel B) Cooperation with Govt Orgs: in 2018 Bandwidth		
	[10-44km]	[45-60km]	[61-93km]	[10-44km]	[45-60km]	[61-93km]
	(Model 1)	(Model 2)	(Model 3)	(Model 1)	(Model 2)	(Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	–0.222***	–0.393***	–0.163***	–0.166***	–0.223***	–0.120***
	(0.013)	(0.018)	(0.016)	(0.013)	(0.015)	(0.013)
Constant	3.382***	3.704***	2.721***	2.879***	4.759***	2.943***
	(0.398)	(0.788)	(0.593)	(0.384)	(0.717)	(0.514)
Observations	446	223	331	446	223	331
R-squared	0.464	0.755	0.383	0.382	0.569	0.325
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Tables 23 and 24 depict the OLS and SRDD estimates, respectively in the case of cooperation with NGOs. In this respect, we find that, unlike cooperation with governmental organisations, exposure to violent shock increases cooperation with NGOs. Panel A in Table 23 shows that, right after the conflict, individuals' cooperation with NGOs enhances by 0.771 points. This effect is even persistent a decade after the conflict, i.e. still the cooperation with NGOs is higher by 0.586 points. Again, the effect is robust across both the rural and urban areas. Moreover, the SRDD results in Table 24

demonstrate that the effect is different for different locations. For instance, the level of cooperation with the NGOs among the highly exposed individuals is 0.315 and 0.210 in 2010 and 2018, respectively as compared to 0.219 and 0.156 for moderately affected and 0.164 and 0.130 for least affected individuals. NGOs play an important role in rebuilding a war-torn society. For instance, NGOs support local groups by increasing their capacity and endowing key agents with new ideas, and promoting training (Parver & Wolf, 2008). Moreover, they are helpful in organisational development in post-conflict life. Thus, the rising activities of NGOs in response to the humanitarian crises motivate individuals to engage in their meetings to take advantage of their services. Alternatively, projects by NGOs in conflict-exposed zones attract individuals to cooperate more with the NGO sector to have a more inclusive society.

Table 23

Cooperation with Non-Government Organisations (OLS)

	(Panel A) Cooperation with NGOs in 2010				(Panel B) Cooperation with NGOs in 2018			
	(Model 1)	(Model 2)	(Model 3)	(Model4)	(Model 1)	(Model 2)	(Model 3)	(Model 4)
Variables	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Conflict	0.805***	0.795***	0.763***	0.771***	0.586***	0.582***	0.559***	0.586***
	(0.034)	(0.034)	(0.036)	(0.037)	(0.028)	(0.028)	(0.029)	(0.030)
Region Dummy	–0.023	–0.028	–0.024	–0.026	0.020	0.019	0.030	0.026
	(0.032)	(0.032)	(0.033)	(0.033)	(0.029)	(0.029)	(0.029)	(0.029)
Constant	1.906***	1.664***	1.595***	1.523***	1.867***	1.698***	1.591***	1.360***
	(0.040)	(0.197)	(0.264)	(0.270)	(0.031)	(0.186)	(0.252)	(0.261)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.442	0.444	0.457	0.458	0.311	0.312	0.328	0.333
Economic Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes	No	No	Yes	Yes
Religious Controls	No	No	No	Yes	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 24

Cooperation with Non-Government Organisations (SRDD)

	(Panel A) Cooperation with NGOs in 2010 Bandwidth			(Panel B) Cooperation with NGOs in 2018 Bandwidth		
	[10-44km] (Model 1)	[45-60km] (Model 2)	[61-93km] (Model 3)	[10-44km] (Model 1)	[45-60km] (Model 2)	[61-93km] (Model 3)
Variables	SRDD	SRDD	SRDD	SRDD	SRRD	SRRD
Conflict	0.219***	0.315***	0.164***	0.156***	0.210***	0.130***
	(0.013)	(0.021)	(0.014)	(0.013)	(0.017)	(0.013)
Constant	1.763***	1.584**	1.702***	1.634***	1.574**	1.308**
	(0.410)	(0.790)	(0.515)	(0.419)	(0.757)	(0.517)
Observations	446	223	331	446	223	331
R-squared	0.472	0.651	0.439	0.330	0.497	0.316
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Religious Controls	Yes	Yes	Yes	Yes	Yes	Yes

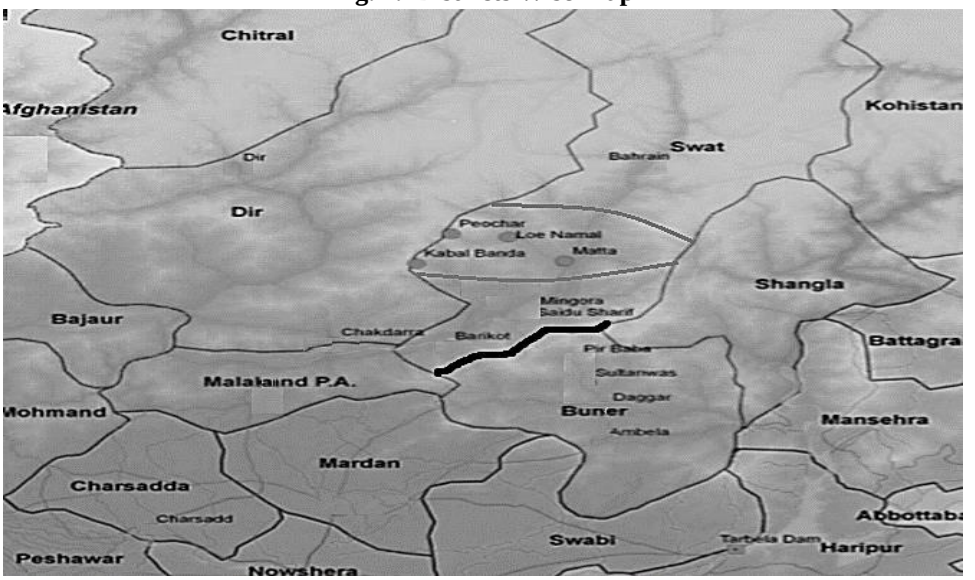
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5. CONCLUSION

This study is motivated by the recent literature which is related to the interaction of institutions with conflicts. Here, we want to investigate the institutional legacy of violent conflict that occurred in the district Swat of Khyber Pakhtunkhwa (KP), Pakistan. We focus on three aspects of informal institutions, i.e. trust, participation, and cooperation. To explore the causal links, we identify district Buner- the neighboring district as a control group. We collect the primary data from 500 households on different institutional information in each district and apply the Ordinary Least Square (OLS) and Spatial Regression Discontinuity (SRDD) for estimation. Our findings suggest that institutions are endogenous to exogenous shocks, i.e., when the underlined structure of institutions expose to unexpected shock, institutions in the society adopt a new equilibrium path. The findings related to trust in society suggest that exposure to violence adversely affects the out-group trust, and trust in governmental organisations; however, it enhances within-group trust and trust in NGOs. Likewise, violence victimisation stimulates participation in political activities social organisations, and NGOs; however, it lowers participation in governmental organisations. Additionally, the occurrence of war enhances the within groups cooperation and cooperation with NGOs. Also, the capacity of society to solve collective problems enhances with conflicts. However, again, cooperation with governmental organisations reduces violent shocks. Moreover, these findings are robust across both the rural and urban areas of the war-exposed district. As far as the spatial distribution of these effects is concerned; the effects are more intensive in highly exposed areas as compared to the moderately affected and least affected areas. Overall, these findings suggest that conflicts result in the transformation of the informal structure of the society and have profound effects as far as institutional persistence is concerned.

APPENDIX

Fig. 1. Districts Wise Map



Source: Refugee Review Tribunal (2009).

Table A1

Table A1.

Descriptive Statistics

	Swat (2010)				Buner (2010)			
Variables	Mean	Std. Dev.	Min	Mix	Mean	Std. Dev.	Min	Mix
Within-Group Trust	2.892	0.276	2.4	3.6	2.374	0.351	1.4	3.6
Out-Group Trust	2.091	0.398	1.5	3	2.814	0.648	1	4
Trust in Govt: Orgs:	2.37	0.348	1.833	3	3.147	0.493	1.833	4
Trust in Non-Govt: Orgs:	2.281	0.522	1.5	3.5	1.713	0.559	1	3
Participation in Social Orgs:	2.439	0.306	2	3.5	1.912	0.427	1	3.5
Participation in Political Activities	2.273	0.276	1.714	3	1.716	0.487	0.857	3.571
Participation in Govt: Orgs:	1.817	0.330	1	2.333	2.710	0.658	1	4
Participation in Non-Govt: Orgs:	2.56	0.354	2	3	1.873	0.297	1.5	2.5
Within Group Cooperation	2.666	0.344	2	3.6	2.118	0.463	1	4
Collective Problem Solution	2.823	0.331	2	4	1.839	0.433	1	3
Cooperation With Govt: Org:	2.29	0.466	1.666	4	3.187	0.479	1.666	4
Cooperation With Non-Govt: Org:	2.7	0.422	2	4	1.882	0.494	1	3.333
	Swat (2018)				Buner (2018)			
Within-Group Trust	2.694	0.299	2	3.6	2.4	0. 352	1.4	3.66
Out-Group Trust	2.114	0.342	1.5	3	2.469	0. 567	1	4
Trust in Govt: Orgs:	2.666	0.372	2	3.16	3.15	0.503	1.833	4
Trust in Non-Govt: Orgs:	1.97	0.322	1.5	2.5	1.831	0.559	1.55	3.33
Participation in Social Orgs:	2.237	0.330	1.5	3.25	2.172	0.730	1.66	3.5
Participation in Political Activities	2.089	0.289	1.285	3	1.974	0.913	1.260	3.671
Participation in Govt: Orgs:	2.077	0.302	1.333	2.666	2.93	0.771	2.33	4
Participation in Non-Govt: Orgs:	2.385	0.333	2	3	1.903	0.353	1.5	2.5
Within Group Cooperation	2.4972	0.344	1.8	3.4	2.291	0.463	1	4
Collective Problem Solution	2.638	0.297	2	3.5	2.31	0.627	1	3
Cooperation With Govt: Org:	2.535	0.3246	2	3	3.426	0.479	1.666	4
Cooperation With Non-Govt: Org:	2.465	0.364	1.666	3	2.173	0.693	1	3.333
	Control Variables							
	Swat				Buner			
	Mean	Std. Dev.	Min	Mix	Mean	Std. Dev.	Min	Mix
Education	13.382	3.540	0	18	11.57	4.774	0	18
Age of The Respondents	31.704	7.963	15	55	36.866	9.980	20	65
Income of Household	62018	27828.7	10000	80000	45538	22602.2	10000	67000
Household Size	11.406	5.141	3	23	9.22	4.466	2	25
Religious Preferences	3.373	0..536	1.333	4	3.788	0.521	1	4
Employment (Dummy)	Employed = 307		Unemployed = 193		Employed = 344		Unemployed = 165	
Marital Status (Dummy)	Married = 385		Unmarried = 115		Married = 439		Unmarried = 61	
Residence Location (Dummy)	Urban = 232		Rural = 268		Urban = 284		Rural = 216	

Table A2

Covariates Balancing Test

Treatment-Effects Estimation Estimator: Inverse-probability Weights Outcome Model: Weighted Mean Treatment Model: Logit			Number of Observation = 1,000		
GT	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
ATE					
Conflict (Swat vs Buner)	–0.0862	0.02022	–4.26	0.000	–0.12586 –0.04659
POmean					
Conflict Buner	2.6120	0.01370	190.59	0.000	2.58519 2.63891
Over-Identification Test for Covariate Balance H0: Covariates are balanced: chi2 (9) = 10.1389 Prob > chi2 = 0.1808					

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62:2 (2023) pp. 265–280

POLICY

Pakistan: One Year Growth Strategy

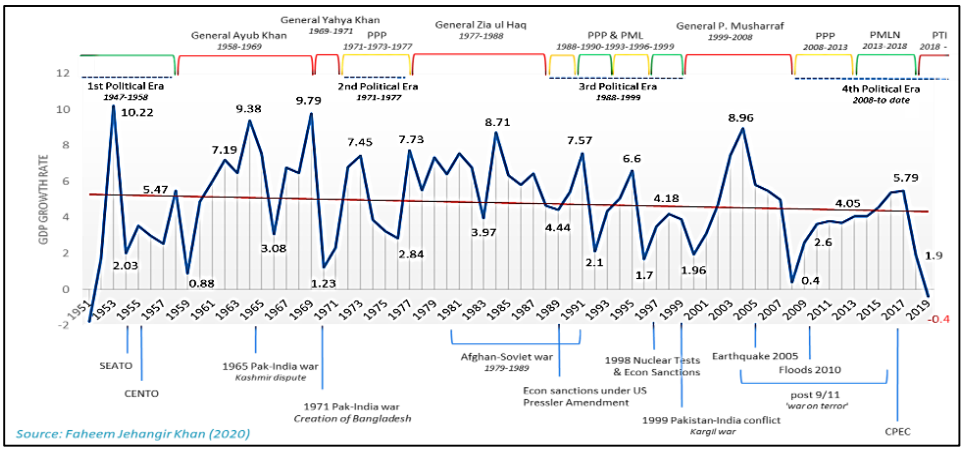
PIDE

ACTION POINTS

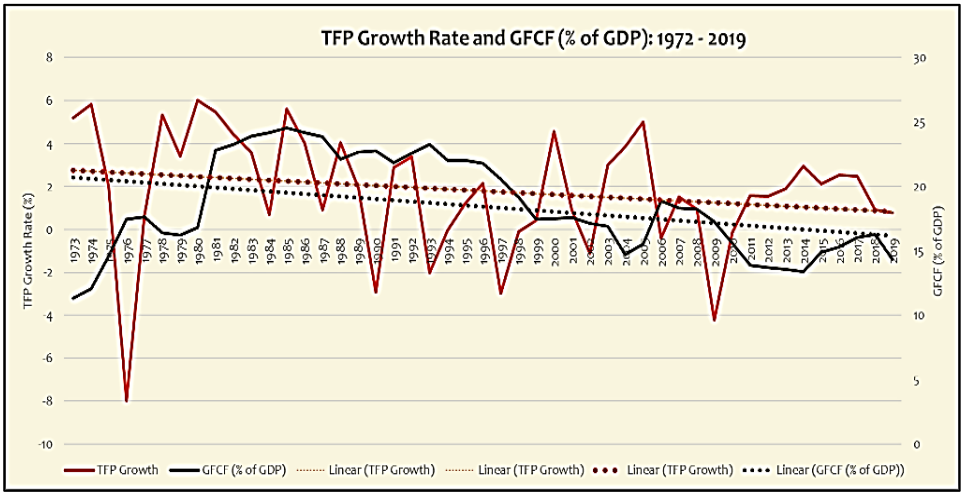
- Focus on Investment, productivity, and exports.
- Remove bottlenecks linked to terrifs, sludge: cost of regulation, financial & energy constraints.
- Initiate "Regulatory Audit".
- Reduce bank's holding of the government securities.
- Create a National Debt Management Office.
- Revisit DISCO's management.
- Introduce pre-paid metering.
- Do away from uniform energy tariffs.
- Introduce wheeling and bilateral agreements.
- Tax Simplification
- Implement Point of Sale (POS)
- Deregulate the real estate market by eliminating NOCs and FBR/DC rates.
- Tie Real estate & city development.
- Unlock dead capital.
- Internet for all.
- Youth Involvement—promote sports, culture & clubs
- Promote street vending—huge employment generation.

BASIC FACTS ON LONG-TERM GROWTH

(1) Our long-term growth is declining



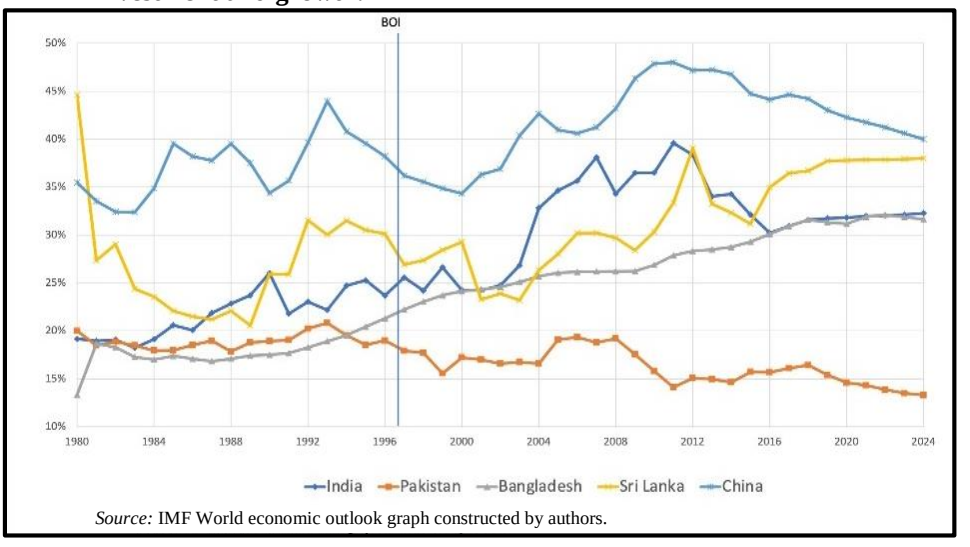
(2) We also have declining productivity and Investment



(3) Productivity Facts

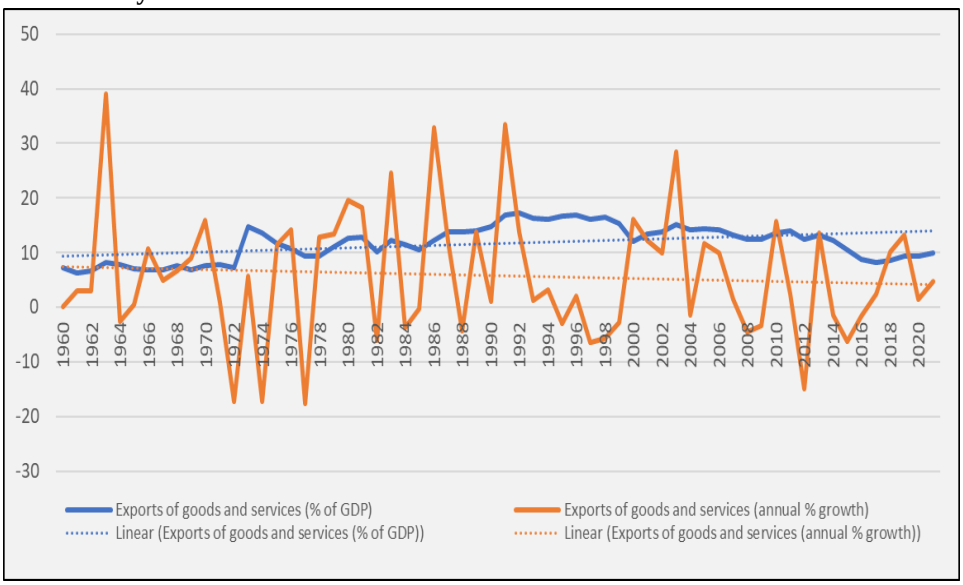
- Negative productivity trend implies a less efficient economy over time
- Sectoral TFP growth estimates show that:
  - Service and tech-based sectors have higher productivity growth
  - The manufacturing sector mostly has low or negative productivity growth
  - Subsidy-receiving sectors have medium/low or negative productivity growth
  - Export-designated sectors have low or negative productivity growth
  - High productivity growth sectors are not major export contributors

(4) We have the lowest investment rate among neighboring countries: our policy is totally focused on the tax rate and revenue collection, with no priority to investment and growth.



Source: IMF World economic outlook graph constructed by authors.

(5) Our export trend is flat despite TDAP, generous trade policies, and MOC fully focused on trade



(6) Government has crowded out market competition

- Government footprint (67 % of GDP)
  - An active player in various sectors: SOEs
  - Energy, transportation, financial, trading, manufacturing
  - Fixing prices
  - Wheat, electricity, gas, medicines, milk, petrol
- Sludge: Over-regulation (39% of GDP)
  - Time-consuming processes in seeking Registration, Licenses, Certificates, and Other permissions (RLCOs)

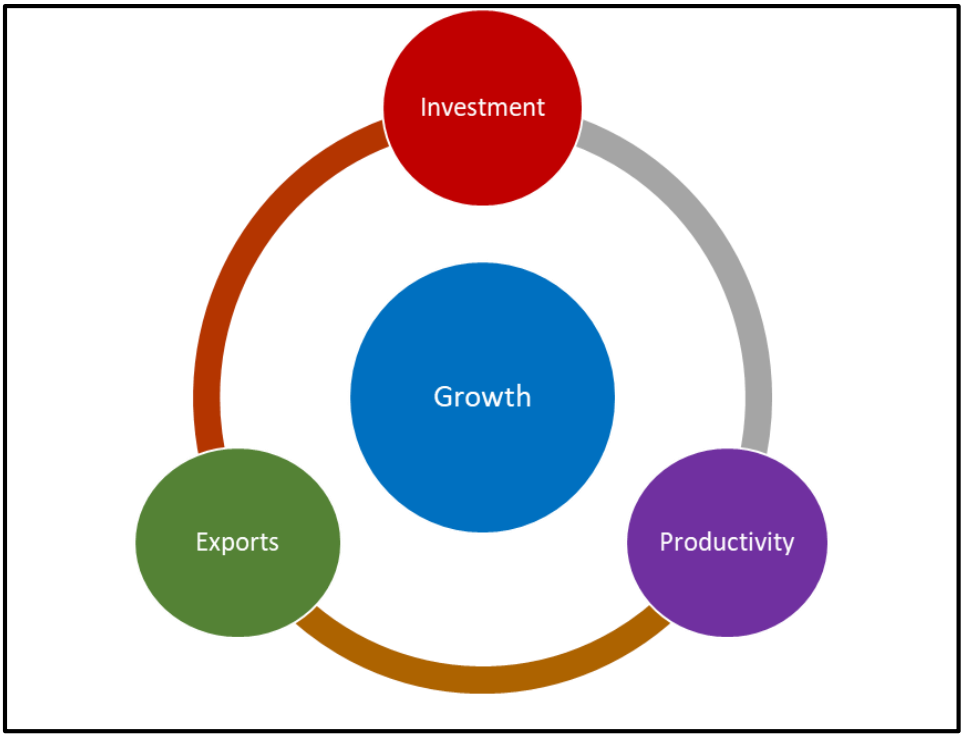
CURRENT CRISIS AND CONSTRAINTS

- Due to the ongoing IMF Program
  - No fiscal space available to the government
  - Increase in public investment is not possible
  - Taxes are too high
  - Balance of payment crisis—highly indebted
  - Rightsizing is required but privatization difficult

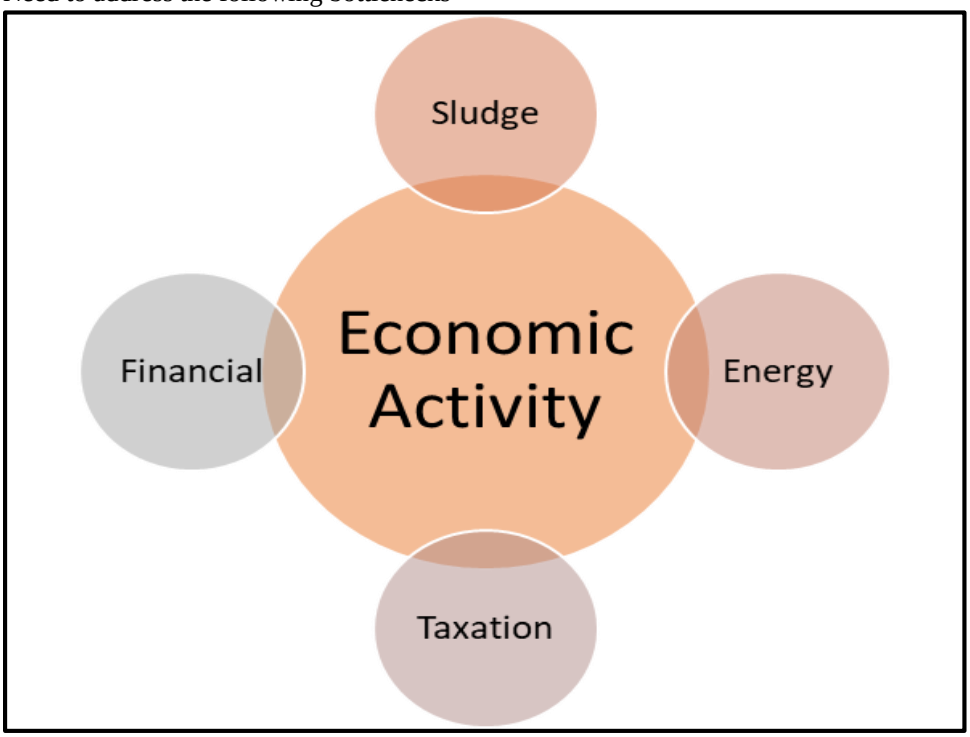
In short, the available policy choices are limited

TIME TO CHANGE PRIORITIES

Historically, taxation has been the priority and growth has been low on the list. Need to make growth a top priority and for that focus on investment, productivity, and exports.



Need to address the following bottlenecks



SLUDGE: THE COST OF REGULATIONS

The government footprint is 60%–80% of the GDP

(1) Pakistan is a permission economy
(2) There are122 regulatory bodies under the Federal Government
(3) Regulations permission NOCs cost more than 39 % of GDP in three sectors alone

PIDE Sludge Audit Vol. I

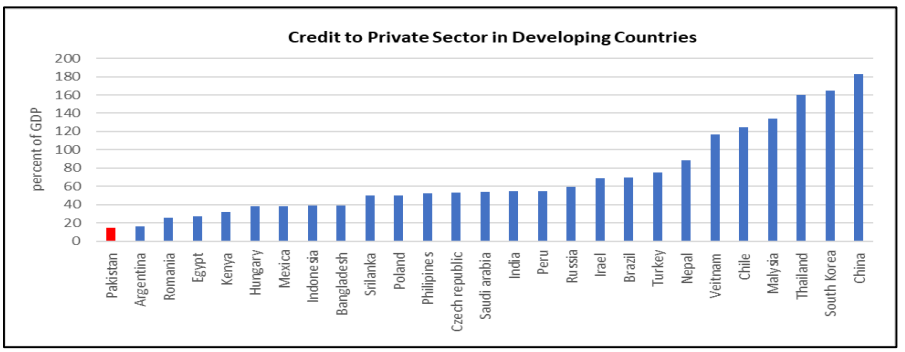
- *Permission process takes 1 – 4 years*
- *Multiple approvals from different agencies are required to set up a business*
- *A plethora of documents*
- *Multiple site visits/inspections.*

Way Forward

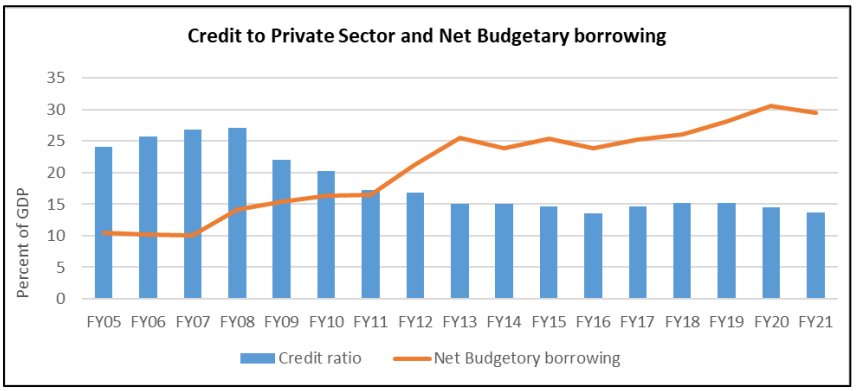
- Choice -1: Regulatory Audit
  - Authorities should initiate a regulatory audit in collaboration with the Board of Investment and the Competition Commission of Pakistan
  - The regulatory audit must be based on the regulatory guillotine strategy
  - Regulations retained after the assessment must be rule-based
  - Authorities must present a plan to achieve automation in the regulatory permission processes
  - Deemed approval: once the application along with the required documents is submitted to the authority and the authority has not taken any action within 15 days of submission, then the application must be considered approved
  - Ensure strict implementation of rules and regulations. employ professional bodies, such as the Pakistan Engineering Council, for monitoring
- Choice -2: Remove of all permissions
  - Remove all Registrations, Licenses, Certificates, and Other Permissions (RLCOs) within 15 days, except for prohibited activities
  - Ask Authorities to prepare a case for RLCOs on the basis of a cost-benefit analysis
  - Cabinet approval: Authorities must seek cabinet approval to implement a regulation within 3 months

FINANCIAL: MORE CREDIT FOR INVESTMENT

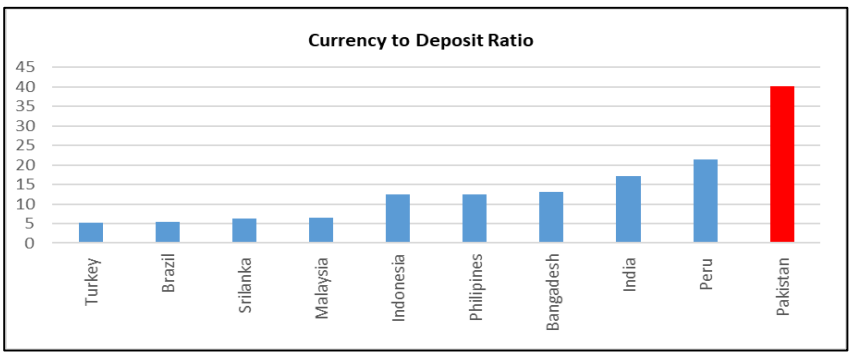
- Pakistan has the lowest ratio of credit to the private sector among the Developing Countries



- loanable funds are heavily tied up in Government securities (52 % investment in securities and an additional 15 % in government guarantee loans)



- This led to domestic advances to deposit ratio drop from 75 % to 40 % from 2008 to 2020
- Moreover, Pakistan has the highest currency in circulation (40 % as compared to the maximum of 20 % in other countries), which also impacts the banking multiplier by limiting liquidity available for the private sector



Way Forward

- Create a ***National Debt Management Office (NDMO)***
  - National Savings merged with Debt Policy Coordination Office along with state bank debt functions
    - Domestic and external public debt management and government guarantees
    - New debt instrument
    - Managing yield curves
    - Provide treasury management functions to the Ministry of Finance reducing cost and better portfolio management
    - Ensuring Fiscal Responsibility
  - Weighted Average cost publicly available and NDMO answerable to parliament

- Capital market will also develop by going beyond banks for bonds markets such as pension funds, institutional investors, NBFIs, and international capital markets

- Increase the fiscal space for credit to the private sector through:
  - Government securities (currently, banks hold around 75 % (Rs. 10.5 trillion) and non-banking institutions only 25 % (Rs. 3.5 trillion))
  - If the bank holding is cut back to 60 %, then a release of Rs. 2 trillion could be put into the private sector
  - If the ratio of currency to deposit can be reduced from 40 to 33 %, then it will add another Rs. 1.5 trillion to the private sector
  - With the added multiplier, these initiatives will provide a strong stimulus for growth

ENERGY: A CHRONIC PROBLEM

- Circular Debt Rs. 2.5 trillion (April 26, 2022)
- Cumulative Losses of Rs.5.4 trillion (since FY 2007)
  - Huge Transmission and Distribution Losses
    - In FY 2021, a loss of Rs. 473 billion – Rs. 402 billion was recovered through tariff, and Rs. 71 billion was added to circular debt
  - Low Bill Recoveries
    - In FY 2021, a financial loss of Rs. 39 billion
  - DISCO Mismanagement
    - Centralized billing system and meter irregularities
  - Capacity Payments Burden
    - In FY 2021, invoiced capacity charges of Rs. 793 billion
  - Unaffordable Tariff and Cross-subsidy
    - Industry and commercial subsidizing household and agriculture

Way Forward

- Billing and Metering
  - Pre-paid meters, linked to DISCO billing
  - Consumer pay for pre-paid meters
- B2B and Wheeling
  - Long-term contracts—Competitive Trading Bilateral Contract Market (CTBCM) not possible
  - Bilateral contracts, such as B2B, between bulk consumers or DISCOs and generators
  - Facilitate wheeling, wheeling charges equal to marginal costs

TAXATION: A PERENNIAL PROBLEM

- Complicated and Distorted Tax Structure
  - Forced to set elusive tax-to-GDP targets and chasing it through arbitrary measures, while growth and employment is left primarily to some PSDP funded projects
  - Policy does not follow principles of fairness, certainty, efficiency, and convenience
  - Higher taxes, narrow base, differential treatments, and exemption hinder growth and flow of revenue
  - Tax policy complex and killing transactions in pursuing tax targets
- Running for Targets

Way Forward

- Withholding Tax (WHT)
  - Eliminate 45 revenue non-spinners with a combined contribution of less than 1% of collections (Rs. 11 billion only)
- Mandatory tax filing
  - Abolish the distinction between filers and non-filers. The distinction just creates a nuisance and does not contribute to improving the tax net (the number of filers was 2.28 million in 2020 and 2.29 million in 2021)
  - Introduce joint return filling instead of individual
- Income tax should be universal and not segmented. The division of income based on agriculture, dividends, and so on must be abolished
- Integrated, fair value single VAT-based system of Sales Tax
- No distinction between services and commodities (FBR-GST on goods 17, Provinces-GST on services 15%-19.5%)
- Tax exemptions
  - Restrict and rationalize
- Point of Sale (POS)
  - Get the POS Tier-1 done in 30 days
  - Outsource the installation
  - More than 6000 identified retailers not integrated yet
  - Outsource monitoring and compliance
  - Provincial to implement in their jurisdiction
  - Implement POS on doctors and other professional services like doctors and lawyers for sales tax and income tax presumption
    - Consider Hedonic income estimation for lawyers for income tax collection

MARKETS AND EXPORTS

(1) Real Estate Market

(2) Cities
(3) Internet for All
(4) Street vending as employment
(5) Sports
(6) Agriculture Market
(7) Export Sector
(8) Setting up Sports Market

REAL ESTATE MARKET

Tax revenue lost due to DC and FBR rates:

- FBR rate estimated 35% less than Market Rate of Transaction, could be much lower in some cases
- At least Rs. 25-30 billion revenues lost in stamp duty due to collection on DC/FBR rate instead of actual market transaction rate
- Another Rs. 25 billion in revenues were lost in Federal CVT
- Real Estate can contribute over Rs. 50 billion more in tax revenues if transactions are recorded at actual value.
- Reduction of tax rates would increase the number of transactions

- Focus on the Real estate market, which has a huge potential to bring growth

- Deregulate the market

Develop an auction market

- Introduce an online bidding mechanism through the portal, where all contracts must be listed before registration
- Transaction to be completed once auction certified
- Market prices transaction revealed
- It will also help to eliminate DC and FBR rates

- Remove height/floor restrictions
  - Introduce zoning laws to allow for high-rise buildings
- Eliminate NOCs for the construction of high-rises
- Monitoring through insurance to ensure compliance with guidelines and zoning laws
  - Can help to evolve a building control monitoring industry in the economy
- Encourage the Private Sector to enter and offer services
- Merge all taxes collected at the time of property transfer into a single tax

RETHINKING CITIES

- Cities are the engine of growth
- Allow high-rise, dense, and walkable cities
- Replace rigid master plans with loose guidelines
- Value in regeneration

- Vibrant city centers with mixed-use
- Vertical Development - Flats as a dominant city unit
- City to be managed by a single authority
- Revise rental and multiple ownership laws

Unlock dead capital – Create a city wealth fund

Unlocking the dead capital - Case study: G-6/1

- 86 acres occupied by government houses
- 77 acres of land by constructing 6 high-rises to accommodate current residents
- Generate Rs. 52.2 billion in revenues
- Increase GDP by 0.09%

Remove car subsidy

- Remove car use subsidy to reduce the burden on city development, which is also a city's source of revenue
- Develop a 'Car Use Policy' with salient features such as congestion tolls and paid street parking
- Sell apartment parking separately from the apartment
- Alternative holistic, in-city mobility policies from public transport to walking

INTERNET FOR ALL

Internet is a basic right

- Make the Internet widely and cheaply accessible
- Don't hoard the spectrum instead release it
- Fiber rights and plans
- Internet taxation should be removed
- Ensure the availability of cheaper devices
- Introduce competition policies based on research and M&E
- Develop data storage, web hosting, etc. within Pakistan
- Need to study possible subsidies to students in disadvantaged sectors

STREET VENDING AS EMPLOYMENT

Large street economy operated by street vendors

- 1.22 % of the employed labor force (0.75 million people)
- Contribute around $ 6.69 billion to the national economy
- Financially excluded (only 11 % have a bank account)
- Without legal protection (only 2 % have a license)

Way Forward

- Provide legal protection

  - Introduce work permits at the local administration level

- Promote financial inclusion
  - Reduce documentation
  - Encourage Micro Finance Institutions to use mobile accounts as security/collateral
- Formalize the income
  - Link renewal of work permit with the annual income statement
- Provide proper space for women to do street vending

SPORTS FACILITIES AND MARKETS

- Youth unemployment is high and salaries low
- Promote sports club culture
- Fund local sports clubs
- Promote indigenous sports
- Subsidy for local theaters and clubs
- Stated set of rules for hiring stadiums and halls
- Announce rental policy

AGRICULTURE MARKET

- Unnecessary delay in approving new varieties by Federal Seed Certification and Registration Department (FSCRD)
  - Limiting investment of the private sector in the seed market
  - Pakistan imported seeds worth USD 70 million in 2020
  - Hybrid maize was introduced in Pakistan in 2000--yield has increased from 17.6 mound/acre in 2000 to 56.8 mound/acre in 2020 (AMIS)
  - The process of approval should be reduced to 1 month
- Input subsidies (water, fertilizer) promote less profitable and water-intensive crops
  - farmers are reluctant to use water-saving technologies
  - Indirect fertilizer subsidy costs more than Rs.200 billion/annum but creates monetary benefits of only Rs.15 per month per person (PIDE knowledge brief)
  - Sugarcane consumes 3.5 times more water than cotton and each litter generates 4 times less monetary benefit than cotton
- Price support for wheat promotes undesirable results without benefiting the consumers and producers
  - Interference in the wheat market costs Rs. 60 billion/annum to the government
  - Created a circular debt of Rs. 800 billion—not sustainable
- Improve processing has the potential to increase agriculture-base export
  - Small proportion of agriculture output is processed
  - Less than 10 % of total milk production and a negligible number of fruits and vegetables are processed
  - Pakistan exported less than 2 % of its meat production in FY 2020
  - Pakistan exported mangos worth USD 1 billion in FY 2020 – the same volume of mangos could have a value of up to USD 5 billion if converted into mango pulp

Way Forward

- Investment in plant and animal breeding techniques needs to improve drastically in a targeted manner
- Promotion of branding and labeling in input-output markets can promote the high-quality product that can lead to increased exports
- Subsidy on inputs such as fertilizer and water have to be withdrawn
- Credit availability to install processing units at low-interest rates may boost the agriculture-based export
- Remove the license Raj that limits new entrants into the sugar industry and promotes centralization
- Set up an agriculture commodity market
    - Warehouse receipt trading
    - Investment in warehouses/storage

EXPORTS

- Key bottlenecks faced by the exporter are
    - Taxation
        - Domestic Taxation
- Complicated tax structure with time-taking refund processes
    - Tariff
- The average effective tariff rate (11.2 %) is the highest in the region
    - Uncompetitive Energy Tariffs
    - Human Capital: Mismatch in the Labor Market
    - Policy inconsistency: uncertainty and increasing transaction costs due to policy inconsistency have eroded the business environment
    - SRO culture and Sludge

Way Forward

- Simplify the taxation regime
- Remove cross-subsidization on energy tariffs
- Protection provided to the local industry should be time-bound with a clear sunset clause to discourage rent-seeking
- Align vocational training and specialized education with the demands of the industry by increasing industry's involvement in the training
- Ensure policy consistency
- Exemptions and concessions in import duties must be provided through tariff codes and not through SROs

Services Exports with a Great Potential: IT & Freelancing

- Upwards of USD 0.5 billion in earnings
- Mandate universities to conduct short courses on freelancing during the summer
- Any tax levied must be on net profits, not revenue
- PSEB registered freelancers to maintain dollar accounts in Pakistan banks (as currently 70 to 80 % of earnings are kept abroad in digital accounts)

- Link dollar accounts to digital accounts
- Require transaction clearing in 03 days
- Exchange rate for dollar-rupee conversion taken at the time of transaction

SETTING UP A SPORTS MARKET

- The sports market should be looked upon as an industry as it will create opportunities for the economy and employment, especially for youth
- The sports industry is a billion-dollar industry and Pakistan has not tapped the potential of this industry due to:
  - The existing sports industry is export-oriented, and industries are reluctant to engage in any league
  - Due to bureaucratic red tape, the private sector is reluctant to engage in organizing sports activities
- The Pakistan Super League (PSL) has broken the ice, and the PSL model should be emulated in other sports in Pakistan such as hockey, kabbadi, football, etc.
- PSL is currently worth around USD 250 to 500 million
- Major sports facilities are underutilized due to bureaucratic red tape

Way Forward

- The government should facilitate the industry through friendly legislation and allocations
- Remove hurdles faced by the private sector in getting permissions from various government departments to organize sporting events
- Introduce public-private partnership models in sporting events
- Promote sports club culture at the community level
- Promote indigenous sports
- Announce rental policy for sports facilities
- Bound managing authorities of the major sports facilities to produce detailed annual reports.

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62:2 (2023) pp. 281–299

A Small Club: Distribution, Power and Networks in Financial Markets of Pakistan

NADEEM UL HAQUE and AMIN HUSAIN

> "For all practical purposes, the 22 families had preempted most investment permits, import licenses, foreign credits and government patronage because they controlled or influenced most of the decision-making forums handing out such permissions. They had virtually established a stranglehold on the system and were in a position to keep out any new entrepreneurs.
>
> The 22 families were a by-product of government policies and a primitive capitalistic system. The Government did not have the courage to change the company law of 1913 under which the industrial sector of Pakistan was still being governed in 1968. This antiquated framework of capital permitted the industrial sector to have managing agencies, cartels, trusts and all other anti-social practices aimed at cheating both the consumer and the Government. The latter became both a conscious and unconscious ally of the private industrialists by giving them generous protection, excessive tax concessions, explicit and hidden subsidies, and representation on many decision making forums."
>
> **Mahbub Ul Haq**
> ***"System is to Blame for the 22 Wealthy Families"***
> *(Article published in 'The London Times', March 22, 1973)*
> https://mhrc.lums.edu.pk/speeches-dr-mahbub-ul-haq

1. THE STOCK MARKET THAT DOES NOT GROW!

Pakistan's stock market tends to make headlines, sometimes because of record highs that make it the 'best performing market of the region', and sometimes because of the crashes. However, the degree to which it contributes to capital formation in the country is not a topic of study, while the ensuing ownership and governance structure is hardly ever made a part of public discourse.

One such study[1] concluded that "around 64 percent of the 44 selected sample companies are controlled by prominent business groups and families of Pakistan". This paper extends the aforementioned research to cover the top 100 companies that constitute the benchmark KSE-100 index[2] at the Pakistan Stock Exchange (PSX). It also analyses the structure of ownership and sponsor control of companies constituting the KSE-100, and their impact on the functioning and transparency of the stock market.

Pakistan's corporate governance and human resource management practices are frequently questioned in the media and academic circles. A common phenomenon is

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[1]Shareholding pattern of corporate sector in Pakistan, an insight on dominance of business groups and families over corporate ownership structure, ICMAP, 2011.

[2]28 Feb. 2019.

companies managed as family enterprises despite being listed on the stock exchange. The offspring of the owners tend to be absorbed into the management of these companies, which are referred to as '*seth companies'*, *seth* being the founder/owner of the company.

The objective of this paper is twofold. The first is to shed light on corporate groups and their ownerships in the stock market. We review the ownership structures of the large conglomerates to examine the extent of diversification in the stock market. This also gives us an idea of the kind of power that large houses wield in the market, and the choices available to the small shareholder. Secondly, we look at corporate governance by looking at how company boards are structured and examine the influence of the owner and his family on the structure and professional management of the company.

Prevailing accounting standards and listed entity regulations require disclosure of shareholding by directors, and significant shareholding of more than five percent held with legal persons (individuals or companies), in addition to those held with associated undertakings, banking and financial institutions, trusts, etc. Using data from disclosures in 2018, this study focuses on directorship and significant shareholding of five percent or more for all listed entities that constitute the KSE-100 index and uses it as an indicator of 'control' and concentration of ownership in the top 100 companies.[3]

Box 1: KSE-100

"The KSE-100 Index was introduced in November 1991 with base value of 1,000 points. The Index comprises of 100 companies selected on the basis of sector representation and highest Free-Float Capitalisation, which captures around 80 percent of the total Free-Float Capitalisation of the companies listed on the Exchange. Out of the following 36 Sectors, 35 companies are selected i.e. one company from each sector (excluding Open-End Mutual Fund Sector) on the basis of the largest Free-Float Capitalisation and the remaining 65 companies are selected on the basis of largest Free- Float Capitalisation in descending order. This is a total return index i.e. dividend, bonus and rights are adjusted. Index Expert Committee (IEC) of PSX recommended to the governing board of directors of the Pakistan Stock Exchange Limited (PSX) in early 2012 to implement the KSE-100 Index on the basis of free-float market capitalisation. In the meeting held on April 24th, 2012, the governing PSX Board ratified the lEG recommendation. The Free-float based KSE-100 was calculated parallel to the full-cap KSE-100 Index since 11th June 2012 and the recomposed KSE-100 Index based on free-float methodology effective from October 15th 2012. In this transition, the Rules for composition and re-composition of the Index based on free-float methodology have remained un-changed other than selection of companies on the basis of free-float market capitalisation as against total market capitalization."

From. https://www.psx.com.pk/psx/themes/psx/documents/BrochureKSE100_Idx.pdf

The paper also attempts to identify the extent of shareholding concentration of business groups and business families with the caveat that secondary information was obtained from web search for prominent business family surnames, where a grouping of two or more members as "family" does not qualify under the legal definition of dependents.

However, the objective behind the identification of business groups and families is to examine the extent of 'true' free-float—i.e. percentage share held by members that are not a part of a significant, or substantial, shareholding, or of a sponsor family. The findings may help address generally held concerns regarding concentration of ownership in KSE-100. This would help determine whether stock prices of these companies reflect the true sentiments of non-

[3]Ownership data for one listed company was unavailable.

affiliated minority buyers and sellers in a freely functioning market, or, are heavily influenced by those with access to material information regarding firm operations, i.e. directors or significant/substantial shareholders with access to key management information and personnel.

The Code of Corporate Governance dictates that the Board of Directors act as a trustee to protect all investors of the firm, whether they belong to the sponsor group or are classified as minority shareholders. However, the study finds that within firms that constitute the KSE-100 index, members belonging to a few sponsor families serve on multiple boards. This raises the risk of these board members acting in concert to protect sponsor interests over the interests of minority shareholders. Thus, future research could analyse the motives for public listing if the shareholding remains concentrated amongst a select few despite higher costs (and penalties) associated with disclosure requirements for listed entities.

2. CORPORATE GOVERNANCE MATTERS

Corporate governance structure specifies the distribution of rights and responsibilities between the many different components of a corporation, such as the Board, managers, shareholders, and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structures through which the company objectives are set, and the means of attaining those objectives and monitoring performance.

Quality corporate governance has underpinned spectacular economic growth in many countries. Firms, which are the basic unit of economic value creation, are the most productive of entities in advanced and emerging countries. The legal regulatory framework of a company, and the evolution of good corporate governance systems and rules, has allowed the separation of ownership and management, thereby allowing arm's length investing in economic enterprise with assurance (Berle & Means 1932; Jensen & Meckling 1976).

If the management, or the sponsor of a firm, is unable to show that decisions regarding the management of assets, profit earnings, and sharing, are transparently in the interests of the shareholders, trust between the two parties will erode. The result will be less than optimal investment leading to stunted growth. Countries unable to develop good corporate governance practices will therefore show low rates of investment and growth (Cueto 2007).

Efforts to improve corporate governance in Pakistan have been made sporadically but much more needs to be done. In the journal of the Pakistan Institute of Corporate Governance, which USAID set up in the early 2000s, Salman and Siddiqui summed up the state of corporate governance:

"In terms of compliance, it has been more of a box-ticking exercise since 2002. Company law has been the basis of corporate governance but there have been issues of ownership and oversight. When chief executives are also owners and not independent, there would be vested interests in the implementation of corporate governance. Ownership has to be separated from the executive to provide a basis for oversight and good governance."

In Pakistan, research on corporate governance has remained weak, mainly relying on examining the larger relationship between the variables of ownership transparency, profitability, and growth of the firm (see Box 2). What is missing is a detailed examination of a firm's ownership structure and the composition of the board. The prime objective of this study is to shed light on the interplay of ownership and control by examining the composition of boards and the structure of ownership in the KSE-100.

Box 2: Selected Results on Corporate Governance in Pakistan

- Kozhich and Hamid (2006) stated that the majority of corporations in Pakistan are family-controlled. Moreover, since the equity culture has been slow to develop, the market remains shallow and is skewed towards a few major companies.
- Javed and Iqbal (2010) claim that size and better corporate governance practices have a positive correlation.
- Yasser et al. (2011) provide evidence of a positive significant relationship between ROE, profit margins, and three corporate governance mechanisms (board size, board composition and, audit committee).
- Ameer (2013) posited that one of the causes of poor corporate governance in Pakistani companies is the ineffectiveness of independent non-executive directors in Pakistani companies. A lack of understanding, inadequately trained personnel, coverage, and policies, etc. further add to the deficiencies in the effectiveness of corporate governance programs.
- Shamsi (2014) points to the lack of adequate compliance with the available code of corporate governance by companies.
- Aziz et al. (2019) note that some major principles of good governance are fairness, accountability, responsibility, and transparency, which are not fully embedded in Pakistan's corporate culture. International standards are still not followed, resulting in a slow developmental pace.
- Government interventions in Asia exacerbate the risk of favouring one sector of society over another, such as providing subsidies and loan guarantees for family-owned companies (Arthur M. Mitchell and Clare Wee, 2004)
- Luqman et al. (2018) found that better corporate governance structures and more dispersed ownership reduces the probability of financial distress.

KSE-100 Shows High Concentration

KSE is heavily skewed with the top 10 companies constituting more than half of total market capitalisation. Annual reports show that directors or significant shareholders (73 percent of total) hold ownership of over PKR 4.963 trillion out of a total market cap of PKR 6.8 trillion. This means that minority shareholders, holding less than 5 percent each, hold about 25 percent of the shares in each KSE-100 firm. Large firms such as Phillip Morris, Pakistan Tobacco, and Pak Suzuki are listed as mostly accounted for, as one or two legal owners hold over 90 percent of shares in the company.

Accounted for: Shareholding that are held by large shareholders (with more than 5 percent and reported in annual report).

Unaccounted for: held by shareholders less than 5 percent shareholding

Who Owns the KSE-100?

Figure 1 shows different categories of entities that have ownership in the KSE-100 and share each owns. These categories include the national government, foreign holding companies, local holding companies, and employee funds etc. Together, the ownership of KSE-100 can be traced to 374 entities, which includes a special category of all unidentified individual owners.

Fig. 1. Overall Ownership of KSE-100

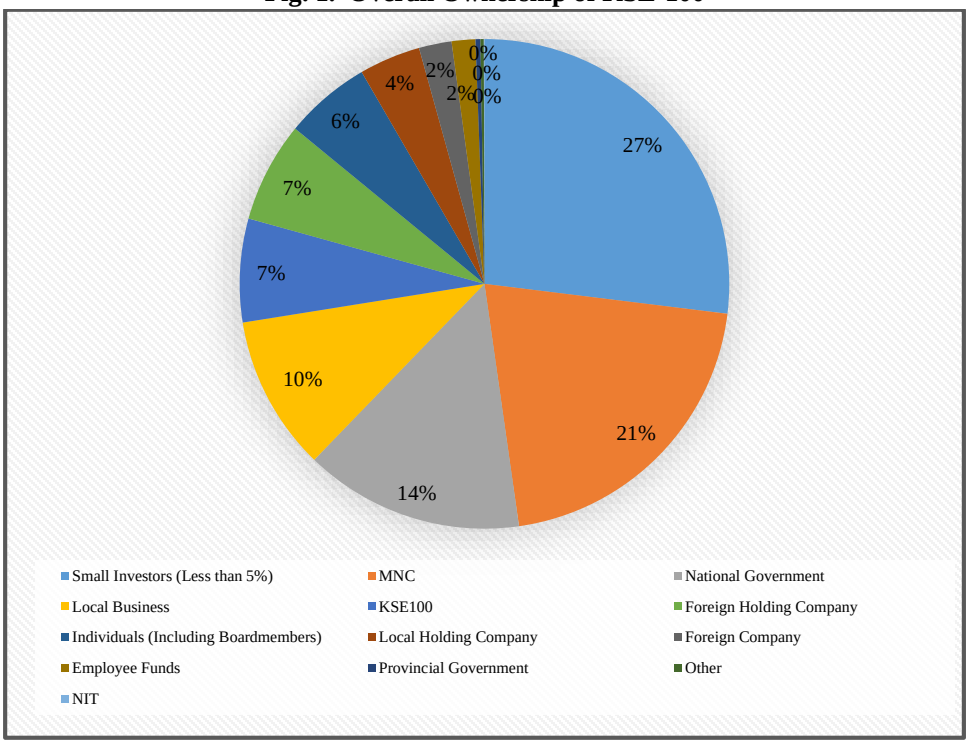
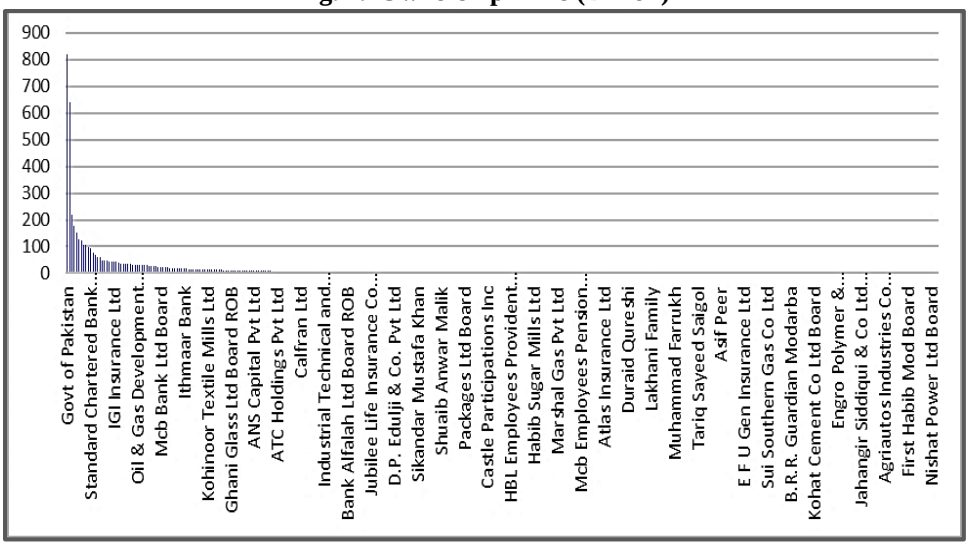


Fig. 2. Ownership in Rs (Billion)



Multinational companies, or MNCs, are the single largest category of shareholders in KSE-100 typically denoting a holding-subsidiary relationship with a foreign principle and a local subsidiary. For example, British American Tobacco accounts for 9 percent of market capitalisation for KSE-100 through its controlling share in Pakistan Tobacco

Company. Collectively, close to 41 percent of ownership in KSE-100 index firms is held with MNCs, whether foreign holding companies or other foreign entities, with a significant shareholding of over 5 percent each.

The second largest category of owners is the National Government, where the Government of Pakistan, directly and indirectly, is an investor through public sector enterprises and corporations such as State Life, State Bank of Pakistan, Privatisation Commission, WAPDA, etc.

We refer to ownership of shares of a KSE-100 company by another KSE-100 company as intra KSE-100 ownership, while local non-KSE-100 companies are Pakistani companies not listed in the KSE-100. Interestingly, intra KSE-100 ownership accounts for just 9 percent of accounted market cap, whereas local non-KSE-100 companies and local holding companies together account for 20 percent of KSE-100 market cap. Individual owners, such as board-members, account for a total of 6 percent market capitalisation, whether in their capacity as directors, director-owners, or non-director significant shareholders. In contrast, provincial governments, public sector banks, and NIT together account for just 1 percent of market capitalisation.

Foreign shareholders and government ownership account for the bulk of ownership in KSE-100 market capitalisation, an estimated 61 percent. (see Table 1)

The ownership of KSE-100 market cap is heavily skewed towards a few large investors. For example, the single largest shareholder is the Government of Pakistan, which accounts for over 12 percent of market capitalisation with its controlling/substantial shareholding in KSE-100 heavyweights such as OGDCL, PPL, K-Electric, Mari Petroleum, PTCL, PSO, SNGPL, among others. Together, the top 10 owners account for 37 percent of the market capitalisation of KSE-100.

Table 1

Shareholding Proportions in KSE-100 (Market Cap)

Owner	Percentage of KSE-100 Market Cap
Govt. of Pakistan	12.07
British American Tobacco Ltd	9.39
Nestle S.A	3.23
Philip Morris Investments B.V	2.59
Fauji Foundation	2.21
Bestway Holdings Ltd	1.87
Aga Khan Fund For Economic Development	1.78
KES Power Ltd	1.59
Ibrahim Holdings Ltd	1.54
Engro Corporation Ltd	1.44

3. NETWORKS AND SUBNETWORKS

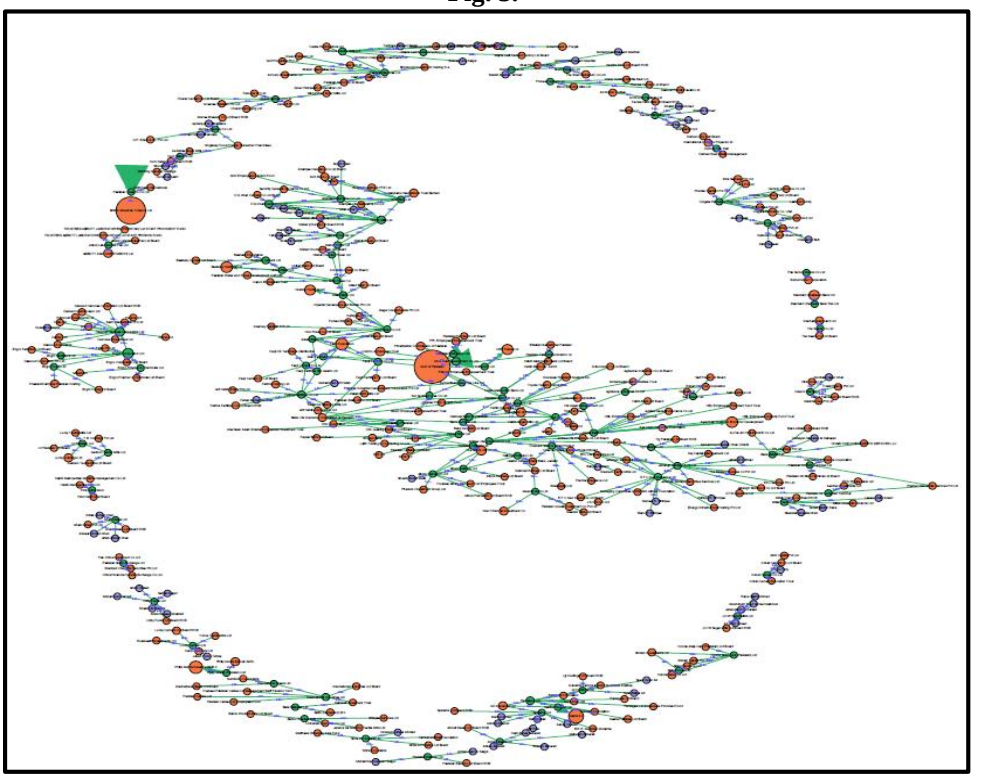
3.1. Shareholder Networks

Graph theory uses mathematical structures, or graphs, to demonstrate pairwise relationships. In the theory, a component is a subgraph where any two nodes are connected either directly or indirectly. Here we look at common shareholders of companies with holdings

of more than 5 percent in each company. Thus, if companies A and B are in the same node, both of them could have common shareholders, holding 5 percent or more of each company's shares. Furthermore, these relationships could be 'indirect' where there are one or more intermediaries between them; for example, A owns shares in C, which owns shares in B. Thus, component structure points towards the interconnectedness of ownership among the KSE-100 companies. If all companies existed in one large component, then their ownership would be interconnected at a higher level, possibly being driven by the same sources. If there is a large number of small components, then company ownership is scattered and companies have little financial linkage to each other.

The Figure 3 shows one large component in the centre, surrounded by 37 other smaller components on the peripheries.

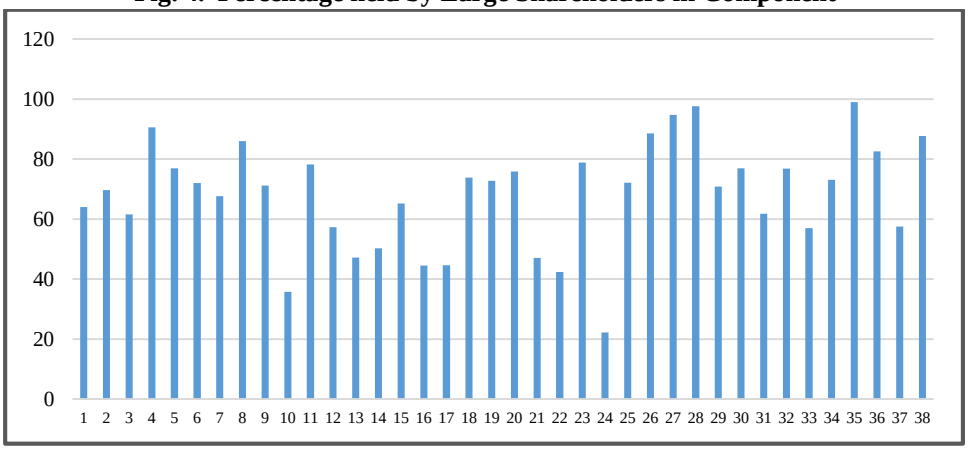
Fig. 3.



The Figure 4 shows how large investors own most of the KSE. Large shareholders hold more than 60 percent on average of the components of the KSE-100. Components 26, 27, and 34 are such examples. They have over 94 percent of ownership accounted for by one or two owners, each. These are prime examples of KSE-100 companies that have little engagement with either the public, or the rest of the market. Furthermore, Component 26 accounts for over 9 percent of total market cap, thus making up a significant portion of total market cap but with little or no engagement with the market.[4]

[4] Details of each component are given in the Appendix.

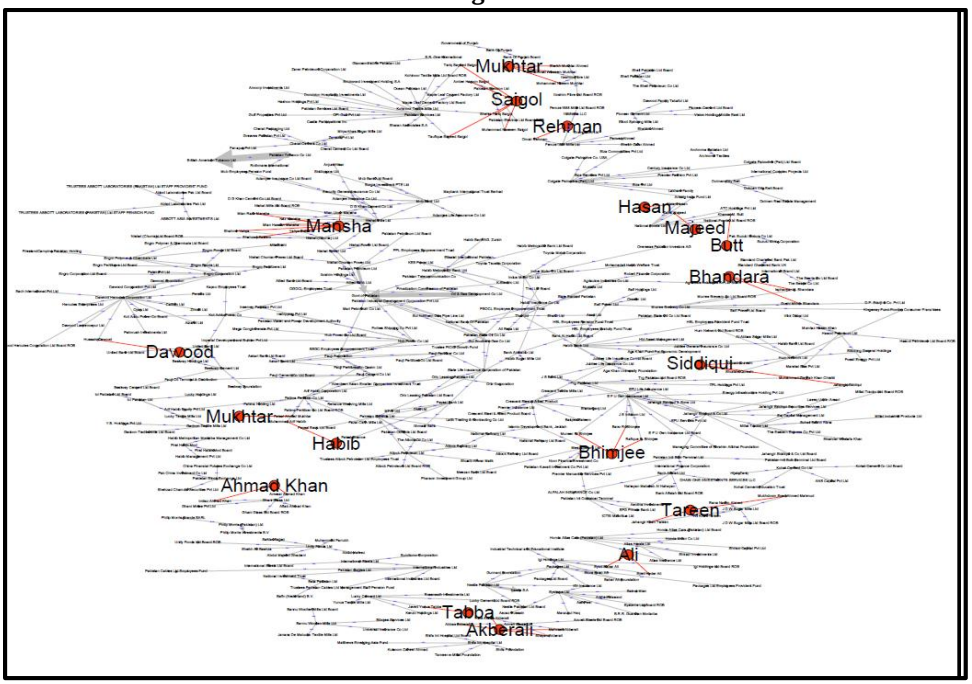
Fig. 4. Percentage held by Large Shareholders in Component



3.2. Network of Families: Mahbub Ul Haq Redux

We repeat the same exercise, this time including the family affiliations we know of. Thus, for individuals in the network who are members of the 31 families we identified, we add links to their family node as well. These family nodes can be seen below in red (see Fig. 5). Mahbub Ul Haq famously pointed to 22 families owning Pakistan. In 2018, when the data was collected, 31 families dominate the KSE.[5] Of course, this is after accounting

Fig. 5.



[5]SECP guidelines require companies to identify each director as one of three categories—Executive, Non-executive and Independent. We have used these classifications in our analysis.

for the government, multinationals, and the army. Of note is the fact that the families have a fair degree of influence in the businesses because of haphazard privatization and relatively lax multinational regulation.[6]

The analysis results in fewer clusters as different clusters are linked through family associations, i.e. if two members of the same family initially owned shares in companies that were previously in two different clusters, these clusters would now be linked since the same family has ownership in both.

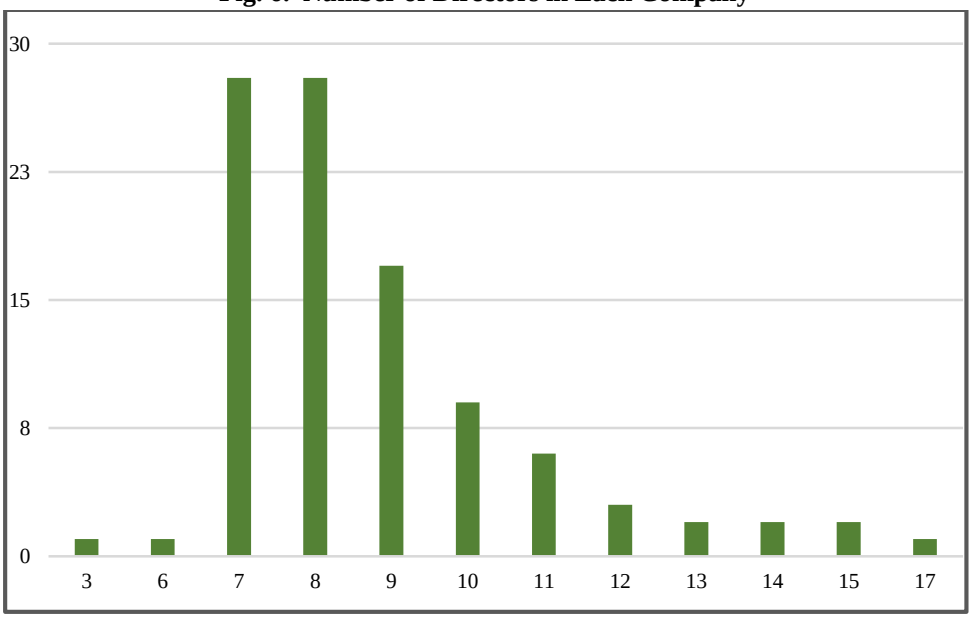
Apart from allowing us to aggregate family ownership in the KSE-100, changes in the structure of the network point to the influence of family ties on the overall structure of the network. If we consider family association unimportant, then the network looks as it did previously. On the other hand, if we consider families to be an important consideration, then this second network gives an insight into the ownership network at a family level.

Looking at the Table 1, we now also add the field for the number of families in each cluster. Clusters that only have a single family are usually family groups running their own business groups. In other clusters, we can see multiple families associated through shared ownership. The largest one here is Component 0, which now has 51 KSE-100 companies. It contains six families linked through shared investors and investment.

4. CORPORATE GOVERNANCE: WHAT BOARD MEMBERSHIPS TELL US!

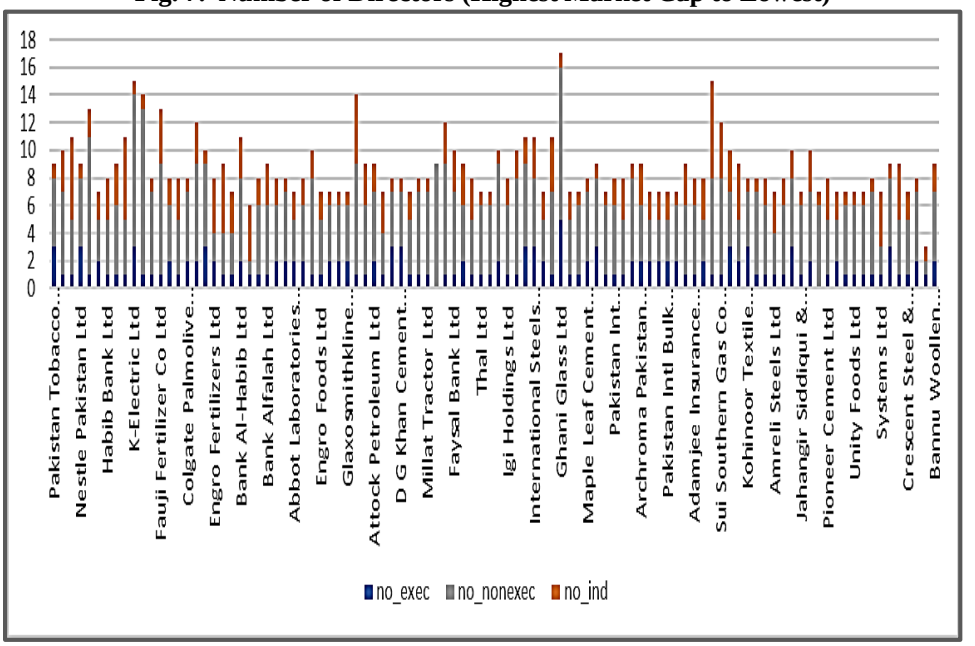
The 100 forms in the index have 880 positions—8.8 on average for a company. The distribution ranges from three to 17 as shown in Figure 6. These positions are filled by 756 unique individuals, with some occupying several positions. Details on this are in Figure 7.

Fig. 6. Number of Directors in Each Company



[6]Individual profiles and family linkage data gathered from sources on the internet, including company websites and interviews.

Fig. 7. Number of Directors (Highest Market Cap to Lowest)



Box 3: The Law on Board Composition

- **Multiple Memberships:** No person shall be elected or nominated or hold office as a director of a listed company including as an alternate director of more than five listed companies simultaneously:
  - Provided that while calculating this limit, the directorship in the listed subsidiaries of a listed holding company shall be excluded.
  - Provided further that the said limit on directorship shall be effective when the board shall be reconstituted not later than expiry of its current term or one year of the effective date of these Regulations, whichever is earlier.
- **Diversity:** The board of directors shall comprise of members having the core competencies, diversity, requisite skills, knowledge, experience and fulfils any other criteria relevant in the context of the company's operations.
- **Representation of Minority Shareholders**:—The minority members as a class shall be facilitated to contest election of directors by proxy solicitation
- **Independent Director:**—The independent directors of each listed company shall not be less than two members or one third of the total members of the board, whichever is higher:
- **Female Director:**—The board of directors shall have at least one female director when it is next reconstituted not later than expiry of its current term or within the next one years from the effective date of these Regulations, whichever is later.
- **Executive Director**:—The executive directors, including the chief executive officer, shall not be more than one third of its board of directors.
- **Chairman of Board**:—The Chairman and the chief executive officer of a company, by whatever name called, shall not be the same person. The chairman shall be elected subject to such terms and conditions and responsibilities as provided under Section 192 of the Act and these Regulations.

From SECP Law
https://www.psx.com.pk/psx/themes/psx/documents/legal-framework/SECP/regulations/listed-companies-(ccg)-regu-2017/ListdCmpCodeOfCorpGovern017.pdf

4.1. Independent Directors

The SECP and corporate governance code requires independent directors. An independent director on the board of directors does not have a material or pecuniary relationship with company or related persons, except to draw a sitting fee. The objective of staffing boards with independent directors is to protect the interests of all investors, especially those belonging to minority interests.[7]

As shown in the Box 4, there is little clarity on what 'independent' means. In many companies, independent directors are long standing employees of owners and their 'independence' in decisions by the board may be questionable.[8]

Box 4: Some Facts on Boards

- 82 percent serve on a single board,
- 12 percent serve on two boards,
- 4 percent serve on three boards,
- 1.5 percent serve on four boards, and 1 percent serve on 6 boards.
- 220 posts exist for independent directors, averaging at over two independent directors per firm.
    - 77 percent of these serve on a single board,
    - 14 percent serve on two boards,
    - 6 percent serve on three boards,
    - 1.5 percent serve on four boards, and
    - 1.5 percent serve on five boards.
- Of the total 880 directorships, just 158 are executive in nature.
- Only 27 out of 100 companies are compliant with the Code of Corporate Governance, while 73 companies are non-compliant in terms of diversity and independent directors.

4.2. The Opportunity to be a Director: A Small Club

Profiles of 573 non-executive and independent directors were collected to better understand the qualifications of those who serve on vital voting positions. Data was collated to create 10 categories reflecting the diverse backgrounds while accounting for the fact that individual board members may overlap categories. Educational qualifications are disregarded. Instead, greater emphasis is placed on professional experience (see Table 2).

[7] Pakistan Telecommunication Co. does not have any independent directors on its board.

[8] In some cases, the particulars of a director are not fully disclosed in annual reports. Not all companies have a complete and well-maintained website.

Table 2

Professional Experience of Directors

Corporate Sector	Includes those with corporate experience. This excludes all individuals whose first post in the corporate sector is that of a board member
Government	• Anyone who has/is working in a government/semi-government organisation, or any state-owned subsidiaries excluding public/ state-owned universities (These fall under services) • Those listed as part of the bureaucracy • Any person serving as advisor to government organisations • Official representatives of the government
Bureaucrats	Bureaucrats, former or current
Army	Members of the Pakistan Army, former or current
Services	Anyone who works as an advisor/consultant for non-government organisations. Includes legal advisory, corporate advisory etc.
Industrialist	Anyone who has founded a business in the manufacturing sector
Businessman	Anyone who has founded a business in the primary or tertiary (services) sector
Family	Anyone who serves on the board of a company exclusively due to family ties. Excludes family members who have not founded the business and have demonstrated experience
PSX	Includes people who have worked/ are working or have any affiliation with Pakistan Stock Exchange (or the now demutualized Karachi Stock Exchange)
NIT and SECP	Includes people who have worked/ are working, or have any affiliation with National Investment Trust Limited and/or Securities and Exchange Commission of Pakistan

Number of individuals in each category are:

Table 3

Number of Directors in Each Category

Corporate	297	Industrialist	35
Government	148	Business	73
Bureaucrat	32	Family	154
Army	22	PSX	28
Services	70	NIT or SECP	25

With this analysis, some points must be emphasised.

- The boards comprise of similar people—corporate, business founders and family, retired and current member of the civil service, and the army. In other words, it parallels a membership of an elite club in Pakistan.
- What is surprising is that there is very little representation from civil society, i.e. professionals and academia of Pakistan.
- Women make up only about 10 percent of the board members in Pakistan.
- It is notable that a significant number of non-executive directors have served as government employees in the past, whether as bureaucrats, the military, or in regulatory bodies such as the SECP.
- The other notable concentration belongs to those identifiable as family members.

5. NETWORK ANALYSIS OF BOARD MEMBERS

Assuming uninhibited communication between both family members and board members of the same company, a network of individuals may be drawn showing flow of information between nodes. This results in components that at maximum have 612 nodes, which implies that 80 percent of the time, some path exists for flow of information between two nodes for all companies that are part of the KSE-100 index.

Network analysis is made by drawing connections between individuals.

(1) All directors serving on the same board have connections drawn between them
(2) Directors and family: board members belonging to the same family have connections drawn between them.

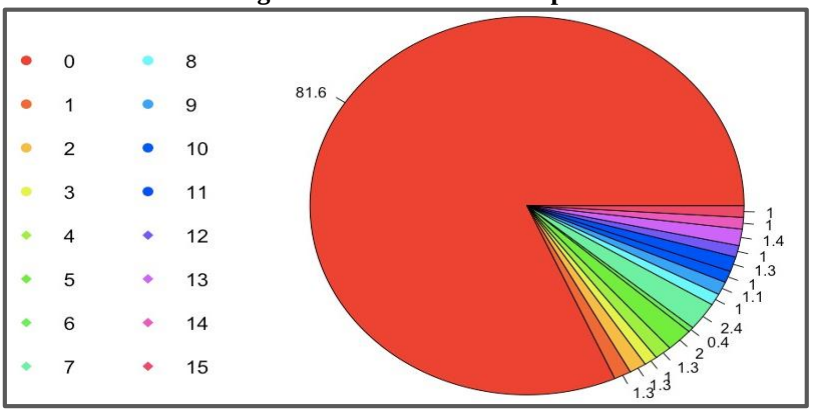
It is important to remember that the following network analysis is based solely on one or two dimensions of these individuals i.e. their membership on boards and their affiliations with different families. Other connections such as social interaction, distant relations etc. are not accounted for, which may alter results.

5.1. A Small Club

When we look at the network of directors, there is a high degree of connectivity, which should be of concern. Boards of directors for KSE-100 companies are all connected in small clusters, where a few members act as go-betweens through memberships on multiple boards, or as part of identifiable family groups.

The network consists of 16 components, where a component refers to the subset of nodes that can be reached through continuous edges, i.e. without any breaks. Recall that components are distinct subgroups. The pie chart below shows the percentage of nodes in each component. It is apparent that a giant component connects 82 percent of the individuals in the network (this number reduces when families are included), with very few smaller components. This indicates that most companies in the KSE-100 are connected to each other through directorships. Only a very few (at most 15) do not share common directorships with other companies in the index (see Fig. 8).

Fig. 8. Common Directorships



6. WHO MATTERS IN PAKISTANI CORPORATIONS?

We have seen that the financial and industrial wealth in the country is concentrated in the hands of a small group. Let us look a little more closely at the network of directors. How does information flow through this small club? Who plays a pivotal role and why? Surely, these connections and flow of information can and will have consequences for business decisions and economic outcomes. While we may not be able to say anything about the final economic outcomes of the small club and its network effects, we can use network science to find out how close knit the club is and who the central players are.

Box 5 shows how the network is connected through the Director positions when evaluated through centrality measures. For example, the study attempts to understand how 'central' certain directors are, given their background. Centrality measures are key measures of influence since these dictate network formation: highly influential and well-connected directors are more likely to control the hiring process, exercise political power derived from positions previously held as elected representatives, bureaucrats, or military personnel, or offer an understanding of functioning of key accountability institutions such as the SECP, amongst many others. These create informal institutions in free markets, and since corporations are divorced from democratic practices, it becomes difficult for people, or even public institutions, to prevent such practices. Even if those practices are highlighted, their existence may be denied.

Box 5: Network Measures

Average Degree of Network indicates the average number of connections per node in the network; this is calculated by summation of number of connections in the network, divided by the number of nodes. The network of directors at KSE-100 has an average degree of 10.514. This may be interpreted as following: on average, a director at one of the firms listed on the KSE-100 is connected to 10.5 people.

Average Clustering Coefficient is a measure of the degree to which nodes in the network tend to cluster. This is calculated using the local clustering coefficient, which quantifies the closeness between node's neighbours, i.e., close enough to be considered a clique, or a complete network. This is then used to calculate the average across the entire network. We find the value of 0.891 for KSE-100 network--a high degree of clustering. The indication is that directors with shared backgrounds, experiences, and industries are more likely to have a relationship with each other than those who do not.

Average Path Length is the average of the shortest path between each pair of nodes in the network. Small Average Path Length of 4.875 indicates that it is both negotiable and efficient: smaller average path lengths disseminate information much faster than those with higher lengths do. Thus, in the club of KSE-100 Directors, firm-related information is transmitted at high rates.

There are many centrality measures based on different concepts of influence in the network. Here we use *betweenness centrality* as a measure of frequency with which a node is in the middle of the shortest path between a separate pair of connected nodes, essentially acting as a conduit between the two. It is calculated by examining all possible pairs of actors in the network, determining the shortest path between them, and counting the frequency with which an actor is found in the middle. In other words, they can act as facilitators, or in some cases gatekeepers, between two actors, so that communication between them can pass through the central individual. A node with higher *betweenness centrality* would have more control over the network, because more information will pass through that node.

Figure 9 shows the network map with the area of the node circle showing its measure of *betweenness centrality*. The larger circles are therefore the more central figures in the KSE-100, being more central to information flows and connections. The figure again shows how well the boards are connected with one large mass in the middle with a few sparsely populated satellites on the periphery. It seems that the organizational separation is very thin.

Fig. 9.

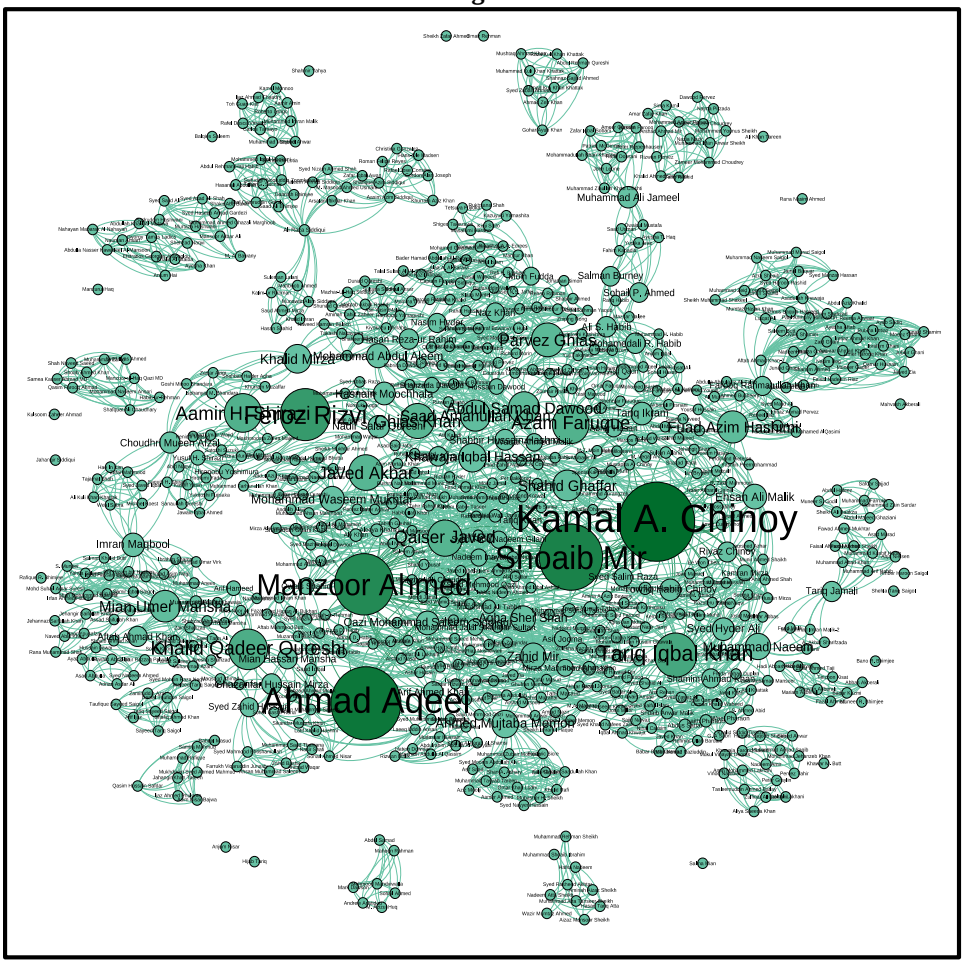


Table 4 looks a little more deeply at the 20 directors with the highest *betweenness centrality* to see what we can learn from their characteristics. The highlights are as follows:

Table 4

Characteristics of Directors with Highest Betweenness Centrality

Name	Profession	State	Resident	No of Companies Served Serving
Kamal A. Chinoy	Former banker, International Group	Owner	Karachi	17
Ahmad Aqeel	Businessman LCCI, PICG	Owner	Lahore	8
Shoaib Mir	civil servant, PICG	government	Karachi	5
Manzoor Ahmed	NIT, PICG	business professional	Karachi	11
Feroz Rizvi	Former ICI	business professional	Karachi	5
Tariq Iqbal Khan	former SECP, ICAP	Accountant	Karachi	17
Khalid Qadeer Qureshi	ICAP Nishat Group	Accountant/business professional	Lahore	5
Aamir H. Shirazi	Honda	Owner	Karachi	17
Azam Faruque	Cherat Cement	Owner		11
Qaiser Javed	professional in Fauji Enterprises/ accountant	accountant/business professional		17
Javed Akbar	ENGRO professional	professional	Karachi	9
Ghias Khan	ENGRO professional, PICG	professional	Karachi	8
Parvez Ghias	accountant PICG Dawood Group	professional	Karachi	8
Abdul Samad Dawood	Dawood	owner	Karachi	13
Fuad Azim Hashimi	accountant International Group	accountant	Karachi	4
Mian Umer Mansha	Mansha/MCB Group	Owner	Lahore	13
Saad Amanullah Khan	Professional PICG	professional	Karachi	11
Shahid Ghaffar	NIT, PICG, Banking, PSX	professional	Karachi	11
Khalid Mirza	Professional SECP. CCA	professional	Lahore	8

- Not surprisingly, there are no influential women
- Interestingly enough although the most visible names (Mian Mansha, Dawood, Hashwani) are not on the list, their children are.
- The list seems to have many accountants, former bankers, NIT employees, and career professionals who have worked at the concerned companies or groups. There does not seem to be much professional diversity in the group.
- It seems that most influential directors come from the large metropolitan centres. They are mostly from Karachi, with Lahore being second. Islamabad has possibly one or two directors.
- It seems that many directors are reappointed in other companies as many of them show that they have been on as many as 17 or 18 boards. The smallness of the club is once again reinforced.

7. CONCLUSION

While most commentators suggest that the availability of finance to corporates is a major requirement of development policy, there is little analysis of financial markets or corporate governance in Pakistan. This paper uses the available information from the SECP to analyse the stock market and develop a snapshot of corporate governance. We have several interesting findings that need careful review for further policy formulation to develop and improve our financial markets.

(1) It is well known that the stock market in Pakistan remains small with few IPOs and thinly traded stocks. This paper confirms these findings. It goes further by looking at connections between firms through cross holdings to find that 31 families appear in the KSE-100. It appears that while Mahbub Ul Haq talked of 22 families dominating Pakistan in 1967, in 2018, some 50 years later, the wealth in the stock market may be largely owned or controlled by 31 families.

(2) The large representation of the government and foreign investors in our stock market remains an interesting phenomenon.

   (a) Several government entities form a large part of the KSE-100 at about 12 percent. This is despite the fact that the government owned companies are government managed with a very small share of their equity on the market.
   (b) The multinational sector and foreign holding companies constitute about 28 percent. Most of the companies are brand names like Nestle or Unilever that do not require local financing but trade only because local rules require them to.
   (c) Local companies, even after 60 years of financial market development, remain a small part of the market at about 30 percent.

(3) In terms of corporate governance, we note:

   (a) Board members are predominantly male.
   (b) Board members are a well-connected group with very easy information flows and connections.
   (c) They are drawn from a fairly narrow group of bankers, accountants, and former corporate professionals, and are mainly from Karachi.
   (d) Other Pakistani professionals don't get much consideration for board memberships.
   (e) NIT continues to own 7 percent of the market with very little oversight. Association with NIT gives significant influence in the corporate world.

Many questions remain for other researchers to examine. The data used in this paper is in the public domain and accessible to anyone. It is important to use it to develop insights on corporate governance. For example, do the close networking and connections highlighted in this paper have any implications for competition in the market? How are these appointments made and why is the pool from which board members are drawn so narrow?

Several curiosities need further examination. Why is the local private sector so small? People remain leery of investing as is evident by our low investment to GDP ratio. Listing on the stock market is not preferred so while business owners complain of high

interest rates, they seem less inclined to raise money through the stock market. Is it because of the huge transactional costs relating to both investing and listing that domestic IPOs and equity financing remains low?

Despite SECP guidelines and the Institute of Corporate Governance exhortations, the boards lack women, truly independent directors, and diversity in the boardroom. A small, well-connected male club is in charge of corporate governance and the stock market. This issue needs further examination if Pakistan is to grow to meet its challenges.

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BASICS Notes

Social and Civic Engagement: Building Community or "Bowling Alone"?

DURR-E-NAYAB

Would Pakistan be experiencing the kind of crises—social, political, economic and one of identity[1]— that it is currently facing, if the country had better social and civic engagement? Would our democracy be more robust with more engagement by the community? These are rather complex questions to give a definitive answer to, but we have examples where extraordinary levels of people's engagement have helped in developing a healthy community, and by implication a more vibrant democracy. It is premised that strong interpersonal sociability and associational life can create opportunities for people, foster a sense of efficacy, and constrain capture by any interest group.

Are people in Pakistan socially engaged or are they "bowling alone"? Bowling alone is an idea given by Putnam (2000)[2] in his study on the changing American behaviour over the decades. Putnam believed that Americans were becoming increasingly individualistic and disconnected from social structures—that is structures like clubs, associations, organisations, or bowling leagues. To him, more and more Americans were preferring to bowl alone instead of with others or in leagues.

Communities develop when there are opportunities for social and civic engagement to emerge. In the PIDE-BASICS Survey,[3] we asked people if they were members of any club or organisation, and if they did any volunteer work. In case they were, we asked them about the nature of the club/organisation, and the kind of volunteerism they did. Based on this information, the current Note will see the trends for social and civic engagement for the four provinces and the three territories, and across regions, sex, age, and education and income levels.

SOCIAL ENGAGEMENT THROUGH MEMBERSHIP OF ANY 'SOCIAL STRUCTURE'

The social structure holds society together. Social roles, statuses, networks, organisations, groups and institutions are the major components of any social structure. In this BASICS Note, we are looking at the membership of any club or organisation as a

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[1]See PIDE BASICS Notes, Number 3.

[2]Putnam, R. D., 2000, *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.

[3]See PIDE BASICS Notes, Number 1, for details about the survey.

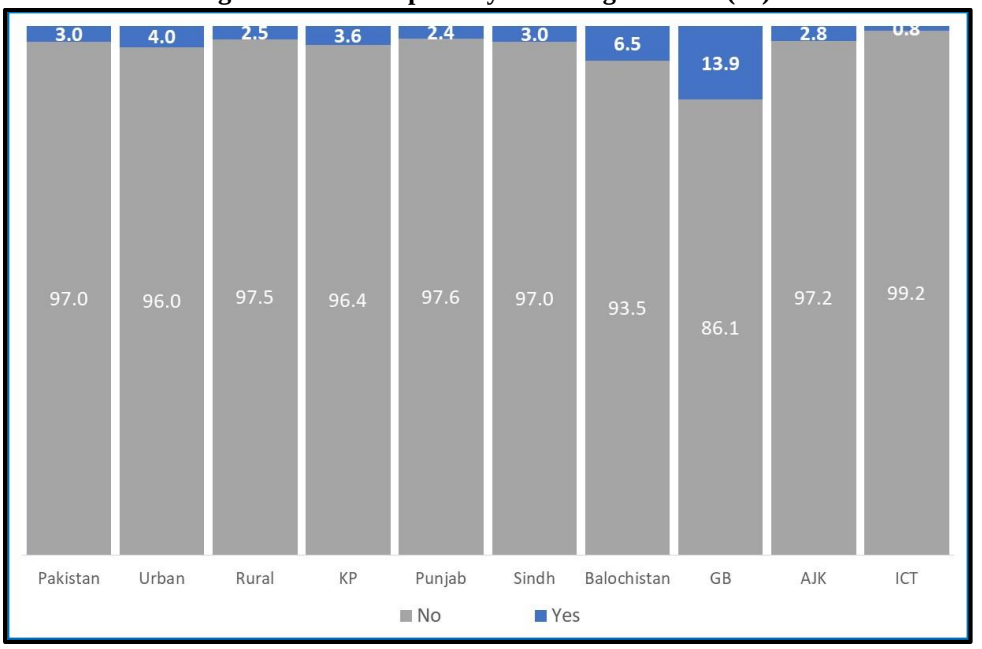
means of social engagement for people. It may be clarified here that the referred club/organisation can be of any size, nature and level of formality.

Membership by Province, Territory and Region

Figure 1 shows that only 3 percent of Pakistanis are a member of any club. The proportion remains generally low across the country, however:

- Slightly more people are a member of any club/organisation in urban Pakistan (4 percent) than in rural (2.5 percent).
- Among the four provinces, Balochistan has the largest proportion (6.5 percent) of the population that is a member of any club/organisation, followed by Khyber Pakhtunkhwa (3.6 percent) and Sindh (3 percent). Punjab has the lowest proportion of 2.4 percent.
- Gilgit Baltistan has the largest proportion (13.9 percent) of club/organisation members across all provinces, territories and regions.

Fig. 1. Membership of any Club/Organisation (%)



Source: Author's estimation using the PIDE BASICS Survey dataset.

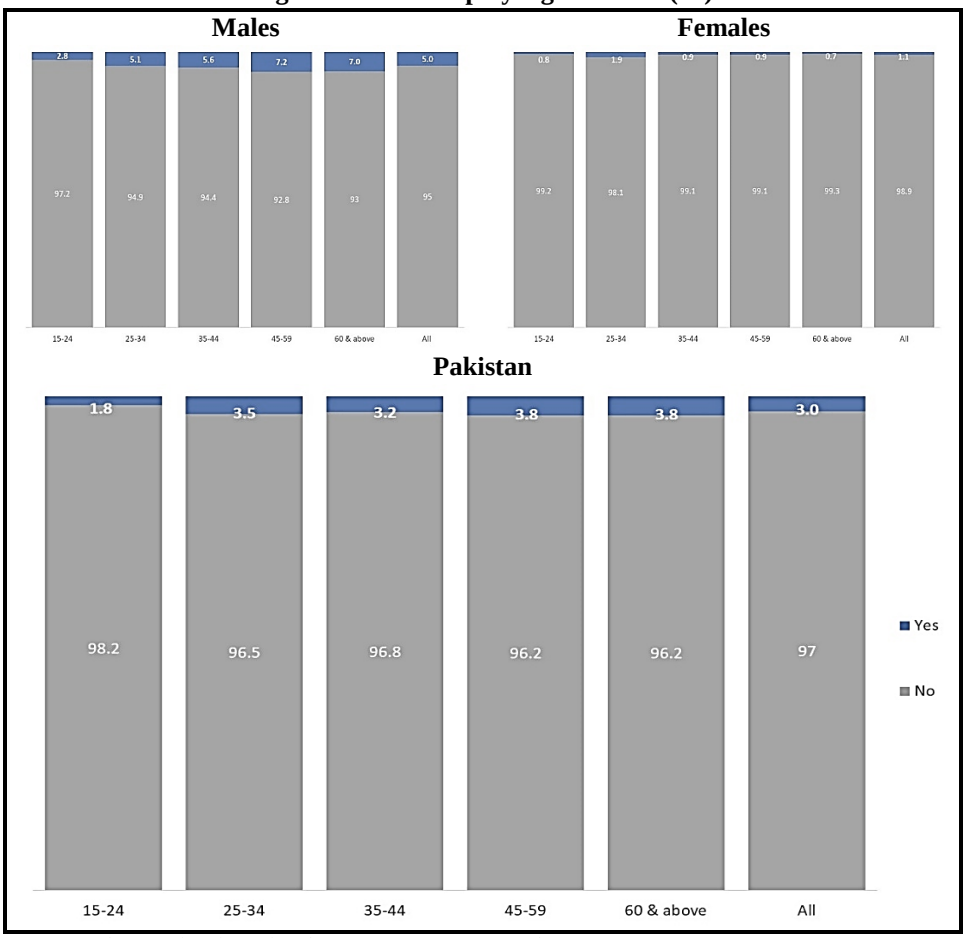
Membership by Age and Sex

Age and sex, as we have seen in previous BASICS Notes, have a major impact on all aspects of life, and this is true for membership of any club/organisation as well. Figure 2 shows the trends by age and sex, and we see that:

- Pakistani males (5 percent) have a higher rate of club/organisation membership than their female counterparts among whom only 1.1 percent have any form of membership.

- The rates remain generally low for all ages but is lowest among the young, i.e., those aged 15-24 year old.
- The rate is highest for males in age groups 45-59 and 60 years and above.
- For females the rates are extremely low, with those aged 25-34 years (1.9 percent) having a comparatively higher rate than those in other age groups.

Fig. 2. Membership by Age and Sex (%)



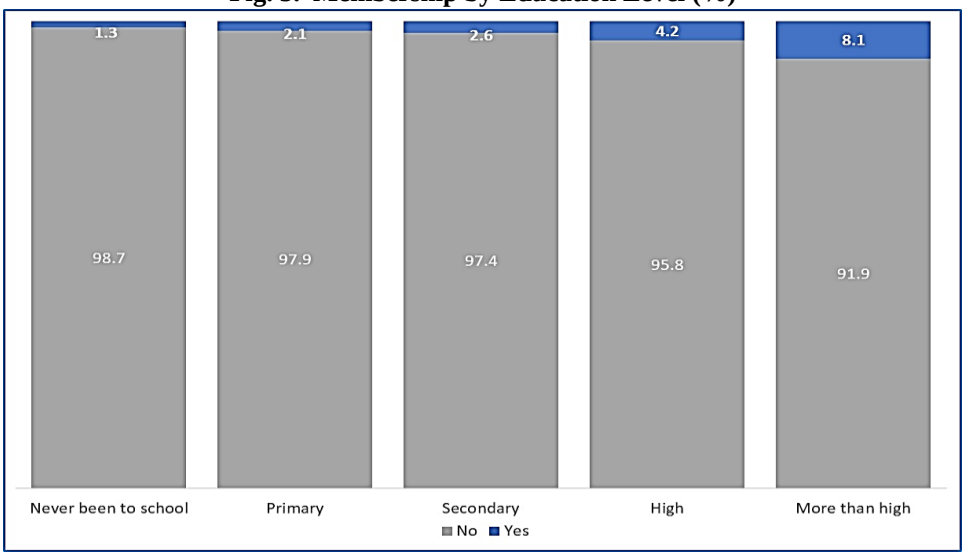
Source: Author's estimation using the PIDE BASICS Survey dataset.

Membership by Education Level

Within the generally low level of club/organisation membership rates, education shows to have an impact on the proportion of people who are members. Figure 3 shows that:

- Pakistanis who have never been to school have the lowest rate of membership of any club/organisation.
- The membership rates show an increase as we go up the education ladder, with those having more than high education showing the highest rate (8.1 percent).

Fig. 3. Membership by Education Level (%)



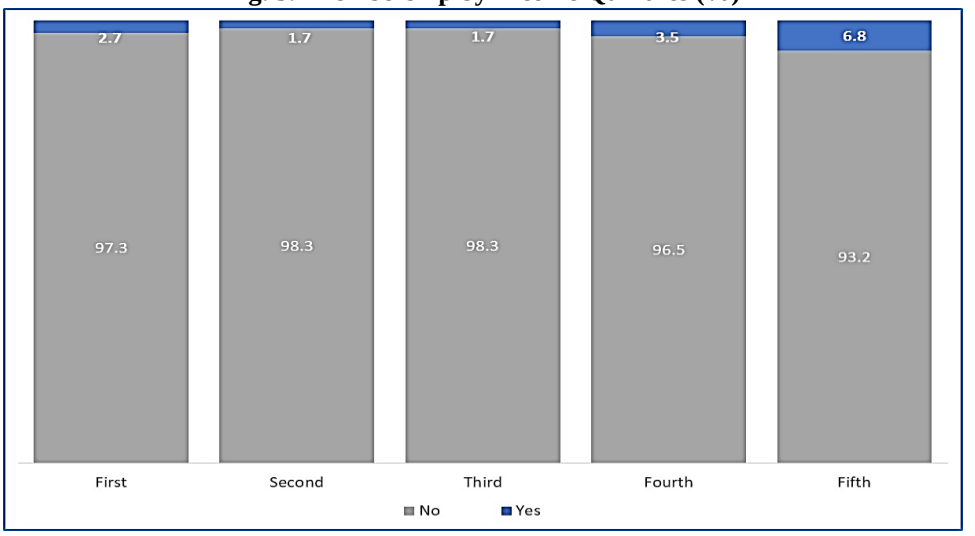
Source: Author's estimation using the PIDE BASICS Survey dataset.

Membership by Income Level

Does an individual's income level affect his engagement in any social structure? Figure 4 shows an interesting trend in this regard. We see that:

- The membership is lowest for the middle-income quintiles (quintiles two and three)—even lower than the first quintile.
- Income level has a positive effect on membership rates after the third quintile, and is highest for the richest quintile (6.8 percent).

Fig. 5. Membership by Income Quintiles (%)



Source: Author's estimation using the PIDE BASICS Survey dataset.

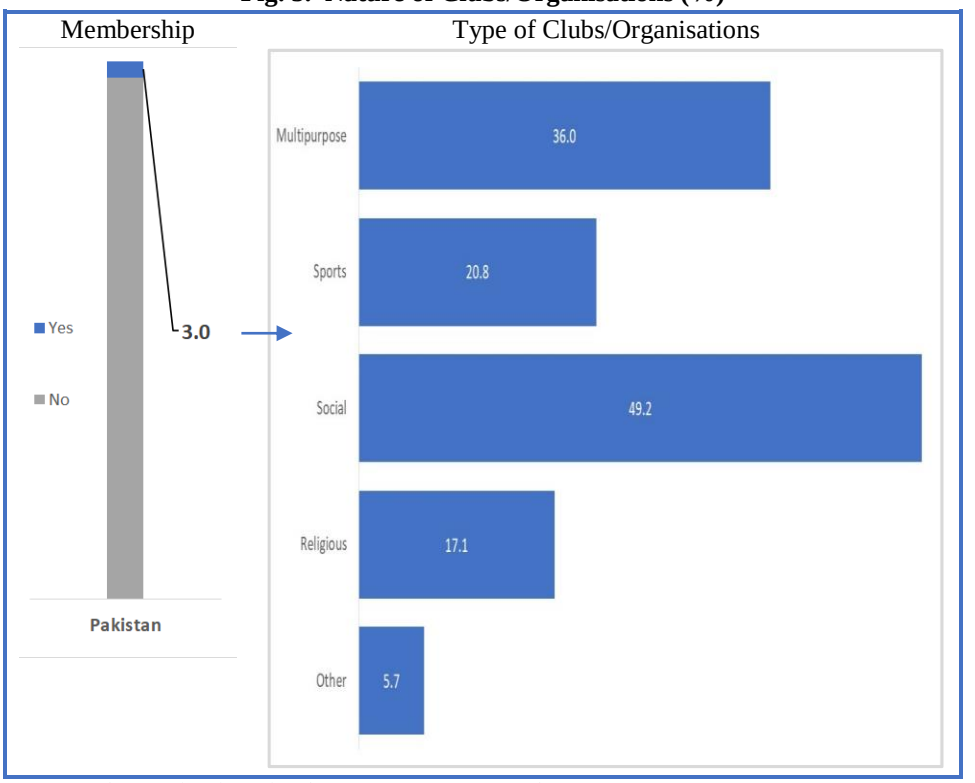
Nature of Clubs/Organisations

The above discussion shows that only 3 percent of the population of Pakistan aged 15 and above is a member of any social structure. Figure 6 shows the nature of these clubs/organisations. Since some people were members of more than one club/organisation, the figure below includes multiple responses.

We see from Figure 5, that:

- The clubs are mainly social, sports and religious in nature, with some being multipurpose. There were a few based on professions, neighbourhood and caste (included in the other category).
- Majority of those who are members are affiliated with structures serving social functions (49.2 percent), followed by multipurpose (36 percent), sports (20.8 percent) and religion (17.1 percent).

Fig. 5. Nature of Clubs/Organisations (%)



Source: Author's estimation using the PIDE BASICS Survey dataset.

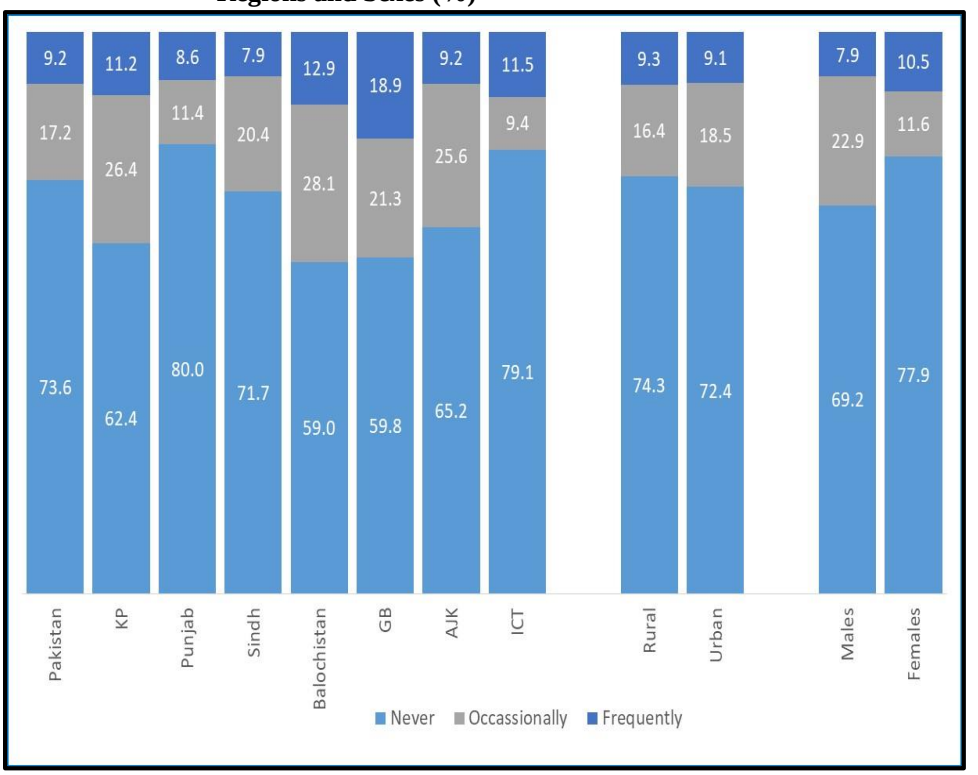
Note: Types of clubs/organisations show: (1) proportions out of the 3 percent who are members; and (2) multiple responses as a person could be a member of more than one club/organisation.

CIVIC ENGAGEMENT

Civic engagement involves actions to make the quality of life in a community better. In the PIDE BASICS Survey, we gauged this through the involvement of people in voluntary work. As can be seen from Figure 6, we found that:

- At the national level, only 9.2 percent of the people did voluntary work on a frequent basis.
- As found in social engagement, civic engagement was stronger in Balochistan and GB as compared to other provinces and territories, respectively. GB had the highest rate across the country.
- Punjab had the highest proportion (80.1 percent) of those not involved in any kind of voluntary work.
- Not much difference was found between the urban and rural areas of the country.
- Males had a slightly higher rate of volunteerism than females, but not by much.

Fig. 6. Nature of Volunteerism Across Provinces, Territories, Regions and Sexes (%)

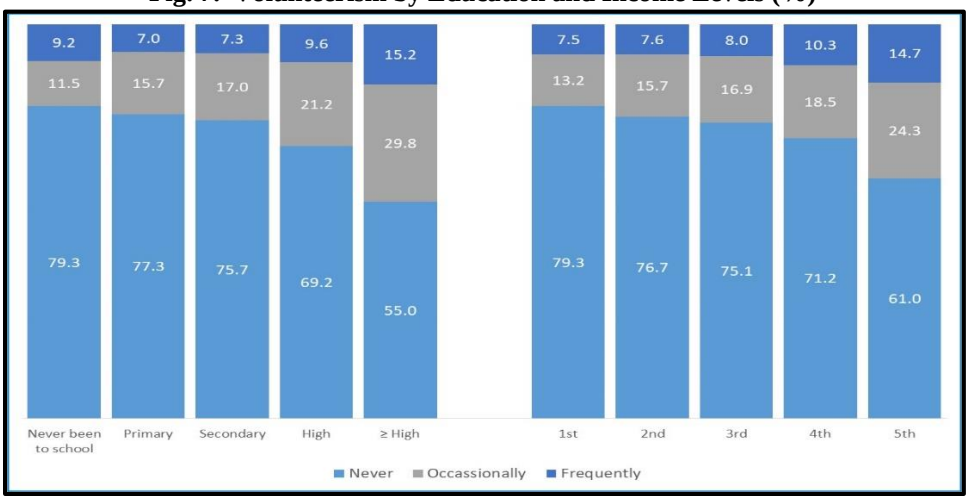


Source: Author's estimation using the PIDE BASICS Survey dataset.

Figure 7 shows the trends of voluntary work across educational and income levels, and we find that:

- Volunteerism increases with increasing educational level, with those with higher or more education having the lowest proportion (55 percent) of those never being involved in voluntary work.
- Increased income levels are associated with a stronger involvement in voluntary work, as can be seen from the highest income level (fifth quintile) having the lowest proportion (61 percent) of those never engaged in voluntary work.

Fig. 7. Volunteerism by Education and Income Levels (%)

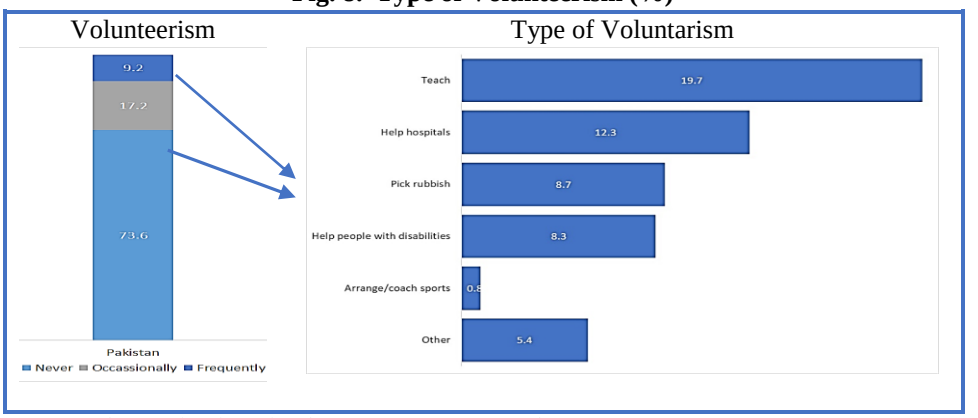


Source: Author's estimation using the PIDE BASICS Survey dataset.

Those reporting to be involved in voluntary work, be it frequent or occasional, were asked the nature of the work they were doing. Those involved in more than one kind of work were allowed to give multiple responses. Figure 8 shows that:

- Teaching and mentoring others (19.7 percent) was the most common kind of volunteerism, followed by helping hospitals by providing provisions (12.3 percent), picking up rubbish and cleaning (8.7 percent), and helping people with disabilities (8.3 percent). A very small proportion (0.8 percent) was involved in coaching and arranging sports.
- Some other tasks (5.4 percent) that people were involved in included helping people out in the neighbourhood whenever help was needed, giving food to the needy, performing tasks at mosques and arranging/donating blood for patients.

Fig. 8. Type of Volunteerism (%)



Source: Author's estimation using the PIDE BASICS Survey dataset.

Note: Types of volunteerism show: 1. proportions out of those involved in volunteerism; and 2. multiple responses as a person could be doing more than one type of act.

BASICS Note 5 shows that social and civic engagement, especially the prior, is not very strong in Pakistan. If people are not often engaged socially, how are they keeping themselves mentally and physically alive? Are there enough libraries and playgrounds/sporting facilities available for doing so?

Next
BASICS Notes Number 6
Shaping Mind and Bodies: Do We Have the Facilities?

EXTRACTS FROM THE CONSTITUTION OF THE PAKISTAN SOCIETY OF DEVELOPMENT ECONOMISTS

ARTICLE 5

5.3 *Membership:* There shall be a select category of Members of the Society. The minimum criteria of eligibility for election as Member of the PSDE are:

(a) Previous *ex-officio* membership of the society;

or

(b) Master's degree in Economics, Business Administration, Public Administration, Agricultural Economics, Statistics Econometrics or Economic Demography and/or an evidence of proven scholarship in these areas of specialisation.

5.4 *Election of Member:* All persons satisfying the minimum eligibility criteria as specified in Article 5.3 may apply for Membership on the prescribed form after having their nominations duly proposed and seconded by any two *Ex-officio* Members/Members of the Society, provided that no such application shall be required of a former *Ex-officio* Member of the Society who may enrol as Member on payment of the prescribed fee at the invitation of the Council. Election to Membership shall be decided by a simple majority of the Executive Council at a constitutionally valid meeting.

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Editor: **Nadeem Ul Haque**

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