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An Analysis of Pakistan's Agricultural Commodities based on Effective Protection Rate and Its Decomposition

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This study analyses the impact of the government's interventionist policies in the product and input markets for the two leading crops of Pakistan, wheat, and cotton. The study employs standard measures of the nominal rate of protection (NRP) and effective rate of protection (ERP). In addition, it also proposes a method to additively decompose the ERP into two components representing the effect of distortions in the product and input markets.

The study finds that government policies in the wheat market are mostly designed to protect flour mill owners and thereby ordinary consumers at the cost of farmers. Since the consumers of wheat by far outnumber the wheat growers, this policy design seems to represent a political decision to appease the common public.

Regarding cotton, the study finds that the government does not intervene much in the market to the extent that farmers are left at the mercy of monopolistic procurement agencies and better-informed rent-seeking intermediaries in the marketing chain. Export procedure is so cumbersome that only the well-informed and well-connected traders can benefit from price hikes in the world market.

The study recommends serious reconsideration of government policies in the light of normative considerations. In this context, open debate on agricultural policy in Parliament and the Senate would be highly desirable.

1. INTRODUCTION

Despite its continuously declining share in GDP, the agricultural sector of Pakistan has always played a key role in the socio-economic development of the country. For a population of 210 million people, the agricultural sector provides a reasonably healthy average food basket and generates a net exportable food surplus. Agriculture contributes about 21 percent to GDP and 43 percent to employment in the country. Wheat is the staple food of Pakistan and contributes to GDP and employment through many food products besides simple bread. Textile, which is by far the largest manufacturing industry of Pakistan in terms of output, employer, and exports earnings, is highly dependent on domestically produced raw cotton.

During the early years after independence, Pakistan faced an acute shortage of primary food products like wheat flour, rice, sugar, and edible oil. Households were protected from the potential food price inflation through rationing. The shortage of wheat

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was partially offset by wheat imports from the USA under the concessional PL-480 programme, especially during the 1960s. However, the process of 'Green Revolution' initiated in the 1960s helped Pakistan overcome food shortage during the 1980s and 1990s. Agricultural productivity was increased substantially with technological advancement in agriculture by developing more productive seed varieties, mechanisation, adopting chemical fertilisers, and better water availability with the help of water reservoirs at Tarbela and Mangla. This process was facilitated by providing cash-starved farmers subsidies on the purchase of inputs and sale of outputs.

Since farmers could not afford to store bulk quantities of output due to lack of storage facilities and urgent need of cash to pay off debts, government agencies ensured that commodity prices did not crash immediately after harvesting. This has been done by procurement of commodities at prices above the market price. In addition, subsidies on fertilisers and other crucial inputs have been provided to ensure that farmers get benefit from better seed varieties.

However, some of these subsidies have been slashed over the years for various reasons. First, it appears that with enough food availability in the country, policymakers no more considered it essential to subsidise farmers when the government was running large budget deficits. To deal with huge losses in public-sector enterprises, especially in transport, communication, and steel industries, along with circular debt in the energy sector, various governments resorted to cut subsidies in all such sectors, especially the agricultural sector, wherein a large number of small beneficiaries could not organise to form a strong coalition to block the change of policy effectively. In other words, subsidies to farmers were gradually taken away to support highly inefficient industries and write-off liabilities of the defaulting elite energy consumers.

This policy shift also got support under the IMF loan agreements. Another reason has been that the provision of cheap food to net consumers of food (also including very small farmers whose consumption exceeds own production), whose number by far exceeds the number of net suppliers of food (the farmers with production greater than own consumption), has been used as a tool to gain popular political support. The subsidies on such food or non-food products that provide raw material to manufacturing firms, specifically cotton and sugarcane, have also been reduced to support the politically well-placed elite owners of mills.

However, the 2007-08 food price crisis triggered many changes in the agricultural trade policy stance adopted by countries worldwide. Export restrictions on agricultural output and regressive measures to curb agricultural imports were observed in the short term to protect consumers from the hike in international food prices. Headey (2010) finds that defensive trade policies during this time exaggerated international price movements. Since the 2007-08 food crisis, many countries have continued with defensive trade policies towards agriculture and have begun to pursue food self-sufficiency policies with hopes to improve food security. For example, the OECD has explored how governments can develop policies and a system that delivers advantages from an open and trade-exposed agricultural sector while at the same time addressing domestic policy objectives such as protecting vulnerable groups. OECD analysis emphasises the important role of decoupling support, targeted and tailored support programmes, and addressing the subsequently disadvantaged groups through compensation or policy measures (Greenville, 2015).

It is suspected that Pakistan's currently prevailing agricultural pricing policy is anti-protective primarily, whether it is in the form of procurement prices, subsidies, or other such incentives. Several studies have employed an effective rate of protective (ERP) as a measure of how government policies serve as protective or anti-protective measures.

The present study has two objectives. First, it provides updated estimates of ERP for wheat and cotton, the two leading crops, for the past 15 years. Second, it proposes and applies a method to additively decompose the ERP into two components representing the effects of distortions in product and input markets.

Estimating ERPs and other related statistics is a time-incentive task as it requires a lot of manual data entry. In addition, there is more than one approach to estimate ERPs depending on how free-market notional prices and distortion-loaded realised prices are computed. Therefore, the study focuses on two major crops, namely wheat and cotton. Wheat is the staple food of Pakistan and contributes about 10 percent to value-added in agriculture and is cultivated on 39 percent of the cropped area in Pakistan. In recent years Pakistan has overcome the demand-supply gap and has become a net exporter of wheat. Pakistan ranks at number seven in terms of area and production of wheat but number 59 in terms of yield (Ejaz and Ahmad, 2019). Cotton is the second major crop of Pakistan in terms of cultivated area (15 percent of the total cropped area) and production (6.7 percent of value-added in agriculture). During the past 25 years, the growth of the textile sector has resulted in faster growth in the use of raw cotton than its production, thereby converting Pakistan's position from a net exporter to a net importer of raw cotton. In addition, Pakistan also imports specific grades of cotton from the USA and Egypt (Ejaz and Ahmad, 2019).

Production of both crops is highly concentrated in the province of Punjab. The province contributes 76 percent to Pakistan's total wheat production and is the only province with surplus wheat with a 95 percent share in procurement. The contribution of Punjab to cotton production is also about 76 percent. Therefore, the study is confined to Punjab to manage the data-related issues in a better way.

The study expects to find that to appease consumers of agricultural products, whether households or manufacturing firms, the agricultural pricing policies of Pakistan have mostly created disincentives for farmers in recent years.

The rest of the paper is organised as follows. Section 2 explains the methodology for estimating nominal and effective rates of protection and decomposing the latter into revenue and cost components. Section 3 describes data sources and details on the measurement of various statistics that go into estimating the nominal and effective rates of protection and the latter's decomposition. Section 4 presents results and discussion, while Section 5 concludes the study.

2. MEASURING NOMINAL AND EFFECTIVE RATES OF PROTECTION

Although traces of the basic idea of ERP could be found in earlier literature on trade and industry, the formal concept was introduced and refined in a number of articles and books by Gorden (1962, 1966, 1969, 1971). He proposed that while evaluating how an industry is being protected from foreign competition with import taxes or export

subsidies, it is essential to net out the impact of taxes and subsidies on inputs used in the production of the goods under consideration. In this context, the literature considers all inputs going into the production process other than factors of production, thereby focusing on how value-added, or equivalently the reward to factor services, in an industry is affected by import taxes and subsidies.

The measure of protection that considers the changes in output value caused by taxes and subsidies on output only, and does not consider the changes in inputs costs due to intervention, is the basic measure and is called nominal rate of protection (NRP). Denoting the output price (value per unit of output) in the presence and absence of taxes and subsidies on output by P_1 and P_0 respectively, NRP is written as:

$$NRP = \frac{P_1 - P_0}{P_0} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

If, however, taxes and subsidies on inputs are also taken into account, then the focus is shifted from output price to value-added per unit. The corresponding measure of protection is ERP and in its simplest form is given by:

$$ERP = \frac{VA_1 - VA_0}{VA_0} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Here, VA_1 stands for value-added per unit of output in the presence of taxes and subsidies on output and inputs, while VA_0 denotes value added in the absence of all such distortions.

It is shown in Appendix that ERP is related positively to NRPs for output and negatively to NRP of each input as follows (see Equation C in the Appendix).

$$ERP = \underbrace{\{S_0^Q \, NRP^Q\}}_{Revenue\ component} + \underbrace{\{-\sum_{i=1}^{n} S_0^i \, NRP^i\}}_{Cost\ component} \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

In this equation NRP^Q and NRP^i denote NRPs for output and input *i*, respectively, while S_0^Q and S_0^i denote the shares of output and input *i* in value-added in the absence of distortions.

It is obvious that S_0^Q is always greater than one whereas S_0^i could be greater than, equal to, or less than one, depending on how large the input cost is relative to value-added. In any case, the above equation shows that the impact of all the distortionary measures can be additively decomposed between the impact on revenue per unit and the impact on the cost per unit. The first component is useful to understand to what extent distortionary policies in the product market tend to protect or harm farmers. The second component indicates whether and to what extent the distortionary policies in input markets supplement or offset the effects of product market policies on farmers.

The algebraic manipulations in the Appendix show that Equation (3) can also be written in a more consolidated form (Equation F in the Appendix) as given below.

$$ERP = \underbrace{\{S_0^Q \, NRP^Q\}}_{Revenue\ component} + \underbrace{\{-S_0^I \, NRP^I\}}_{Cost\ component} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where S_0^I is the combined share of the cost of all inputs in value-added in the absence of distortions and NRP^I is the NRP of the price index of inputs measuring distortionary input prices relative to distortion-free input prices. In this index, the realised input

quantities per unit of output (in the presence of distortions) are used as weights. The price index here has the interpretation of the Paasche price index. The two components of ERP are hereby referred to as the revenue and cost components.

Later on, the formulas for NRP and ERP had to be revised to account for measures of protection other than taxes and subsidies. To take into account all forms of protective measures in the estimation of ERP, the value-added measures VA_1 and VA_0 are respectively interpreted as value-added in the presence and absence of distortions (domestic as well as at the border) caused by all types of policy interventions in the product and input markets. This interpretation, however, necessitated the need to convert, for example, import quota to an equivalent import tariff. But it turned out that equivalence between tariffs and quotas and other direct or indirect trade restrictions is not straightforward (Bhagwati 1968, Chiou, *et al*. 2005 and Lake and Linask, 2013). To overcome this difficulty, the hypothetical output price in the absence of all policy distortions is set equal to the pre-tariff border price further adjusted for inland transportation and other such charges.

For the estimation of ERP for crops in Pakistan, the first point that needs some deliberations is the identification of the intended beneficiaries of protection. Since the decision-makers whose behaviour matters are farmers themselves, all other agents involved in the delivery of output from farm to market and inputs from market to farm are not considered. This basically means that all calculations are to be made with prices prevalent or effective at farm-gate. Thus, the output value is estimated as the farm-gate equivalent of the price received by farmers, which is adjusted for transportation and other such costs. Likewise, the cost of purchased inputs is also estimated in farm-gate equivalent costs, adjusting for transportation costs, etc.

Since the focus of protection is farmer, value-added includes income that accrues to the farmer in terms of imputed cost of labour, land rent, and rental cost of farm machinery owned by farmers. All other purchased inputs, specifically seeds, fertilisers, pesticides, weedicides, and rent of hired machinery, are counted in input costs. In other words, value-added is calculated as:

$$VA = \textit{value of output} - (\textit{cost of seeds} + \textit{cost of fertilisers} + \textit{cost of pesticides} + \textit{cost of weedicides} + \textit{cost of hired machinery}$$

A number of inputs are used within each category with varying rates of taxes and subsidies. In particular, the following inputs are considered in the estimation of ERP.

Seeds
Fertiliser
  DAP (Di-ammonium phosphate)
  Urea
  NP (Nitrogen phosphorus)
  CAN (Calcium ammonium nitrate)
  Gypsum
  SOP (Sulphate of potash)
  SSP (Single superphosphate)
Pesticides
Weedicides

Hired Machinery
Ploughing
Planking
Levelling
Tractor Drilling Cost
Ploughing in Case of Broadcast
Planking in Case of Broadcast
Threshing

For the actual application, we start with NRP for output, which is the relative difference between the realised price received by farmers and the hypothetical benchmark price that would prevail in the absence of intervention. The latter is estimated as the farm-gate equivalent of border price. It is estimated by adjusting the border price for inland transport, marketing margins, and quality differences. Conversion of border price to farm-gate price depends on whether the product under consideration is exportable or importable. For exportable products, the farm-gate equivalent price is obtained by subtracting from the *fob* export price all the per-unit costs involved in the transfer of the product from farm to port, including transportation, handling, and marketing costs, wholesale margins, storage charges, and other charges like toll charges/fees. The reason is that if the farmer chooses to export the product, all such costs will amount to a drain on receivables for farmer. In case the product needs any processing for exports, the processing cost per unit of output is subtracted from the border price and if a non-exportable byproduct is to be separated, its value (at farm-gate) is added to the border price. For example, in the case of cotton, the cost of separating cotton seeds from the raw crop (seed cotton) per unit of the crop is subtracted from the border price, while the value of seeds per unit of the crop is added.

Likewise, for importable products, the farm-gate equivalent price is obtained by adding to the *cif* import price all the per-unit costs involved in transferring the product from port to the reference market where farmers are supposed to sell their product. These costs include transport costs, toll/fees, handling charges, etc. Further, wholesale margin and incidental expenses are subtracted, and adjustment is made for quality differences to arrive at the benchmark import price at farm-gate.

NRP is also estimated for inputs, which indicates how the cost of production for farmers is affected by government interventions. However, as opposed to product-market interventions, any policies that tend to raise (reduce) input prices like tariffs (subsidies) on imports tend to harm (protect) farmers by raising (reducing) the cost of production per unit.

Once the NRPs on output and inputs are estimated, it is straightforward to estimate NRP and its two components as indicated by Equation (3). The advantage of ERP over NRP is that the former considers the combined effects of all trade barriers and price interventions both in product and input markets (Valdes, 2013).

3. DATA

Data needed for the study are not available in consolidated form from any single source, and several sources are used to collect all the required data. The main data

sources are the crop-wise annual booklets published by Agriculture Policy Institute, specifically *Cotton Policy Analysis* and *Wheat Policy Analysis*. Data on realised input prices (including the effects of distortions, if any), input quantities per unit of output and, hence, input costs (all in the presence of distortions) are either directly given or derived from the information given in these booklets. The realised product prices of cotton and wheat are obtained from *Agricultural Statistics of Pakistan*, Pakistan Bureau of Statistics and *Pakistan Economic Survey*, Ministry of Finance.

The distortion-free wheat and cotton prices are estimated as the farm-gate equivalent of border prices adjusted for transportation and other such costs. The data on the border price of wheat are obtained from *External Trade Statistics Pakistan* published by the Pakistan Bureau of Statistics, while the data on the border price of cotton are taken from the website www.cotlook.com. Data on the exchange rate, to convert dollar prices in rupees' denomination, are taken from *Annual Reports* of the State Bank of Pakistan.

For distortion-free prices of inputs, we need data on taxes and subsidies. The required information is available from the document *Customs Tariffs* published by the Federal Board of Revenue. The five types of taxes on trade that are considered for NRP on inputs and ERP of the two products are custom duties (applied to *cif* value of imports), regulatory duty (a tax on luxury items to manage-supply imbalance and BOP in general), federal excise duty (including special federal excise duty applied on the *cif* value of imports), sales tax (applied on value of imports including all types of duty and withholding tax (advance tax applied on value of imports including duties and sales tax that can be reclaimed on the filing of return with the revenue department).

4. RESULTS AND DISCUSSION

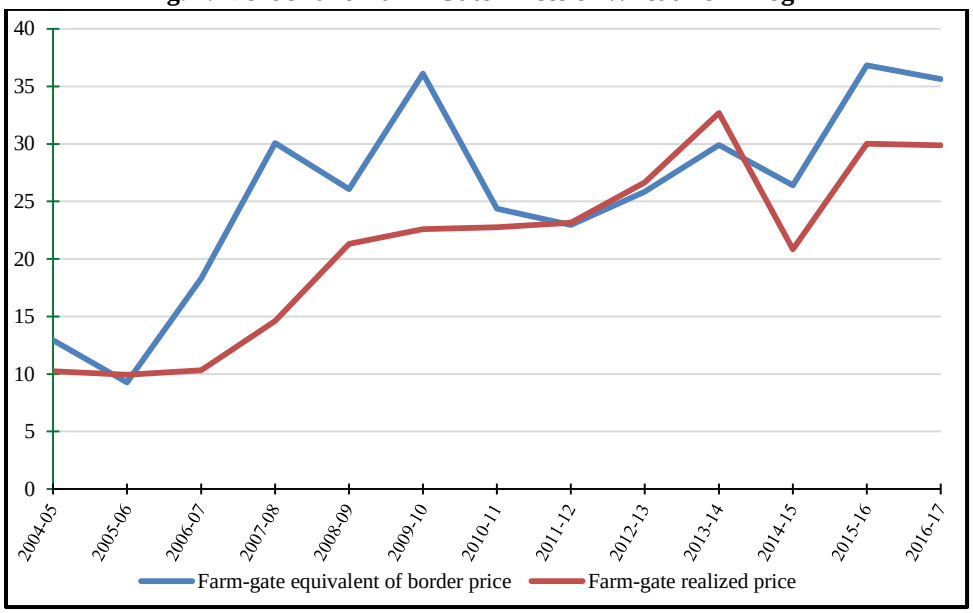
NRP and ERP along with its two components, are estimated for wheat and cotton over the years 2004-05 to 2016-17 using the methodology and data explained above. The crop-wise discussion follows below.

4.1. Wheat

With a sudden surge in excess supply during the harvest season (May and June), the market price of wheat tends to decline. Farmers, especially those with small and medium farm holdings, face the risk of losses as they do not have adequate storage facilities and cannot hold on to their produce in the hope of better prices in the future. The wheat procurement policies of the Federal g and Punjab government are implemented by Pakistan Agricultural Storage and Services Corporation. Ltd (PASSCO) and Provincial Food Departments (PFD) of Punjab. These policies are supposed to protect farmers by providing a price floor (often referred to as 'support price') during the harvest season, subject to annual review with possible revision. Supplemented by trade restrictions, wheat procurement policies are meant to absorb the effects of market forces on the wholesale price of wheat, especially major international price shocks. As explained in Dorosh and Salam (2007), the main objective of wheat procurement at support price is to protect farmers' incomes and subsidise wheat sales to flour mills and households at stable and affordable prices. When needed, the federal government imports wheat to ensure sufficient food stock to keep the price of wheat stable in short to medium terms.

Here it will be useful to make a simple comparison between the realised farm-gate price of wheat and the farm-gate equivalent of border price to have some idea about how wheat price in Pakistan has been moving in comparison to world market prices. Figure 1 presents the trends. The figure shows that the farm-gate equivalent of border (world) price of wheat increased sharply during 2006-07, 2007-08 and 2009-10, resulting in a 290 percent increase in just four years (from the year 2009-10 compared with 2005-06). In contrast, the realised farm-gate price increased by 127 percent only as the so-called 'support price' was kept low to protect domestic consumers. Later on, when the farm-gate equivalent of border price fell during the next two years (2010-11 and 2011-12) by 36 percent, the realised farm-gate price increased by 2.5 percent. In the next two years (2012-13 and 2013-14), the farm-gate equivalent of border price and the farm-gate price increased by 30 percent and 41 percent, respectively, making farm-gate price exceed border price for the first time after the year 2005-06. In 2014-15, border prices decreased by about 12 percent, whereas farm-gate prices declined sharply by 36 percent. After that, the farm-gate price remained substantially below the border price.

Fig. 1. Border and Farm-Gate Prices of Wheat Per Kilogrm



The above analysis shows that the realised farm-gate price of wheat has remained below in most of the years or slightly above the farm-gate equivalent of border price. Another observation is that the year-to-year variations in realised farm-gate price have been mostly smaller than the variations in the farm-gate equivalent of border price, thereby indicating that the wheat procurement policy has been designed mainly to absorb fluctuations in world prices. The overall picture that emerges from the graph is that the wheat procurement policy for Punjab has focused mainly on subsidising and insulating consumers from world market fluctuations at the cost of farmers. This seems more of a political decision to gain popular support from consumers who outnumber the wheat growers.

We now move to the estimation of protection rates. Table 1 presents the results on NRP and ERP along with the two components of the latter. The table shows that with the exception of four years 2005-06, 2011-12, 2012-13, and 2013-14, the NRP on wheat has remained negative, as can also be inferred from Figure 1. This means that the direct product price policy for wheat has been anti-protective for farmers in most of the years.

The highest value of negative NRP was observed during the years 2006-07, 2007-08, and 2009-10. This coincided with the period of the world commodity price hike when the government banned the export of wheat. The export restriction was lifted in 2010-11 when world price decreased substantially, and the private sector exported one million tons of wheat without any subsidy. During the ban, in surplus years, the government procured wheat at a low price and sold abroad. The export of wheat is now freely allowed according to Export Policy Order 2013. This observation indicates that government did not allow the private sector to benefit from higher world prices and acted as a rent-seeking intermediary between farmers and the world market. Had the private sector been allowed to export wheat, some of the benefits of higher world prices would have passed on to farmers as the private sector would be bidding better prices in competition with government procurement agencies.

Dorosh and Salam (2007) have pointed out that since the price at which wheat has been sold to flour mills does not include the transactions cost of procurement, or handling and storage cost, mills owners also have been reaping economic rent, though the benefit of this subsidy has been partially passed on to consumers. One can infer from these observations that during the three years of abnormally high negative nominal protection rates, government and flour mills benefitted and consumers of wheat remained protected from world food inflation,[1] while farmers did not gain much. It should also be noted here that negative nominal protection rate in any year does not necessarily mean that wheat price has declined during the year or farmers are worse off compared to their previous position; it just means that government intervention has caused the price to remain less than the level that would prevail under free-market conditions.

Table 1

Estimates of Protection Rates for Wheat

Year	Status of Net Trade	NRP	ERP	Revenue Component	Cost Component
2004-05	Importer	–20.78	–32.23	–31.08	–1.16
2005-06	Importer	7.34	24.83	19.71	5.12
2006-07	Importer	–43.63	–61.65	–63.03	1.38
2007-08	Importer	–51.41	–66.42	–67.73	1.30
2008-09	Importer	–18.23	–28.08	–30.65	2.57
2009-10	Importer	–37.46	–52.31	–53.35	1.04
2010-11	Exporter	–6.63	–10.37	–12.02	1.65
2011-12	Exporter	0.83	7.44	2.59	4.85
2012-13	Exporter	3.08	10.03	7.20	2.83
2013-14	Importer	9.26	21.72	19.47	2.24
2014-15	Importer	–21.08	–55.18	–54.88	–0.30
2015-16	Exporter	–18.51	–33.35	–34.17	0.82
2016-17	Exporter	–16.11	–30.11	–30.66	0.54

[1] This does not mean that consumers were not affected in general. Increase in the world prices of pulses were generally passed on to consumers.

The table shows that after a period of low NRP for four consecutive years (2010-11 to 2013-14), farmers again faced a high degree of negative NRP, which seemed odd for the year 2014-15 when border price decreased by 12 percent.

Moving to ERP, we observe almost the same pattern and trend as depicted by NRP, the only difference being that the value of ERP is higher as compared to NRP mainly because the former has a substantially smaller denominator than the latter.

It is further observed that variations in ERP are mainly driven by the variations in its revenue component, representing the effects of distortions in the product market. The cost component that shows the effect of distortions in the input markets is throughout very small. Furthermore, the sign of the revenue component of ERP (the same as the sign of NRP on the product) is negative for most of the years and positive for some years. On the other hand, the cost component of ERP is positive in all but two years, 2004-05 and 2014-15, when it was negligibly small. The year 2004-05 is the only one when fertiliser was taxed, while in both 2004-05 and 2014-15, weedicides/pesticides and machinery were taxed. Although these taxes continued in the subsequent years as well (though with reduced rates), yet the cost component of ERP remained positive as their impact was offset by subsidy on fertilisers. This means that while government interventions in the wheat market have been mostly unfavourable to wheat growers, the interventions in input markets have been mostly favourable, though their impact has been rather small.

The main factor contributing to negative average NRP on inputs and, hence, positive cost component of ERP on wheat is the subsidy on inputs, especially DAP and exemption of taxes and duties (regulatory duties, custom duties, federal excise duties, sales tax, etc.) on seeds, fertilisers, pesticides, weedicides, and farm machinery.

4.2. Cotton

The vulnerability of cotton growers to market fluctuations is not different from that of wheat growers, especially when prices fall sharply during harvest season (December and January). Trading Corporation of Pakistan (TCP) is the sole government agency responsible for buying cotton lint directly from farmers. In 1995 the practice of fixing support price was replaced by announcing indicative benchmark prices (WTO, 2015). As noted in Ejaz and Ahmad (2019), "According to Import Policy Order 2012–15, published by the Ministry Of Commerce, there is no restriction on import of cotton", while "cotton can be exported only after an export contract registration (against a security deposit of 1 percent of the contract value) with the Trade Development Authority of Pakistan (TDAP) and a classification certificate issued by the Pakistan Cotton Standards Institute".

However, it is observed that government does not intervene directly in the product market as rigorously as in the wheat market. It is perhaps because the maintenance of low price to protect the chain of textile industry and ultimately consumers (households) is not considered as crucial as the protection of wheat flour mills and, hence, consumers of wheat. Thus, the rates of export and import duties on cotton have remained low since the mid-1990s. The Trading Corporation of Pakistan (TCP) made an exception in 2008 when it bought 42,000 tons of cotton in an effort to boost domestic prices.

Figure 2 presents the relative position and trend in the realised farm-gate price and the farm-gate equivalent of border prices of cotton. The figure shows that both the prices

continued to increase steadily till the year 2009-10, after which a sharp hike in the price is observed in 2010-11, followed by an equally sharp decline in 2011-12 and finally settled to somewhat stable path till the last year of analysis. Incidentally, in 2010-11 not only the farm-gate equivalent of border price of cotton increased sharply, but Pakistan also lost about 2–3 million bales of cotton as a result of widespread floods.

Notably, the realised farm-gate price remained below the farm-gate equivalent of border price throughout the period of analysis irrespective of the time trend. The minimum gap between the two prices was observed in 2013-14. The gap increased sharply in recent years, reaching the maximum level in 2016-17. In 2010-11, when border price increased sharply, the realised farm-gate price also went up partially due to the loss of crop in floods, thereby maintaining almost a similar gap between the world and domestic prices as prevailing in other years.

Fig. 2. Border and Farm-Gate Prices of Cotton per Kilogrm

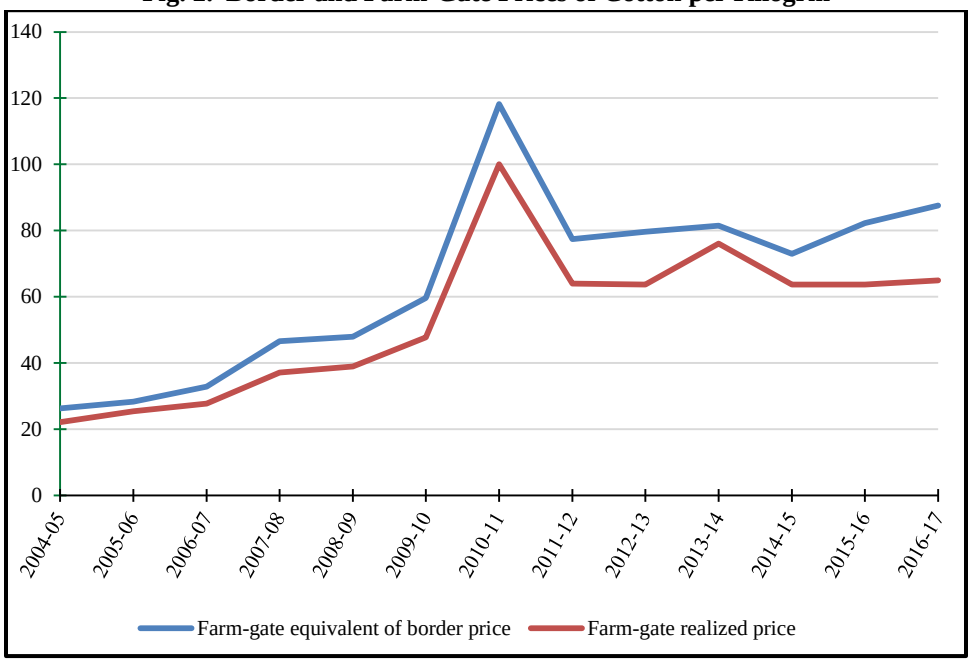


Table 2 presents the results on the rate of protection and other related statistics. First, note that as indicated by Figure 2, the NRP for cotton has remained negative throughout the period of analysis with the minimum values observed in the years 2013-14 (6.6 percent). In the very next year, NRP increased to the second highest level (22.5 percent) and then to the highest level (25.8 percent) in 2016-17. This perhaps suggests a change of policy as the increase in world price was not matched by a similar increase in farm-gate price.

The table also shows that NRP for cotton has been more stable with the same average value compared to NRP on wheat. Customs duties on the import of cotton are exempt, while exports are subject to a small percentage of export surcharge. In addition, there are no restrictions on imports either.

This low level of government intervention in the cotton market seems inconsistent with the observed values of NRP, which is by no means negligible. Ejaz and Ahmad (2019) attribute this inconsistency to the structure of the cotton market within the country. The study quotes official sources in the Ministry of Textile Industry suggesting that "cotton ginners buy seed cotton from farmers at the domestic farm-gate rates…and they sell to APTMA (All Pakistan Textile Mills Association, the sole buyer of lint). The monopsonistic power enjoyed by APTMA allows it to depress the local price of lint by restricting purchases from the local market." The disparity between border and farm-gate prices cannot be bridged through exports because of procedural difficulties and complications in the export of cotton. To export cotton, one must first get registered, and exports must be carried out within a short period after registration. World cotton prices are pretty unstable, and there is no guarantee that an exporter would benefit from a price hike because, by the time export permission is guaranteed, the price may have declined. Most exporters tend to shy away from this risky situation.

Table 2

Estimates of Protection Rates for Cotton

Year	NRP	ERP	Revenue Component	Cost Component
2004-05	–15.81	–41.82	–37.22	–3.95
2005-06	–10.25	–23.86	–29.51	6.01
2006-07	–15.56	–38.12	–43.44	5.59
2007-08	–20.23	–39.00	–42.11	3.36
2008-09	–18.86	–59.61	–68.58	9.31
2009-10	–19.95	–53.65	–58.81	5.41
2010-11	–15.34	–24.59	–25.70	1.19
2011-12	–17.38	–46.15	–48.96	2.87
2012-13	–19.97	–107.54	–117.00	9.43
2013-14	–6.56	–28.34	–36.41	8.34
2014-15	–12.69	–134.42	–127.73	–7.30
2015-16	–22.52	–113.79	–116.28	2.41
2016-17	–25.75	–111.30	–114.82	3.47

Another possible reason mentioned in Ejaz and Ahmad (2019) is that farmers do not have sufficient knowledge to take benefit from rising world prices, while the chain of intermediaries in the marketing business tends to reap the rent.

Moving ahead, we observe that ERP on cotton has remained negative throughout the analysis period. Unlike the case of wheat, NRP and ERP on cotton always showed a consistent pattern of government policies being unfavourable for farmers. The ERP went up to more than 100 percent in recent years, indicating that the cotton policy has become highly anti farmer-friendly. This pattern is quite astonishing given that the cost component of ERP has remained favourable to farmers except for two years, 2004-05 and 2014-15 for a reason explained in the sub-section of wheat.

It is evident from this analysis that it is the revenue component and, hence, product-market interventions that have harmed the farmers. Notably, there is no

particular policy in place that could protect farmers from world market price fluctuations. The procurement agencies and the marketing chain of intermediaries are given a free hand to exploit farmers based on their monopolistic powers, superior knowledge of marketing procedures, and storage capacity that small to medium farmers are unable to match.

5. CONCLUDING REMARKS

The study finds that the realised farm-gate price of wheat has mostly remained relatively more stable and lower than (or slightly above) the farm-gate equivalent of border price. During the period of world commodity price hike (2007-08 and 2009-10), while government acted as a rent-seeking intermediary as it bought surplus wheat at a low price to be sold at a much higher world price, the private sector was not allowed to benefit from higher world price. This eliminated any chances of transmitting the dividend of world food inflation to farmers through competition between government procurement agencies and private exporters. While government and flour mills benefitted and consumers of wheat remained protected from world food inflation, farmers did not gain. It appears that the wheat procurement policy is framed to favour wheat consumers and mill owners rather than wheat growers.

The current procedure of filing applications to wheat procurement agencies, deposit of 110 rupees per bag to a commercial bank for the purchase of each standardised (gunny) bag and waiting for a week for obtaining the sale receipts is too difficult for most farmers, which creates room for the entry of agents ('Arties'). This procedure needs simplification. For example, gunny bags should be made available in the open market. Commercial banks may be instructed to make instant payments to farmers, and the cost of this bridge financing may be borne by the government.

Regarding cotton crop, the study observes that the government does not intervene directly in the product market as rigorously as in the wheat market. It is perhaps because the maintenance of low price to protect the chain of textile industry and ultimately consumers (households) is not considered as crucial as the protection of wheat flour mills and, hence, consumers of wheat. Nevertheless, the realised farm-gate price has consistently remained below the farm-gate equivalent of border price.

The study concludes that in the case of cotton, it is the revenue component of ERP and, hence, product market interventions that have harmed the farmers. There is no specific policy to protect farmers from world market price fluctuations. The marketing chain of intermediaries led by government procurement agencies tends to exploit farmers based on their monopolistic powers, superior marketing knowledge, and storage capacity.

The collusion amongst textile mills in buying cotton has resulted in depressed prices received by farmers; the gap between the farm-gate price and farm-gate equivalent border price has widened over the past 3 years which shows that the anti-farmer bias has been getting stronger in recent years. To remove the anti-farmer bias in the cotton market, it is recommended that the Competition Commission of Pakistan should intervene and break the monopsony power exerted by APTMA. Although government procurement policy can also break the monopsony power of APTMA, yet such an intervention is not recommended as it ultimately leads to inefficiency, distortion, and corruption.

APPENDIX
Proofs of Equations (3) and (4)

Substituting for the value-added in the presence and absence of distortions in ERP formula given by Equation (2), denoting the prices of input i in the presence and absence of distortions by W_1^i and W_0^i respectively, the realised quantity of input i in the presence of distortion by X_1^i and re-arranging the resulting expression, yields:

$$ERP = \frac{\left(P_1 - \sum W_1^i\ x_1^i\right) - \left(P_0 - \sum W_0^i\ x_1^i\right)}{P_0 - \sum W_0^i\ x_1^i} = \frac{P_1 - P_0}{P_0 - \sum W_0^i\ x_1^i} - \frac{\sum W_1^i\ x_1^i - \sum W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i} \quad \ldots \quad \text{(A)}$$

Further manipulations result in Equation (3) as follows.

$$ERP = \frac{P_0}{P_0 - \sum W_0^i\ x_1^i}\ \frac{P_1 - P_0}{P_0} \ - \ \sum_{i=1}^{n} \frac{W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i}\ \frac{W_1^i - W_0^i}{W_0^i} \quad \ldots \quad \ldots \quad \ldots \quad \text{(B)}$$

Or

$$ERP = S_0^Q\ NRP^Q - \sum_{i=1}^{n} S_0^i\ NRP^i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(C)}$$

The second expression in Equation (A) can also be manipulated as follows.

$$\frac{\sum W_1^i\ x_1^i - \sum W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i} = \frac{\sum W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i}\ \frac{\sum W_1^i\ x_1^i - \sum W_0^i\ x_1^i}{\sum W_0^i\ x_1^i} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(D)}$$

Or

$$\frac{\sum W_1^i\ x_1^i - \sum W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i} = \frac{\sum W_0^i\ x_1^i}{P_0 - \sum W_0^i\ x_1^i}\ \frac{\sum W_1^i\ x_1^i / \sum W_0^i\ x_1^i - 1}{1} = S_0^I\ NRP^I \quad \ldots \quad \ldots \quad \text{(E)}$$

Substituting this result into Equation (A) and carrying the result to equations (B) and (C) yields the following result.

$$ERP = S_0^Q\ NRP^Q - S_0^I\ NRP^I \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(F)}$$

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Non-tariff Measures, Overall Protection and Export Competitiveness: Evidence from Pakistan and Regional Countries

IRFAN ALEEM and BUSHRA FAIZI

Pakistan's exports have stagnated since 2013 after growing significantly during the previous decade. While many other factors have undoubtedly contributed to the stagnation in exports, the evidence outlined in this paper indicates that the substantial increase in overall protection, driven by the incidence of non-tariff measures, has had a significant and decisive impact.

The paper investigates the incidence and intensity of non-tariff measures (NTMs) in Pakistan from 1967- 2015, based on trade theory to calculate ad valorem equivalent (AVE) of NTMs and overall trade protection in combination with tariffs. The incidence and intensity of core NTMs and with-it overall protection increased substantially over time, especially after 2013, even though tariffs continued to decline over this period. Overall protection rose from about 18 percent in 2003 to 68 percent in 2015 when the average tariff rate had declined to 12.7 percent and with the tariff equivalent of NTMs, contributing the balance 55 percent. Our results confirm that core NTM protection dominates the increase in overall trade protection in Pakistan. The increase in average AVEs of NTM, from 1 percent in 2003 to 55 percent in 2015, is much higher than regional comparators. Also, the data provided by Niu, et al. (2018) suggests that the AVEs of NTMs in Pakistan's major export markets (reflecting health, safety, labour, and product standards) increased significantly from 2003 to 2015.

To enhance the competitiveness of Pakistan's exports, reducing tariffs will undoubtedly help. Still, this paper presents an urgent need to manage NTMs by reassessing their necessity and coverage, streamlining the regulatory process, harmonising it with trading partners, and improving the infrastructure to help Pakistan's exporters comply with international standards.

Keywords: Non-tariff Measures, Tariff Equivalent, Protection, NTMs on Goods, Export Competitiveness

1. INTRODUCTION

1.1. Context and Rationale

Pakistan's exports have largely remained unchanged in value terms in the last decade (Figure 1). After 2013, Pakistan witnessed a significant decline in goods and exports in subsequent years. This trend exacerbated during the last six months of 2020 by the aftereffects of the pandemic and the associated slowdown in the global economy.

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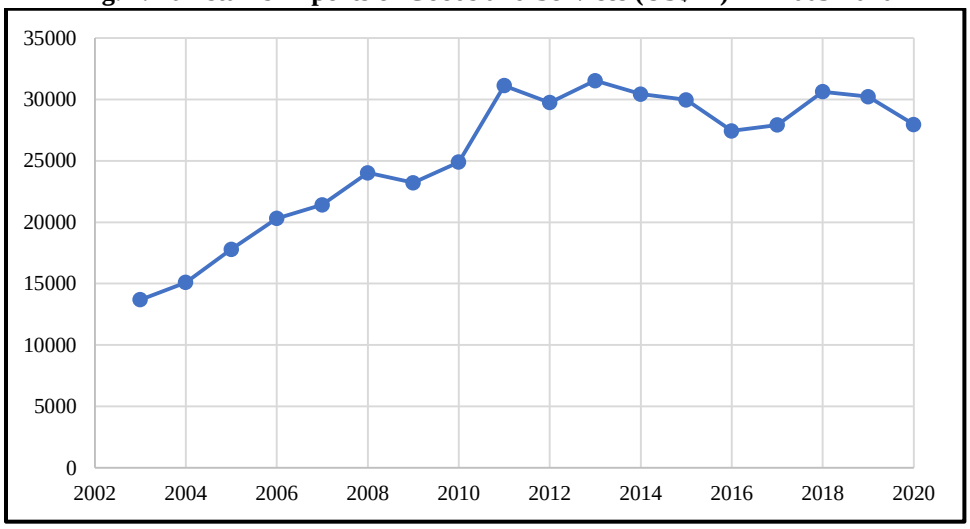
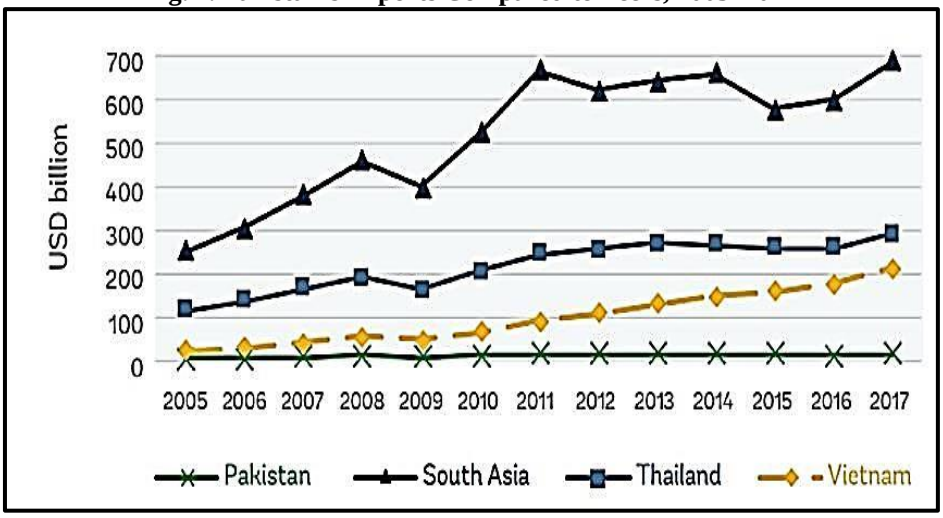
Fig. 1. Pakistan's Exports of Goods and Services (US$ m) FY 2003-2020



Source: Author's calculation based on State Bank of Pakistan/ Haver Analytics data.

The stagnation in Pakistan's export has been accompanied by weak performance relative to comparators. Exports of goods and services in value terms by Pakistan increased by 58 percent between 2005 and 2017, from US$ 17.7 billion to US$ 27.9 billion. This compares with 165 percent growth in total exports by the South Asia Region, 136 percent by Thailand, and 519 percent by Vietnam. 1 (Figure 2). Bangladesh's exports, which were about the same as Pakistan's in 2005, were US$ 47 bn in FY 2018, 50 percent higher than Pakistan's, US$ 30.6 billion.

Fig. 2. Pakistan's Exports Compared to Peers, 2005–2017

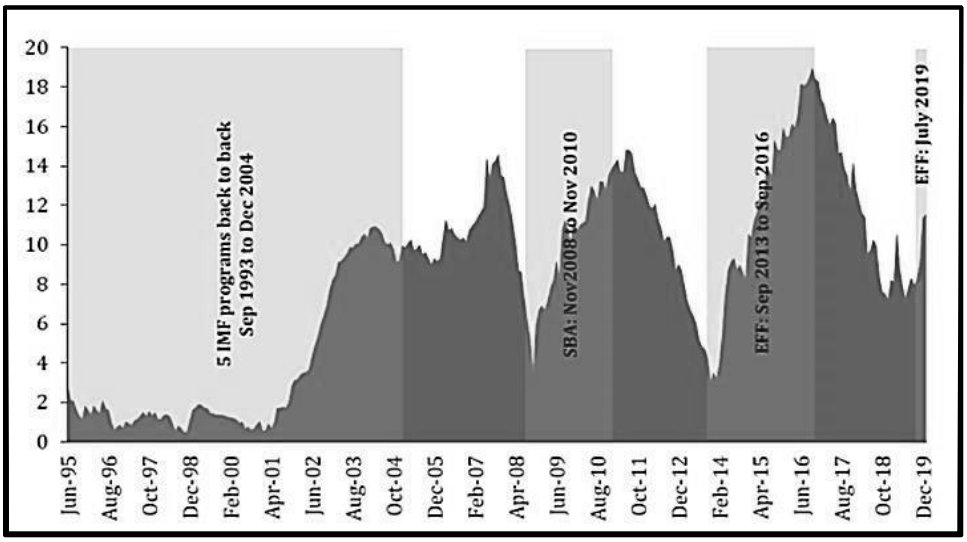


Source: United Nations Conference on Trade and Development (UNCTAD).

[1]Pakistan Trade Strategy Development and Modernising Trade in Pakistan: A Policy Reform Handbook" World Bank, September 2019.

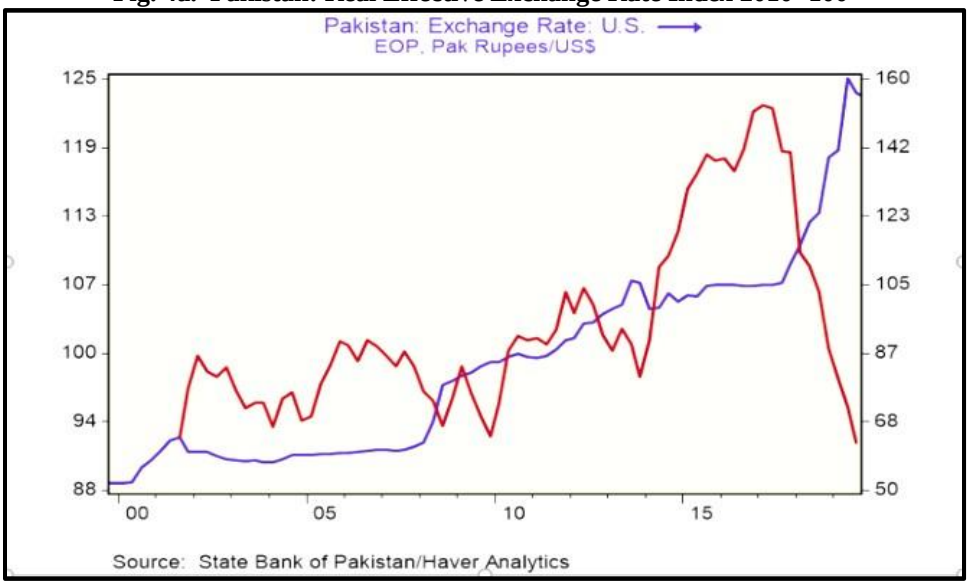
The lack of growth in exports has contributed to lower growth prospects and macroeconomic imbalances. Between 2008 and 2017, Pakistan's GDP rose at an annual growth rate of 3.7 percent, while South Asian countries' GDP grew by 6.6 percent. As exports have stagnated, low reserves have triggered IMF programs repeatedly in the past (Figure 3). Without substantial and sustained growth in export earnings, foreign exchange reserves have been insufficient to provide an adequate buffer to cope with global and internal shocks and debt servicing.

Fig. 3. Pakistan's Foreign Exchange Reserves in US$ Billion



Source: SBP.

Fig. 4a. Pakistan: Real Effective Exchange Rate Index 2010=100



Source: State Bank of Pakistan/Haver Analytics.

Although many factors contribute to the stagnation in Pakistan's past exports, a significant reason for the poor performance in exports is a protectionist trade policy reflected in high tariffs.[2,3] The argument is that such a policy created an anti-export bias suppressing the growth of exports.

Average tariffs (or import duties) in Pakistan were 12.58 percent in 2018, some of the world's highest. These tariffs (customs duties) are about two times higher than the world average and three times in East Asia and the Pacific. According to the Overall Trade Restrictiveness Index (OTRI) provided by the World Bank, Pakistan is the 7th most protected economy globally.

Tariffs play an essential role, which explains the difficulty of reducing them. They are a vital source of revenues for the government; in FY 19, customs duties and trade-related regulatory taxes contributed 16 percent to tax revenues. This is above the average for countries with a similar per capita income.

Tariffs also play a second important role, namely protection, which allows the government to use tariffs to allocate resources and impact export competitiveness. Tariffs create a gap between the world price of a product and its domestic price and that of local substitutes, affecting resource allocation in both production and consumption by raising the price of imported goods relative to those produced locally. This distortion creates incentives to allocate resources into the domestic economy rather than for production for export markets where they would get world prices that are lower than in local markets. Hence, creating a bias against exports with the duty on imports becomes a tax on exports.[4]

Pakistan also has a high differential between tariffs on consumer goods and raw materials and between intermediate goods and raw materials relative to more open economies in the East Asia Region, which participate successfully in global value Chains. This creates the well-known cascading effect and, with it, high effective rates of protection in many of Pakistan's manufacturing sectors. (see Figure 4b).[5]

What is important to note in Figure 4b is that even after cascading, the maximum tariff on consumer goods averages about 13 percent. This becomes relevant in our subsequent discussions and the importance of Non-tariff Measures (NTMs).

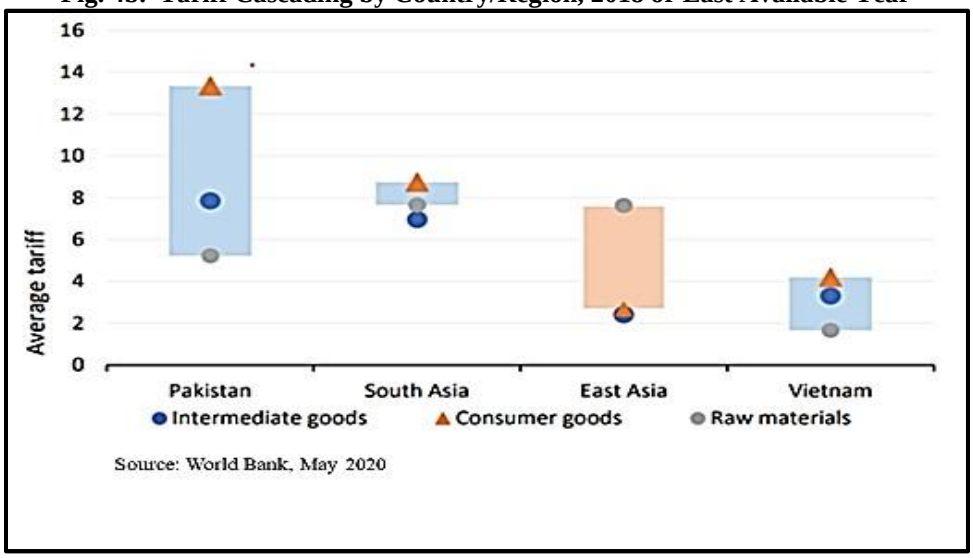
[2]Overvalued real and nominal exchange rate, an outdated trade policy, regulatory policies affecting the business environment, policy on trade services, and trade facilitation, logistics, and weakness in infrastructure.

[3]See Pakistan Economic Survey (2019) and "Pakistan Trade Strategy Development and Modernising Trade in Pakistan: A Policy Reform Handbook" World Bank, September 2019 (pages 18-19). The Handbook also argues (Pg. 19) that stagnant exports were due to an overvalued real exchange rate. This is questionable, at least in the short run, as Pakistan's exports in the first eight months of the fiscal year ending June 2020, before the onset of Covid-19, increased only 1.1 percent despite a significant devaluation (Figure 4).

[4]"Economic Policy for Competitiveness Import Duties and Performance—Some Stylised Facts for Pakistan", Varela, G. J., Gambetta, J. P., Ganz, F., Eberhard, A., Franco Bedoya, S., & Lovo, S. (2020). World Bank.

[5]Op cit.

Fig. 4b. Tariff Cascading by Country/Region, 2018 or Last Available Year



1.2. The Role and Importance of Non-tariff Measures for Trade

The internationally accepted definition of NTMs is that they are "policy measures other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, change in quantities traded, or prices or both (UNCTAD 2016)".

The following note taken from World Bank and UNCTAD provides a clear explanation about the measures included under the definition of NTMs, implications of introducing these essentially regulatory measures on trade and our daily lives, the difference between NTMs and traditional trade measures such as quotas, and the role of NTMs in sustainable development.

The definition of NTMS covers "a broad range of policy instruments including traditional trade policy instruments, such as quotas or price controls, as well as regulatory and technical measures that stem from important non-trade objectives related to health and environmental protection (Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade (TBT)).

The concept of NTMs is neutral and does not necessarily imply a negative impact on trade. Some NTMs might even have a positive effect on trade. However, many NTMs are thought to have a significant restrictive or distortionary impact on international trade regardless of whether they are applied with protectionist intent or to address legitimate objectives, such as protecting health, safety, or the environment.

Most traded goods are affected by non-tariff measures. Most NTMs are regulatory measures, while traditional trade measures such as quotas and non-automatic licensing are less common. Since most regulations apply equally to domestic products, NTMs affect most of the products that we encounter in our daily lives: packaging requirements and limits on the use of pesticides ensure safe food; restrictions on toxins in toys protect our children; mandatory voltage standards for household plugs enable regional mobility, and emission standards for cars limit climate change.

While tariffs are transparent in their intent, the role of NTMs is less straightforward. On the one hand, many regulatory NTMs are indispensable for sustainable development. They aim to protect human, animal, or plant health and the environment. These objectives are at the core of social and environmental sustainability policies, and the measures are legitimate tools in the countries' efforts to achieve the Sustainable Development Goals. On the other hand, NTMs can also raise costs and create hurdles for trade and economic development. Private sector surveys indicate that technical regulations and related processes pose a significant challenge for trade. (World Bank, UNCTAD (2018): The unseen impact of non-tariff measures: Insights from a new database.)"

Annex-1 provides the standard definition and classification of NTMs provided by UNCTAD.

A robust regulatory framework at the national and international levels can reduce the adverse effect of NTMs on trade. For example, regulatory bodies can harmonise protection policies in all countries. The cost of compliance is higher for developing countries as compared to high-income countries. Reduction in the cost of processing the regulatory requirements may reduce the adverse effect of NTMs.

An import tax is implicitly an export duty, as discussed earlier. Import restrictions (both tariffs and NTMs) by a country affect its exports through different channels, as identified in earlier studies[6]. This paper examines the export statistics and the pattern of import protection (AVEs of NTMs) in Pakistan. We find that the imports of Pakistan are highly protected, and we suggest easing the import restrictions to expand exports.

The important point to note is that NTMs inhibit imports of the home country, which obviously, also reduce the exports of the trading partner. In the same spirit, when countries to which Pakistan exports its products introduce NTMs on imports, that also reduces exports of Pakistan. The impact of NTMs on trading partners' exports has been widely discussed in the literature as discussed in the next section[7]. However, we have not looked explicitly at that issue. We are looking particularly at the effect of NTMs imposed by Pakistan, on its trade, both its imports and exports.

2. LITERATURE REVIEW

This section discusses the recent development in research related to NTMs as one of the indicators of trade protection. NTMs provide a significant measure of trade restrictiveness. The assessment of NTMs has been limited because of identification and measurement problems. Much of the past research on NTMs has been done in the form of simple indicators, which lack theoretical underpinning, or aggregate measures that fail to capture actual trade protection policies (Niu, et al., 2018, p. 676). One of the first studies to develop a quantitative methodology for defining and measuring the AVEs of NTMs (or Tariff equivalent of NTMs) based on the theoretical concept that allows an

[6]Tokarick (2006) concludes that exports expand due to elimination of NTMs on imports. Varela et.al, (2020) conclude that the aggregate export of Pakistan increased between 2005 and 2016 due to access to high quality imported inputs as a result of removal of import restrictions under free trade agreement between China and Pakistan. Another study by Amiti and Konings (2007) concludes that easing import restrictions enhances the productivity of firms, which can increase exports.

[7]For example, see Ghodsi,2020; Gourdon et al.,2020; Bao and Qiu,2012; Bratt,2017; Jordaan,2017; Ali, 2017.

assessment of overall protection and comparison with the tariff is that of Looi Kee, et al. (2009). In Pakistan's case, there is a dearth of studies discussing the AVEs of NTMs as a measure of trade protection in general, especially using the trade theory-based methodology outlined in Looi Kee, et al. (2009). Our paper intends to fill this gap.

The effect of NTM on trade depends on multiple factors. The results vary based on the types of NTMs under discussion (as some NTMs are viewed as more trade-restrictive than others), the type of product (final good or intermediate good), and the type of firm (exporter or importer). Certain kinds of NTMs, when applied on imports of final goods, may reduce imports by a more significant percentage than when applied on intermediate goods.[8] At the same time, the difference in model specification yields different results, as studied by Fugazaa and Maur (2008). Researchers have also examined the effect of specific types of NTMs on other sectors and found mixed results (Ghodsi, 2020; Webb, et al. 2020; Jafari and Britz, 2018; Yousefi and Liu, 2013; Li and Beghin, 2010; Bao and Qiu, 2012; Disdier, et al. 2008).

Kee, et al. (2009) estimate AVEs of NTMs, as a measure of trade restrictiveness indices. They were the first to develop an empirical model based on the theoretical work of Anderson and Neary (1992; 1994; 1996; 2003; 2007). Looi Kee, et al. (2009) measure the restrictiveness indices using AVEs of NTBs for 87 countries.[9] The main finding of this study is that contribution of NTBs to trade restrictiveness, in most countries, is more than that of the tariff. Their results also show that low-income countries have a more restrictive trade regime and face a higher export barrier than developed countries. Looi Kee, et al. (2009) also investigate whether the NTBs and tariffs are substitutes for each other. They conclude that after they control for country and product fixed effects, tariffs and AVEs of core NTBs were substitutes to each other.[10] Kee and Nicita (2016) also conclude that AVEs of NTMs and tariffs are substitutes. They highlight the importance of considering the AVEs of NTMs in multilateral trade negotiations.

A shortcoming of the study by Looi Kee, et al. (2009) is that it uses data from a single period of 2002, covering 87 countries that do not include Pakistan. Therefore, this study could not explain the evolution of protection from NTMs over time and the outcome for Pakistan. The study by Niu, et al. (2018) overcomes these shortcomings.

Niu, et al. (2018) build on the work of Kee, et al. (2009) and estimate the AVEs of NTM using discrete data at three years intervals from 1997-2015. Niu, et al. (2018) use a newly constructed database, UNCTAD-TRAINS, and consistently estimate the NTMs over time for 97 countries, including Pakistan.[11] Like Kee, et al. (2009), they also conclude that the evolution of overall protection is dominated by NTM protection and not by tariffs. Niu et al. (2018) also looked at the aftermath of the financial crisis in 2008 and found that AVEs and overall protection increased in the wake of the 2008 financial crisis. Although Looi Kee, et al. (2009) and Niu, et al. (2018) both conclude that low-income

[8] See Webb, et al. 2020

[9] At the time of writing of Looi Kee, et al. (2009), the UNCTAD -MAST definition and classification of NTMs didn't exist, which came in 2010.

[10] Looi Kee, et al. (2009) mention, that as anecdotally reported, constraints imposed by international or bilateral trade agreements on government ability to set tariffs may induce some countries to replace tariff with more restrictive NTBs (and vice versa) P.186

[11] Looi Kee, et al. (2009) use UNCTAD's old system of classification of NTM, called TCMS, while Niu et al. (2018) use a new system of classification, i.e., UNCTAD-MAST (see Annex-i for details).

countries generally have the highest level of NTMs protection, they do not provide details of individual countries' overall protection.

Niu, et al. (2009) also addressed how the AVE of NTMs changed in the wake of the trend towards global liberalisation and the gradual reduction in tariff, especially after the Global Financial Crisis 2008. Using frequency indices, they find that the overall incidence of core NTMs increased over the period, and technical measures were the most widely applied NTMs each year, followed by quantitative restrictions. The incidence of price control and monopolistic measures were relatively low. They conclude that overall protection was rising despite the gradual trade liberalisation associated with reducing tariffs.

Looi Kee, et al. (2009) and Niu, et al. (2018) constraint the co-efficient of core NTMs to be negative. However, some empirical studies relax this restriction and find that NTMs also have a trade-facilitating effect (Godshi, et al. 2016; Beghin, et al. 2015; Bratt, 2017; Timini and Conesa, 2018; Ali, 2019). Beghin, et al. (2015) estimate AVEs with market imperfections (externalities) in the model and find the trade-facilitating effect of NTM. They explain that the impact of NTMs is asymmetric: The same NTMs can have positive or negative impacts on different trading partners. Also, Bratt (2017) finds that NTMs imposed by importing countries tend to effect low-income exporters more than high-income exporters.

Researchers use different data and econometric methods to estimate AVEs of NTMs. Looi Kee, et al. (2009) and Niu, et al. (2018) estimate the AVEs using import values evaluated at exogeneous world prices, normalised to unity, making import quantities equal import value.[12] Kee and Nicita (2016) use bilateral trade data, using a gravity model with the quantity of imports as the dependent variable. Cadot, et al. (2018) estimate trade effects of NTMs, separating price effects from volume effects, and assert that price-based effects can facilitate trade, but the trade cost of NTMs often reduces trade volume. The price-based estimation results show that NTMs reduce information asymmetries and enhance consumers' confidence in imported products. The volume-based estimates show that trade costs from NTMs often reduce trade volume, except for the sanitary and phytosanitary areas.[13]

Cadot and Gourdon (2016) and Cadot, et al. (2018) address what they see as the limitation of Looi Kee, et al. (2009) and use unit values (equivalent to price) to estimate AVEs, without using import elasticity directly.[14] However, these two papers have significant limitations as Cadot and Guordon (2016) do not logically explain using a monopolistic competition framework for empirical analysis instead of trade theory. Also, Cadot et al. (2018) use OLS regressions without defining the theoretical framework.

A vital shortcoming of the papers by Kee, et al. (2009), Kee and Nicita (2016), and Niu, et al. (2018) is that they do not focus on streamlining the regulatory environment, an option available to countries to reduce the impact of NTMs. More recent work by Cadot,

[12]We interpret the objective of normalisation as to render the results more interpretable. Estimation is unaffected. The normalisation has the impact of changing the units in which output is measured. Doing that, quantities and values become equal in terms of numerical values.

[13]Unlike Looi Kee, et al. (2009) method of measuring AVEs using import elasticities, Cadot, et al. (2018) build on the approaches of Gruber, et al. (2016) on volumes and Cadot and Gourdon (2016) on prices in two separate sets of equations.

[14]Cadot, et al. (2018); note that one of the limitations of using trade values in the paper by Kee et al. (2009) is that trade value will not change with change in restrictiveness when import elasticity is unity. P.6.

et al. (2018) estimates the trade effects of NTMs both on trade volume and value captured in AVEs, considering the regulatory distance. One of their essential conclusions is that the regulatory differences are the key contributor to NTM-related trade costs.[15] However, they did not mention streamlining and harmonising regulations.

Other studies discussing the effect of NTMs on trade without measuring AVEs include Liu, et al. (2019. They compare the estimated export values without NTMs, with the actual export values after NTMs implementation for agri-food in African countries for 1996-2013. They conclude the actual export values after the impact of NTMs is less than the estimated values without NTMs, for developing countries. They assume that the difference between actual export values and estimated ones captures the effect of NTM on export volume. They did not calculate the AVEs of NTMs.

There has been limited research done on NTMs and their impact on trade in Pakistan. Kiyani and Shah (2014) report that Pakistan's NTBs have no significant effect on imports. They use data from 2010/2011 and therefore are unable to compare with the pre-2006 situation. Another study by Yeo and Deng (2019) finds that NTBs negatively affect Pakistan's trade with its dominant partners. However, this study uses a subjective assessment of NTBs existing in 2015, ranging from 1 (tolerant) to 7 (strict), and they also ignore the incidence of NTMs before 2006.

Some researchers discuss the relevance of NTMs in Pakistan using bilateral trade data. Pasha and Pasha (in an undated paper) discuss the trade restrictions imposed by India on Pakistan and conclude that exports of Pakistan may increase if India relaxed NTMs. However, this study is also based on outdated data and compares NTMs from 1994 to 2004, while most of the NTMs, as we explain in this paper, evolved in Pakistan after 2013. Mustafa and Qayyum (2016) assess Pakistan's export to China, evaluate the impact of TBT and conclude that TBT enforcement increases exports of Pakistan to China. However, this assessment is narrow because they consider only TBT and again do not estimate AVEs of NTMS.[16]

Another significant limitation of the above studies is that none looked at the impact of restriction posed by NTMs on services. Significant improvement in this respect is provided by Fontagne, et al. (2016), which calculates the impact of NTMs on services. They do so by comparing the cost of eight critical services in 117 countries with the most competitive cost in global markets.[17] In Pakistan's case, they estimate that the average cost of these eight critical services is increased by around 88.3 percent due to NTMs compared with 54.5 percent for Vietnam, 72.8 percent for India, and 86.6 percent for Sri Lanka. This introduces an immediate cost to the exporters of goods and services that use these services. In Pakistan's case, services account for 59.8 percent of Pakistan's overall exports when measured in value-added.[18] In this research, we focus on the tariff equivalent of NTMs of goods only. In a subsequent paper, we will study the protection given by NTMs in the service sector.

[15]The detailed methodology of measuring regulatory distance is given in Cadot, et al. (2018), Annex 6; P.29.

[16]The study uses the Tobit model and data set for the years 2002-2015.

[17]The eight services sectors are communication, construction, other business services, trade, insurance, other financial intermediation, other government services, and transport. See "Estimated Tariff Equivalents of Services NTMs", Lionel Fontagné, Cristina Mitaritonna & José Signoret; CEPII Working Paper (2016) and Website http://www.cepii.fr/CEPII/fr/bdd_modele/presentation.asp?id=33 .

[18]See "Pakistan Trade Strategy Development and Modernising Trade in Pakistan: A Policy Reform Handbook" World Bank, September 2019; P 105.

3. ESTIMATING AVES OF NTMS (TARIFF EQUIVALENT OF NTMS) AND THEIR RELEVANCE

To obtain the AVEs of NTMs, the quantity impact of NTMs and tariffs on imports is first estimated. As a second step, we transform the quantity impact into price effects, using import demand elasticities. The paper follows the methodology that Niu, et al. (2018) adopted from Looi Kee, et al. (2009).

3.1. Estimating Impact of Tariffs, NTMs, and other Protective Measures on Imports

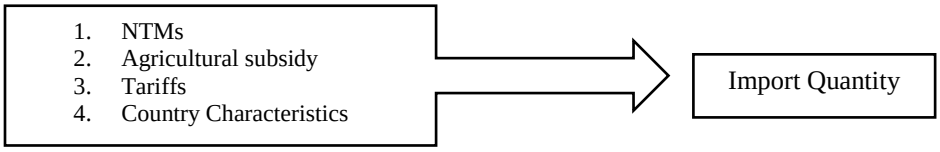
The basic equation is based on trade theory and accommodates both tariffs and NTMs in an n-good n-factor general equilibrium model.

$$\ln m_{nc} = \alpha_n + \sum \alpha_{nk} \; C_c^k + \beta_{nc}^{Core} Core_{nc} + \beta_{n,c}^{DS} \ln DS_{nc} + \epsilon_{nc} \ln(1 + t_{nc}) + k_{nc} \quad \dots \quad (1)$$

where;

- $m_{n,c}$ is the import value of good n in country c evaluated at exogenous world prices, which are all normalised to unity. As discussed in the previous section, imported quantities equal $m_{n,c}$.
- α_n is the product line intercept, which captures factors related to product n that do not change across countries;
- C_c^k are k variables that represent country characteristics
- $\alpha_{n,k}$ is the coefficient to measure the impact of country-specific characteristics
- $Core_{n,c}$ is a dummy variable for each category of core NTMs for product n in country c; it takes value 1 in the presence of the core NTMs; otherwise, it is 0.[19]
- $\beta_{n,c}^{Core}$ is a coefficient that captures the impact of the presence of core NTMs by country c and product n.
- $DS_{n,c}$ is the domestic agricultural support (subsidies) provided in dollars
- $\beta_{n,c}^{DS}$ is the coefficient that captures the effect of agricultural support by country c and product n.
- $\epsilon_{n,c}$ is the import demand elasticity, which is assumed to be constant over time
- $t_{n,c}$ is an ad-valorem tariff on good n in country c
- $k_{n,c}$ is an error term

Equation (1) represents imports as a function of NTMs, tariffs, subsidies, country characteristics, and an error term. It can be expressed in a simple, functional form as follows:



[19] NTMs are divided into core and non-core (see section 4). In this assessment, by convention, we use a limited category of core NTMs namely technical measures, quantity control measures, price measures, and monopolistic measures.

Equation (1) is modified by imposing structures on the coefficients $\beta_{n,c}^{Core}$ and $\beta_{n,c}^{DS}$ by decomposing each one into country-specific factors and product (tariff line) specific factors. This decomposition captures product and country variation and improves econometric estimation. The modified equation, shifting tariff to the left-hand side, takes the following form:

$$\ln m_{nc} - \epsilon_{nc} \ln(1 + t_{nc}) = \alpha_n + \sum_k \alpha_{nkt} C_C^k + \left(\beta_n^{Core} + \sum_k \beta_{nk}^{Core} C_c^k\right) Core_{nc} + \left(\beta_n^{DS} + \sum_k \beta_{nk}^{DS} C_c^k\right) \ln DS_{nc} + k_{n,c} \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

In Equation (2) β_n^{Core} and β_n^{DS} give the product-specific factors and $\beta_{nk}^{Core} C_c^k$ and $\beta_{nk}^{DS} C_c^k$ give country-specific factors. β_{nk}^{Core} estimates the effect of *k*th country-specific endowment on the import volume for product n in country c in the presence of a core NTM category. The co-efficient β_{nk}^{DS} measures the effect of *k*th country-specific endowment on the import volume for product n in country c with 1 percent increase in $\beta_{n,c}^{DS}$ (the coefficient for agriculture support).

An important assumption underlying the model is that theoretically, the coefficients β_n^{Core} and β_n^{DS} are expected to be negative. They can be zero if the NTM measure is not restrictive when the tariff is binding, but the unrestricted positive estimates are economically meaningless. Hence β_n^{Core} and β_n^{DS} are constrained to be non-positive. To apply this restriction in the model, exponential functions are applied to the coefficient for core NTM and domestic support. The modified equation then takes the following non-linear form:

$$\ln m_{nc} - \epsilon_{nc} \ln(1 + t_{nc}) = \alpha_n + \sum_k \alpha_{nk} C_C^k + \left(-e^{(\beta_n^{Core} + \sum_k \beta_{nk}^{Core} C_c^k)}\right) Core_{nc} + \left(-e^{(\beta_n^{DS} + \sum_k \beta_{nk}^{DS} C_c^k)}\right) ln DS_{nc} + k_{nc} \quad \dots \quad \dots \quad (3)$$

Thus, the estimate of the impact of core NTNs and agricultural domestic subsidies on imported volumes (β_n^{Core} and β_n^{DS}) is obtained by estimating (3) using non-linear least squares regression.

3.2. Estimating AVEs of NTMs and Overall Protection

We now need to obtain the tariff equivalents of NTMs, the AVEs of NTMs, to allow comparison with tariffs. This is obtained in a second step using equation (1) to transform the quantity impact of core NTMs into the impact of the core NTMs on domestic prices.

We start by partially differentiating equation 1 with respect to core NTMs, noting that p^d is the domestic price

$$\frac{\partial \ln m_{nc}}{\partial Core_{nc}} = \frac{\partial \ln m_{nc}}{\partial \ln p_{n,c}^d} * \frac{\partial \ln p_{n,c}^d}{\partial Core_{nc}} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

Re-writing Equation (4), noting that $\frac{\partial \ln m_{nc}}{\partial \ln p_{n,c}^d}$ is the elasticity of imports with respect to domestic prices, $\epsilon_{n,c}$, and $\frac{\partial \ln p_{n,c}^d}{\partial Core_{nc}}$ is the tariff equivalent of NTMs, $Ave_{n,c}^{Core}$, measuring the impact of core NTMs on domestic prices.

$$\frac{\partial \ln m_{nc}}{\partial Core_{nc}} = \epsilon_{n,c} * Ave^{Core}_{n,c}$$

Or,

$$Ave^{Core}_{n,c} = \frac{1}{\epsilon_{n,c}} \frac{\partial \ln m_{nc}}{\partial Core_{nc}} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Since the $Core_{n,c}$ is a dummy binary variable, and therefore not subject to differentiation, we obtain $\frac{\partial \ln m_{nc}}{\partial Core_{nc}}$ by taking the difference of equation 1 evaluated at $Core_{n,c} = 0$ and at $Core_{n,c} = 1$. This gives the percentage change in imports due to core NTMs (See Annex-III for mathematical proof)

$$\frac{\Delta m_{nc}}{m} = e^{\beta^{Core}_{nc}} - 1 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Where $\frac{\Delta m_{nc}}{m}$ is approximately equal to $\frac{\partial \ln m_{nc}}{\partial Core_{nc}}$.

Substituting equation (6) in equation (5), we get the following equation:

$$Ave^{Core}_{n,c} = \frac{e^{\beta^{Core}_{n,c}} - 1}{\epsilon_{n,c}} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

Equation (7) gives the instantaneous percentage change in domestic prices due to core NTMs. To estimate AVEs, we need estimates of demand elasticities of imports and $\beta^{Core}_{n,c}$. As noted above, non-linear regression estimates of Equation (3) give the estimates of $\beta^{Core}_{n,c}$.

Finally, overall protection T_{nc}, is the sum of tariffs imposed by country c on product n, t_{nc} And AVEs of NTMs imposed by country c on product n, Ave_{nc}, given as:

$$T_{nc} = t_{nc} + Ave_{nc} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

3.3. Estimating the Relevance of AVEs through the Frequency Index and Coverage Ratios

Following Nicita and Gourdon (2013), the frequency index of NTMs imposed by country j is calculated using the following equation:

$$F_{ijk} = \left[\frac{\sum D_{ijk} M_{ij}}{\sum M_{ij}}\right] * 100 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

where F_{ijk} is the frequency index for a group of products, i, in country j for a particular category of the core NTMs, k; M_{ij} is a dummy variable that indicates whether there are imports of those products, i, into country j, and D_{ijk} is a dummy variable reflecting the presence of at least one of the core NTMs in the category being considered, k, for the product group, i in country j. *The frequency index (FI) summarises the percentage of the number of imported products in the group affected by at least one category of core NTMs being considered.* The measured frequency lies between 0 and 1, and the greater the value, the higher frequency of core NTMs; in this paper, we represent the frequency index as lying between 0 and 100 percent.

The importance of NTMs on overall imports is measured using the coverage ratio. *The coverage ratio (CR) measures the share of the value of imports subject to at least one category of core NTMs being considered for a country*, with a higher value indicating greater coverage by core NTMs.

The coverage ratio formula, also adopted from Nicita and Gourdon (2013), is given as:

$$C_{ijk} = \left[\frac{\sum D_{ijk} V_{ij}}{\sum V_{ij}}\right] * 100 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (11)$$

where C_{ijk} is the coverage ratio for a group of products, i, for a particular category of the core NTMs, k, in country j; V_{ij} is the import value of these products i in country j, and D_{ijk} is a dummy variable reflecting the presence or absence of at least one category of the core NTMs in the category being considered, k, for the product group, i. in country j.

4. DATA

According to the MAST classification of NTMs, prepared by UNCTAD in 2012, there are 22 main categories of NTMs, of which 16 are related to imports.[20] If we include subcategories, there are a total of 150 NTMs. By international convention, we are focusing on core NTMs which fall under four categories: Price control measures (TRAINS M3 code F1-F3), Quantity Restrictions (TRAINS M3 code A1, B1, E1-E3, G33), Technical measures (TRAINS M3 code A, B, C), and Monopolistic measures (TRAINS M3 code H). We use the classification of NTMs developed by UNCTAD under the MAST framework outlined in Annex-1.

We are using the latest data on NTMs from the World Integrated Trade Solution database (WITS) for Pakistan for 96 product groups.[21] The latest NTM data available for Pakistan at detailed 6-digit HS product level covers NTMS introduced from 1967 to 2015. The data for 2016 is available but shows that there has been no change in 2016, and our estimates were carried out for 2015 to allow international comparison and estimates of AVEs of NTMs. It is also to be noted that there is no data available for core NTMs related to Pakistan's monopolistic measures and price controls. Therefore, our estimation is limited to only two core NTMs: technical measures and quantity control measures. The top ten most applied NTMs to imports in Pakistan in 2015 are listed in Table 1. Note that the E322 measure applied to 100 percent of all imports and was introduced in 2013 (Annex VI). The significance of this in estimating FI and CR is discussed later.

Tariff data is taken from the WITS database. The import data for Pakistan is also taken from the WITS database. Estimates of AVEs for Pakistan have been extracted from the public database created by Niu, et al. 2018.[22]

[20]See Annex IV.

[21]WITS software offers an interface that provide access to UNCTAD Trade Analysis Information System (UNCTAD-TRAIN data) and United Nations Commodity Trade Statistics (COMTRADE) at https://wits.worldbank.org/

[22]The data is available at https://www.nottingham.ac.uk/gep/links/index.aspx

Table 1

Top 10 Most Applied Non-tariff Measures on Imports in Pakistan in 2015 Listed According to Frequency Index Measured as a Percentage

	Core NTM type	FI	CR
1	**E322**. Prohibition for political reasons (embargo)	100	100
2	**B7.** Product quality, safety, or performance requirements	24.32	17.20
3	**E316**. Prohibition of used, repaired, or remanufactured goods	13.15	16.19
4	**B31**. Labeling requirements	10.49	12.15
5	**A83**. Certification requirements	9.86	4.81
6	**E129**. Licensing for non-economic reasons not elsewhere specified	7.83	25.41
7	**B33**. Packaging requirements	7.29	6.13
8	**B42**. Technical barriers to trade regulations on transport and storage	6.65	4.59
9	**B32**. Marking requirements	6.52	4.24
10	**C3**. The requirement to pass through a specified port of customs	5.50	8.46

Source: Author's calculation using WITS data (Annex V).

5. RESULTS AND DISCUSSION

5.1. Incidence of NTMs

To investigate the evolution and intensity of NTMs, we use the two measures outlined in the previous section. We start with the frequency index, which estimates the percentage of imported products in the group affected by at least one category of core NTMs.

The frequency index of quantity control measures and technical measures was estimated for 2003, 2006, and 2015 for 18 product groups as shown in Table 2. No data is available on price control and monopolistic measures for Pakistan. Also, the data shows that no new core NTMs were introduced between 2004 and 2012, and the coverage of existing NTMs in terms of products to which they apply also remained unchanged except for minor changes in 2005 and 2006 (see Annex VI and Table 4). Thus, there was no significant change in the frequency index in 2009 and 2012. Table 2 gives unweighted means for agricultural and manufacturing sectors and all sectors.

Table 2 explains important points. First, the frequency index increased substantially between 2003 and 2015, indicating an increasing number of NTMs and their coverage in terms of products they apply. The evidence shows that the increase in coverage in terms of products to which the new or existing NTMs apply was much higher than the number of new NTMs introduced each year (see Table 4 and Annex VI).

The total mean of the frequency index for quantity control measures for all products jumped from 7.6 percent in 2003 to 30 percent in 2015 on an unweighted basis. The equivalent index for technical measures also increased from 9.2 percent in 2003 to 46.9 percent in 2015 on an unweighted basis.

Second, on average, more agriculture products are subject to at least one NTM than manufacturing products. Looking at Figure 5, which gives the estimated frequency index in 2015 combining both Quantity Control and Technical Measures, on average, 85.7 percent of agriculture products are subject to at least one core NTM compared to 56.4 percent in the manufacturing sector. Within the manufacturing sector, the footwear sector has the highest frequency index of 100 percent, while the textiles sector is exposed to the second-highest level of NTM measures at 93.7 percent. Live animals have the highest frequency index of 100 percent in the agriculture sector.

Table 2

Frequency Index of Types of Core NTM Types across Economic Sectors (Percentages) (QC is Quantitative Restriction and TM Refers to Technical Measures)

	2003		2006		2015	
Industry Name	QC	TM	QC	TM	QC	TM
Agricultural Products (HS0 Industry 1-24)						
Live Animals (1-5)	9.26	74.07	16.22	77.03	81.44	100
Vegetable Products (6-14)	7.19	24.18	5.53	19.60	10.34	94.40
Fats and Oils (15)	0.00	2.70	2.86	5.71	61.76	69.70
Prepared food stuffs (16-24)	9.92	19.01	9.72	20.14	24.85	73.94
Agricultural mean	6.59	29.99	8.58	30.62	44.60	84.51
Manufacturing products (HS0 Ind. 25-97)						
Mineral products (25-27)	1.06	0.00	1.12	0.00	16.51	8.26
Chemical Products (28-38)	36.19	36.88	37.05	37.88	51.30	51.01
Rubber and Plastics (39-40)	0.00	0.00	0.00	0.00	54.37	49.51
Raw hide and skins (41-43)	0.00	0.00	0.00	0.00	0.00	0.60
Wood (44-46)	0.00	0.00	0.00	0.00	0.00	15.58
Paper (47-49)	0.00	0.00	0.00	0.00	13.33	61.48
Textile (50-63)	0.58	0.19	0.30	0.15	0.43	93.56
Footwear (64-67)	0.00	0.00	0.00	0.00	0.00	100
Stone and cement (68-70)	0.00	0.00	0.00	0.00	7.25	78.26
Base metals (71-83)	0.20	0.00	0.19	0.00	19.23	13.92
Machinery and electrical equipment (84-85)	0.00	0.00	0.00	0.26	49.27	6.09
Motor vehicles (86-89)	0.00	0.00	0.00	0.00	74.34	12.39
Optical and medical instruments (90-92)	0.00	0.00	0.00	0.00	34.00	17.00
Miscellaneous goods (93-97)	6.15	0.00	6.47	0.00	13.18	36.43
Manufacturing Mean	3.16	2.65	3.22	2.73	23.80	38.86
Mean for all Products	7.55	9.20	7.36	9.31	29.96	46.85

Source: Author's calculation based on WITS data.

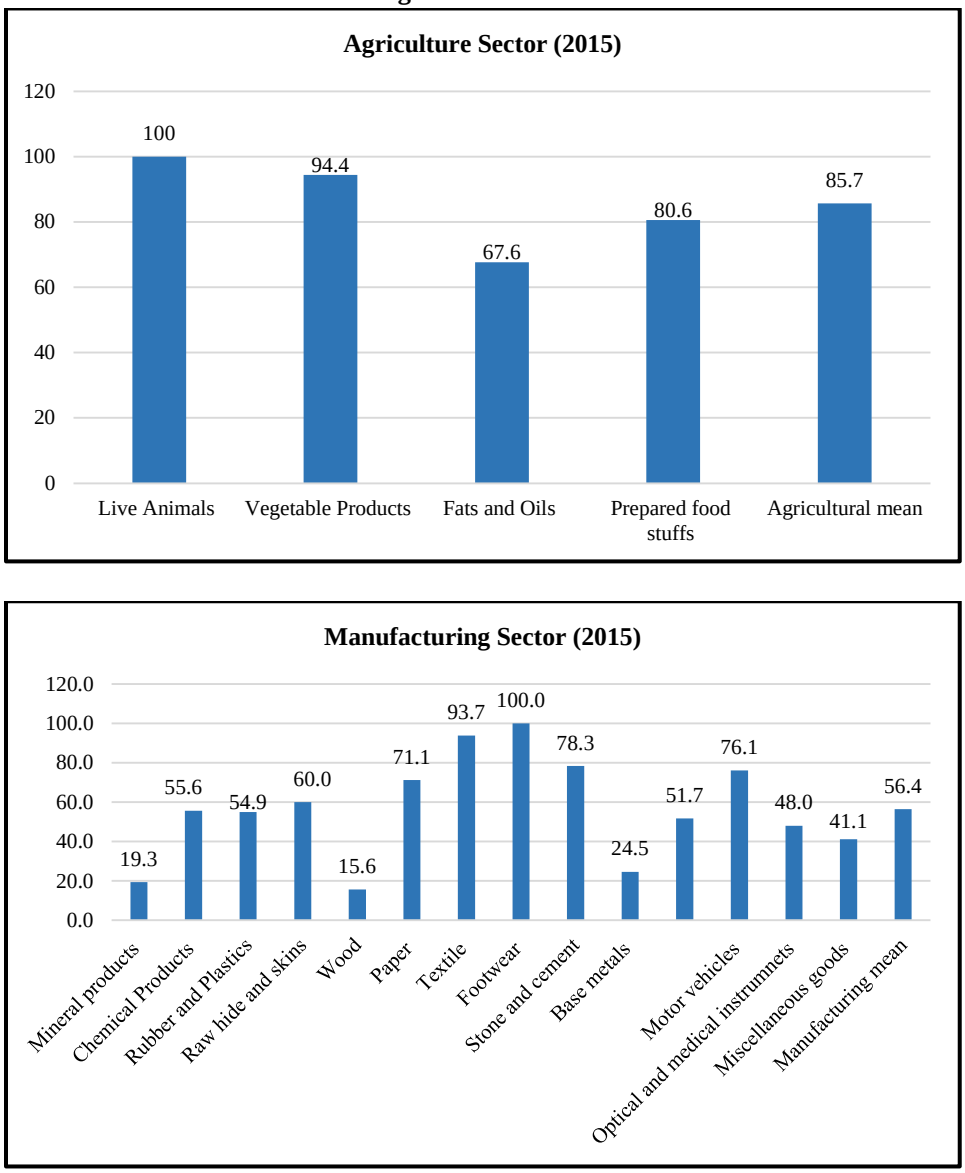
The third point is that the most widely applied NTMs across Pakistan's sectors were the technical measures. The average frequency index for all products (HS code 1-96) of technical measures is greater than quantity control measures in 2003, 2006, and 2015.

Finally, the frequency index for both quantity control and technical measures is about the same in 2003 and 2006 before increasing substantially in 2015. One major explanation is that the WITS database shows that no new NTMs were introduced between 2004 and 2012, and almost half of all NTMs (17 out of 42) were introduced between 2013 and 2015. Simultaneously, the increase in coverage in terms of products they apply in 2013-2015 accounts for about two-thirds of those in the entire period from 1967 to 2015 (12,534 out of 18,206).[23]

An important technical point is worth noting in estimating the frequency index and coverage ratio. For 2015, estimates for FI and CR exclude the E322 NTM as they apply to 100 percent of products - as noted in the data section, this NTM was first introduced by Pakistan in 2013, as shown in Annex VI. This approach is consistent with the process used by UNCTAD. If we include E322, all estimates for the frequency index and coverage ratio in 2015 would be 100 percent.

[23]See Table 4 and Annex VI.

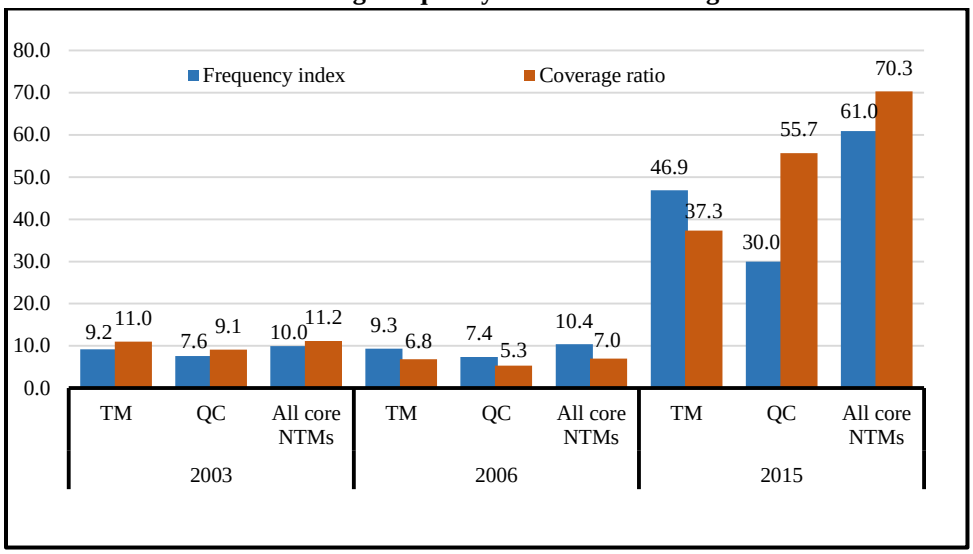
Fig. 5. Frequency Index of All Core NTMs Applied to Agriculture and Manufacturing Sector



Source: Author's calculation based on WITS data.

Figure 6 compares the incidence of different core NTMS over time using the frequency index and the coverage ratio. It clearly shows that the incidence of different types of NTMs increased substantially between 2003 and 2015 but remained relatively unchanged between 2003 and 2006. The coverage ratio, which measures the share of imports covered by different types of NTMs, is about the same level as the frequency index. It tends to be higher than the frequency index if the value of imports of the products with the NTMs being considered is higher and vice versa.

Fig. 6. Incidence of Different Types of Core NTMs Overtime for Pakistan using Frequency Index and Coverage Ratio



Source: Author's calculation using WITS data.

5.2. AVEs of NTMs (The Tariff Equivalent of NTMs)

Table 3 summarises the estimates of AVEs (tariff equivalent of NTMs) and their distribution across the sectors for the years 2003, 2006, and 2015. As can be seen, the average protection by NTMs as represented by AVEs in total jumped from about 1 percent in 2003 to 55 percent in 2015. This can also be seen clearly in Figure 7. If we compare agriculture with manufacturing sectors in Table 3, both were equally protected at about 1 percent in 2003, and this remained true in 2015: the protection provided by NTMs in the manufacturing sector (55.8 percent) is of the same order although a little higher than in the agriculture sector (45.2 percent). We arrive at a similar conclusion by comparing 2006 and 2015: NTM protection increased substantially in both sectors when looking at the average AVEs of NTMs in the two sectors and the overall mean.

Within the agricultural sector, the sectoral distribution of AVEs of NTMs indicates that fats and oils were the most protected product groups in 2003 and 2006 (10.7 percent), while in 2015 there is a substantial increase in AVEs across the board with vegetable products having the highest protection by NTMs (64.2 percent) as measured by AVEs and with live animals, the second highest at 51.5 percent.

Within the manufacturing sector, the sectoral distribution of AVEs of NTMs indicates that chemical products had the highest AVEs in 2003 at 5 percent. The picture changed substantially in 2015. AVEs increased across the board with the highest protection afforded to optical and medical instruments of 102 percent, with machinery and electrical equipment in second place with AVEs of 73 percent and rubber and plastics third at 72 percent. The textile sector, which contributes the most to Pakistan's exports, also had a high AVE of 41 percent, representing substantially increased protection compared with 2003 when the AVE was zero.

Table 3

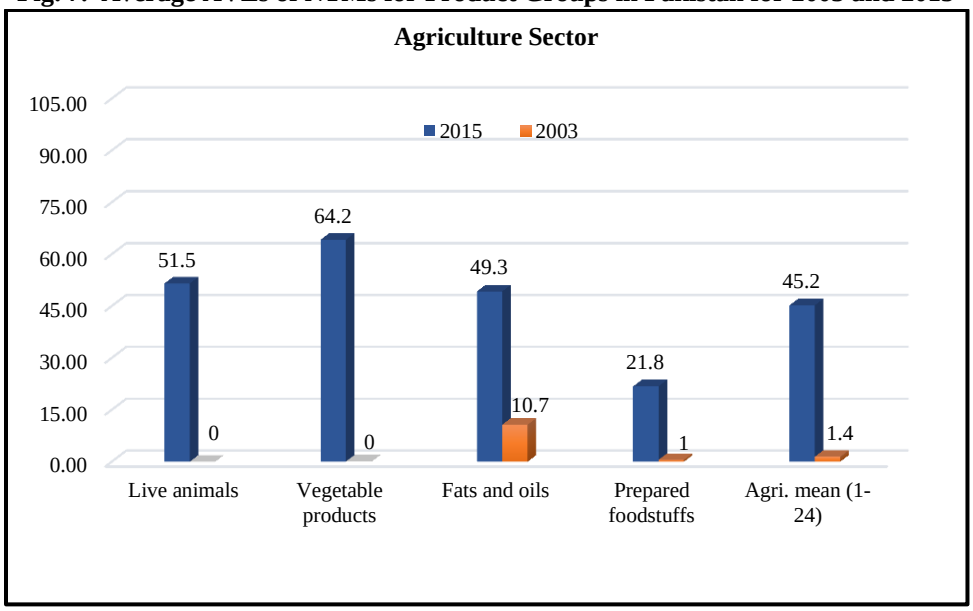
Average AVEs of NTMs (Expressed in Percentages) for Product Groups for Pakistan

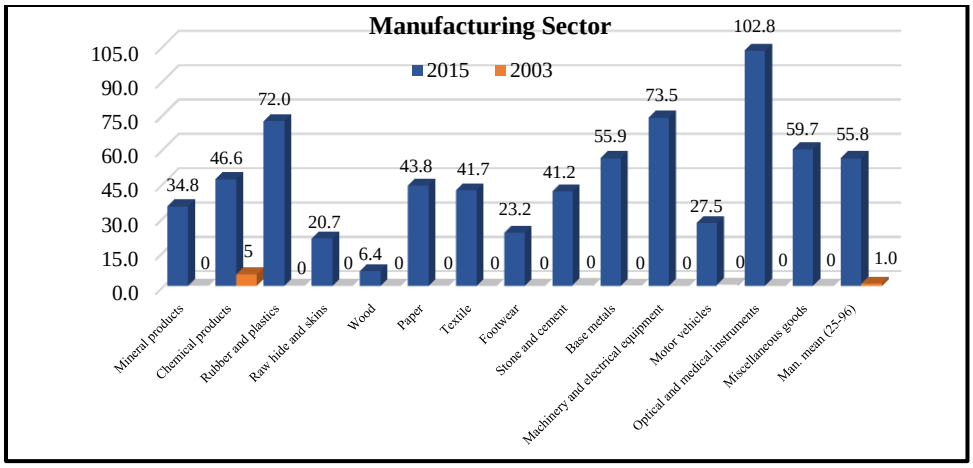
Industry Code	Industry Name	2003	2006	2015
1-5	Live animals; animal products	0.01	0.13	51.54
6-14	Vegetable products	0.08	0.10	64.21
15	Fats and oils	10.71	18.08	49.25
16-24	Prepared foodstuffs	0.54	0.39	21.78
Agricultural mean (1-24)		**1.43**	**2.20**	**45.21**
25-27	Mineral products	0.04	0.00	34.77
28-38	Chemical products	5.03	1.86	46.61
39-40	Rubber and plastics	0.02	0.00	71.95
41-43	Raw hide and skins	0.00	0.00	20.65
44-46	Wood	0.00	0.00	6.41
47-49	Paper	0.02	0.53	43.83
50-63	Textile	0.00	0.14	41.73
64-67	Footwear	0.00	0.00	23.15
68-70	Stone and cement	0.32	0.10	41.20
71-83	Base metals	0.16	0.00	55.85
84-85	Machinery and electrical equipment	0.00	0.19	73.50
86-89	Motor vehicles	0.45	0.03	27.47
90-92	Optical and medical instruments	0.00	0.00	102.76
93-96	Miscellaneous goods	0.00	0.00	59.67
Manufacturing Mean (25-96)		**1.03**	**0.44**	**55.80**
Total Mean – All Products (1-96)		**1.06**	**0.58**	**55.18**

Source: Author's estimation using data from Niu, et al. (2018).

Note: The estimated mean for the agriculture sector is the average of AVEs of all products in groups 1 to 24. This is not equal to the mean of the four product groups in the agriculture sector as they have a different number of products in each group. The same is the case for manufacturing AVEs and for the Total Mean.

Fig. 7. Average AVEs of NTMs for Product Groups in Pakistan for 2003 and 2015





Source: Author's estimation using data from Niu, et al. (2018).

If we consider the NTMs data for Pakistan in Table 4, we better understand why the AVEs increased so substantially between 2003 and 2015. First, there were no new NTMs introduced from 2004 to 2012. Subsequently, a substantial number, 17, was introduced in 2013 and 2014, representing a little less than half of 42 NTMs covering imports in Pakistan introduced from 1967 to 2015.

Second, the number of NTMs introduced each year is dominated by the coverage of products affected by NTMs. As noted above, two-thirds of the products affected by these NTMS were introduced after 2013.

Third, there is a possibility that the regulatory process was intensified with the increase in coverage and led to a higher impact on domestic prices. This is also likely, especially given that 100 percent of imports were subject to at least one NTM (E322) and thus examination by customs compared with 11.2 percent in 2003. However, we do not have any data on the regulatory process.

Table 4

*Number of New (Core) NTMs and Coverage in Pakistan (1967-2015)**

Year	Number of New (Core) NTMs	Coverage
1967	17	1875
1973	4	36
1976	1	46
1979	1	23
1980	0	1680
1986	0	150
1991	0	41
1997	1	134
2003	1	1680
2005	0	2
2006	0	5
2013	16	10953
2014	1	1144
2015	0	437
Total	**42**	**18206**

Source: Author's calculation based on WITS data.

*Coverage represents new products subject to existing or new core NTMs introduced that year.

Table 5 outlines the relative increase in AVEs between 2003 and 2015 in the case of Pakistan and comparator countries for which estimates of AVEs are available from Niu, et al. (2018). As can be seen, the relative increase in the AVEs for imported goods between 2003 and 2015 in Pakistan dwarfs the rise in India, Sri Lanka, and Vietnam. On average, for all sectors in Pakistan, the estimated AVEs in 2015 were 52 times higher than in 2003 than six times in India and 1.53 times in Vietnam and declined by 2 percent in Sri Lanka. In the case of manufacturing, AVEs in Pakistan were over 54 times the level in 2003 during this period compared with 8.6 times in India, 1.7 times in Vietnam, and unchanged in Sri Lanka.

At a minimum, this suggests that comparator countries had introduced NTMs earlier and had more time to adjust to them by streamlining the regulatory process and harmonising NTMs with trading partners, especially for exports. Pakistan is now recognising the impact of these essentially non-tariff barriers and playing catch-up late in the day.

Despite this increase or catch-up, AVEs in Pakistan were still lower than in the other three countries by 2015, representing a potential for further increases post-2015. However, suppose AVEs in Pakistan were by 2015 lower than comparator countries. In that case, it still raises the question of why Pakistan's exports were stagnating while those in comparator countries with higher protection, as measured by AVEs, flourishing?

One possible answer may lie in the enormous impact of the NTMs on services on exporters' costs. As noted above, in Pakistan's case, services account for 59.8 percent of Pakistan's overall cost of exports, and the average cost of critical services is estimated to have increased by around 88.3 percent because of NTMs. This compares with 54.5 percent for Vietnam, 72.8 percent for India, and 86.6 percent for Sri Lanka.[24]

Table 5

AVEs of NTMs between 2003 and 2015 in Comparator Countries

Country	Sectors	2003	2006	2015	2015 as a Ratio of 2003 22003*
India	Agriculture (1-24)	0.4508	0.3686	0.6807	1.51
	Manufactg. (25-96)	0.0872	0.1006	0.7458	8.55
	All Sectors (1-96)	0.1185	0.1225	0.7412	6.25
Sri Lanka	Agriculture (1-24)	0.8086	0.6527	0.5304	0.66
	Manufactg. (25-96)	0.7489	0.4526	0.7558	1.01
	All Sectors (1-96)	0.7544	0.4696	0.7405	0.98
Pakistan	Agriculture (1-24)	0.0143	0.0220	0.4521	31.62
	Manufactg. (25-96)	0.0103	0.0044	0.5580	54.17
	All Sectors (1-96)	0.0106	0.0058	0.5518	52.06
Vietnam*	Agriculture (1-24)	–	0.7195	0.6260	0.87
	Manufactg. (25-96)	–	0.4868	0.8022	1.65
	All Sectors (1-96)	–	0.5126	0.7849	1.53

Source: Author's calculation using data from Niu, et al. (2018).

*For Vietnam, we are using 2006 as the base year instead of 2003.

[24]These estimates were for 2011, and we hope to update them in a forthcoming paper.

5.3. Overall Protection

To measure overall protection, using Equation (5), we combine the data on tariffs and AVEs of NTMs. Table 6 summarises the average estimated AVEs of NTMs, average tariffs, and overall protection for 2003, 2006, and 2015. The evolution of NTMs increased significantly from 2013 to 2015. NTMs evolved as a dominant source of protection compared to the tariff for Pakistan when average tariffs were declining. In 2003 average AVEs were lower than average tariffs, but the opposite was confirmed in 2015.

Table 6

Average AVE Estimates, Tariffs, and Overall Protection (in Percentages)

	Simple Average			Import-weighted Average			
Years	AVEs	Tariffs	Overall	AVEs	Tariff	Overall	Imports (US $ Billion)
2003	1.06	16.98	18.04	1.44	16.71	18.15	13.0
2006	0.58	14.86	15.44	0.79	12.71	13.50	29.8
2015	55.18	12.73	67.91	50.83	9.58	60.41	43.9

Source: Author's calculation using import data and tariff data from WITS.

Average tariffs have been declining only slightly over the years, while the AVEs have increased several-fold in the same period. The unweighted average tariff rate fell from 17 percent in 2003 to 13 percent in 2015, but the overall protection level has been increasing. The average AVEs of NTMs increased from 1 percent in 2003 to 55 percent in 2015 and 51 percent in import weighted terms. The tremendous surge in NTMs and their coverage contributed to the increase in overall protection from 18 percent in 2003 to 68 percent in 2015. NTMs have evolved as a more important source of protection than tariffs over the years.

Thus, tariffs contributed more to overall protection in 2003 and 2006, while the opposite was in 2015. Trade liberalisation policies addressing tariffs alone may not help boost exports in Pakistan; NTMs need to be addressed. The overall level of protection is exceptionally high. It is underestimated by looking only at declining tariffs, which do not measure overall protection.

5.4. Impact of NTMs on Domestic Prices and Policy Options to Enhance Export Competitiveness—NTM Simplification

The paper confirms the price-raising effect of NTMs in Pakistan. Our analysis suggests that NTMs raise the domestic price of affected products, on average, by a considerable 55 percent. The streamlining of non-tariff measures provides the best entry door to that process by reassessing their necessity and coverage, streamlining the regulatory process, and harmonising it with trading partners. We have not looked at the NTMs imposed by the importers of Pakistan's products. Available data on five major markets to which Pakistan exports its products suggests that their AVEs also increased in

our sample period (2003-2015), which gives additional reason for export stagnation in Pakistan. For example, if we look at the AVEs of those five major export markets, based on Niu et al. (2018), we see that the AVEs of the US increased from 27 percent to 74 percent from 2003 to 2015, AVEs of Germany and the UK rose from 2 percent in 2003 to 67 percent in 2015. Similarly, the AVEs for Afghanistan and China were 57 percent and 75 percent, respectively as of 2015.[25]

This will help enhance export competitiveness, reduce the impact on domestic prices and help ease inflationary pressures, a significant concern of policy-makers.

Streamlining NTMs should not be thought of as a search for quick wins to reduce trade costs by a few percentage points, but more ambitiously in the context of a wide-ranging regulatory improvement agenda.

Consistent with Cadot's recommendations for Morocco, two crucial actions will help streamline NTMs in Pakistan.[26]

(a) A comprehensive review of existing NTM measures to eliminate the inefficient NTMs based on cost-benefit analysis.
(b) Build an effective regulatory and governance structure for the new and updated NTMs.

The government should collaborate with the private sector to conduct such reviews to gain efficiency and transparency in the system. This will reduce trade costs arising from NTMs and open doors to improving the ease of doing business. Ideally, the streamlining of NTMs should be based on "regulatory impact assessment" (RIA).

The government of Pakistan should devise policies for easing and simplification of NTMs. The benefit of doing so is well articulated by a recent World Bank blog post that emphasises the challenges faced by developing countries regarding trade costs stemming from compliance with NTMs. They report that developed countries are better able to manage NTM simplification.[27]

> *"Beyond tariffs, many goods that go through customs face myriad inspections and certifications to confirm they satisfy various safety requirements, health standards, and technical regulations…. Complying with NTMs is costly and time-consuming for both importing and exporting firms. Tariff reductions and NTM simplification are not likely to impose high costs on high and upper-middle-income countries, which account for over 90 percent of world trade.* (Looi Kee, et al. 2020)".

6. CONCLUSIONS

We explain in the paper the poor performance of exports in Pakistan and the pattern of import protection in the form of increasing core NTMs. The results help provide an alternative and convincing explanation for why Pakistan's exports have stagnated since around 2013 after growing substantially during the previous decade. While many other factors have undoubtedly contributed, as discussed in the introduction, the evidence outlined in this

[25]According to WITS data and Pakistan Economic Survey 2015, the top five countries to which Pakistan exported in 2015 are: US, China, Afghanistan, UK, and Germany.

[26]See chapter on Trade Competitiveness (by Oliver Cadot) in Country Economic Memorandum of the IDB Group for Morocco (2012) Edited by Irfan Aleem.

[27]https://blogs.worldbank.org/developmenttalk/free-trade-now-case-tariff-reductions-and-non-tariff-measures-simplifications-fight

paper indicates that the substantial increase in overall protection driven by the incidence of non-tariff measures has had a major and decisive impact. Policymakers need to focus on the rise in overall protection caused by NTMs rather than tariffs alone.

To enhance the competitiveness of Pakistan's exports, reducing tariffs, which are among the highest in the world, will undoubtedly help. However, this paper presents the urgent need to manage and reduce the impact of NTMs, which dominate overall protection, by reassessing their necessity and coverage and streamlining and harmonising the regulatory process with trading partners. This will also help reduce the impact on domestic prices and help ease inflation, a major concern of policymakers. Also, the data provided by Niu, et al. (2018) suggests that the AVEs of NTMs in Pakistan's major export markets increased significantly from 2003 to 2015. Hence, there is an urgent need to harmonise the regulatory process with these partners and improve the infrastructure to comply with international standards.

This paper investigates the evolution and intensity of NTMs in the goods sector at specific points over the period 2003-2015 for Pakistan and their impact on domestic prices. Our results show that the increasing proportion of products was subject to quantity control measures and technical measures in Pakistan from 2003 to 2015. Technical measures are the most widely applied NTMs across the sectors. The agricultural sector has a higher frequency index than the manufacturing sector; on average, 85.7 percent of agriculture products are subject to at least one core NTM compared to 56.4 percent in the manufacturing sector as of 2015.

The protection provided by NTMs as measured by AVEs significantly increased from 1 percent in 2003 to 55 percent in 2015. Within the agricultural sector, the sectoral distribution of AVEs of NTMs indicates that fats and oils were the most protected product groups in 2003 and 2006 (10.7 percent). In 2015, there was a substantial increase in AVEs across the board, with vegetable products having the highest protection by NTMs (64.2 percent) as measured by AVEs and live animals, the second highest at 51.5 percent.

Within the manufacturing sector, the sectoral distribution of AVEs of NTMs indicates that chemical products had the highest AVEs in 2003 at 5.3 percent. The picture changed dramatically in 2015. AVEs increased across the board with the highest protection afforded to optical and medical instruments of 102 percent, with machinery and electrical equipment in second place with AVEs of 73 percent and rubber and plastics third at 72 percent. The textile sector, which contributes the most to Pakistan's exports, also had a high AVE of 41 percent, representing substantially increased protection compared with 2003 when the AVE was zero.

The increased incidence of NTMs has been driving overall protection in comparison to tariffs since 2003. While average tariffs have been declining since 2003, there has been an increase in overall protection driven by NTMs. Overall protection increased from 18 percent in 2003 to 68 percent in 2015. Hence. We conclude that NTMs, a large number of which were introduced between 2013 and 2015, have evolved into a more important protection source than tariffs over the years since 2003.

The average AVEs of NTMs for Pakistan increased from 1 percent in 2003 to 55 percent in 2015. This increase is ten to thirtyfold higher than regional comparator countries and puts it at a disadvantage. At a minimum, this suggests that comparator countries had introduced NTMs earlier and had more time to adjust to them by

streamlining the regulatory processes and harmonising NTMs with trading partners, especially for exports. Pakistan is now recognising the impact of these essentially non-tariff barriers and playing catch-up late in the day.

Another exacerbating factor in Pakistan's case is the significant impact of the NTMs on services on exporters' costs. As noted above, in Pakistan's case, services account for almost 60 percent of Pakistan's overall cost of exports. The available data suggests that the average cost of key services is increased by around 88 percent because of NTMs. This estimated cost increase is much higher than for comparator countries, but these figures need updating and more investigation.

Our results are consistent with Niu, et al. (2018) that NTMs dominate the increase in overall protection compared to the tariff. A limitation of our study, perhaps more than that of Niu, et al. (2018), given our emphasis on export competitiveness, is that we have not adequately investigated the impact of NTMs on services and have only tangentially taken it into account by considering the results of other studies. This is a priority for future research, given that services account for most of the estimated costs of Pakistan's overall exports when measured in value-added.

ANNEX-I

The MAST (Multi-agency Support Team) Classification System 2012 for Non-tariff Measures

Imports	Technical Measures	A	Sanitary and phytosanitary measures (SPS)
		B	Technical barriers to trade (TBT)
		C	Pre-shipment inspection and other formalities
	Non-Technical Measures	D	Price control measures
		E	Licenses, quotas, prohibition and other quantity control measures Nontechnical measures
		F	Charges, taxes and other para-tariff measures
		G	Finance measures
		H	Anti-competitive measures
		I	Trade-related investment measures
		J	Distribution restrictions
		K	Restrictions on post-sales services
		L	Subsidies (excluding export subsidies)
		M	Government procurement restrictions
		N	Intellectual property
		O	Rules of origin Export measures
Exports		P	Export-related measures (including export subsidies)

Source: UNCTAD (2016).

Explanation: Measures are divided into two broad categories: import measures and export measures. All chapters from A to O reflect the importing country's requirements on its imports. Only chapter P comprises export measures, which refer to requirements imposed by the exporting country on its exports. Import measures can be executed or verified in either the exporting or the importing country but always relate to a condition for importing the product.

Import measures are further subdivided into technical measures and non-technical measures.

The first group is comprised of three chapters (A to C): SPS, TBT, and pre-shipment inspection, and other formalities. Non-technical measures are subdivided into twelve chapters (D to O). Export measures comprise only one chapter (P). Currently, measures falling within chapters J through O are not collected. So, the data are available on Chapters from A to I and Chapter P.

Note: Difference between regulations and measures: A regulation is a legal document issued officially by a government, such as a law, decree, or directive. An official regulation could bear several measures (or NTMs). In the classification, a measure is a mandatory trade control requirement enacted by an official regulation. Each regulation must be read to distinguish all measures within its text. All identified measures should be registered separately. In the database of Non-tariff Measures, both regulations and measures must be recorded and fully to reflect the information embedded within the legal document which is relevant to the trade requirements.

(UNCTAD, 2016, Guidelines to collect data on official non-tariff measures).

Brief Description of NTM Chapters

Chapter A, on SPS measures, refers to measures affecting areas such as restriction of substances and measures for preventing the dissemination of disease. Chapter A also includes all conformity assessment measures related to food safety, such as certification, testing and inspection, and quarantine.

Chapter B, on technical measures, refers to measures such as labeling, other measures protecting the environment, standards on technical specifications, and quality requirements.

Chapter C, classifies the measures related to pre-shipment inspections and other customs formalities.

Chapter D, price-control measures, includes measures that are intended to change the prices of imports, such as minimum prices, reference prices, anti-dumping or countervailing duties.

Chapter E, licensing, quotas, and other quantity control measures, groups the measures that have the intention to limit the quantity traded, such as quotas. Chapter E also covers licenses and import prohibitions that are not SPS or TBT related.

Chapter F, on charges, taxes, and other para-tariff measures, refers to taxes other than custom tariffs. Chapter F also groups additional charges such as stamp taxes, license fees, statistical taxes, and also decreed customs valuation.

Chapter G, on finance measures, refers to measures restricting the payments of imports, for example, when the access and cost of foreign exchange are regulated. The chapter also includes measures imposing restrictions on the terms of payment.

Chapter H, on anticompetitive measures, refers mainly to monopolistic measures, such as state trading, sole importing agencies, or compulsory national insurance or transport.

Chapter I, on trade-related investment measures, groups the measures that restrict investment by requiring local content or requesting that investment should be related to export in order to balance imports.

Chapter J, on distribution restrictions, refers to restrictive measures related to the internal distribution of imported products.

Chapter K, on the restriction on post-sales services, refers to difficulties in allowing technical staff to enter the importing country to provide accessory services (for example, the repair or maintenance of imported technological goods).

Chapter L, contains measures that relate to the subsidies that affect trade.

Chapter M, on government procurement restriction measures, refers to the restrictions bidders may find when trying to sell their products to a foreign government.

Chapter N, on intellectual property measures, refers to problems arising from intellectual property rights.

Chapter O, on rules of origin, groups the measures that restrict the origins of products or their inputs.

Chapter P, on export measures, groups the measures a country applies to its exports. It includes export taxes, quotas or prohibitions, and the like.

Source: (UNCTAD, 2016, Guidelines to collect data on official non-tariff measures).

ANNEX-II

Interpreting AVEs of NTMs

"The ad valorem equivalent (AVE) of an NTM is the proportional rise in the domestic price of the goods to which it is applied, relative to a counterfactual where it is not applied. It is often interpreted as measuring the distortion imposed by the NTM to the domestic economy. While this would be true in an economy characterised by pure and perfect competition and the absence of externalities or public goods, it is not true in more general – and realistic – settings.

While the term "non-tariff measures" suggests a simple parallel with tariffs, NTMs take many forms and fulfil in reality a broad range of objectives, trade and non-trade. In order to disentangle these different forms and objectives and how they map into one another, at the broadest level, two different types are usually distinguished. The first type of measures, called "non-technical", includes quantitative restrictions (QRs), price measures, forced logistics or distribution channels, and so on. The second type of measures, called "technical", includes primarily sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) measures.

Technical measures are generally imposed to address market failures such as information asymmetries or negative externalities. For instance, the distribution of counterfeit drugs has a large negative impact on public health. Inspection and testing requirements on imported drugs are NTMs, and depending on how heavy the requirements are, they can have high AVEs on all drugs, including legal ones. Similarly, two-wheelers with two-stroke engines generate toxic smoke with adverse health effects in urban areas.

Restrictions on the importation of such products are NTMs; they can be considered, de facto, as trade restrictions when the products are not produced locally. However, the measures can be justified as correcting negative externalities, and simply interpreting AVEs as measuring distortions would be severely misleading.

Even if externalities are left aside, interpreting the AVE of a technical measure as a pure trade cost, a tradition that goes back to the work of Otsuki, Wilson and Sewadeh (2001), can be misleading. First, NTMs can alter fixed costs and can thus have different effects on small compared to large firms. For example, a non-discriminatory regulation that induces the exit of small firms, domestic and foreign alike, will alter the market structure. The induced change in market structure may leave non-exiting large firms with more market power than before, and this may apply to foreign as well as domestic firms (Asprilla et al., 2016). In that case, a rise in trade unit values may compound the effects of increased market concentration with NTM compliance costs.

Moreover, an alternative strand of work suggests that NTMs related to standards can work as market-creating "catalysts" in situations of asymmetric information (see e.g. Henson and Jaffee, 2007; Maertens and Swinnen, 2007; Xiong and Beghin, 2014). When the quality of suppliers is heterogeneous and unknown to buyers, regulations can overcome the information deficit and convey a signal that all producers conform to a certain standard, encouraging demand.2 Good regulations can facilitate trade. In such cases, NTMs affect both the product supply curve through the various costs associated with compliance and the

demand curve through signaling or "catalyst" effects. (Cadot, et al. 2018)."

ANNEX-III

Derivation of Equation (4) from Equation (1) to estimate AVEs

$$\ln m_{nc} - \epsilon_{n,c} \ln(1 + t_{nc}) = \alpha_n + \sum \alpha_{nk} C_c^k + \beta_{nc}^{Core} Core_{nc} + \beta_{n,c}^{DS} \ln DS_{nc} + k_{nc} \quad \dots \quad (1)$$

$$\ln m_{nc}|_{Core=1} - \epsilon_{n,c} \ln(1 + t_{nc}) = \alpha_n + \sum \alpha_{nk} C_c^k + \beta_{nc}^{Core} + \beta_{n,c}^{DS} \ln DS_{nc} + k_{nc} \quad \dots \quad (2)$$

$$\ln m_{nc}|_{Core=0} - \epsilon_{n,c} \ln(1 + t_{nc}) = \alpha_n + \sum \alpha_{nk} C_c^k + \beta_{n,c}^{DS} \ln DS_{nc} + k_{nc} \quad \dots \quad (3)$$

Difference of Equation 2 and Equation 3 gives:

$$\ln m_{nc}|_{Core=1} - \ln m_{nc}|_{Core=0} = \beta_{nc}^{Core}$$

Given that difference in log equals to log of the ratio:

$$\frac{\ln m_{nc}|_{Core=1}}{\ln m_{nc}|_{Core=0}} = \beta_{nc}^{Core}$$

Taking exponents on both sides gives:

$$\frac{m_{nc}|_{Core=1}}{m_{nc}|_{Core=0}} = e^{\beta_{nc}^{Core}}$$

Subtracting 1 from both sides gives:

$$\frac{m_{nc}|_{Core=1}}{m_{nc}|_{Core=0}} - 1 = e^{\beta_{nc}^{Core}} - 1$$

$$\frac{\Delta m_{nc}}{m} \simeq e^{\beta_{nc}^{Core}} - 1 \quad \dots \quad (4)$$

Equation (4) states that the coefficient of core NTMs minus 1 gives the percentage change in imports due to core NTMs.

This implies that the exponential of the coefficient on Core NTBs, β_{nc}^{Core}, minus 1 will give us the instantaneous percentage change in imports due to Core NTBs.

Note that the above mathematical proof is not provided in Looi Kee, et al. (2009) and Niu et al. (2018).

ANNEX-IV

Box- 1

Categories of NTMS by UNCTAD-MAST Classification and Available at WITS

A - Sanitary and Phytosanitary Measures

(1) A1 - Prohibitions/restrictions of imports for SPS reasons
(2) A3 - Labelling, marking, and packaging requirements
(3) A8 - Conformity assessment related to SPS

B - Technical Barriers to Trade

(4) B1 - Import authorisation/licensing related to TBT
(5) B3 - Labelling, marking, and packaging requirements
(6) B4 - Production or post-production requirements
(7) B8 - Conformity assessment related to TBT

C - Pre-shipment Inspection and other Formalities

(8) C3 - Requirement to pass through the specified port of customs

E - Non-automatic Import Licensing, Quotas, Prohibitions, Quantity-control Measures, and other Restrictions other than SPS or TBT Measures

(9) E1 - Non-automatic import-licensing procedures other than authorisations covered under SPS and TBT chapters
(10) E2 - Quotas
(11) E21 - Permanent
(12) E3 - Prohibitions
(13) E31 - Prohibition for economic reasons
(14) E32 - Prohibition for non-economic reasons

F - Price Control Measures including Additional Taxes and Charges

(15) F8 - Decreed customs valuations

J - Distribution Restrictions

(16) J2 - Restrictions on distribution channels

P - Export Related Measures

(17) P1 - SPS and TBT related export measures
(18) P16 - Conformity Assessment
(19) P162 - Inspection requirement
(20) P3 - Export-license, -quota, -prohibition and other restrictions other than SPS or TBT measures
(21) P31 - Export prohibition
(22) P33 - Licensing, permit, or registration requirements to export.

Source: WITS.

ANNEX-V

Core Non-tariff Measures Introduced in Pakistan and Coverage by Products (2015)

NTM- Description	NTM Code	Core NTM Coverage
Prohibitions for sanitary and phytosanitary reasons	A11	1,378
Geographical restrictions on eligibility	A12	12
Authorisation requirement for sanitary and phytosanitary reasons for importing certain products	A14	443
Prohibitions or restrictions of imports for sanitary and phytosanitary reasons, not elsewhere specified	A19	7
Labeling requirements	A31	540
Packaging requirements	A33	1
Microbiological criteria of the final product	A41	1
Hygienic requirements not elsewhere specified	A49	1
Cold or heat treatment	A51	2
Fumigation	A53	209
Storage and transport conditions	A64	1
Testing requirements	A82	358
Certification requirements	A83	2,102
Inspection requirements	A84	471
Origin of materials and parts	A851	41
Distribution and location of products after delivery	A853	41
Quarantine requirements	A86	684
Tolerance limits for residues of or contamination by certain substances	B21	2
Labeling requirements	B31	621
Marking requirements	B32	336
Packaging requirements	B33	417
Technical barriers to trade regulations on transport and storage	B42	342
Product quality, safety or performance requirements	B7	1,185
Product registration/approval requirements	B81	111
Certification requirements	B83	221
Inspection requirements	B84	48
Pre-shipment inspection	C1	19
The requirement to pass through a specified port of customs	C3	368
Other formalities not elsewhere specified	C9	520
Non-automatic import-licensing procedures other than authorisations covered under A11 and technical barriers to trade	E1	254
Licensing for non-economic reasons	E12	8
Licensing for religious, moral, or cultural reasons	E121	23
Licensing for non-economic reasons not elsewhere specified	E129	478
Quotas Permanent	E21	9
Full prohibition (import ban)	E311	28
Prohibition of used, repaired, or remanufactured goods	E316	590
Prohibition for economic reasons not elsewhere specified	E319	6
Prohibition for non-economic reasons	E32	214
Prohibition for religious, moral, or cultural reasons	E321	65
Prohibition for political reasons (embargo)	E322	5,992
Prohibition for non-economic reasons not elsewhere specified	E329	54
Authorisation linked with non-official foreign exchange	G33	3
Total	-	18,206

Source: Author's calculation based on data from World Integrated Trade Solution (WITS).

ANNEX VI

Core NTMs Introduced Each Year, and the Coverage in Terms of New Products Subject to Existing and New Core NTM

NTMCode	1967	1973	1976	1979	1980	1986	1991	1997	2003	2005	2006	2013	2014	2015	Total
A11	42	0	0	0	0	0	0	0	0	0	0	1,120	216	0	1,378
A12	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12
A14	436	0	1	0	0	0	0	0	0	1	0	5	0	0	443
A19	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7
A31	0	0	0	0	0	0	0	0	0	0	0	540	0	0	540
A33	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A49	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
A51	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
A53	209	0	0	0	0	0	0	0	0	0	0	0	0	0	209
A64	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A82	0	0	22	0	336	0	0	0	0	0	0	0	0	0	358
A83	353	0	22	0	336	0	0	0	0	0	0	503	888	0	2,102
A84	135	0	0	0	336	0	0	0	0	0	0	0	0	0	471
A851	41	0	0	0	0	0	0	0	0	0	0	0	0	0	41
A853	41	0	0	0	0	0	0	0	0	0	0	0	0	0	41
A86	208	0	1	0	336	0	0	0	0	0	0	28	0	111	684
B21	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
B31	41	6	0	0	0	75	41	0	336	0	0	122	0	0	621
B32	0	0	0	0	0	0	0	0	336	0	0	0	0	0	336
B33	0	6	0	0	0	75	0	0	336	0	0	0	0	0	417
B42	0	6	0	0	0	0	0	0	336	0	0	0	0	0	342
B7	0	0	0	0	0	0	0	0	0	0	0	1,079	0	106	1,185
B81	0	6	0	0	0	0	0	0	0	0	0	105	0	0	111
B83	0	0	0	0	0	0	0	0	0	0	5	101	9	106	221
B84	0	0	0	0	0	0	0	0	0	0	0	48	0	0	48
C1	0	6	0	0	0	0	0	0	0	0	0	0	9	4	19
C3	177	0	0	0	0	0	0	0	0	0	0	191	0	0	368
C9	136	0	0	0	336	0	0	0	0	0	0	48	0	0	520
E1	0	6	0	0	0	0	0	0	0	0	0	129	9	110	254
E12	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8
E121	0	0	0	23	0	0	0	0	0	0	0	0	0	0	23
E129	0	0	0	0	0	0	0	134	336	1	0	7	0	0	478
E21	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
E311	0	0	0	0	0	0	0	0	0	0	0	28	0	0	28
E316	0	0	0	0	0	0	0	0	0	0	0	590	0	0	590
E319	0	0	0	0	0	0	0	0	0	0	0	2	4	0	6
E32	0	0	0	0	0	0	0	0	0	0	0	214	0	0	214
E321	0	0	0	0	0	0	0	0	0	0	0	65	0	0	65
E322	0	0	0	0	0	0	0	0	0	0	0	5,992	0	0	5,992
E329	44	0	0	0	0	0	0	0	0	0	0	10	0	0	54
G33	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Total	1,875	36	46	23	1,680	150	41	134	1,680	2	5	10,953	1,144	437	18,206

Source: Author's calculation based on data from World Integrated Trade Solution (WITS).

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Experimental Evidence on Public Good Behaviour across Pakistan's Fractured Educational System

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This paper investigates how Pakistani higher education students from different social strata act within the context of a game that allows for cooperation and punishment. Findings reveal that both female and male madrassa students are the most generous players. Moreover, there is more gender and social consciousness in male students than female students when deciding to penalise or not. Male madrassa students penalise female students more than male higher-income students; moreover, elite male students penalise male madrassa students more heavily than fellow elite students. The latter result suggests the presence of *spite* among elite boys towards high contributors if they belong to another social class/group. This research helps us break from social stereotypes that depictlower-income madrassa students as particularly intolerant of other social groups.

JEL Classification: C71, C90, D91, Z12, Z13
Keywords: Higher Education, Madrassas, Public Goods Game, Social Stratification.

1. INTRODUCTION

Pakistani society is fractured across economic, political, and linguistic dimensions. These fractures have manifested in an unequal education system with three different streams of education: high-income (elite) private universities, middle-income public and private sector colleges/universities, and madrassas. This educational system, in turn, also reinforces these inequalities. In this paper, I investigate how the resulting distinct identity groups influence behaviour, where identity is a multi-layered concept, incorporating a social dimension (class and gender) and has ideological (religious and educational) and linguistic dimensions. The students from the three education streams are proxies for three identity groups that capture some of the schisms segmenting today's Pakistan. In this paper, I focus on how these different identity groups interact both within each group and amongst these groups. More specifically, the chapter explores how Pakistan's fractured society impacts the way in which its different identity groups choose to cooperate and punish each other.

While the existing experimental literature in the Pakistani context has used dictator games to measure trust (Delevande and Zafar, 2011), this paper uses the public goods game to measure cooperation. I also go one step further by including the option to punish in the second stage of the game, thus allowing the players to interact—an opportunity not allowed in existing experimental studies on Pakistan. I move this literature forward in the

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context of Pakistan by investigating the following questions: (1) Does cooperative behaviour differ across these different groups? (2) Does the propensity to punish vary across these groups? (3) Does the behaviour vary within identity groups, depending on the respective identity group one is interacting with. Moreover, my sample of students includes female madrassa students (a group not included in the existing studies), which allows us to understand the gender dimension better.

I find that madrassa students are more generous and cooperative than both public/private university students and high-income private university students, even if they exhibit some intolerant attitudes in the detailed questionnaire. Public/private university students seem to want to hold onto resources for themselves and are less cooperative than madrassa students. High-income students are generous and cooperative, but exhibit a different kind of selfishness; they want to be associated with such benevolence themselves to the exclusion of others.

When I look across the gender dimension, I find that female students are less likely to punish than males, suggesting that it is easier for women of different identity groups to coexist than men. In contrast, male madrassa students, exhibited more punitive behaviour towards women, while high-income male students punished females less, showing a decline in the propensity to punish females as one moves along the spectrum from madrassa students towards high-income private university students.

2. BACKGROUND

Identity formation itself is a dialectical relationship between the individual and society. To understand the group identities that have segmented Pakistani society, we need to understand its history as the seeds of stratification were present in its very genesis.

2.1. State Formation as Distinct from National Identity Formation

Pakistan, for much of its history, has been a state searching for a national identity. Post-colonial theorists argue that post-colonial states such as Pakistan, which arrived at independence without a prolonged struggle, emerged as divided states. In the words of Vali Nasr, Pakistan emerged as a weak state, with a weak notion of nationality—a state that was "literally conceived of at the moment of birth" (Nasr, 2001). Pakistan, according to Nasr, "was not forged through the crucible of the struggle for independence, but was rather handed down as a result of intricate negotiations over power between future leaders, colonial powers and various ethnic and social groups" (Nasr, 2001, pg 25). Therefore, since conception, it has been an insecure state with a weak notion of nationhood.

2.2. The Colonial Experience

The British colonial policy had discouraged national identity formation but encouraged sub-national identity consciousness through its policy of indirect rule, supporting local landed/tribal elites. Jinnah had used these very feudal power structures to garner support for Pakistan, which ensured their continuation post-independence. Pakistan also inherited an equally patriarchal bureaucratic and military elite who had until recently been in the service of the British Raj. Hence, the state did not replace the colonial state so much as it took over its operations (Alavi, 1972).[1] In using these very

[1]Hamza Alavi, aptly dubbed Pakistan a "vice-regal" state—a state that continued to be ruled by the "salariat" in power: the military, bureaucratic and landed elite that continued its pre-colonial administrative practices.

intermediaries in his struggle for the Muslim national movement, uniting them under the umbrella of Islamic universalism, Jinnah made these social structures even more firmly embedded in what emerged as the state of Pakistan.

2.3. The Continued Use of Religion

Given the role of religion in its very genesis, this state, divided along multi-lingual and multi-ethnic lines, with a weak centre with only limited ability to assert its authority, continued its tendency to appeal to religion to overcome its limitations. The authoritarian state attempted national integration through the use of religion as early as 1962.[2] But, it was in the 1970s, under Bhutto and then Zia, religion took its place in the public sphere, and the colonial state was repackaged as the Islamic Republic of Pakistan. [3]

2.4. A Linguistically Fractured Society

During the struggle for independence, besides religion, the language had also become an identity marker, with Persianised Urdu being associated with Muslim identity and Sanskritised Hindi with Hindu identity. While language has often been associated with national and regional/ethnic identity formation, in the case of the Indian Subcontinent, language also became associated with *religious* identity. Thus, it is not surprising that at the time of Pakistan's creation, Urdu acquired the status of *lingua franca*, the national language, with the view to unifying an ethnically heterogeneous multi-lingual population.[4]

However, note that while the ruling party has ostensibly supported Urdu because of its integrative value as a symbol of Pakistani national identity, as opposed to ethnic identity, in the formal official domains, it continued to support English because it is English that ensures its social distinction from the non-elite; facilitates the entry of members of its own class, including the younger generation, into elitist positions.

2.5. Gender, Islam, and Militarisation

In its early decades, despite Pakistan's oscillation between democracy and authoritarian rule, it saw the adoption of a liberal and modern agenda with regard to women. [5] However, in the late 1970s, Zia (1979-88) categorically and ideologically challenged the liberal agenda of his predecessors: Religious discourse was used to subdue the populace: especially women were a target of this strategy.[6] Post Zia, although women have regained many of their legal rights, including the passage of the "Prevention of anti-

[2]Ayub Khan declared that "it is immaterial whether you are a Bengali or a Sindhi, a Balochi or a Pathan or a Punjabi—we are all knit together by the bond of Islam."

[3]Bhutto's focus was mainly on Islamic symbolism, measures mainly designed to placate the Islamaic ulema and gain state legitimacy. But it was under Zia's martial law, that the role of religion in state affairs came into its own, and the nexus between state, religion, and the military was forged. But, the use of religion, rather than uniting a pluralistic society opened the door to new conflicting identities.

[4]However, despite the assumed integrative appeal associated with Urdu, the decision was opposed by the Bengali majority who favoured Bangla. See Murshid (1985) for a detailed account of the Bengali movement in the early 1950s which finally led to Bangla also being given the status of national language.

[5]Under the Family Law, 1961, women gained inheritance right to agricultural land, right to initiate divorce, and a system of marriage registration was introduced.

[6] Regulations were introduced, including the law of evidence, which reduced the woman to half of a man in legal forums, accompanied by a state-sponsored media campaign promoting the "four walls and the veil" ideology that emphasised women's place in the home.

Women Practices Act 2011", but *wani* and honor killings still exist, property rights are not always enforced, and issues related to women's mobility and economic empowerment, remain highly contested terrains.

2.6. Post-Independence Pakistan Remains a Segmented Society

Today's Pakistan is still segmented along provincial, linguistic, ethnic, and gender divides: with growing income inequality further reinforcing these differences. Jamal (2009), based on a multi-dimensional poverty index that includes financial and human poverty, poor housing, and inadequate access to physical infrastructure, estimated that 54 percent of Pakistanis live in a state of multiple deprivations.[7] Although since then, the incidence of poverty in Pakistan has declined (24.3 percent in 2015-16), resulting in an HDI of 0.562. However, once this index is adjusted for inequality, it falls to 0.387, a loss of 31 percent due to inequality.

2.7. Political, Social, and Economic Fractures Reflected in a Hierarchical Education System

As we retraced Pakistan's historical journey above, along political, social, and economic dimensions, it reveals how a weak center used language and religion to unite an ethnically diverse society. This journey has manifested into a polarised society, which is reflected in the form of four distinct schooling streams, separated along class lines, and representing a fractured educational culture: higher income classes attend the elite English medium schools, middle and lower middle class students attend public schools or the non-elite private schools, while the poorest of the poor end up in the madrassas. These distinct schooling streams have further manifested in an equally hierarchical college/university system, which we narrow down into "three" identity groups: Elite English-medium universities, Middle-income public, and private sector universities, and Madrassas; and it is the students at these universities that comprise our target population.

3. OUR THREE IDENTITY "GROUPS"

To reflect the main lines of fractionalisation in Pakistan, in the experiments, we use samples of students from Private high-income Universities, Public/Private sector Universities, and Madrassas. We focus on students of 18 years and above. This is a narrow cross-section of a largely uneducated population.

Higher-income private universities in Pakistan may be compared to American Liberal Arts colleges: The curriculum is more varied, with secular programmes featuring more prominently and more likely to touch upon social and value-based concepts in a comparative fashion. The two other distinguishing characteristics are being co-educational and using English as the language of instruction rather than Urdu. Furthermore, these universities encourage independent thinking and questioning while being more open to ideas from different cultures and parts of the world. While religion

[7] At the regional level Punjab (the most populace province) dominates economically, a direct consequence of its agricultural productivity and large share of remittances from the Middle East. However, despite these advantages, according to Jamal's multidimensional index 52 percent of the Punjab population is classified poor. In comparison, 74 percent of Baloch population is classified as poor, leading to increasing resentment among the Balochis against the Punjabi dominated centre.

may be taught at these schools, it is considered in a more expansive fashion with greater room for interpretation and a greater willingness to adapt it to modern society.

Madrassas are available to the broader Pakistani population at zero monetary cost, the curriculum is narrow and pre-defined; they teach a dated curriculum with a focus on reading and memorising the Quran and other Islamic teachings in the early years, and move on to the *Dars-e-Nizami* in later years (Rahman, 2008). This curriculum draws on texts dating back to the 14th century.[8] The majority of Madrassas do not impart any secular or vocational training. Students typically come from modest origins, have limited exposure to Western ideas in school, study in Urdu, and base their studies on religious texts. As instruction is in Urdu and focused solely on religion, the ability to incorporate ideas from other sources and ideologies is limited therefore offering a limited perspective on the religion in an out-dated manner. Moreover, these campuses are strictly segregated by gender.

Public sector universities and middle-income private universities lie in the middle of this spectrum. In terms of cost, they are not as expensive as the higher-income private universities but are not free. The curriculum is more secular than madrassas and contains more practical/vocational/technical type training. Although the medium of instruction at these universities is officially English, but teachers may use Urdu during class to explain concepts. Some of the universities in this group are segregated, while some are mixed. Given this background, there is some exposure to different perspectives and debates, but with a more pragmatic curriculum, the opportunity to consider social and value-based concepts does not feature as strongly at these universities as they do at private higher-income universities. Furthermore, the students' focus at these universities is upward mobility and economic improvement rather than more philosophical or ideological thinking that would feature more strongly at high-income universities.

School Type	Private Higher Income	Public / Private Middle Income	Madrassas
Identity Characteristics			
Class	Higher income	Middle/low-income	Low income
Curriculum	Liberal Arts	Technical	Religious
Language	English	English	Urdu
Gender Segregation	Mixed	Mixed	Segregated

These three types of universities are good proxies for our three identity groups: They not only reflect three different income classes, but are also shaped by the existing fractionalisation in today's Pakistan, along the lines of language, religion, and gender, manifesting itself in a stratified education system, and this educational system, in turn, further reinforces these fractures, making it that much more challenging to create a stronger and more unified national identity despite the potentially unifying factor of religion that cuts across the three identity groups. This is due to the fact that, while there is one religion that cuts across the three identity groups, the religion means something different to each class (see discussion under descriptive statistics).

[8]The *Dars-e-Nizami* is taught for eight years following the completion of elementary school and covers religious sciences (e.g. jurisprudence, the Quran and its commentaries) and rational sciences such as Arabic grammar and literature, logic, and rhetoric (Rahman, 2008).

4. LIMITATIONS

The groups we consider are endogenous because families and individuals self-select into schools, with higher-income families choosing elite English medium schools and colleges for their children. While the humblest and poorest end up in madrassas, with public sector universities lying in the middle of this spectrum catering to low and middle-income families. We use demographic and other background information as controls in our estimation methodology to overcome possible self-selection bias. For the penalty data, however, we can arrange our data as a panel and use individual fixed effects, which helps us control for omitted variable bias.

5. LITERATURE ON GROUP IDENTITY

Since Akerlof and Kranton's seminal work on identity and its introduction in economic analysis, empirical work investigating the impact of group membership has taken the following two approaches: the first approach focuses on exogenously induced group membership, while the second approach focuses on pre-existing group membership, such as membership to different ethnic or religious communities, or economic or social class. It is the latter approach that we will be employed in this paper.

In Henrich, et al. (2005), the authors conducted ultimatum, public good, and dictator games with subjects from fifteen hunter-gatherer, nomadic herding, and other small-scale societies. They observed that local, group-level effects explain variation in behaviour better than individual-level within-group differences and report that the selfishness axiom was violated in some way in every society they studied, across all three experimental games mentioned above. Further, the experiments led the authors to conclude that societies with higher degrees of market integration and higher payoffs to cooperation in the production of their livelihood demonstrated a greater level of cooperation in the games.[9] Ostrom, et al. (1990) studied the public goods game in the developing country context and introduced the opportunity to punish free-riders by paying a fee. Individuals bore the fee, but the benefits in the form of higher contribution would go to the group as a whole. Thus, the Nash equilibrium was no punishment, but the experiment's outcome showed that there were significant levels of punishment. I focus on generosity versus selfishness and then, in the second stage, on the propensity to punish. While it focuses on Pakistani society, the study is closer in experimental design to Gachter and Herrmann (2010). To examine the impact of identity on cooperation, Gachter and Herrmann (2010) conducted public goods experiments with and without punishment using young and old participants from urban and rural Russia. They concluded that rural residents and mature participants were more generous and cooperative than urban residents and young people. The authors also observed substantial punishment of free riders and people who contributed the same or more than the punishing subject. This specific finding in Gachter and Hermann (2010) that subjects in all four groups

[9]Note that the rationale for payoffs to cooperation as an explanatory variable is that it is perceived that those societies that earn their livelihood through cooperative endeavours (e.g. whale hunting) they are more likely to cooperate in games. The rationale for market integration is that the more frequently people experience market transactions; the more they are likely to experience abstract sharing principles concerning behaviour towards strangers.

considered[rural/urban/old/young]chose to punish people who contributed more than them is similar to the higher income university males in our sample who display similar antisocial punishment of high contributors.

If we move to the context of Pakistan, Delavande and Zafar (2011), measuring trust, found that madrassa students are more trusting than higher-income students, which is in line with our finding that madrassa students are more generous than their public/private school counterparts. Still, one must note that Delavande and Zafar (2011) limited their survey to four universities in Pakistan, while the survey in this paper was far more extensive.

In contrast, Rahman (2005) conducted a qualitative survey of students from the same leading Pakistani schools as in this paper (Urdu-medium schools, elite English-medium schools, and madrassas) and questioned them about their views regarding the "Other", whether it might be religious minorities, India, or gender. Madrassa students were the most intolerant in their responses, while the private elite English medium students were more tolerant of religious minorities and advocated equal rights for women. The responses by Urdu medium students fall between these two extremes: these students were less tolerant of minorities but believed in equal rights for women.

My paper overlaps with some of the themes covered by these papers and shares some of the findings, but it goes beyond these papers by using mixed methods to understand this complex phenomenon: Firstly, taking the work of Delavande and Zafar (2011) forward, the present study focuses on the public goods game, which will allow an analysis of the level of generosity in the three identity groups. Adding a punishment element to the public goods game allows us to observe if students from different universities are more inclined to punish (even at a cost to themselves), and also to investigate if punishment varies based on the identity of the individual one is interacting with. This is important because, without the work that was conducted, it was assumed that madrassa students would be more likely to punish (due to the intolerant views expressed in Rahman 2005), but actually we found elite university males willing to punish as well. Moreover, our identity groups, comprise both males and females, and allow us to confirm if gender plays a role in either the generosity or selfishness displayed or in the capacity to punish.

6. THEORETICAL FRAMEWORK

We borrow and adapt the theoretical model presented in Delevande and Zafar (2011). This model adopts Akerlof and Kranton's utility function, which incorporates identity, but they also consider the multi-dimensional nature of identity by separately considering social identity, s, and gender, g.

We similarly consider a player with social identity, s, and gender, g. The player's, utility, $U_{s,g}$ (.) is assumed to be a function of her own payoff, and also her partner's payoff, where the partner's characteristics are (s',g'). For simplicity, utility is assumed to be linear in both the subject's payoff and her partner's payoff, which, in turn, is a function $\beta_{s,g;s',g'}$ (.). This function, $\beta_{s,g;s',g'}$ (.), depends on the characteristics of both players and captures how much a player with characteristics (s,g) values the payoff of her partner with characteristics (s',g').

This setup suggests the presence of other-regarding preferences, which, in turn, could be motivated by altruism, inequality aversion, or spite (we are agnostic about these underlying motivations and $-1 \leq \beta \leq 1$).

We assume utility to be separable in both the subject's payoff and the partner's payoff, where a, is own payoff, and b, is the partner's payoff. The utility function is then:

$$U_{s,g}(a,b) = a + \beta_{s,g;s',g'}(b)$$

Adapting this framework to our one-shot public goods game with punishment: We only play the one-shot public goods game in the first stage, while the second stage incorporates punishment.

Stage 1: The player's expected utility is given by:

$$Max_{\Pi} = E_{s,g;s',g'}\lfloor \pi_i^1 + \pi_i^2 \rfloor$$

where $E_{s,g;s',g'}$ is the player i's expectation of the payoff which depends on her own characteristics and those of her partner's.

And the payoff π_i^1 is:

$$\pi_i^1 = y - (g_i) + m \sum_{j=1}^{n} g_j$$

here,

y = initial endowment, Rs 100.
g_i = investment in public good, $0 \leq g_i \leq y$
g_j = other group members contribution to the public good, where $i \neq j$.
n=4; m = marginal per capita return from contribution to the public good.

This is followed by the second stage when players have the option to punish, and the utility function maximised now is:

Stage 2: The following function is maximised:

$$Max_{\Pi} = \pi_i^2 + \beta_{s,g;s',g'}\pi_j^2$$

where the payoff is:

$$\pi_i^2 = y - \sum_{j \neq i} P_j^i - a \sum_{j \neq i} c(P_i^j)$$

where,

y = again equals endowment.
P_j^i = amount subject *i* is punished by partner *j*.
P_i^j = amount partner *j* is punished by subject *i*.
$c(P_i^j)$ = cost to subject *i* of punishing subject *j*.

7. EXPERIMENTAL DESIGN

Participants played a standard double-blind public goods game (with punishment) within a one-shot environment: in repeated games, subjects may use sanctions to influence the behaviour of others in future rounds and not solely to sanction them for their behaviour in the current round. This one-shot environment allows us to investigate

to what extent subjects are willing to sanction others (at a personal cost) when they cannot expect to receive any benefit in the form of increased cooperation in future rounds.[10]This structure allows the study to focus on the innate propensity to cooperate or punish.

We realised that the best way for students of different identity groups to interact was to let the students play the game in their own university environment and use the cell phone to update the forms after the first stage of the experiment was complete. While the students filled out the questionnaire, the forms for the second stage (the sanctioning phase) of the public goods game were updated with each partner's contribution in the first stage.[11] There were 904 subjects, 488 madrassa students (200 female students, 288 male students), 344 middle-income universities (176 public university students, 168 private middle-income), and 72 elite private students.[12] Each experimental session lasted around 2 hours; 29 experiments were conducted in Islamabad and Lahore, from March to May 2013 and then September to December 2013.

7.1. The Experimental Setting

The instructions informed the subjects that they would be interacting with three other students and that the composition of their group would remain the same for the entire session. Complete anonymity was assured however, each player was informed of the respective gender and the type of university their group members belong to.[13]

In the first stage, each subject received an endowment of Rs 100 to be divided between two investment opportunities, labeled 'individual account' and 'group account', respectively. The individual account earned no reward to the subject investing in it, while each Rupee invested in the group account was matched by a Rupee as reward, and the total 'group account' contribution was divided equally among the four members of the group, regardless of who invested it. Thus, the Nash equilibrium is for each participant to invest his or her entire endowment in the individual account.

In the second stage, the subjects were informed of the other participants' contributions to the public account. The instructions for the second stage not only informed the students of the investment decisions of the other participants as well as to which identity group they belonged but also provided the subjects the opportunity to punish their respective participants if they were not satisfied with their contribution. The subjects were provided a further Rs. 100 for the second round. They could punish their respective group members by decreasing their earnings from the first round, but the

[10]Fehr and Gächter (2001) deal with this problem indirectly by examining a "stranger" treatment in which subjects are randomly regrouped after each round of the experiment. But, even in that case, a subject that has observed the sanctioning behaviour of others may be influenced in future rounds even if he or she will not encounter the same group members again.

[11] We faced technological problems with respect to access to the internet. We had initially planned to communicate via Skype to update forms for the second stage, however, due to weak, or absent, internet signals, in most low-income and middle-income universities, we had to update forms on the cell phone. This procedure was tedious, but within a few pre-testing rounds, the routine had become efficient, and the forms were ready much before the students completed the survey questionnaire. Each experimental session lasted around 2 hours.

[12]Note that we have relatively fewer private elite students; because of the security situation in the country we were not able to go back to the elite university for follow up experiments.

[13] Instructions and the accompanying questionnaire are available from the author upon respect.

punishment was at a cost to themselves; for instance, if a subject decreased a group member's earnings by Rs. 10, his/her own endowment was reduced by Rs. 6.[14]

Note that in the first stage, i.e. standard public goods game, complete free riding is a dominant strategy. In the second stage, punishing is costly for the punisher, and therefore, purely selfish subjects will always free ride and never punish in a one-shot context. In sharp contrast to this prediction, empirical research has found vastly different contributions and sanctioning behaviour, respectively: e.g., Gächter and Herrmann (2010). Subjects tend to punish despite the cost, and not only do subjects punish low contributors but as Gächter and Herrmann (2010) found earlier, even high contributors are punished if they are perceived as not adhering to the social norm.

7.2. Results: Descriptive Statistics

Table 1 provides statistics on economic, religious, and social factors that shape the members of the identity groups. For the purpose of descriptive statistics, the middle-income university students are disaggregated to highlight some nuanced differences. See Annexure I for additional descriptive results in Tables A1-A4.

Table 1

Summary Characteristics

	Madrassas		Public Sector Universities		Private Middle Income Universities		Private Elite Universities	
	Male	Female	Male	Female	Male	Female	Male	Female
Number of Observations	288	200	116	60	115	53	50	22
Number of Siblings (average)	7.1	6.3	5.5	4.5	4.1	4.9	3.3	3.3
% Parents own:								
Home	90.9	75.4	90.4	86.7	90.4	96.1	96.0	90.5
TV	21.0	37.7	82.5	91.7	88.3	94.1	98.0	100
Cell Phone	83.7	92.5	86.1	93.3	84.0	94.1	98.0	100
Motorbike	48.3	62.3	63.5	53.3	67.9	66.7	36.6	33.3
Car	9.7	10.6	43.5	56.7	51,0	52.9	89.8	85.7
Computer	27.4	28.1	73.0	84.5	73.2	92.2	98.0	95.5
Internet Access	8.4	9.6	56.1	78.0	67.6	84.3	98.0	95.5
Religiosity (1<Rel.<10)	8.4	7.7	5.6	5.9	5.9	6.1	5.4	5.9
No. of times pray daily (out of 5)	4.9	4.9	2.7	3.4	2.8	3.9	2.9	2.6

(i) *Exposure to Media Influenced by the Medium of Instruction*

In terms of exposure to media and education, madrassa students focus almost exclusively on Urdu newspapers. Thus, their exposure to different perspectives on religion, gender, and tolerance is very Pakistan-centric and, therefore, more limited than the other identity groups. Middle-income students are exposed to both Urdu media and read English media expanding the sources from which they draw opinions. The elite, in contrast, mostly focus on English print and electronic media shaping their views on religion, gender, and tolerance.

[14]Each student received Rs. 200 on average for the experiment. Rescaling this amount using per capita GNI numbers at PPP, this corresponds to around USD 40. Therefore, the stakes involved in the experiments were considerable. This is particularly true for the low-income students in our sample, who predominantly belong to Madrassas and who are found to exhibit the strongest cooperative behaviour. Therefore, our results cannot be attributed to the stakes being low.

(ii) ***Income Inequality***

This language divide is closely linked to the income divide: almost 83 percent of madrassa students belong to the Rs 10,000 – Rs 30,000 per month income bracket, while 53 percent of elite students come from households with income exceeding Rs 100,000/month. The middle-income students, as expected, lie in the middle of this spectrum, with private middle-income students belonging to relatively higher-income households than their public sector counterparts (see Table A3). We control for household income by using low, middle, and high household income dummies. We realise that this is household income as reported by the students and therefore is only an estimate.

(iii) ***The Political Divide***

Finally, with respect to the political divide, over 97 percent of madrassa students feel that they are first a Muslim and then Pakistani. In comparison, 62 to 65 percent of the elite think that they are first Muslim and then Pakistani (see Table A4, Annex I). Moreover, with respect to giving equal rights to minorities, we find madrassa students are much more conservative than their middle-income and elite counterparts: within the madrassa students, females are more intolerant than male students. Thus, our survey results tend to support the findings of Rahman (2005) confirming intolerance, and we extend the results to female madrassa students. Finally, with respect to giving equal rights to men and women, while we find support for equality among the elite, only 46 percent male madrassa students and 60 percent female madrassa students support equality among the two sexes (see Table A5). It is interesting that female madrassa students themselves attach less value to their rights, demonstrating evidence for Sen's work on perceptions, or in this case, self-perception (Sen, 1990).

7.3. Results: Disaggregating the Data

With respect to the first stage of the public goods game, Figure 1 presents the kernel density functions for the contribution of the three groups. The initial look at the data suggests madrassa students contribute more to the public good as compared to middle-income students, who contribute the least. Higher-income private university students also contribute substantively to the public good, but their contribution remains less than the madrassa students. Figure 2 goes on to present the kernel density functions for penalty behaviour. We mainly see low penalty behaviour, with higher-income male students punishing the most.

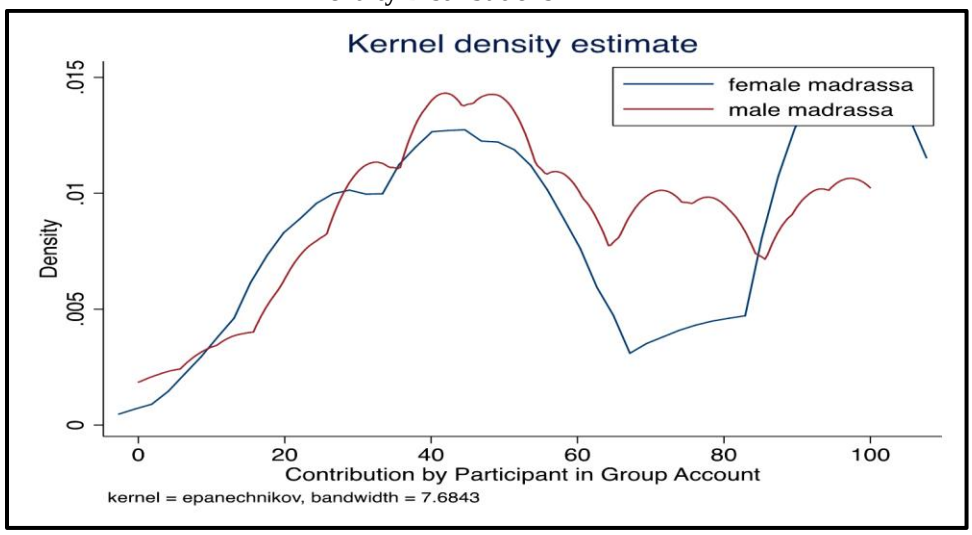
Note the two peaks in the madrassa kernel density functions (Figure 1), suggesting that madrassas as a group are not homogenous, and, therefore, we hypothesise that it is important to distinguish between progressive, well-equipped madrassas, which follow both the public-school curriculum and their own religious teachings, and more old-fashioned, cash-strapped, smaller madrassas which, in turn, are more ideological and conservative in their approach.

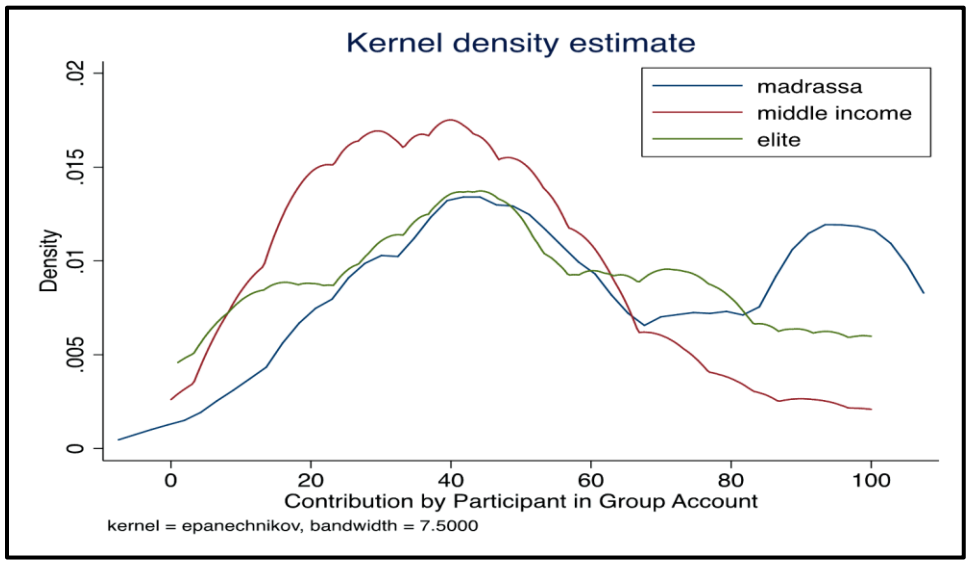
We find that the more progressive larger, better-equipped madrassas, with the dual curriculum (madrassas like IUI for boys and JUBB for girls; see Annexure 2 for a glossary of abbreviations), are less generous than their less progressive, more congested counterparts (like JMU, JUSI, and JRSL for boys, and ABB for girls), in fact, they

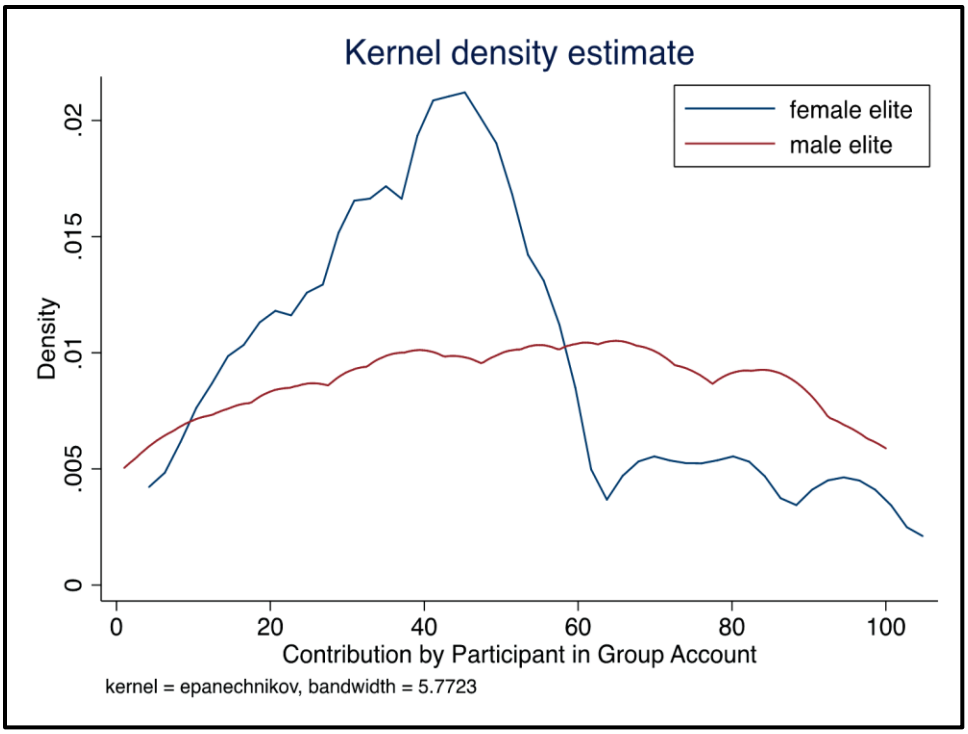
behave more like their private/public university counterparts. On average, students from middle-income madrassas, middle-income public-private universities, and elite university, are less generous than their lower-income madrassa counterparts. That is why we divide the madrassa identity group further into low-income madrassa and middle-income madrassas for analysis purposes.

With respect to penalty behaviour, our respective kernel density functions are right-skewed, reflecting the not too aggressive punishing behaviour in this sample. But, we still find distinct behavioural variations, based on gender and class. Overall, madrassa students punish the least, and elite boys punish the most.

Fig. 2.1 and 2.2. Kernel Density Functions for Contribution and Penalty Distributions






Kernel density estimate
female elite
male elite
Density
0
.005
.01
.015
.02
0
20
40
60
80
100
Contribution by Participant in Group Account
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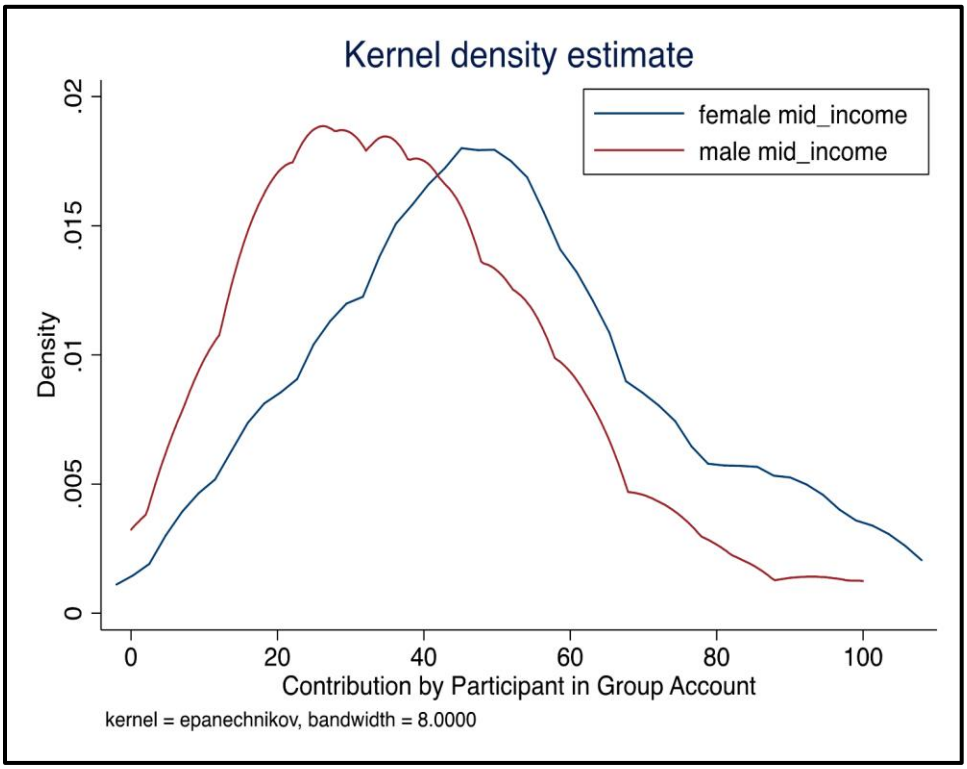
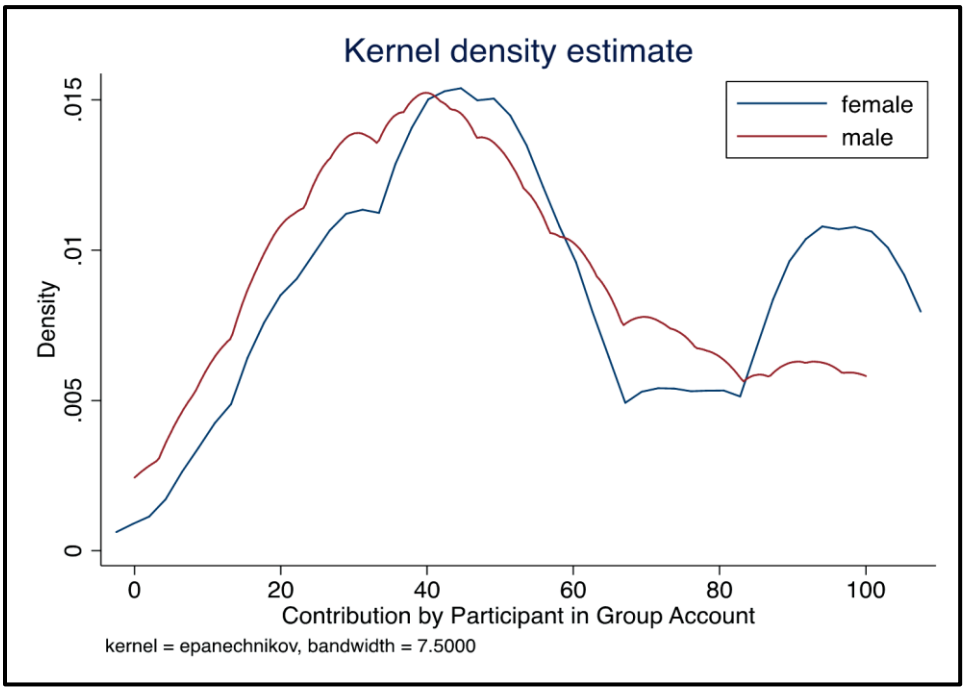
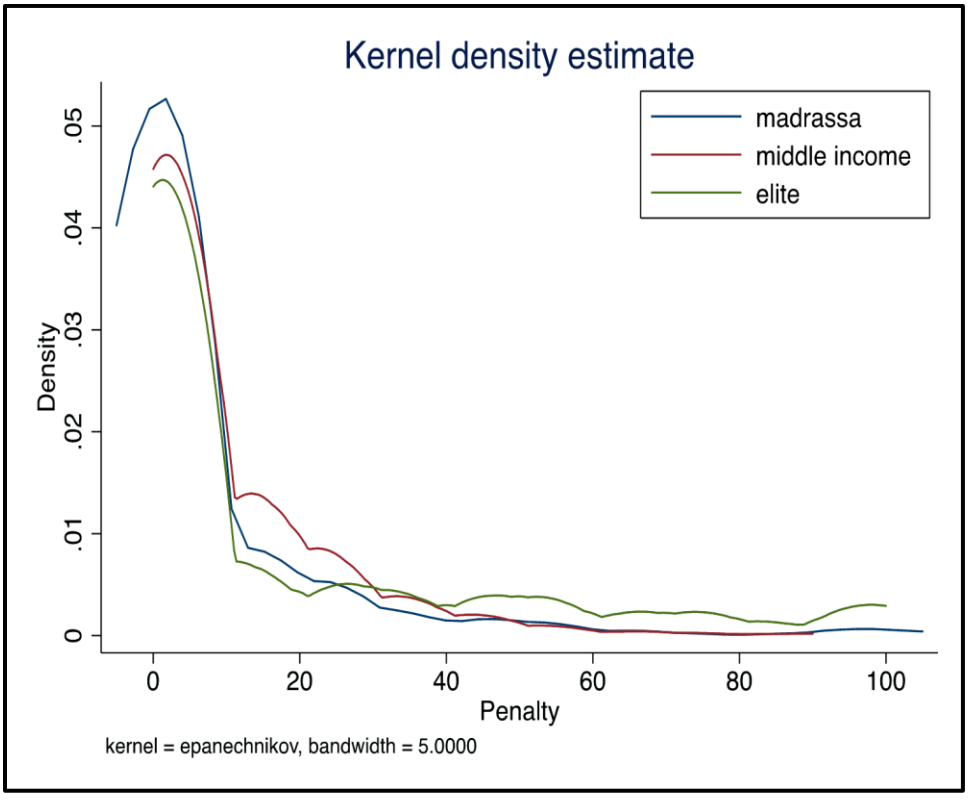

Kernel density estimate
female mid_income
male mid_income
Density
0
.005
.01
.015
.02
0
20
40
60
80
100
Contribution by Participant in Group Account
kernel = epanechnikov, bandwidth = 8.0000


Kernel density estimate
female
male
Density
0
.005
.01
.015
0
20
40
60
80
100
Contribution by Participant in Group Account
kernel = epanechnikov, bandwidth = 7.5000


Kernel density estimate
madrassa
middle income
elite
Density
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.01
.02
.03
.04
.05
0
20
40
60
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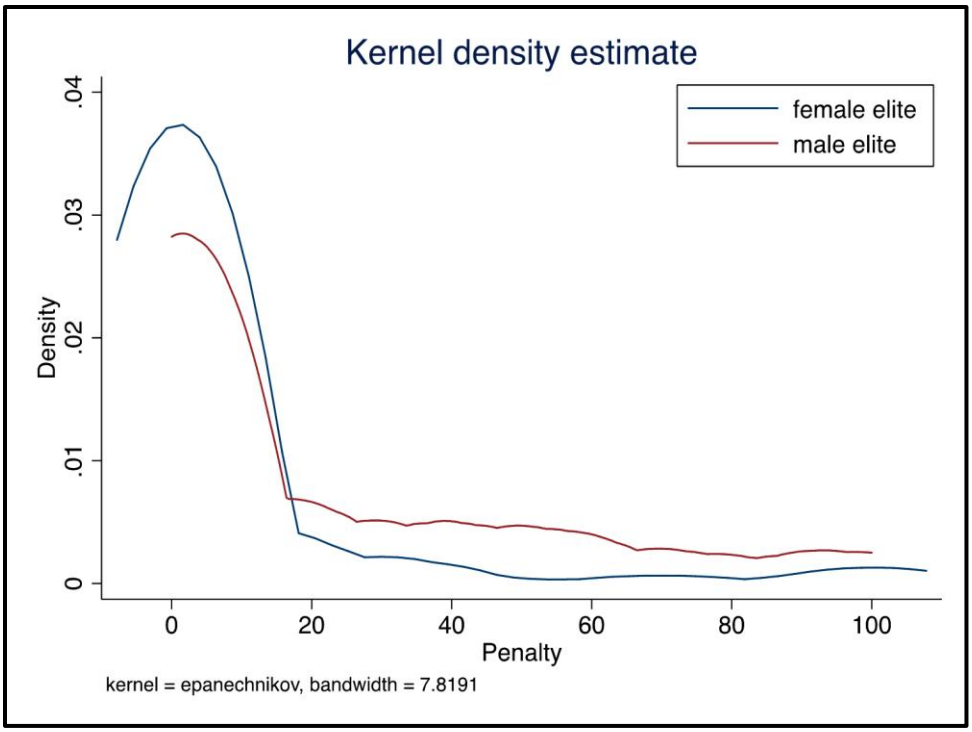
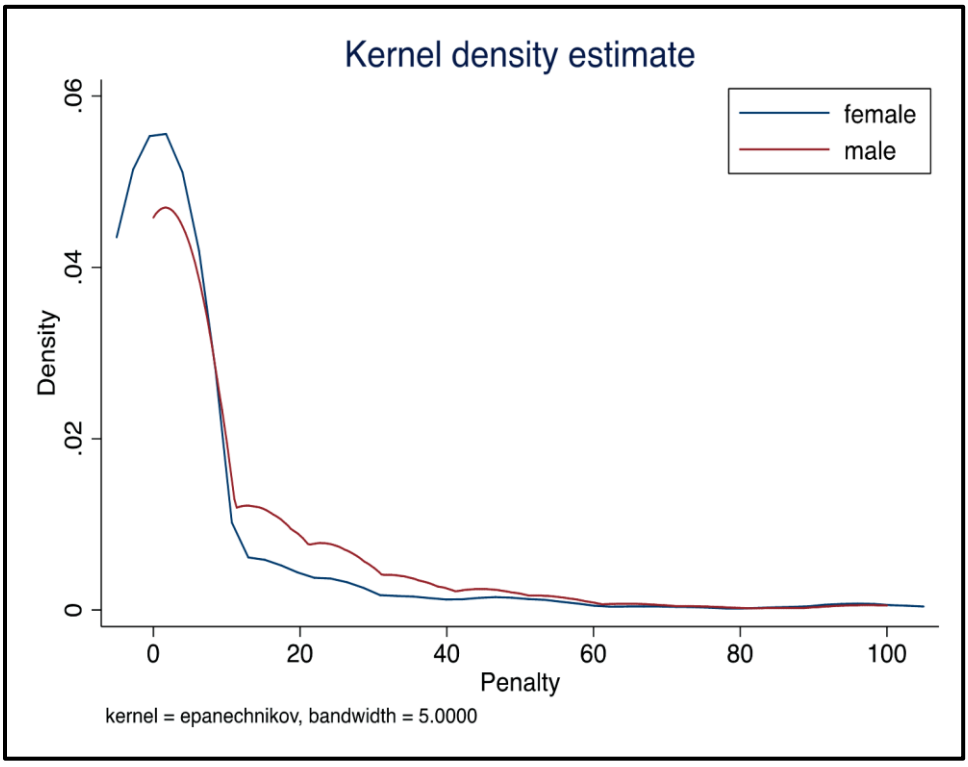
100
Penalty
kernel = epanechnikov, bandwidth = 5.0000


Kernel density estimate
female elite
male elite
Density
0
.01
.02
.03
.04
0
20
40
60
80
100
Penalty
kernel = epanechnikov, bandwidth = 7.8191


Kernel density estimate
female
male
Density
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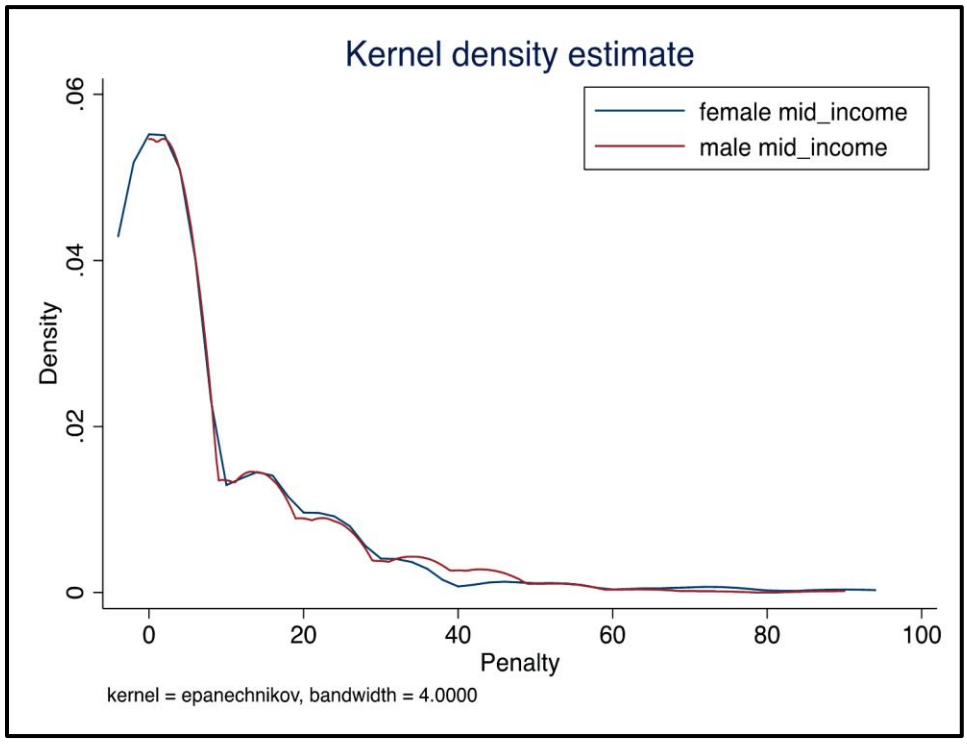
.02
.04
.06
0
20
40
60
80
100
Penalty
kernel = epanechnikov, bandwidth = 5.0000


Kernel density estimate
female mid_income
male mid_income
Density
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.02
.04
.06
0
20
40
60
80
100
Penalty
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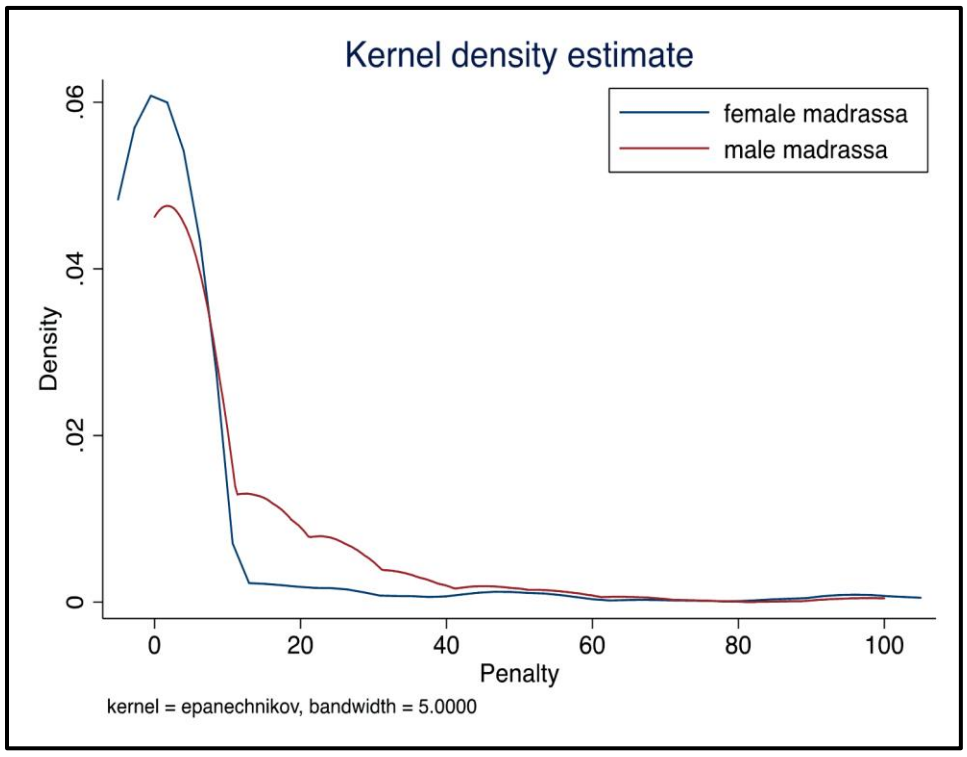
Kernel density estimate
female madrassa
male madrassa
Density
0
.02
.04
.06
0
20
40
60
80
100
Penalty
kernel = epanechnikov, bandwidth = 5.0000

8. METHODOLOGY

With respect to contribution behaviour, a Tobit model is used to investigate the individual characteristics associated with contribution to the public good. Since our data is censored, the tobit model is an inherently better model to use than Ordinary Least Square. We run separate models for male and female students. The chow test confirms that the two distributions are structurally distinct, hence the separate models.

The structural equation for the Tobit model is:

$$y_i^* = X_i\beta + \varepsilon_i$$

where yi*, contribution to the public good, is a latent dependent variable, observed for values greater than zero and censored otherwise, such that:

$$y_i = y_i^* \text{ if } y_i^* > 0$$

$$y_i = 0 \text{ if } y_i^* \leq 0.$$

Xi is our vector of explanatory variables where $\varepsilon i \sim N(0,\sigma 2)$

The first model examines the relationship between contribution to the group account (our dependent variable as defined above) and respective institutes students belong to. Our respective regression models control for income, parents' education, medium of instruction at school, and ideological variables such as number of times the respondent prays in a day and how the respondent ranks himself in terms of religiosity on a scale of 1 to 10.

With respect to penalty behaviour, we reorganise the data as a panel to capture the second stage of the experiment: We employ the fixed effects technique and observe how the same individual member's penalising behaviour changes based on her respective group member's contribution, gender, and educational institution. The data is organised such that:

(i) there are 3 observations per individual. Each of the three observations relates to one's partners (group members).
(ii) one's characteristics are repeated through these 3 observations except for 2 variables: one's penalty (it is partner-specific), and one's partners' contribution.

We have a balanced panel, with k regressors, such that: (X1it , X2it,…… Xkit, Yit) where

i = 1,...,n (no. of individuals)
t = 1,...,T (for the 3 group observations per individual)
T = no. of members in the group = 3 ; total no. of observations = 3 x n

With the panel, we can control for factors that vary for the individual but do not vary within the group, and therefore, can control for the individual type or other unobserved individual characteristics.

Table 2 represents both the variation within the group and between groups, where each group comprises 3 members, and there are 904 groups. We note that there is variation within the group with respect to both penalty behaviour (std. is 10.47) and contribution made by each respective group member (std. is 20.95).

Table 2

Summary Statistics for our Panel Data

Variable		Mean	Std. Dev.	Min	Max	Observations
Penalty	Overall	7.51	16.26	0	100	N = 2712
	Between		12.44	0	100	n = 904
	Within		10.47	–59.15	74.18	T = 3
Own Contribution to the Group	Overall	53.22	27.81	0	100	N = 2712
	Between		27.82	0	100	n = 904
	Within		0	53.22	53.22	T = 3
Contribution of Each Respective	Overall	53.21	27.81	0	100	N = 2712
Group Member	Between		18.30	11.67	100	n = 904
	Within		20.95	–12.79	111.54	T = 3

To reiterate, the fixed effects technique allows us to investigate how the same individual member's penalising behaviour changes based on who the respective individual is interacting with: her respective group member's contribution, gender, and educational institution (see Table 4).

9. EMPIRICAL FINDINGS

9.1. Cooperative Behaviour

Table 3 reports the results from the basic Tobit models used to investigate the determinants of contribution to the public good for boys and girls, respectively. As mentioned above, madrassas are differentiated into low and middle-income madrassas, and the two other broad categories of educational institutes considered were: elite and middle-income colleges/universities. The middle-income colleges are the omitted category. The main findings are summarised below:

1. ***Among our main identity groups, low-income madrassa boys and girls contribute significantly more to the group account than their middle-income public and private university counterparts.***

Looking at Table 3, we observe that the predicted contribution by madrassa boys is Rs. 20.2 higher than their middle-income counterparts, while for girls, it is Rs 32.1 higher than middle-income students. In contrast, middle-income madrassa boys contribute only Rs 7 more than middle-income private/public university students, while middle-income madrassa girls do not contribute significantly more than their middle-income university counterparts, holding all else constant.

2. ***Elite university boys also contribute significantly more than their middle-income counterparts.***

Elite university boys contribute, on average, Rs 10 more than their middle-income counterparts to the public good, holding all else constant. Thus, although elite male students contribute generously to the public good, in absolute terms, their contribution is less than the contribution by madrassa students.

Table 3

Estimating the Determinants of Contribution to the Public Good for Boys and Girls

	Tobit (1) Boys	Tobit (2) Girls
Low Income Madrassa	23.16***	39.56***
	(0.000)	*(0.000)*
Middle Income Madrassa	7.37***	0.53
	(0.004)	*(0.859)*
Elite	10.40***	– 7.83**
	(0.000)	*(0.032)*
Mother's Education	0.62	– 0.76
	(0.259)	*(0.287)*
Father's Education	1.00	– 0.10
	(0.124)	*(0.871)*
No. of Daily Prayers	1.32	–1.28
	(0.006)	*(0.105)*
Religousity	0.16	– 0.79**
	(0.429)	*(0.013)*
Low Middle Income	– 1.63	–6.18***
	(0.338)	*(0.002)*
Middle Income	0.49	– 10.70***
	(0.844)	*(0.000)*
High Income	–1.13	– 7.10**
	(0.684)	*(0.036)*
Medium of Instruction at School	5.05***	9.15*
	(0.002)	*(0.000)*
_cons	28.64***	59.72***
	(0.000)	*(0.000)*
N	569	335
_se	24.70	24.16

p-values in parentheses: = "* p<0.1, ** p<0.05, *** p<0.01."

9.2. Penalty Behaviour

As the second stage of the public goods experiment allows direct response to the respective group members' behaviour in the first stage, it allows us to not only look at how ones' own identity affects behaviour, but also how penalty behaviour may change based on the identity of the respective individual one is interacting with. We again run separate male and female models, and the data is sliced across educational institutions, which form our core social identity groups; that is, we run four separate models for boys: low and middle-income madrassa boys, middle-income public/private university boys, and elite boys, and four separate models for girls: low and middle-income madrassa girls, middle-income university girls, and elite girls (see Table 4).

Table 4

Gender and Institution Disaggregated Fixed Effects with Continuous Penalty Variable (robust std errors)

	MALE			
	Low-income Madrassa **Penalty**	Middle-income Madrassa **Penalty**	Middle-income University **Penalty**	Elite University **Penalty**
Group Member's Contribution to the Public Good	–0.004	–0.188***	–0.08	–0.1
	(0.886)	*0.000*	*(0.160)*	*(0.490)*
Madrassa	–4.625*	0.958	1.52	17.05
	(0.054)	*(0.646)*	*(0.400)*	*(0.130)*
Female	3.570*	1.902	–0.21	–16.99**
	(0.093)	*(0.509)*	*(0.880)*	*(0.050)*
constant	10.88***	15.45***	10.90***	28.19***
	0.000	*0.000*	*0.000*	*(0.001)*
N	696	168	693	150
No. of Groups	232	56	231	50
Obs. per Group	3	3	3	3
R-squared				
Within	0.03	0.21	0.02	0.02
Between	0.01	0.01	0.01	0.01
Overall	0.01	0.07	0.02	0.02
Rho	0.54	0.66	0.34	0.42
	FEMALE			
Group Member's Contribution to the Public Good	–0.065**	0.045	–0.213***	–0.09
	(0.047)	*(0.109)*	*0.000*	*(0.380)*
Madrassa	–12.254**	0.383	3.49	–4.49
	(0.041)	*(0.557)*	*(0.200)*	*(0.360)*
Female	2.362	–0.142	3.13	–1.55
	(0.587)	*(0.916)*	*(0.200)*	*(0.500)*
Constant	17.693***	–0.143	16.19***	13.86***
	0.000	*(0.931)*	*0.000*	*(0.010)*
N	234	366	339	66
No. of Groups	78	122	113	22
Obs. per Group	3	3	3	3
R-squared				
Within	0.118	0.0235	0.16	0.04
Between	0.0056	0.0035	0.01	0.01
Overall	0.0413	0.0131	0.07	0.02
Rho	0.546	0.404	0.42	0.53

Standardised beta coefficients; p-values in parentheses * p<0.1, ** p<0.05, *** p<0.0.

3. *Both low-income male and female madrassa groups penalise their fellow madrassa students less.*

The first column represents the penalty behaviour of male (upper panel, Table 5) and female (lower panel) low-income madrassa students. Remember, in this panel, all individual characteristics of the subject are repeated throughout the group and therefore drop out of the fixed-effect model: only how much the individual penalises his/her group members varies across the observations, and the partner's characteristics vary by (i) the partner's contribution to the public good, (ii) the institute the group member belongs to, and (iii) the gender of the partner.

Low-income male madrassa students penalise fellow madrassa students Rs 4.65 less than non-madrassa students, holding all else constant. While female madrassa students penalise fellow madrassa students Rs 12.25 less than non-madrassa students, holding all else constant.

4. ***Male Madrassa students play more punitively with respect to women, while elite male students punish women less.***

With respect to the penalising behaviour of male students, madrassa boys penalise female students by Rs 3.57 more than male students, holding all else constant. In contrast, elite male students penalise female students Rs 16.99 less than male students, holding all else constant.

5. ***Elite students penalise high contributors (i.e., madrassa students) more***

Elite male students may be beneficent, but they penalise madrassa students Rs 17.05 more than fellow elite or middle-income students, holding all else constant.[15] With respect to this behaviour, exit interviews reveal resentment to the high levels of the contribution made by the madrassa students.

6. ***Middle-income students penalise only based on the actions of their respective members, irrespective of their group members' class and gender identity.***

For middle-income female university students, we find that their decision to penalise mostly depends on the contribution of their partner players in the first stage, and holding all else constant, middle- income female students decrease the penalty amount by Rs 0.21, for every Rupee contributed to the public good, holding all else constant. Male middle-income madrassa students decrease the penalty amount by Rs 0.19 for every Rupee contributed to the public good, holding all else constant.

Overall, however, the magnitude of penalties remains modest for all identity groups, except elite boys who tend to punish heavily the high contributors (i.e., madrassa students). Moreover, in the exit interview, most low and middle-income students respond that they do not penalise low contributors much, not because there is a cost attached to it, but because they understand other students' income constraints and respect their choice.

10. DISCUSSION

The first stage of the public goods game investigated the tendency to cooperate and how ones' own gender and social identity affect one's behaviour. Our empirical findings suggest that with respect to cooperative behaviour, low-income madrassa students are the most cooperative: within the madrassa group, girls are more cooperative than boys. This result is in line with Delavande and Zafar (2011), and we take the empirical evidence forward by confirming their findings for both male and female madrassa students (while Delavande and Zafar only surveyed male madrassas). This

[15]Note that wrt the elite male regression, the level of significance for the madrassa dummy is 13 percent. But, especially in the case of survey data, this is an important result which warrants consideration.

result also helps break negative stereotypes about madrassas and suggests the possible presence of other-regarding preferences and generosity among these religiously inclined groups, even if they exhibit intolerant attitudes in the detailed questionnaire. Middle-income university students are the least cooperative, and as we further disaggregate the data, we find relatively more progressive male and female madrassas behaving more like their middle-income counterparts, i.e. we find the cooperative behaviour demonstrated by low-income madrassas, is gradually replaced by individualistic behaviour, as we move on to middle income students.

The second stage of the experiment allowed students to directly respond to their respective group members' first move, and we could observe how penalty behaviour varied, not only based on ones' own identity, but also how behaviour is effected by the identity (both social status and gender), and the actions of the individual one is interacting with. We find that in the case of male students, there is more consciousness with regard to both social and gender identity of the respective individual one is playing with: Male madrassa students penalise female students more than male higher-income students; Moreover, elite male students penalise male madrassa students more heavily than fellow elite students. The latter result is in line with Gächter and Herrmann (2010), and suggests the presence of *spite* among the elite boys towards very high contributors if they are members of another social class/group.

Finally, going back to Akerloff and Kranton, our results confirm that madrassa students, middle-income public/private university students, and elite university students exhibit distinct behaviour in line with their group identity than according to simplistic economic reasoning, i.e. their decision to contribute to the public good, and their decision to penalise (despite a cost attached to punishing) is not driven only by economic concerns, but by feelings of cooperation (in the first stage of the experiment) and at times resentment and even *spite* when considering punishing behaviour. Penalty behaviour also varies based on the social and gender identity of the individual they are acting with. The above is especially true for both low-income male and female madrassa students and for male elite students. In contrast, middle-income students behave more in line with the standard textbook *homo economicus* motivated largely by self-interest when we focus only on the public goods game, demonstrating the least contribution to the public good. But, when considering penalty behaviour, we observe reciprocity as their behaviour varies with the actions of fellow players' first move.

11. CONCLUSION

Our broader question at the beginning of this paper was to investigate aspects of Pakistani social stratification. We chose to examine the different behaviour of students who are in distinct higher education systems. We focus on both social status and gender, and unlike previous studies which have used games, we examine both cooperation and punishment behaviour. It is not clear why madrassa students are more generous in this public goods game than others. This might be a function of religious teachings, and this hypothesis is further buttressed by the fact that male madrassa students were more willing to punish females as compared to both public/private university students and elite students. Given the brand of religion that one would expect to find in a madrassa is more fundamental, views towards females are perhaps shaped by this education. This finding is

further supported the survey work of Rahman (2005), who initially hinted at intolerant attitudes among madrassa students. Further, although elite university students, particularly males, exhibit generosity, they also act to protect their association with generosity by punishing madrassa students that acted more generously, thus demonstrating *spite*. Lastly, the individualistic behaviour of public/private university students may be explained by the fact that public/private university students view education more instrumentally. The distinct behaviour of our three groups suggests a divided society. This result advances the experimental literature on Pakistan by noting the different results that arise once participants are allowed to interact. Further research on these questions is warranted. In particular, research design which combines the introduction of games with more intensive ethnographic research could help illuminate the reasons why behaviour varies across social identity types and gender.

The base category for educational institutes is middle-income (the dummies included are for low-income and middle-income madrassas, and elite institutes).

The base category for the income variable is (less than Rs. 30,000).

English Medium of Instruction refers to the educational background in high school.

Parents' education is a continuous variable

Male and female distributions are structurally distinct (as confirmed by the Chow test); hence, separate models are run.

ANNEXURE I
DESCRIPTIVE STATISTICS

Table A1

Exposure to Media

	Madrassas		Public Sector Universities		Private Middle Income Universities		Private Elite Universities	
	Male	Female	Male	Female	Male	Female	Male	Female
% Students:								
Watch Urdu news	59.64	31.66	90.43	76.67	91.30	83.02	68.00	59.09
Read Urdu Newspaper	85.46	58.38	83.48	61.02	80.87	65.38	33.33	18.18
Watch English News	17.54	6.03	50.86	51.67	49.57	45.28	79.59	77.27
Read English Newspaper	17.44	7.65	82.76	68.33	63.48	59.62	85.71	77.27

Table A2

Income Distribution: Percentage in the Income Distribution

Monthly Total Income of Parents	Male Madrassa	Female Madrassa	Public Sector University	Private Middle Income	Private Elite
Less than 10,000	2.1	0.62	2.22	–	–
10,000-30,000	83.57	82.5	42.22	22.97	7.04
30,000-50,000	9.44	8.12	16.3	21.62	7.04
50,000-70,000	3.15	4.38	11.85	21.62	11.27
70,000-100,000	1.75	3.12	13.33	22.3	21.13
100,000 and above	–	1.25	14.07	11.49	53.52

Table A3

Tolerance

	Madrassas		Public Sector Universities		Private Middle Income Universities		Private Elite Universities	
	Male	Female	Male	Female	Male	Female	Male	Female
% feel they are First a Muslim and then Pakistani	97.52	98.49	86.96	91.67	86.96	100.00	65.31	61.90
% feel Pakistan should be a Secular State, not Islamic	1.42	1.01	19.13	26.67	16.52	3.77	70.21	71.43
% feel:								
Give Ahmedis Equal Rights	27.60	11.62	39.66	40.68	29.82	38.46	83.33	85.00
Don't Know	11.83	8.08	18.97	37.29	23.68	38.46	10.42	15.00
Give Hindus Equal Rights	37.99	14.14	76.52	70.00	63.72	78.85	93.88	100.00
Don't Know	9.32	2.02	6.09	15.00	15.04	13.46	4.08	00
Give Christians Equal Rights	42.20	23.71	78.45	71.67	71.05	86.54	93.88	100.00
Don't Know	10.28	10.31	6.90	15.00	10.53	3.85	4.08	00

Table A4

Equality for Men and Women

	Male Madrassa	Female Madrassa	Private Middle Income		Public Sector Universities		Private Elite	
			Male	Female	Male	Female	Male	Female
Give Women Equal Rights								
Yes	45.52	60.13	86.00	97.83	82.95	87.23	95.55	100
No	43.73	36.71	11.00	2.17	14.77	6.38	3.45	0
Don't Know	10.75	3.16	3.00	0	2.28	6.39	0	0

ANNEXURE II

UNIVERSITIES/MADRASSAS SAMPLED

IUI: Idara Ulum E Islami (Islamabad) Male Madrasa
RIU: Riphah International University (Rawalpindi)
JMU: Jamia Muhammadia (Islamabad) Male Madrasa
ARID: Pir Mehr Ali Shah Arid Agriculture University (Rawalpindi)
JUSI: Idara Ulum E Shariah (Islamabad) Male Madrasa
JASH: Jamia Ashrafia (Rawalpindi) Male Madrasa
JRSL: Jamia Rasheed School (Lahore) Male Madrasa
ABB: Female Madrasa (Lahore)
JMUL: Jamia Muhammadia Lahore (Lahore) Male Madrasa
PU: Punjab University (Lahore)
PCC: Punjab College Of Commerce (Lahore) Private College
JUBB: Jammia Ullumia Al-Biniyato Al-Binine (Lahore) Female Madrasa
QAU: Quaid-e-Azam University
PIDE: Pakistan Institute of Development Economics (Islamabad)
LUMS: Lahore University of Management Sciences (Lahore)

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The Spatial Effects of Road Infrastructure on Employment in Pakistan: Quantifying the Role of Complementary Factors

SAIMA NAWAZ, SABA ANWAR, and NASIR IQBAL

This study uses district-level panel data to measure the spatial effects of road infrastructure on employment while accounting for institutional quality, rural connectivity, and labour productivity in Pakistan. The estimates based on the spatial regression model show that road density positively and significantly impacts employment. A 10 percent increase in road infrastructure would lead to a 4.3 percent increase in employment directly and indirectly—the spillover effects of road infrastructure help optimise the benefits of public investment in infrastructure projects. Empirical results reveal that institutional framework and access to rural areas complement road infrastructure in channelising road development's employment effects. These findings suggest a call for a comprehensive policy to reap the potential benefits of road infrastructure. Apart from developing the road network, the government should also develop complementary factors, namely institutional reforms and rural connectivity.

Keywords: Road Infrastructure, Employment, Institutional Quality, Spatial Analysis, Pakistan

1. INTRODUCTION

The economic literature has recognised that transport infrastructure, mostly road, is essential for economic development (Arif & Iqbal, 2009; Aschauer, 1989; Banister & Berechman, 2001; Boopen, 2006; Laborda & Sotelsek, 2019).[1] It leads to economic development by promoting trade, enhancing competitiveness, and reducing transport costs by integrating regions and countries (Hassan, 2018; Hope & Cox, 2015; Kanwal, Chong & Pitafi, 2019; Melecky, Roberts, & Sharma, 2019; Sahoo & Dash, 2012; Tate, 2018).

Road infrastructure creates employment directly and indirectly (Berechman & Paaswell, 2001; Haynes, 1997; Rietveld, 1989). Road infrastructure makes three types of

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[1] There are two broad categories of infrastructure, namely physical infrastructure (economic infrastructure) such as road, energy and soft infrastructure (social infrastructure) like human capital and patents etc. (Arif & Iqbal, 2009; Laborda & Sotelsek, 2019).

employment. It includes direct jobs—created by the actual public spending on infrastructure, and the wages are paid from the project funds. It creates indirect jobs through expenditures the suppliers make to produce the materials used for the infrastructure projects and induced jobs–elsewhere in the economy as increases in income from the direct public spending that leads to a further rise in spending by workers and firms (Fageda & Gonzalez-Aregall, 2017; Hijazi, Syed, Shaikh, & Bhatti, 2017; Rashid, Zia, & Waqar, 2018).

However, recent studies tend to find a negligible and smaller effect on employment (Laborda & Sotelsek, 2019; Schwartz, Andres, & Dragoiu, 2009). Melecky et al. (2019) argued that employment creation depends on other "complementary factors [also called structural factors] that affect many aspects of the economy at the same time." These factors comprise initial conditions in the local economy, namely the availability of skilled labour, local connectivity–rural connectivity, and institutional structure. Melecky et al. (2019) further highlighted that infrastructure might also "*affect the complementary factors themselves*." Thus, road infrastructure may induce employment directly and indirectly through improving complementary factors, i.e., structural changes in the economy – a natural outcome of infrastructure development (Zia & Waqar, 2018).

This study revisits the impact of road infrastructure on employment after controlling for "complementary factors" in Pakistan. The literature identifies various complementary factors, including labour productivity, local connectivity, and institutional framework, among others, to induce employment (Arif & Iqbal, 2009; Khandker & Koolwal, 2010; Melecky, et al. 2019). Institutions—"the rule of the game" provides a favourable environment for channeling the impact of road infrastructure. Weak institutions reduce the marginal productivity of infrastructure investment by allowing rent-seeking activities, especially in developing economies (Iqbal & Daly, 2014; Nawaz & Mangla, 2018). The institutional framework enhances coordination and reduces information costs (Chijioke & Ugochukwu, 2015). Local connectivity enables the local citizens to reap the potential benefits of highways by engaging themselves in non-basic production such as retail, restaurants, construction, and personal services (Iqbal & Nawaz, 2017; Kanwal, et al. 2019; Lee & Clarke, 2019).

The literature highlights that road infrastructure benefits are not region-specific; they could spillover effects in other regions (Chen & Haynes, 2015). Infrastructure reshapes geographical connectivity and helps in the agglomeration of economic activities. It reduces trade costs and facilitates trade flows between regions (Cohen, 2010; Fujita & Krugman, 2004). This discussion leads us to measure the spillover effect of road infrastructure. Therefore, this study aims to quantify the spatial impact of road infrastructure on employment while accounting for Pakistan's *complementary factors*.

Based on district-level panel data, the empirical analysis shows that road infrastructure has a positive direct and spillover effect on employment. Empirical results reveal that institutional framework and access to rural areas complement road infrastructure in channelising road development's employment effects. A 10 percent increase in road infrastructure would lead to a 4.3 percent increase in employment directly and indirectly. The institutional quality index has a positive and significant direct and indirect impact on employment. This implies that institutional development would promote employment directly and indirectly. Rural connectivity has a positive and

significant direct effect on employment while an insignificant indirect effect on employment. This shows that rural connectively play a more critical role in the respective district rather than neighboring districts. The interaction terms confirm the role of complementary factors in shaping the effects of economic corridors.

We add to the literature on the impact of infrastructure on employment in three ways. First, earlier literature signifies the role of proximate factors such as institutional quality to enhance road infrastructure effectiveness (Chen & Haynes, 2015; Esfahani & Ramírez, 2003). However, these studies do not explicitly include underlying factors in their modeling framework (Chen & Haynes, 2015; Esfahani & Ramírez, 2003). We contribute to the literature by adding institutional quality in the road-employment nexus. Second, we contribute to the literature by developing a comprehensive institutional quality index at the sub-national level in Pakistan. Earlier, Nifo & Vecchione (2014) developed a similar institutional quality index at sub-national levels for Italy. Lastly, we use spatial econometric techniques to find the spillover effect of road infrastructure at the district level using district-level panel data.

This study has enormous policy implications due to the massive investment in Pakistan's road infrastructure under the China-Pakistan Economic Corridor (CPEC).[2] The CPEC is widely recognised as a hub to connect regions through infrastructure development. Under CPEC, three road networks, namely eastern, central, and western, with a total road length of 3000 KM, are started.[3] The proposed transportation infrastructure will contribute positively to Pakistan and China's economic performance and have a spillover effect on other countries like Iran, the Middle East, Afghanistan, India, and the Central Asian Republic by enhancing geographical connectivity (Mirza, Fatima & Ullah, 2019). It is a significant stimulus for Pakistan, ensuring rapid economic growth with massive infrastructure development and employment creation (Blanchard, 2017; Kanwal, et al. 2019).

The rest of the paper is structured as follows: Section 2 briefly reviews the previous studies related to road infrastructure and job creation. Section 3 presents the modeling strategy; Section 4 gives data description and discussion on empirical methodology. Section 5 offers a situational analysis of critical variables/indicators and multivariate analysis, while the last provides concluding remarks and a policy framework.

2. LITERATURE REVIEW

The economic benefits of road infrastructure are stem from a reduction in transportation costs and an increase in economic activities (Estache, Ianchovichina, Bacon & Salamon, 2013; Forkenbrock & Foster, 1990). A bulk of the literature has shown positive spillover effects of infrastructure on economic growth (Dehghan Shabani & Safaie, 2018; Li, Wen & Jiang, 2017; Qi, Shi, Lin, Yuen, & Xiao, 2020; Wang, Lim, Zhang, Zhao, & Lee, 2020). The lower transaction and input costs through improved

[2]CPEC is a framework of regional connectivity. It is a collection of infrastructure projects including construction of modern transportation network, energy projects and special economic zones with the value of $62 billion. For further details, see official website http://cpec.gov.pk/introduction/1.

[3]Eastern alignment connects big cities like Karachi and Lahore, western alignment links Khyber Pakhtunkhwa and Balochistan while central alignment links Punjab, Balochistan and Khyber Pakhtunkhwa (for further detail see Appendix Figure 1).

roads can lead to more employment (Grimm, Lutz, Mayer, & Paffhausen, 2014). Employment creations through road infrastructure vary across different projects, working environment, human capital availability, other country infrastructure like energy, and so forth (Rashid et al., 2018). The employment generation of any project is measured through direct, indirect, and induced employment effects. Direct employment refers to employment generated by the activities to accomplish projects, while indirect employment refers to a job produced under input and output markets (Fageda & Gonzalez-Aregall, 2017; Rashid et al., 2018).

Fageda & Gonzalez-Aregall (2017) estimate the direct and indirect impacts of infrastructure on industrial employment using the spatial econometric method for the Spanish region for the period 1995-2008. This study finds that the density of motorways has a significant impact on industrial work. Chakrabarti (2018) estimates the effects of national highways on employment in India using state-level data. This study shows that a 10 percent increase in national highway density is associated with a 1 – 6 percent increase in India's non-agricultural private sector employment. He, et al. (2014) found that a 10 percent increase in total highway capacity is estimated to create over 1.5 million new jobs for the entire economy in the long run in the USA. However, the employment effects vary across industrial sectors. Highway investment leads to employment growth, mainly in retail, trade, construction, manufacturing, and accommodation services sectors (He, et al. 2014).

The varying results show that the impact of road infrastructure differs across countries and sectors. Complementary factors reshape the contribution of road infrastructure in generating employment. Chijioke & Ugochukwu (2015) argue that strengthening institutions can promote employment. The enhanced coordination among public institutions is also pivotal in establishing peace and prosperity, and it also helps build the infrastructure in Nigeria.

Bülow (2015) investigates the impacts of institutional quality on the firms' performance, and evidence obtains from emerging and transition facing economies. This study generates an institutional quality index by combining the six dimensions of governance indicators. These dimensions are voice and accountability, political stability, the effectiveness of government and regulations, law and order, and corruption. The study's findings show that institutional quality is the source to expand the firms' productivity and capacity, which ultimately leads to employment creation in emerging countries. The higher level of institutional quality provides grounds to exercise higher business activities in respective economies.

Udah & Ayara (2014) argue that sound governance structure and quality of institutions are the key drivers of economic performance and building infrastructure and a business enabling environment in Nigeria. Quality of government, physical infrastructure, and human capital are the key determinants of economic growth and employment in the European Union (Crescenzi, Di Cataldo, & Rodríguez-Pose, 2016; Di Cataldo & Rodríguez-Pose, 2017). Further, these studies focus on making better of low-skilled labour by bringing about improvement in government institutions. In addition to employment generation, government and institutions' effectiveness also benefit marginalised people's social inclusion.

Fujimura & Edmonds (2008) also found that cross-border infrastructure development complements the domestic road structure and fosters trade. Thus, connecting regional economies to global economies creates employment opportunities within the region through foreign direct investment. However, the infrastructure enhances growth by reducing inequalities in accessibilities at the city level, increasing disparities at the regional level (Gutiérrez, 2001). Thus, it calls for a cautious approach while analysing the impact of new infrastructure.

Human capital encompasses the knowledge, skills, competencies, and other attributes embodied in individuals relevant to economic activity. Vision 2025 also emphasises human capital development for inclusive growth in Pakistan. Local connectivity through roads, and transport is integral to connecting rural markets with urban hubs. The rural road is needed to interconnect all growth generating sectors in different regions and achieve a better and broader distribution of the economic growth benefits. Building a road network is a pre-requisite to developing remote and geographically difficult areas (Arif & Iqbal, 2009).

Infrastructure investments in rural areas lead to higher farm and non-farm productivity, employment, and income opportunities (Khandker & Koolwal, 2010). Fageda & Gonzalez-Aregall (2017) argue that investment in infrastructure has two effects. In the short run, this investment reactivates the construction sector while, in the long run, the investment is having a visible impact on production costs by reducing accessibility costs. These effects significantly increase employment in the industrial sector. Institutions play a significant role in attracting foreign direct investment to develop businesses across the CPEC route. The poor performance of institutional indicators constrains foreign direct investment inflows.

The above discussion reveals that road infrastructure investment's impact on employment differs across countries and sectors. Various factors, especially existing human capital, rural connectivity, and institutional quality, determine road infrastructure investment contribution to employment. The present study investigates the complementary role of these factors in creating jobs through road investment in Pakistan.

3. MODELING STRATEGY

Road infrastructure generates economic benefits by reducing transportation costs. Lower production costs increase productivity and profits. Due to the high-profit margin, existing firms are induced to increase output while new firms are attracted, leading to higher labour demand. These business expansions lead to employment growth (Chakrabarti, 2018). Road infrastructure leads to an increase in production technology, which could affect overall labour demand. The decline in travel time and cost due to better road connectivity improves individuals' accessibility to the job market and increases the overall labour supply (Jiwattanakulpaisarn, Noland, & Graham, 2011; Jiwattanakulpaisarn, Noland, Graham, & Polak, 2009).

These arguments provide a basis to develop an empirical model for analysis. Following Chakrabarti (2018), we can drive a reduced-form model for equilibrium employment that assumes road infrastructure, among other factors, could affect the levels of employment equilibrium in the labour market. The compact form of the model is given as:

$$E = f(R, X) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where E is the equilibrium employment, R represents road infrastructure, and X is the vector of other socio-economic control variables. For empirical testing, the general specification of the equilibrium employment in log-linear form is given as follow:

$$LnE_i = \alpha + \beta_1 LnR_i + \gamma' LnX_i + \varepsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

where α, β, and γ' are coefficients, i represents the unit of analysis, i.e., district in this case, and ε_i is an error term.

As discussed in the previous section, numerous "*complementary factors,"* namely institutional quality, local connectivity, and labour productivity in the region, determine the efficacy of road infrastructure investment (Calderon, Cantu, & Chuhan-Pole, 2018; Iqbal, Din, & Ghani, 2012; Melecky et al., 2019). On the one hand, these factors directly impact employment, and on the other hand, these factors complement the road to scale up the contribution of road investment. This study augments the basic employment model given in equation (2) using institutional quality, local connectivity, and labour productivity along with interaction terms. The expanded version of the empirical model is given as:

$$\begin{aligned} LnE_i = {} & \alpha + \beta_1 LnR_i + \beta_2 LnIQI_i + \beta_3 LnRCI_i + \beta_4 LnLPI_i + \delta_1 Ln(R * IQI)_i \\ & + \delta_2 Ln(R * RCI)_i + \delta_3 Ln(R * LPI)_i + \gamma' LnX_i + \varepsilon_i \quad \ldots \quad \ldots \quad (3) \end{aligned}$$

where δ represents coefficient, IQI represents institutional quality, RCI denotes rural connectivity, LPI indicates labour productivity, $(R * IQI)$ is the interaction of road, and institutional quality, $(R * RCI)$ is the interaction of road, and rural connectivity and $(R * LPI)$ is the interaction of road and labour productivity. This model provides the following testable hypothesis:

(i) *Road infrastructure has a positive impact on employment implies that* $\frac{d(LnE_i)}{d(LnR_i)} = \beta_1$ *where* $\beta_1 > 0$

(ii) *Road infrastructure and institutional quality complement each other to promote employment imply that* $\frac{d(LnE_i)}{d(LnR_i)} = \beta_1 + \delta_1 IQI$ *where* $\beta_1 > 0$ *and* $\delta_1 > 0$. *This indicates that when institutional quality increases, given the road infrastructure, employment increases.*

(iii) *Road infrastructure and rural connectivity complement each other to generate employment imply that* $\frac{d(LnE_i)}{d(LnR_i)} = \beta_1 + \delta_2 RCI$ *where* $\beta_1 > 0$ *and* $\delta_2 > 0$. *This indicates that when rural connectivity increases, given the road infrastructure, employment increases.*

(iv) *Road infrastructure and labour productivity complement each other to enhance employment imply that* $\frac{d(LnE_i)}{d(LnR_i)} = \beta_1 + \delta_3 LPI$ *where* $\beta_1 > 0$ *and* $\delta_3 > 0$. *This indicates that when rural connectivity increases, given the road infrastructure, employment increases.*

The proposed model is further adjusted to measure the spillover effects of road infrastructure to analyse its spillover effects. The spatial modeling strategy is used to model spillover effects (LeSage & Pace, 2010).[4] This inclusion of spatial effects is

[4]This strategy is widely used in the exiting literature (Arbués, et al. 2015; Cohen, 2010; Li, et al. 2017; Ojede, Atems, & Yamarik, 2018).

motivated on practical grounds, owing to the peculiarities of data used in the analysis (Anselin, 2013). The spatially integrated regression model is given below:

$$LnE_i = \varrho \sum_{j=1}^{N} w_{ij} LnE_j + Lnx_i\beta + \sum_{j=1}^{N} w_{ij} lnx_j \, \varphi + \varepsilon_i \qquad \ldots \qquad \ldots \quad (4)$$

where $\sum_{j=1}^{N} w_{ij} LnE_j$ is the spatially weighted effects of LnE_i. This helps to measure the spillover effects of the dependent variable. In this case, it implies that the employment of neighboring district j shaped by the employment in district i as a consequence of spillover effects. With LnE_j in neighboring districts, the parameter ϱ is the coefficient attached to the autoregressive term. It measures the power of spatial correlation between two districts and gives the impact of neighboring districts' employment. w_{ij} is a spatial weight matrix that captures the spatial interaction among districts. φ is a vector of coefficients linked with explanatory variables other than the lag of the dependent variable. These adjustments in the original model provide a basis to disentangle the direct and spillover effects of road infrastructure on employment after controlling *complementary factors*.

4. DATA AND EMPIRICAL METHODOLOGY

4.1. Data Sources and Construction of Variables

This study uses various secondary data sources to quantify the impact of road infrastructure on employment at the district level in Pakistan. These include Pakistan Social and Living Standards Measurement (PSLM)[5] Survey and MOUZA Statistics.[6] Apart from these sources, this study uses the Enterprise Survey data for Pakistan collected by the World Bank,[7] and the Provincial Development Statistics reports published by relevant provincial departments. A panel is developed for 111 districts across Pakistan for 2008, 2010, 2012, and 2014. The choice of districts and periods depends on data availability for required variables.

4.1.1. *Employment and Road Infrastructure*

The dependent variable is the level of employment. It is defined as a percentage of people (all male/females ten years of age and older) who are currently employed. The data on employment are taken from various issues of the PSLM survey. Road length is used to measure the impact of road infrastructure on employment. The information on road length is taken from Provincial Development Statistics (PDS) of each province. Chakrabarti (2018) and Jiwattanakulpaisarn et al. (2009) use a similar measure to measure the highway's impact on employment in India and North Carolina, respectively.

4.1.2. *Institutional Quality Index (IQI)*

The institutional quality index (IQI) captures a broad range of governance indicators. The IQI follows the methodology proposed by the World Governance

[5]http://www.pbs.gov.pk/content/pakistan-social-and-living-standards-measurement-survey-pslm-2014-15-provincial-district

[6]http://www.pbs.gov.pk/content/mouza-statistics

[7]http://www.enterprisesurveys.org/data/exploreeconomies/2013/pakistan

Indicator (WGI) of the World Bank. Following the WGI, the IQI is based on six broad dimensions, such as government effectiveness, the situation of rule and law, voice and accountability, corruption, regulation quality, and political stability and avoidance of violence. Various studies have used the same dimensions to construct institutional quality index at sub-national levels (Bülow, 2015; Nifo & Vecchione, 2014; Udah & Ayara, 2014). A detailed discussion on these dimensions is given as follows.

(i) *Voice and Accountability (VA):* The VA dimension indicates that if people in any district have the right to vote and freedom of expression, it will exhibit institutions' quality. This dimension's indicators are participation in an election measured as the turnout in the election. The turnout data is collected from the Election Commission of Pakistan (ECP) for Pakistan's general election. The second available indicator is social cooperatives, which show that the higher level of social cooperatives signifies the higher quality of institutions, as Nifo & Vecchione (2014) described for Italy. Various other studies have used similar indicators to measure institutions' voice and accountability dimensions (Bülow, 2015; Udah & Ayara, 2014).

(ii) *Government Effectiveness (GE):* GE affects institutional quality positively. Two indicators are taken in this regard: the government's ability to provide social facilities such as schools, colleges, hospitals, and other social amenities. The data of these variables are taken from the PSLM. The vibrant institutions are supposed to provide social facilities by government agencies. Hence, the higher values of the social facilities indicate higher quality of institutions. Similarly, the government's ability to increase the tax base is also showing the quality of institutions.

(iii) *Regulatory Quality (RQ):* This dimension's main essence is to measure how much a government can formulate sound policies and regulations, ultimately providing a business enabling environment to the private sector. The higher-level quality of regulations is indicative of the higher quality of institutions. The study, in this regard, uses two indicators: (1) business density, which is measured by several industrial units established in each district, and (2) business environment indicator is computed by using further three indicators, i.e., several cooperative societies, membership of cooperative societies, and several commercial banks in each district of Pakistan. These indicators represent a business enabling environment for the private sector. The data of the indicators, as mentioned above, are taken from the Provincial Development Statistics of each province of Pakistan.

(iv) *Political Stability and Absence of Violence (PS)*: This dimension indicates how political stability is destabilised by unconstitutional means such as violent and terrorist activities. The study uses the terrorism index measured by violent events, murders, kidnappings, and blasts. Based on these indicators, the index of terrorism is generated, indicating how much a government is destabilised. This dimension is negatively affecting institutional quality. However, the study takes the inverse of the terrorism index, demonstrating the higher institutional quality as the value of the terrorism index increases.

(v) *Rule of Law (RL):* this dimension signifies the extent to which citizens abide by the rules of society, and it includes the safety of property rights, violation of the rule of law. The ability of institutions to ensure the establishment of the rule of law also indicates its quality. The study employs the crime rate of each district as the indicator of the rule of law dimension. Crimes include crimes such as theft, murder, snatching, etc. The data of these variables are taken from Provincial Development Statistics.

(vi) *Control over Corruption (CC):* The sixth dimension of the institutional quality is showing the extent to which public office holder is found indulged in exercising it for private gain. An index for corruption is used as Nifo and Vecchione (2014) for Italy have employed. Corruption is perceived as one of the critical dimensions of institutional quality. The study takes the inverse of this variable to construct the index.

In the first step, all indicators are normalised. In the second step, Principal Component Analysis (PCA) is used to compute each indicator's weight. PCA is a widely used method to obtain weights when required to construct the index based on numerical data (Nawaz, Iqbal, & Khan, 2014). The estimated weights are reported in table 1. Udah and Ayara (2014) also used this weighting method to generate an institutional quality index. The IQI ranges between 0 and 1; the higher the value of IQI, the higher the quality of institutions, and vice versa. The PCA-based weights show that dimensions such as regulatory quality, voice and accountability, and political stability, and avoidance of violence are conceding higher weights than other dimensions and indicators. The correlation matrix of these dimensions and indicators demonstrates relatively higher and reasonable coefficients of correlation amongst these variables. Further, all associations are found statistically significant, which are essential for the application of PCA.

Table 1

Dimensions and Indicators of Institutional Quality Index (IQI)

Dimensions	Indicators	Weights
VA	Participation in elections: turn out in the general election	0.0616
	Social cooperatives index	0.2146
GE	Social Facilities: index based on the provision of health, education, transport facilities.	0.1527
	Tax revenue collections by district-level departments	0.0460
RQ	Business density: number of industrial units in each district	0.1775
	Business environment: index is generated by using several cooperative societies and memberships, bank facilities	0.1478
PS	Violence and terrorist activities: an index used which is combined by murder, blasts, and other terrorist activities	0.1453
RL	Crime Rate: The crime rate is computed by different sorts of reported crimes in each Pakistan district.	0.0105
CC	Index of corruption	0.0436

Source: Author's formulation.

4.1.3. *Rural Connectivity Index (RCI) and Labour Productivity Index (LPI)*

Rural connectivity is measured using access to the metallic road within one kilometer range. Rural connectivity index (RCI) is defined as the percentage of MOUZA falling within a radius of less than one kilometer from a metaled road. The data is taken from MOUZA statistics. It is a census since it covers all mouzas in the country. The Human Development Index developed by the UNDP is used as a proxy to measure labour productivity index (LPI).

4.1.4. *Other Control Variables*

We use various control variables, including urbanisation and provincial dummies, to control area-specific heterogeneities and other socio-economic differences at the district level. The descriptive statistics of all variables are given in Table 2. The last column presents the correlation of explanatory variables with employment.

Table 2

Summary Statistics

Variables	Mean	S.D.	Min	Max	Correlation
Ln(EMP)	3.55	0.24	2.64	4.17	1.0000
Ln(Road)	6.96	0.74	4.87	8.33	0.2301*
Ln(IQI)	3.99	0.13	2.99	4.24	0.1173*
Ln(RCI)	3.83	0.78	0.33	4.56	0.0582*
Ln(LPI)	3.87	0.46	1.10	4.49	-0.1171*

Source: Author's calculation. The last column presents the correlation matrix with Ln(EMP). * Indicates a significant correlation at the 10 percent level.

4.2. Estimation Methodology

This study uses panel data to estimate the impact of road infrastructure on employment at the district level. As discussed earlier, there is a spillover effect of road infrastructure due to connected boundaries and easy access to the neighboring region (Fageda & Gonzalez-Aregall, 2017). Generally, two types of spatial dependence are observed in the literature (Bailey & Gatrell, 1995; Fageda & Gonzalez-Aregall, 2017). First occurs due to spatial error terms, suggesting that the different geographical units' errors are correlated with each other. While the second exists when the dependent variable of one location is influenced by the outcome variable of other locations (Higazi, Abdel-Hady, & Al-Oulfi, 2013). The spatial econometric techniques are used to address these issues (Maddison, 2006).

Following Fageda and Gonzalez-Aregall (2017), this study uses a spatial Durbin model (SDM), which measures the dependent and independent variables' spatial interaction. The spatial analysis helps examine the direct effect on the areas in which the road infrastructure is located and the spillover effects on neighboring districts (LeSage, 2014; LeSage & Pace, 2010). The spatial regression model produces unbiased and efficient parameters because the ordinary least square (OLS) may not produce unbiased estimates due to spatial autocorrelation. It shows when a value is estimated in one area

may depend on the neighboring location. This study defines the following SDM using the model given in Equation 4:

$$\begin{aligned} LnE_{i.t} = {} & \varrho \sum_{j=1}^{N} w_{ij} LnE_{j,t} + \beta_0 + \beta_1 LnR_{i,t} + \beta_2 LnIQI_{i,t} + \beta_3 LnRCI_{i,t} \\ & + \beta_4 LnLPI_{i,t} + \delta_1 Ln(R * IQI)_{i,t} + \delta_2 Ln(R * RCI)_{i,t} + \delta_3 Ln(R * LPI)_{i,t} \\ & + \varphi_1 \sum_{j=1}^{N} w_{ij} LnR_i, t + \varphi_2 \sum_{j=1}^{N} w_{ij} LnIQI_{i,t} + \varphi_3 \sum_{j=1}^{N} w_{ij} LnRCI_{i,t} \\ & + \varphi_4 \sum_{j=1}^{N} w_{ij} LnLPI_{i,t} + \varphi_5 \sum_{j=1}^{N} w_{ij} Ln(R * IQI)_{i,t} \\ & + \varphi_6 \sum_{j=1}^{N} w_{ij} Ln(R * RCI)_{i,t} + \varphi_7 \sum_{j=1}^{N} w_{ij} Ln(R * LPI)_{i,t} + \varepsilon_i \quad \ldots \quad (5) \end{aligned}$$

Global Moran's I test is applied to detect spatial dependence, which depends on the weight matrix (Higazi et al., 2013).[8] The Moran test is usually used after OLS, which suggests whether the spatial regression model is applicable or not. After finding spatial autocorrelation, the study endeavors to observe the required analysis using the spatial regression model given in equation 5 above. To estimate the optimal spatial model, the OLS may not be the appropriate approach. It tends to produce biased or inefficient results due to a weighted spatial matrix (You & Lv, 2018). This study uses Maximum Likelihood (ML) estimators (Arbués, Banos, & Mayor, 2015; Nawaz & Mangla, 2018; You & Lv, 2018). The construction of w_{ij} is very important in the spatial econometric model as different specifications capture different channels of spillovers (LeSage & Pace, 2010). This study uses a physical contiguity matrix in which a value 1 is assigned for two districts having a common border while 0 for all other districts (Arbués, et al. 2015; Nawaz & Mangla, 2018).

Up to now, we consider road infrastructure as an exogenous variable to the economic system. However, this may not be the case, as literature has pointed out the endogenous nature of road infrastructure due to reverse causality (Arbués, et al. 2015). The issue is compounded when the road infrastructure variable is added to the equation with other variables like institutions and human capital (Nawaz & Khawaja, 2019). The use of ML resolved the issues associated with the endogeneity arises due to the inclusion of spatially weighted lag of the dependent variable. The spatial fixed effects technique may also address the omitted variables bias (Nawaz & Mangla, 2018).

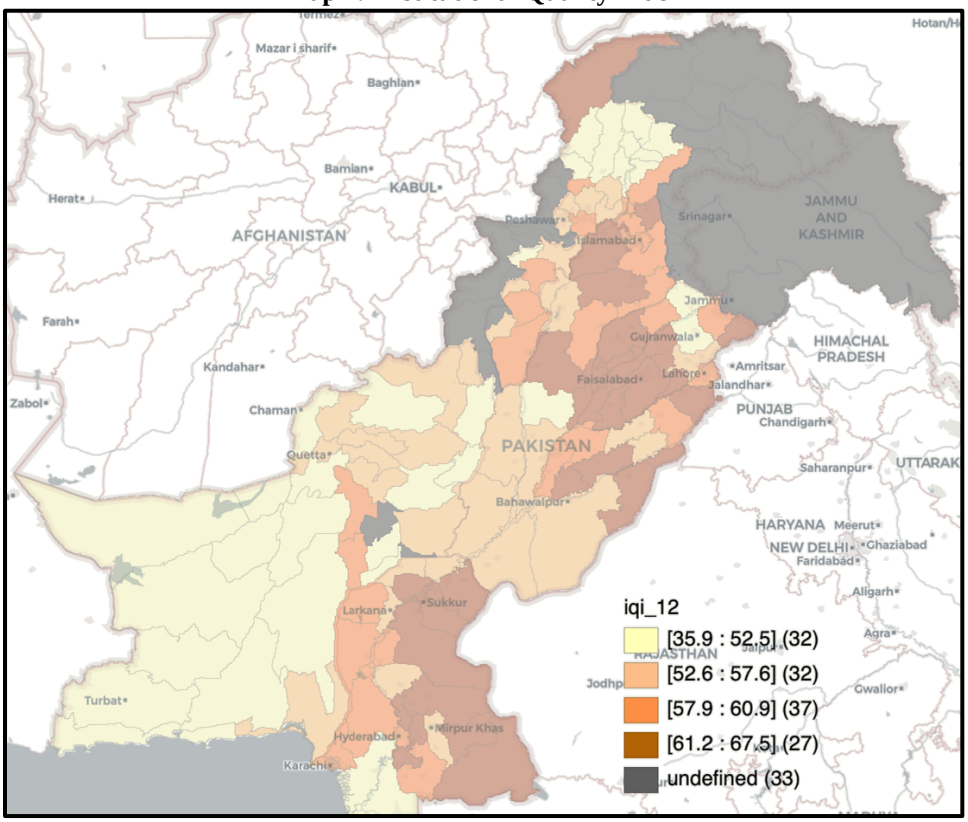
5. RESULTS AND DISCUSSION

5.1. Situational Analysis

The situational analysis highlights the relationship between road density, employment, and other complementary factors at the district level. The districts are divided into four groups based on the institutional quality index score, including high quality, moderate quality, low quality, and very low-quality institutions. The institutional quality index (IQI) indicates that most districts from Punjab show a better ranking than districts from Sindh and Balochistan. Most of districts from Balochistan are found facing poor institutional quality (Map 1). Peshawar is the top-ranked district from KPK. The weak institutional quality may act as a binding constraint to induce employment in the region.

[8]Spatial weights are generated by using STATA command "***spatwmat***" in STATA 15.

Map 1. Institutional Quality Index



Source: Author's formulation using GeoDa software.

Similarly, the districts are divided into four groups based on RCI, including high connectivity, medium connectivity, low connectivity, and very low or no connectivity. The map shows that most of the districts from Balochistan and KPK either have very low or no connectivity and low rural connectivity. On the other hand, Punjab districts have a high level of rural connectivity (Appendix Map 1). A similar situation has been observed in labour productivity across the districts (Appendix Map 2). This analysis reveals that institutions' quality is deficient, coupled with low human capital and weak rural connectivity in most Balochistan, KPK, and interior Sindh districts.

5.2. Multivariate Analysis

This study uses various diagnostic tests to establish the adequacy of the spatial econometric model. First, we apply the Moran's I test for reach year, and the outcome is presented in Table 3. The Moran I validates the existence of spatial autocorrelation. The test values show that the employment variable has a positive autocorrelation at the district level. The spatial dependence across the districts among all variables is confirmed by the Cross-sectional Dependence (CD) test (Table 3). These tests confirm spatial dependency among the variables; hence the estimation without controlling for spatial dependency may produce biased estimators.

Table 3

Moran I and CD Tests

CD Test Variables	Value	Moran, I Test for each year Year	Statistics (P-Value)
Ln(EMP)	95.79***	2008	39.97 (0.000)
Ln(Road)	63.54***	2010	74.00 (0.000)
Ln(IQI)	14.91***	2012	81.32 (0.000)
Ln(RCI)	26.85***	2014	94.69 (0.000)
Ln(LPI)	61.05***		

Source: Author's calculation. The CD test is performed using the "xtcd" STATA 16 command. The test is performed under the null hypothesis of cross-section independence CD ~ N(0,1). ***Indicates significant at the 1 percent level. Columns 3 & 4 presents the Moran's I test for each year. P-values are given in parenthesis.

To start with multivariate analysis, we have estimated the non-spatial regression panel model. The results are presented in Table 4. Four different specifications are estimated. Model 1 is estimated using pooled OLS by employing road, IQI, RCI, and LPI variables. Model 2 is estimated using a fixed-effect estimation technique based on the same variables. In Model 3, interaction terms of IQI, RCI, and LPI with the road are used. In the last model, urbanisation is used as a control variable apart from all other variables.

Table 4

Estimation Results of the Non-spatial Panel Model

Variables	(1) Pooled OLS	(2) FE	(3) FE	(4) FE
Ln(Road)	0.095***	0.082***	0.699*	1.064*
	(0.015)	(0.013)	(0.416)	(0.597)
Ln(IQI)	0.194**	0.145*	1.553	2.101*
	(0.088)	(0.078)	(1.028)	(1.082)
Ln(RCI)	0.026	0.027*	0.318**	0.360**
	(0.017)	(0.015)	(0.136)	(0.175)
Ln(LPI)	-0.119***	-0.136***	-0.739***	-0.660**
	(0.029)	(0.025)	(0.277)	(0.334)
Ln(Road)*Ln(IQI)			0.199	0.259*
			(0.145)	(0.152)
Ln(Road)*Ln(RCI)			0.042**	0.0458*
			(0.019)	(0.0242)
Ln(Road)*Ln(LPI)			0.088**	0.0618
			(0.040)	(0.0474)
Ln(Urban)				0.0926***
				(0.0171)
Constant	2.478***	2.637***	-1.756	-4.769
	(0.355)	(0.314)	(3.812)	(4.277)
Observations	444	444	444	418
R-squared	0.114	0.325	0.339	0.390

Source: Author's own calculation. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05 and * p<0.1 indicate the 1 percent, 5 percent and 10 percent level of significance, respectively. Where FE represents fixed-effects model.

The results show that road has a positive and significant impact on employment. This implies that the development of road infrastructure induces direct employment in the respective districts. These findings are supported by existing literature (Aschauer, 1989; Babatunde, 2018; Calderón, Moral-Benito, & Servén, 2015; Égert, Kozluk, & Sutherland, 2009). Fageda and Gonzalez-Aregall (2017) find that the motorway directly impacts employment in the manufacturing sector in Spain. Chakrabarti (2018) finds that a 10 percent increase in road density leads to a 1 to 6 percent increase in employment in India's private sector. It can be concluded that districts with a better road infrastructure endowments generate higher employment. This evidence implies that expansion in road networks is appeared as beneficial for generating employment in respective districts.

The result shows that IQI has a positive and significant impact on employment. This finding implies that other things remain the same; the improvement in institutional quality would increase the employment level. Similarly, RCI has a positive and significant impact on employment, implying that promoting rural connectivity enhances employment. Rural connectivity means connecting far-flung areas with main roads. The estimated results highlight that connecting local areas with main roads also contribute to employment generation's beneficial influences.

We find that the labour productivity index hurts employment. Various studies have found similar results (Junankar, 2013; Kaplanis, 2010). One can argue that the quality of human capital (skill composition) is not matched with employment opportunities in the region. The skill mismatch may also contribute negatively to employment (Farooq, 2011). The educated youth fail to obtain jobs, hence induce a lower employment ratio. This calls for further investigation to find the nexus between the nature of education and job requirements.

We further test the implication of interaction terms on employment. The results show that road, accompanied by good quality institutions, positively and significantly impacts employment. Similarly, the interaction term of the road with RCI has a positive and significant impact on employment. These findings reveal that complementary factors play an essential role in channelising the effects of road infrastructure.

Table 4 shows a positive relationship between road and employment for a penal of 111 districts across Pakistan. This leads to extending the analysis by looking at the spillover effects of road infrastructure. Table 3 also confirms the existence of spatial autocorrelation and cross-section dependency in the data. We have estimated the spatial regression model to address spatial dependence and measure the spillover effect. The results are presented in Table 5, while direct, indirect, and total impacts are presented in Table 6. The results show that spatial autocorrelation is statistically significant in both specifications, employing the existence of spatial dependence in the data.

The results show positive impacts of the spatial lag of the dependent variable, ranging from 0.87 to 0.86. The estimated effects are statistically significant at a 1 percent level in all specifications. This implies that employment in neighboring districts positively influences employment in a particular district. A 10 percent increase in employment in a neighboring district would lead to an 8 percent increase in employment in a particular district.

Table 5

Results of Spatial Regression Model

Variables	(1)	(2)
Ln(Road)	0.026*	0.398*
	(0.015)	(0.240)
Ln(IQI)	0.029**	0.980*
	(0.015)	(0.523)
Ln(RCI)	0.030**	0.196
	(0.014)	(0.129)
Ln(LPI)	–0.076***	–0.527*
	(0.027)	(0.283)
Ln(Road)*Ln(IQI)		0.133*
		(0.076)
Ln(Road)*Ln(RCI)		0.024
		(0.018)
Ln(Road)*Ln(LPI)		0.069*
		(0.041)
W*Ln(Road)	0.135***	0.048**
	(0.043)	(0.023)
W*Ln(IQI)	0.155*	0.122***
	(0.094)	(0.041)
W*Ln(RCI)	0.044	0.340
	(0.041)	(0.388)
W*Ln(LPI)	0.113*	-0.466
	(0.070)	(0.906)
W*Ln(Road)*Ln(IQI)		0.017*
		(0.010)
W*Ln(Road)*Ln(RCI)		0.042*
		(0.025)
W*Ln(Road)*Ln(LPI)		0.050
		(0.131)
e.Ln(EMP)	0.870***	0.866***
	(0.031)	(0.032)
Constant	3.383***	0.706
	(0.305)	(3.100)
Observations	444	444
sigma_u	0.102***	0.099***
	(0.010)	(0.010)
sigma_e	0.115***	0.115***
	(0.005)	(0.005)
Wald test of spatial terms	809.00(0.00)	785.35(0.00)
Number of groups	111	111

Source: Author's calculation. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05 and * p<0.1 indicate the 1 percent, 5 percent and 10 percent level of significance, respectively.

Table 6 shows that the direct elasticity of road infrastructure (0.39) is positive and statistically significant. This shows that a 10 percent increase in road infrastructure would lead to a 3.9 percent increase in employment in the district. Road infrastructure also has a positive and significant spillover effect. The indirect elasticity of infrastructure is 0.04 and is statistically significant at the 10 percent level, implying that a 10 percent increase in road infrastructure in neighboring districts would lead to a 0.4 percent increase in employment of a particular district. The institutional quality index has a positive and significant direct and indirect impact on employment. This implies that institutional development would promote employment directly and indirectly.

RCI has a positive and significant direct effect on employment while an insignificant indirect effect on employment. This shows that rural connectively play a more critical role in the respective district rather than neighboring districts. LPI has either a negative or insignificant impact on employment. The interaction terms show that IQI and RCI enhance both direct as well as indirect impact of road infrastructure on employment. This confirms the role of complementary factors in shaping the effects of economic corridors.

Table 6

Direct, Indirect and Total Effect based on Spatial Regression Model

Variable	Coefficient	P-Value	Coefficient	P-Value
		Direct Impact		
Ln(Road)	0.026	0.078	0.398	0.066
Ln(IQI)	0.029	0.059	0.980	0.034
Ln(RCI)	0.030	0.028	0.196	0.028
Ln(LPI)	-0.076	0.005	-0.527	0.063
Ln(Road)*Ln(IQI)			0.133	0.055
Ln(Road)*Ln(RCI)			0.024	0.184
Ln(Road)*Ln(LPI)			0.064	0.114
		Indirect Impact		
Ln(Road)	0.113	0.002	0.040	0.094
Ln(IQI)	0.129	0.100	0.102	0.085
Ln(RCI)	0.037	0.283	0.284	0.081
Ln(LPI)	0.094	0.129	-0.389	0.170
Ln(Road)*Ln(IQI)			0.014	0.094
Ln(Road)*Ln(RCI)			0.035	0.044
Ln(Road)*Ln(LPI)			0.042	0.700
		Total Impact		
Ln(Road)	0.139	0.000	0.438	0.035
Ln(IQI)	0.158	0.071	1.081	0.056
Ln(RCI)	0.067	0.105	0.481	0.056
Ln(LPI)	0.018	0.016	-0.916	0.316
Ln(Road)*Ln(IQI)			0.146	0.088
Ln(Road)*Ln(RCI)			0.059	0.318
Ln(Road)*Ln(LPI)			0.106	0.419

Source: Author's own calculation based on point estimates reported in Table 5.

6. CONCLUDING REMARKS AND POLICY FRAMEWORK

The efficient transport network is vital in today's economy as they connect the underdeveloped region with development, attach markets, and create demand, which is essential for economic growth. The broader economic advantages of road infrastructure development can come from urbanisation and job creation around this new infrastructure. However, local complementary factors play a critical role in this regard. The present study examined the impact of road infrastructure on employment while accounting for rural connectivity, institutional quality, and labour productivity. The critical takeaway from empirical analysis is that road has a significant impact on employment. Furthermore, institutional quality and rural connectivity considerably contribute to promote employment. It is also evident that institutional quality and rural connectivity complement with road infrastructure to encourage employment.

Based on the empirical findings, the following are policy implications:

(i) Road infrastructure development will boost employment in Pakistan. Apart from developing main highways and motorways, the government should also focus on local roads, especially those linking rural areas with the central hub. Rural connectivity is essential to facilitate local labour to get connected with services, especially hoteling along the highways and motorways. The development of local roads is also significant to link local or rural industries, especially agriculture, and the leading industry established in megacities. Intuitively, road infrastructure development links the cities and far-flung regions to transport goods and services from manufacturing hubs to high demand locations and destinations. The main advantage of investing in road networks is related to job creation around new road infrastructure. Despite these, the construction of vast roads and highways open new avenues for international trade with neighbouring countries. Despite the expansion of road networks, local connectivity, which links local areas to main roads, also provides opportunities to enhance people's access to the major amenities offered by governments such as education and health facilities, employment, and other facilities. The study also finds the combination of local connectivity and road density caters significant and favourable impacts on the employment level. Hence, connecting the rural and backward areas with main roads and building heavy roads are the key drivers of achieving a higher level of employment and economic growth.

Policy intervention: The government should expand the local road network connecting rural markets with the central hub along with highways and motorways development.

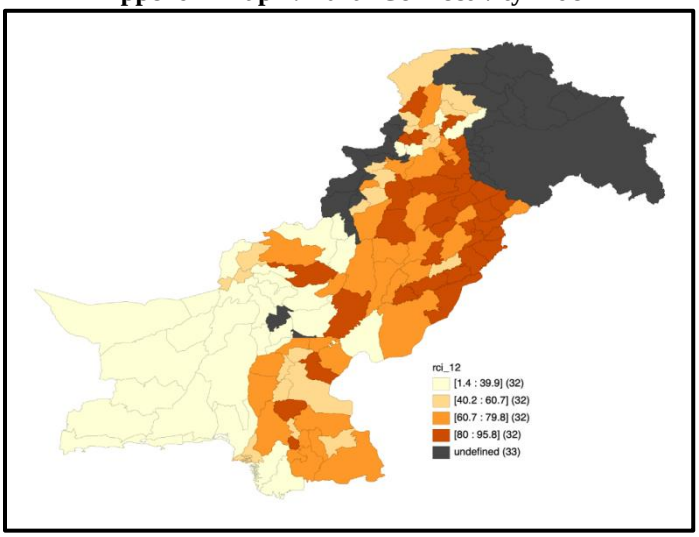
(ii) It is evident that well designed and enforced institutional framework is a prerequisite to reap the potential benefits of road infrastructure. Empirical analysis reveals that institutional quality has a significant impact on employment. This suggests that the government should invest in promoting institutional reforms, especially implementing the rule of law, ensuring political stability, and providing a productive business environment. And ultimately, improved institutional quality increase the employment level. The conducive institutional environment encourages investors to invest in these areas, which untimely leads to higher employment.

Policy intervention: The government should focus on institutional reforms at the national level and the area-specific reforms that should be introduced, especially in CPEC related districts. The government provides incentives to local investors to establish local industries along the CPEC route.

In a nutshell, a comprehensive policy framework is required to mobilise the local labour force to benefit from infrastructure investment under CPEC. Apart from developing a road network, the government should also focus on developing complementary factors, namely institutional reforms, rural connectivity, and primary education.

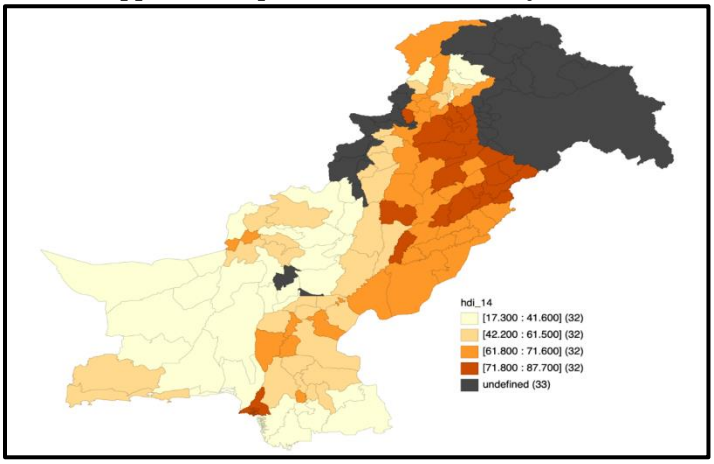
APPENDIX

Appendix Map 1. Rural Connectivity Index



Source: Author's formulation using GeoDa software.

Appendix Map 2. Labour Productivity Index



Source: Author's formulation using GeoDa software.

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Endurance or Submission: How Terrorism Frame Households' Time Allocation?

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Terrorism cause psychological injury, placing an unsettling impact on human life. In Pakistan, the continuous stream of terrorism since 2009 induced fear, expectedly influencing households' behaviour about their economic decisions. In this context, the study empirically investigates the effects of terrorism on households' time allocation decisions in the pre-2009 and post-2009 periods to track their time allocation for business activities and leisure. For this study, 200 households are interviewed from district Peshawar of the KPK province in Pakistan, one of the worst-hit districts from terrorism.

Findings of the study reveal that in general, terrorism has posed a significant impact on households' time allocation patterns. Analysis explains that in the post-2009 period, increasing incidents of terrorism triggered fear in the people's minds. Consequently, time for business activities shrunk while the time for leisure increased. To be more exact, households preferred to stay at home and spend time on leisure activities (with no financial yield) rather than engaging in business activities.

JEL Classification: D91, R23, R28
Keywords: Terrorism, Fear, Violence, Time Allocation Pattern, Pakistan

1. INTRODUCTION

Terrorism is a global concern; however, Pakistan has been through a lot of it, mainly because of her role as a front-line ally of the United States in the "war against terrorism" in Afghanistan. After the US-led intervention in the wake of September 9/11, terrorism seriously affected the existing social and economic fabrics in Pakistan. Suicide bombings and terrorist attacks killed innumerable civilians and security personnel across Pakistan[1] and left the physical infrastructure shattered. This has resulted in huge socio-economic challenges that had never happened before, including social injustice, economic disparity, political instability, religious intolerance, and international conspiracies (Rasul and Iqbal, 2019). Terrorism has turned Pakistan into a harassed community by raiding the population and compelling the people to change their economic activities. Counter-terrorism operations against the activists in several districts[2]

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[1]Army Public School attack on December 16, 2014, is one of the noticeable terrorist events in human history that causes demises of 149 innocent people including 132 school children.

[2]Districts include Bunir, Lower Dir, Upper Dir, Malakand, Shangla, Swat; FATA are Bajawar, Mohmand, Khyber, Orakzai, Kurram, North Waziristan, and South Waziristan.

of the Khyber Pakhtunkhwa (KPK) province and all seven Federally Administered Tribal Areas (FATA) caused social and psychological sufferings to the individual life. More than three million people were displaced, which is considered one of the most extensive relocations ever in the history of humankind.[3]

The never-ending terrorism since 2009 (see Appendix-A1) in Pakistan caused a psychological injury, prompting unsettling influence in the psychological balance of the people. The continuous wave of terrorism paved the track for the joint progression of the menace of sapping despair and insecurity that have reshaped the behaviour of different economic units about their economic decisions. In Pakistan, terrorism and its consequences are not a sudden occurrence; however, the existing frame of studies on the subject is highly deficient and does not cover the matter in its entirety. Some efforts have been made to present the bigger picture of the issue, yet no attempt has been made to offer comprehensive exploration at the micro-level. The existing array of studies on the topic mainly covers causes and determinants of terrorism, Pakistan's performance in counter-terrorism operations, and the impact of terrorism on the macroeconomic performance of Pakistan. For instance, Looney (2004); Grare (2007); Asal et al. (2008); Schaffer (2008); Nasir and Rehman (2019); Khan (2014); Shabib et al. (2015) explored the determinants and causes of terrorism. Tellis (2008) examined the performance of Pakistan in the war against terrorism. Riedel (2008) explores the efforts of Pakistan in the war against terrorism. Some others, especially Khan (2011), examined the impact of the military operation in FATA and PATA[4] on Pakistan's economic performance. Similarly, Saeed and Syed (2017) examined the causal linkages between terrorism and the economic growth of Pakistan.

Beyond the causes, direct losses, and macroeconomic perception of terrorism, the consequential terror-posed prolonged fear of imagined dangers has repercussions for preferences, choices, and eventually for decisions of economic units. However, the available literature on the subject is highly insufficient and does not cover the repercussions of the consequential terrorist acts on the households' economic decision-making at full length. There has been little understanding of the economic impacts of the psychological trauma of casualties on economic agents and their families. Terrorism may cause higher spending on health, absenteeism at work, and reduction in labour productivity, which collectively diminish the welfare and life satisfaction that households may endure.

To fill this gap, this study intends to examine the effects of terrorism on households' time allocation patterns, capturing their change in preferences about time allocation. In this context, the study empirically investigates the effects of terrorism on time allocation decisions in the pre-2009 and post-2009 periods to seek their time

[3]Due to the unfolding crisis in different districts of the Malakand division of the KPK province, in April 2009, about 550,000 people were registered as Internally Displaced Persons (IDPs). In May 2009, the government launched a military operation against militants in district Swat causing the displacement of nearly 2.5 million people. In October 2009, military operation in FATA (Bajaur Agency, Mohmand Agency) started another wave of displacement as a result at the end of December 2009 around 250,000 people from Bajaur Agency and 180,000 from Mohmand Agency fled the area and migrated to different parts of the country. The third wave of displacement started in October 2009, as a result of the military operation against militants in South Waziristan that pushed around 293,000 people to displacement (Center for Research Security Studies, 2010; Amir-ud-Din, and Malik, 2016).

[4]Provincially Administered Tribal Areas.

allocation towards business activities and leisure time. The primary motivation behind the study is that the continuous stream of terrorism since 2009 induced fear, which triggers the behavioural change of economic units. Fear-based oppression raises costs of increased security measures, weakening the physical and mental human capacity that in turn affects the time allocation of individuals to business activities and leisure.

As fear is highly subjective, it cannot be measured easily; however, some innovative approaches attempt to value the loss in life stratification and welfare that households experience due to the fear that the acts of terrorism induce. The two approaches are Contingent Valuation and Hedonic Market approach that can be used to estimate the price of fear as indicated by Frey, Luechinger, and Stutzer (2007), and Frey, Benz and Stutzer (2004). Our study is subjective in nature, devoted to examining how the acts of terrorism result in stress and trauma (Psychology) of the economic unit and therefore affect its behaviour about time allocation. Hence, keeping in view the nature of the study, a perception-based survey is conducted to investigate how the acts of terrorism affected the economic units and consequently influenced their decision about time allocation. The study used primary data set obtained from the survey through a questionnaire collected from district Peshawar, KPK province of Pakistan.

Peshawar district is not only the most populous district of KPK province of Pakistan but it also happens to be the largest and capital city (Peshawar) of the province. A road and rail center near the famed Khyber Pass; Peshawar city is an important military and communications center, the historic terminus of the Grand Trunk Road of India, and the major depot for trade with Afghanistan. District Peshawar of KPK province is selected as a sample area. The following reasons may explain why. Firstly, frequent and continuous terrorist attacks have been witnessed since 2009 in district Peshawar; the one notable is the Army Public School terrorist attack on December 16, 2014. Secondly, being the capital city of Khyber Pakhtunkhwa province and located at the doorstep of Afghanistan, the ongoing war against terrorism affected the social and economic fabrics of the district Peshawar on many fronts. Thirdly, due to counter-terrorism operations against activists in several districts of the KPK province and FATA, most Internally Displaced Persons (IDPs) settled in district Peshawar, hence stand highly targeted area for terrorist activities. Under the rationale of these motives, we select district Peshawar as the study area to analyse the impact of terrorism on households' time allocation patterns.

In brief, one basic motivation to take on this study is the potential gap in the existing literature on the subject. The received literature does not cover the psychological trauma caused by terrorism on economic agent and their family. Since a result-oriented public policy requires knowledge at the micro-level, hence having analysis at the household level, we believe that our study feeds well into understanding the effects of terrorism on the state of life.

The rest of the paper is structured as follows. Section 2 presents a review of the existing studies on the subject in Pakistan and other countries. Section 3 presents the methodology for the study, which includes theoretical underpinning, empirical model, definition and construction of variables under consideration, and estimation technique. Section 4 presents data, sampling, and situational analysis of the study area (District Peshawar). Section 5 illustrates the estimated results and their interpretations. Finally, section 6 presents the concluding remarks extracted from the study findings.

2. INSIGHTS FROM THE LITERATURE

As the feeling of uncertainty, fear and risk aversion intensifies over time, the individuals get the real effect of terrorism (Becker and Rubinstein, 2011). Terrorist acts may initiate fear in one's mind while intensifying negative feelings and thus influencing economic conduct (Marshall et al., 2007; Holman et al., 2014; Rasul and Iqbal, 2019). Becker and Rubinstein (2011) analysed that media coverage of terrorist acts has been the major contributor to changing an individual's behaviour. Additionally, terrorism may increase stress, having spillover effect on both adult and children's health (Camacho, 2008; Pesko, 2014; Pesko and Baum, 2016).

Terrorism has an adverse impact on subjective well-being; an area where terrorism has been on the peak, its inhabitants are less happy than those living in a country with orderly political conditions. Frey & Stutzer (2003) introduce the concept of happiness and illustrate it with subjective well-being. This can contribute to a new understanding of utility in economics, in addition to the 'Economics of Happiness' concept, which has opened up new possibilities of understanding different models of behaviour. Kimball & Willis (2006) differentiate between happiness and utility, stating that utility is what people achieve and what they care about (learned about by their choices), whereas happiness is how they feel. Although both utility and happiness are different in meaning, collectively these show one's subjective well-being. Frey and Stutzer (2005) have argued that citizens strongly value the right to participate, even down to inferring a monetary value.

Thus, what theorist calls "procedural utility" does seem to exist that is, people obtain utility not only from the outcome but also from participating in the procedures that lead to it, e.g., socialising, leisure activities, or voting. Correspondingly, Frey, Luechinger, and Stutzer (2007) and Frey & Stutzer (2005) propose another approach in light of satisfaction in life and the data on subjective well-being. They provide a shred of empirical evidence by studying the individual living in Germany and states that terrorism leads to a considerable reduction in life satisfaction, suggesting that individuals incur large utility losses. In particular, numerous scholars agree that utility and wellbeing can be measured with some degree of accuracy (e.g., Kahneman *et al.*, 1999; Kahneman and Krueger, 2006).

Furthermore, several studies have reported that subjective well-being is sensitive to life's changing circumstances. Consistency tests uncover that happy individuals' smile often all amid social interactions, are evaluated as happy by loved ones and by their friends, express positive feelings more frequently, and are optimistic, social, extravert, and sleep well. However, a single terrorist attack could change it all. Thus, terrorism can trigger the effective feeling of fears in the individuals' minds, where fear is defined as how much subjective conviction about peril goes astray from objective assessments of risks. Along these lines, the dangerous impacts of fear on individuals' acts can help in clarifying individuals' "irrational" reactions to terrorism. This offers a more extensive way to deal with the economics and psychology of fear to represent the individuals' responses to terrorist acts. They additionally recognise that individuals modify or adjust in the said environment.

Pakistan is busy countering terrorism. Gupta (2011) explains how Southern and Western states of Pakistan were countering terrorism by using diverse truces and pacts

specifically made to counter it at the national level and at the regional or global level. Khan (2011) concludes that the participation of Pakistan in the war against terrorism and military operations in the nation has expanded militancy and intolerance to the degree that it had never been. Pakistan needs a balanced and conclusive policy towards the disposal of the danger of the terrorism hazard. Khan (2011) analyses the implication of military operations on individual life and states that such operations cause damage to the social and physiological conditions of the public, not only do they get relief from terrorists, but also socially and physiologically, they are living under the enduring fear of war. However, Frey (2006) suggested that to deal with terrorism, the government should eliminate the social and economic disparities that cause terrorist activities and, secondly, opt for a peace talk.

The review of the existing literature and knowledge uncovers the accessible empirical literature and helps understand the procedures that prompt different effects. Yet, little is thought about the structure and conduct of dread associated with the consequence. Exclusively constrained conclusions can be drawn about the effects and viability of safety efforts to decrease terrorism while evidence explaining the time allocation pattern is missing. In brief, it can be stated that before evaluating the impact of terrorism on the macro-economic level, micro-economic processes that determine the overall macro-economic impacts, should be considered. This study exploits the underlying procedure that affects the macroeconomic outcome i.e., households' time allocation pattern, that resulted in a change of preferences and subjective well-being.

3. METHODOLOGY

The methodology section comprises five subsections. Subsection 3.1 presents theoretical underpinning relating the effect of terrorism on the economic unit's behaviour. Section 3.2 presents the specification of the empirical model, 3.3 describes the definition and construction of variables. Subsection 3.4 presents an estimation technique to examine how acts of terrorism affect the decision of economic units about time allocation.

3.1. Theoretical Underpinning

Humans are created with a nature that depends on various ecological layers around them for their survival, for instance, growth, satisfaction, comfort, and accomplishment. The ecological system theory developed by Bronfenbrenner (2005) looks at the process of human development, examining how human beings create a specific environment in which they survive. According to Bronfenbrenner (2005), the ecological system has four subsystems (ecological layers): micro-system, eco-system, exo-system, and macro-system. To some extent, in all these ecological layers, human is interdependent. However, the size of interdependency varies across these subsystems. For instance, the first ecological layer (microsystem) is very close to the child, the contained family (especially parents), school, and neighbourhood, whereas, macro-system is very broader that covers the overall pattern and capture the cultural and social context that human takes in. The interdependency of humans in all these ecological layers compelled it to allocate their time to different deeds to meet their immediate needs and social dealings needed. Humans allocate their time among different activities like passive leisure (sleeping), active leisure (personal activities, religious/spiritual activities, time for

family/society), and economic activities to keep up with these ecological layers. However, other things being equal, the allocating of time in a balanced way among these activities depends on the local environment in which humans endure.

The acts of terrorism induce fear, which negatively impacts the local environment. As a result, humans (in abstract form economic unit) change their behaviour mainly concerning time allocation. Fear in the reaction to terrorism is a psychological phenomenon that worries humans about a blend of possible intense horrendous mishaps, sooner or later. However, the fear intensity of terrorism varies from person to person depending on the degree of its vicinity detriment to which the demonstration has been submitted. In addition, fear intensity also depends on the fierceness of the occasion, coping capacity, and adapting styles of individuals. The vicinity detriment from terrorism minimises exposure of economic units to risk, referred to as 'Constrained Behaviour' by Greenberg, *et al.* (1992).

Consistent with Constrained Behaviour phenomena, the vicinity detriment due to terrorism generates fear-based oppression hence distresses the physical and mental capacity of humans, which has obvious consequences for the individual's time allocation in a balanced way.

In this framework, the impact of terrorism on the state of life (time allocation) should be hypothesised as "under a specific economic, social, and demographic profile, the preferences of an economic unit about time allocation change with terrorism".

3.2. Empirical Model

This section presents the empirical models in order to assess the impact of terrorism on household time allocation to leisure and economic activities empirically. To meet the research objectives, the empirical analysis is carried out by estimating four different empirical models examining the time allocation for leisure and business in the pre and post-2009 scenarios. The empirical analysis in this study builds upon Frey, Benz, and Stutzer (2004), aiming to understand the impact of different terrorism activities on a household's time allocation pattern. To assess change in time allocation pattern, we use the proxy of time allocation to 'leisure' and 'business activities'. Taking 2009 (the most intense terror hit year) as the base, Equation (1) analyses leisure time in pre and post-2009 periods. Similarly, Equation (2) is used to analyse the change in Business Activity in the pre and post-2009 period.

$$\begin{aligned} \mathrm{TAL}_{\mathrm{ki}} &= \beta_0 + \beta_1 \mathrm{TI}_{\mathrm{Seen_i}} + \beta_2 \mathrm{B}_{\mathrm{Hrd_i}} + \beta_3 HH_{Afft_i} + \beta_4 EP_{Afft_i} \\ &\quad + \beta_5 LOC\_Afft_i + \acute{\beta} X_i + + \varepsilon_{\mathrm{i}} \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1) \end{aligned}$$

$$\begin{aligned} \mathrm{TAB}_{\mathrm{ki}} &= \beta_0 + \beta_1 \mathrm{TI}_{\mathrm{Seen_i}} + \beta_2 \mathrm{B}_{\mathrm{Hrd_i}} + \beta_3 HH_{Afft_i} + \beta_4 EP_{Afft_i} \\ &\quad + \beta_5 LOC\_Afft_i + \acute{\beta} X_i + + \varepsilon_{\mathrm{i}} \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2) \end{aligned}$$

Where, the subscript i denotes cross-sectional unit, whereas the subscript *k* refers to pre and post 2009 scenarios, hence each equation captures two different scenarios.

3.3. Variables' Definition and Construction

Since data is survey-based, hence most of the variables are self-constructed. In this subsection, detailed definitions and construction of variables and the methodology used for their construction are given.

Dependent Variables

As the study aims to investigate the impact of terrorism on the pattern of time allocation, the dependent variable is captured with time allocation to 'leisure' and 'business activities'. In this context, the study treats two variables as categorical for two different time periods. These categorical dependent variables are further explained below.

Time Allocation to Leisure (TAL_i)

Leisure broadly falls into two types, passive leisure (sleeping) and active leisure. As far as passive leisure is concerned it is a pre-requisite for life survival that a minimum of six hours of sleeping is essential (Yetish, et al. 2015). Active leisure falls into three different activities namely personal activities, religious/spiritual activities, and time for family/society (social activities). In this context, we constructed an index covering the above three activities to measure the total time that a household allocates to active leisure.[5] As we consider time allocations to active leisure only, the total available time for leisure is 18 hours. To measure how much a household allocates time to these three different activities out of the available 18 hours, we construct an index measuring the scale from 1 to 6.[6] Thus, by summing up the active leisure activities, the following index values of the household's active leisure time for two different periods pre and post 2009 are constructed.

$$\mathrm{TAL_i} = \frac{\sum_{j=1}^{3} \mathrm{A_j}}{\mathrm{Total}} * 100$$

Where $\mathrm{TAL_i}$ denotes index of household's time allocate to active leisure, $\sum_{j=1}^{3} \mathrm{A_j}$ is the sum of three active leisure activities that household allocate their time to.

Time Allocation to Business Activities (TAB_i)

Deducting six hours of passive leisure (sleeping) time form total available (24 hours), the maximum time that an individual allocates to business activities is 18 hours[7]. The overall business activity has three sub-business activities, namely time allocation to main business activity, time allocation to part-time activity, and time allocation to business travel. In order to measure how much a household allocates time to these three different business activities out of the available 18 hours, we constructed an index measuring the scale from 1 to 6[8]. Thus, by summing up these different business activities, the following index values of household's time allocation to business activities for two different periods, i.e., pre and post-2009, are constructed.

$$\mathrm{TAB_i} = \frac{\sum_{j=1}^{3} \mathrm{B_j}}{\mathrm{Total}} * 100$$

Where $\mathrm{BAL_i}$ denotes index of household's time allocated to business activities, $\sum_{j=1}^{3} \mathrm{B_j}$ is the sum of three business activities that household allocate their time.

[5]The available time for total leisure and active leisure is 24 and 18 hours respectively.

[6]Scale 1 stands for 1 hour allocated to active leisure, 2 stands for 2 hours and similarly scale 6 stands for 6 hours allocated to a given active leisure.

[7]Time meant for attending or promoting business activities.

[8]Scale 1 stands for 1 hour allocated to active leisure, 2 stands for 2 hours and similarly scale 6 stands for 6 hours allocated to active leisure.

Independent Variables

Among explanatory variables, terrorism is our variable of attention. In this context, to measure the intensity of terrorism, five attributes are used as proxy, namely Number of Terrorist Incidents Seen by Respondent **(**TI_Seen_i**),** Number of Blasts Respondent Heard (B_Hrd_i), Respondent's HH Affected by Terrorism (HH_Afft_i), HH Economically or Physically Affected (EP_Afft_i), and Locality affected by Terrorism (LOC_Afft_i). The first proxy Terrorist Incidents Seen by Respondent **(**TI_Seen_i**)** is measured with the scale from 0-5 (Scale 0 reflects not witnessed;1 reflects 1-2 times; 2 reflects 3-5 times; 3 reflects 6-8 times; 4 reflects 9-12 times; while 5 reflects 13 and above times). Witnessing terror attack incidence has obvious psychological consequences that have a high probability of affecting respondents' time allocation. The higher the intensity (the greater the number of terrorist incidents seen) the greater would be the negative impact on time allocation. The second proxy of terrorism is the Number of Blasts Respondent Heard (B_Hrd_i). Like the first case, this proxy is measured with the scale from 0-5 (Scale 0 reflects not affected; 1 reflects 1-2 times; 2 reflects 3-5 times; 3 reflects 6-8 times; 4 reflects 9-12 times; while 5 reflects 13 and above times). The third proxy is the respondent's HH Affected by Terrorism (HH_Afft_i). This variable captures whether the respondents have borne any direct trauma and fear from terrorist attacks, which involved their family members. The variable takes values from 0-4 according to the severity of the situation (Scale 0 reflects not affected; 1 reflects slightly; 2 reflects to some extent; 3 reflects to a considerable extent; 4 reflects totally destroyed). The fourth measure is the economic and physical effects of terrorism on respondent's HH (EP_Afft_i). The variable takes values from 0-4 according to the severity of the situation (scale 0 reflects not affected; 1 reflects slightly; 2 reflects to some extent; 3 reflects to a considerable extent; 4 reflects 'totally destroyed). The last measure is Locality affected by Terrorism (LOC_Afft_i). This variable helps us to understand whether the respondents have been indirectly affected by the terrorist attacks or not. Individuals living in the surroundings of threat-alert areas have undergone high physiological pressure, choking their time allocation. If the locality is affected by terrorism, its intensity is expected to decide the severity of the incidence on their time allocation. As incidence increases, it is expected to negatively affect the time allocation to both the activities i.e., Leisure and Business. The variable takes values from 0-4 according to the severity of the situation (scale 0 reflects not affected; 1 reflects slightly; 2 reflects to some extent; 3 reflects to a considerable extent; 4 reflects 'totally destroyed).

Along with the variable of interest (terrorism), we used a set of control variables considering their relevance and potential for affecting time allocation patterns in response to terrorism. For example, Household Size (HHS_i) which measure is the total members of HH. This variable shapes the household decision about time allocation, i.e., whether to invest time in business activities or leisure time. If the HH size is large, it is easy to spare time both for leisure and business because of the less per capita engagements (Iqbal & Nawaz, 2017).

Among the explanatory variables, the second control variable is Education Status(EDU_i) which plays an important role in shaping the time allocation. If the household is equipped with education, then they tend to have higher income, thereof, increase the allocation towards leisure activities and reduces business activities as they value family time more (Iqbal & Awan, 2015). The variable takes values from 0-8, 0 stands illiterate, and 8

stands the highest level (postgraduate). Household Income (INC_i) is another control variable, which is measured with the total income of all members of HH. Numerous studies considered income as the key determinant of individual time allocation.

Community Decision (COM_i), is captured with 'involvement in community-level decisions and responsibilities. This variable ranges from 0-3 (0 stands no involvement and 3 means high involvement). The underline hypothesis is that a HH having its members involved more in community decisions, is expected to allocate more time to leisure. On the contrary, if HH is less involved in community decisions, it will spare more time for business activities.

In addition, it is generally purported that there is relatively more social contact in the village than town/ city, therefore HHs are expected to spare more time to leisure than business in rural areas. Whereas, as in town/city there is relatively less social interaction, hence HHs are expected to spare more time to business activities. In this context, the Locality of Respondents (LOC_i), is also used as a control variable (treating it as a dummy variable).

3.3. Estimation Technique

Keeping in view the nature of the data and model, the empirical analysis is carried out through the Simple Ordinary Least Squares (OLS) estimation technique to analyse the impact of terrorism on the household's Time allocation. The OLS regression technique is useful due to its simplicity and data efficiency. If the data carries the desired characteristics, OLS produces the best results.[9]

4. DATA AND SAMPLING

Under the rationale discussed above, we selected district Peshawar as a study area to analyse the impact of terrorism on the state of life (time allocation). The target population of this study was households in district Peshawar; hence, 200 households (both from rural and urban areas) were interviewed. Although the terrorism intensity varied by area, still the majority of the people came across specific incidences. The majority of the blasts and mishaps occurred in the market place and along the roadsides that people witnessed while traveling to offices or visiting markets. Hence one way or the other, the incidence was not restricted to specific areas. Therefore, we randomly selected different areas and adopted the simple random sampling technique for data collection from households (HHs). Still, the sample was equally distributed between rural and urban localities (see Table 1). A well-structured, pretested questionnaire was used to collect data.

Table 1

Sample Areas

S. No.	Urban Areas	Sampled HHs	Rural Areas	Sampled HHs
1	Hashtnagri	20	Chamkani	20
2	Tehkal Bala	20	Badbher	20
3	Warsak Road	20	Mashu Gaggar	20
4	Hayatabad (Phase-IV)	20	Regi	20
5	Abdara	20	Pawaka	20
		100		100

[9]See appendixes A2 and A3 for diagnostic tests.

4.1. Situational Analysis of the Study Area

To analyse the impact of terrorism on households' time allocation patterns, a household survey was conducted in district Peshawar, Khyber Pakhtunkhwa, Pakistan. The survey was designed to evaluate the impacts of terrorism on time allocation patterns of households in pre-2009 and post-2009; the year when terrorism was at the peak. This section of the study presents a situational analysis of the study area to examine some basic characteristics of the unit of analysis (respondent) and the prevailing situation and intensity of terrorism in the sample area.

To avoid any biases in the results, it is important to evaluate the characteristics of the sample unit for its appropriateness, representativeness, and relevance to the subject matter. Keeping in view the sensitive nature of the study, respondents having age 20 or above were targeted for interviews, hence the age of the sample ranges between 22-60 years. The sample is also balanced as for as gender of the respondent is concern that out of 200 sample 122 (61 percent) were male and 78 (39 percent) were female. Moreover, out of 200 respondents, 54 percent of respondents were married, whereas 26 percent were unmarried and 19.5 percent widowed. Similarly, Table 2 presents the income profile of the respondent's household.

Table 2

Household Income (in Rupees)

	Mean	St. Div.	Min	Max
Household Income	39927	22936	11000	100000

Another attribute of the respondent is its involvement in decision-making at HH and community level. Two reasons may justify why? First, involvement in decision making shapes the respondent's time allocation pattern, and the basic hypothesis is that if an individual involves more in decision making, then they can allocate less time to business and more to leisure. Second, the decision decision-making involvement status of the respondent points towards the conformation and authenticity of the responses. Hence, we anticipate responsible behaviour from interviewees, and the responses reported can be trusted. In this context, the following Figure 1 demonstrates the involvement status of respondents in decision-making at HH and community levels. Data presented in the figure point towards the conformation and authenticity of the responses as the majority of the respondents reported being involved in decision-making at HH and community levels. Figure 2 reflects that our sample is more concentrated in the city area where the severity of the situation exists. Overall, this information provides evidence that the sample is balanced and representative.

Fig. 1. Respondent's Involvement in Decision Making at HH and Community Level

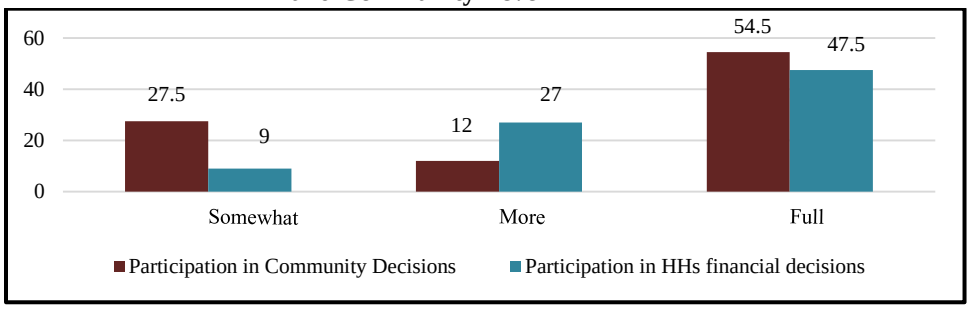


Fig. 2. Locality of the Sampled Household in District Peshawar

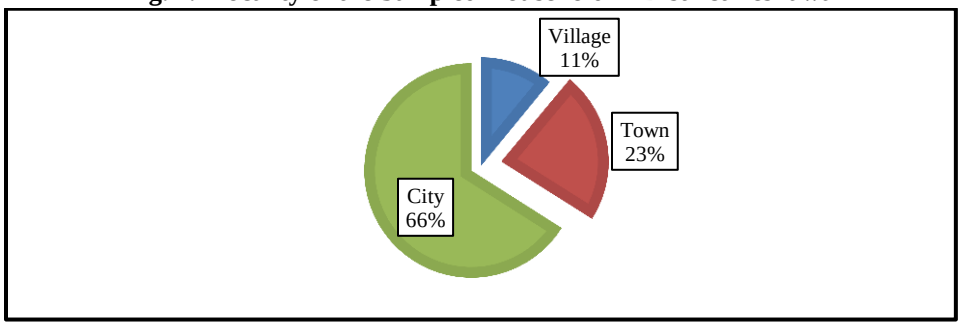
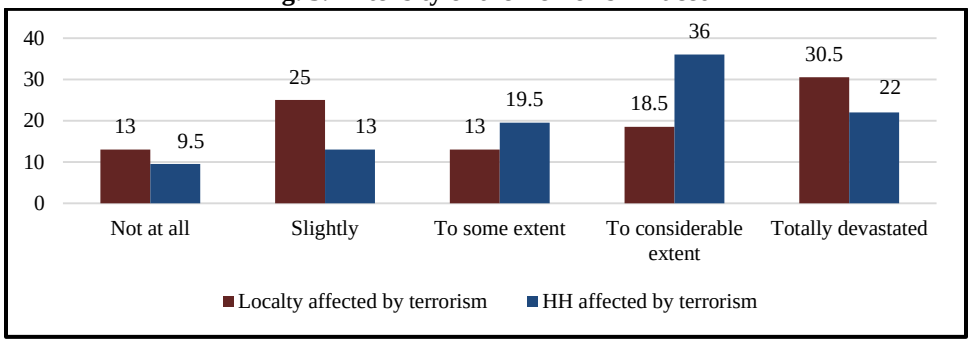


Figure 3 endorses the situation by presenting the status of localities affected by the terrorist attack. Around 30.5 percent of the respondent's locality was totally devastated by terrorism. Similarly, 18.5 percent and 13 percent of the respondents' areas were significantly affected by terrorist activities. However, 25 percent were slightly affected, while 13 percent of the households were safe from any adverse effects of terrorism activities. Hence, data reflects the extent of damage in the surveyed area, which is expected to trigger a serious change in the state of life.

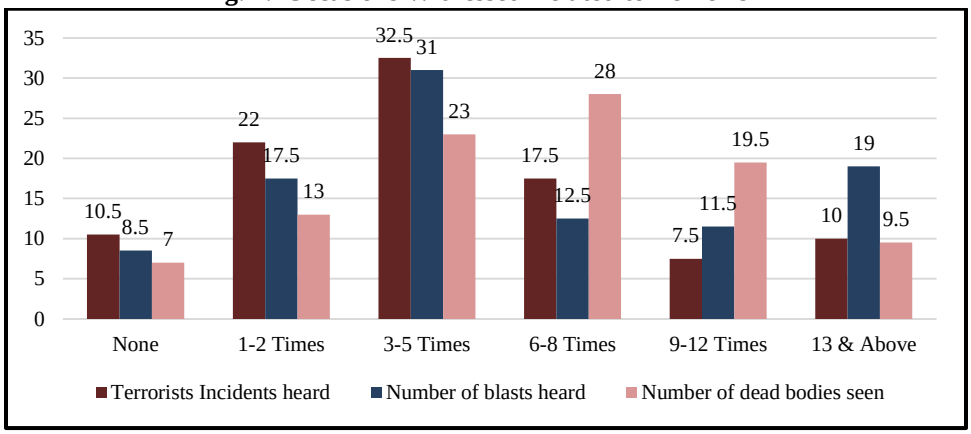
Fig. 3. Intensity of the Terrorism Faced



In addition to the respondent's perspective regarding the area, the direct effect imposed on households was also inquired. Results indicate that continuous terrorist activities in the locality have jeopardised the household's life. As shown in Figure 3, about 58 percent of respondents were significantly affected by the terrorism acts, depicting the unfathomable impact of terrorism in district Peshawar which is bound to influence an individual's state of life.

If we further dig deep, the psychological effects of terrorist activities are as severe as the physical damage. While district Peshawar was in the wrath of terrorist attacks in 2009 and onwards, the number of incidents had violently increased in the city, and the people living in surrounding heard attacks nearly on a daily basis. This increased the sense of insecurity among people, inflicting fear, despite escaping the direct effect of any terrorist attack. Figure 4 shows that almost 90 percent of the respondents had heard the blasts, which is significant. The highest number of attacks heard is 3-5 times, reported by 31 percent of the respondents. According to the data, 10.5 percent of respondents never heard any blast.

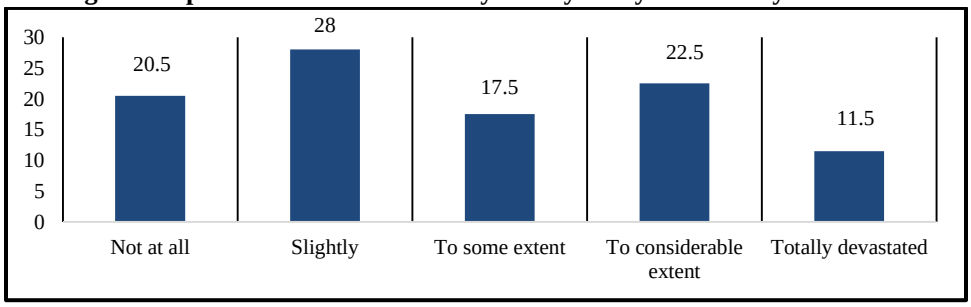
Fig. 4. Occasions Witnessed Related to Terrorism



Similarly, another very important aftereffects of any terrorist attack are the immediate aftermath following the activity. These scenes impose long-lasting negative impacts on people who witnessed the proceedings following any attack, ultimately affecting their own psychological state and of those who listen to their discussions of the occasion. Owing to the highly terror-prone area, respondents of the survey witnessed various incidents and have seen the dead bodies. Such visuals trigger the fear in the respondent's mind and have the potential to seriously affect their state of life. Alarmingly, 28 percent of households have seen the dead bodies up to 6-8 times, while if we combine, overall, about 93 percent of the respondents have witnessed similar aftermath, which indicates the intensity of the situation (Figure 4).

Last but not least, almost 80 percent of the respondents reported to be economically or physically affected by the terrorist activities (Figure 5), which is alarming. One can imagine the direct psychological impact of such a situation and explain the extent of damage imposed by terrorism on society in Peshawar. Hence, it is not unexpected that such a situation will have impacted the individual's state of life.

Fig. 5. Respondents are Economically or Physically Affected by Terrorism



In brief, the higher the intensity of terrorism acts, the more affected people will be emotionally and economically. Figures above have indicated the extent of incidence, and the sections following further elucidate the consequence borne by the household from the terrorist activities analysing the household's time allocation before and after 2009.

5. RESULTS AND DISCUSSION

As explained earlier, the dependent variable is time allocation, which we capture through time allocated between leisure and business activities. Before estimating our model, first, we tested the existence of multicollinearity among explanatory variables. The result of Variance Inflation Function (VIF) shows that all of our explanatory variables have no problem of multicollinearity.[10] After performing basic diagnostic tests, the study's empirical findings are presented in Table 3.

Table 3 carries four columns where model 1 presents the first empirical model having the dependent variable is Time Allocation for Leisure in the Pre-2009 period. Similarly, model 2 captures the impact of terrorism on individual Time allocation for Leisure in the post-2009 scenario. Likewise, model 3 and 4 captures the effect of independent variables on time allocation for business activities in the pre-2009 and post-2009 scenario. Overall, the models estimated carry satisfactory diagnostics and F-test for each model; hence, it depicts the consistency of the models.

Table 3

Empirical Findings (Dependent Variable: Time Allocation)

		Time Allocated to Leisure		Time Allocated to Business	
		Pre-2009	Post-2009	Pre-2009	Post-2009
Variable	Abr.	Model 1	Model 2	Model 3	Model 4
Number of Terrorists Incidents Seen	TI_Seen_i	0.0069	–0.0171*	0.0168	–0.0122
Number of Blasts Heard	B_Hrd_i	0.0066	–0.0069	0.0421**	–0.0338**
HHs Affected by Terrorism	HH_Afft_i	0.0280***	0.0006	–0.0224	–0.3050***
Family is Economically or Physically Affected by Terrorism	EP_Afft_i	0.0163**	–0.0157	–0.38554***	–0.21638***
Extent of Terrorism in the Locality	LOC_Afft_i	–0.0946***	–0.0049	0.2320***	–0.0625***
HH Size	HHS_i	0.0765***	0.0912***	0.0068	–0.0037
Respondents Education	EDU_i	–0.0468***	0.0091	–0.0159	–0.0312***
HH Income	INC_i	–0.0326	–0.1709	–0.2928	0.4753
HH Involvement in Community Decisions	COM_i	0.0199**	–0.2802***	–0.1213***	–0.0773***
HH Location-City	LOC_c	0.3973***	–0.03725	0.1956***	0.3299***
HH Location-Village	LOC_v	–0.0441	–0.10871**	0.2574**	–0.9292***
Constant	Con.	2.7036***	3.2488***	3.444***	4.442***
No. of Obs.		200	200	200	200
Rank		12	12	12	12
F Statistic		57.16	59.83	48.94	67.16
Prob._F		0.0000	0.0000	0.0000	0.0000
R^2		0.77	0.78	0.74	0.79
R^2_Adj.		0.76	0.76	0.73	0.79
Legend: *p<0.1; ** p<0.05; *** p<0.01					

5.1. Discussion

As evident, terrorism is a variable of interest in this study. In order to examine rigorously the effect of terrorism, different proxies of terrorism have been used as explanatory variables. In this subsection, the impact of these different measures of terrorism on the set of dependent variables is discussed one by one.

[10] Appendix A2.

Extent of Terrorism in the Locality (LOC_Afft$_i$): The first measure of terrorism is the extent of terrorism in the locality, even prior to the 'war against terror' in Pakistan, KPK used to remain vulnerable to various ethnic, religious, and tribal conflicts. Hence, the presence of such incidents in the locality is expected to have a heavy bearing on individuals' daily routine. According to our findings presented in Table 3, where the locality was prone to terror attacks even before 2009, it had negatively affected HHs time allocation to leisure (–0.095) which is highly statistically significant. Despite having the correct sign, such incidence has a statistically insignificant effect on time allocation to leisure in the post-2009 scenario.

The effect is more obvious in the event of time allocation to business. Prior to the 'war on terror' in Pakistan, local disputes failed to have any bearing on time allocation to business as the coefficient (0.232) is statistically significant and positive. However, once the incidence of terrorism changes in its nature, when the locality was perceived to be affected by terrorism, the HHs' time allocation to business activities was negatively affected (–0.062). Hence, evidence suggests that terrorism had negatively affected the productive use of time in the post-2009 period. The result favoured the results as explained by Downes-Le Guin and Hoffman, 1993; Sunstein, 2003; Viscusi and Zeckhauser, 2003; Becker & Rubinstein, 2004, suggesting that terrorism triggers the fear impact which changes individual decision about leisure time and business activity. As the terrorist activities intensify, the individual will increase their business activities. Whenever terrorists strike a locality, the targeted victims are the households, hence, have significant effects on households and change their time allocation. Our result is aligned with Sacco, et al. (2003) and Pyszczynski, et al. (2003), which states that to compensate for the feeling of insecurity, people make conservative decisions that are less risky.

HHs Affected by Terrorism (HH_Afft$_i$): To investigate further the intensity of terrorism on the household's time allocation pattern, we used HHs affected by terrorism as an explanatory variable. The rationale behind is if an immediate member of a HH gets affected in a terror attack, such an event is expected to have a heavy blow on their time allocation. Such an impact was captured through the said variable, which presents interesting results. Prior to intensified terrorism, if a HH member got affected by a violent attack, such an event did not hurt the time allocation to leisure in the pre-2009 period. Hence, people seemed to have dealt with it as an 'Act of God' and did not take it seriously. The results turn statistically insignificant for models 2 and 3, which leaves us with no choice but not to comment any further. Nevertheless, in the post-2009 period after the terrorism intensity increased, if a HH member was affected by terrorist activity, it has a significantly negative impact on time allocation to business (–0.305). Such a high coefficient indicates the high toll of terrorism on the household's time allocation and modifies their behaviour to productive use of their time.

Number of Terrorist Incidents Seen (TI_Seen$_i$): The intensity of terrorism may increase more if an individual has directly witnessed any terrorist incident. In this context number of terrorist incidents seen is used as an explanatory variable. Despite its significance, our analysis indicates only a small impact on time allocation for leisure in the post-2009 period, when such feelings have resulted in a negative effect. Overall, results indicate that people of the sample area (District Peshawar) showed resilience to terrorism on this front as per our findings.

Number of Blasts Heard (B_Hrd_i): The more the terrorist activities with individuals hearing the bomb blasts in their surroundings, the greater sense of fear triggers in the individual minds, and thus their decision towards time allocation changes. Our result signifies the impact of individual decisions regarding time allocation to business activities in the pre and post 2009 period (models 3 & 4) whereas, in the case of leisure activities (models 1 &2), the results are statistically insignificant. In the pre-2009 period, the number of blasts heard did not hinder time allocation to business, instead, as per our results, people used to allocate more time to the business to offset any unforeseen events. On the other hand, once the terrorist activities intensified and people started to listen to bomb blasts more frequently, they reduced the time allocated to business activities, as evident from a statistically significant coefficient with a negative sign (–0.034). Our finding is aligned with Brück, and Wickström (2004), Frey, et al. (2007), and Stutzer and Frey (2010). These studies argued that individual's preferences changes as terrorism hit the country, and the cost of terrorism is paid by a diminishing trend in business activities. The outcome is fear which keeps the individual to spend more time at home in religious or family activities.

Family is Economically or Physically Affected by Terrorism (EP_Afft_i): Finally, the aftermath of terrorist activities involves the psychological and financial constraints faced by the families living in the affected areas. Our result indicates that for Model 1 terrorism has a statistically significant and positive impact on the household's time allocation, as shown in the table. As discussed before, such events, prior to intensification of terrorism appears to be dealt with as 'Act of God', and hence, more time was allocated to leisure without getting any psychological impact of getting affected in a violent attack. However, for the post-2009 period (Model 2) the results were statistically insignificant. Similarly, for time allocation to business activities (in Models 3 & 4), if a HH was affected economically or physically, it has negatively affected time allocation to business activities.

In addition to this, the subjective well-being fell after terrorism hit, and the individual preferences to spend more time towards leisure activities increased instead of economic activities. Hence, the individual is more sensitive to the attack, and the fear keeps them away from economic activities, favouring our argument that psychological factors such as fear significantly impact the household's time allocation as explained by the term 'the price of fear'. Frey and Lüchinger and Stutzer (2007) and Frey (2006) combined indicators of welfare (from the Euro Barometer) with three terror indicators. They analysed the impacts of terrorism on micro-economic happiness in France, the Republic of Ireland, and the UK. In all three countries, they concluded that terrorist attacks negatively affect the life satisfaction of individuals.

To investigate the impact of terrorism on the household's time allocation, we use a set of control variables. In this context, this subsection is devoted to presenting these control variables' impact on the set of dependent variables one by one.

HH Size (HHS_i): Results presented in Table 3 show that in Model 1& 2 (modeling time allocation to leisure) our first control variable enters significantly and with a positive sign, indicating a significant and positive relationship between the HH size and the time allocation for leisure. The possible justification may as that leisure time includes all the social, religious, and recreational activities, hence with an increase in HH size, people

can spare more time to take care of leisure activities instead of involving in other (business) activities. It is important to be noted that the coefficient has increased in the post-2009 scenario (0.091 from 0.076), which depicts that social bonding has increased with terrorism. In addition, this can be an indication that following terrorism hype household member prefers to spend more time in social activities or at home rather than engaging in economic activities. In contrast, in the case of Models 3 and 4, where the dependent variable is time allocation to business, the variable turns statistically insignificant, indicating that HH size does not help in determining time allocation to business activities.

Respondents Education (EDU_i): Respondent education is another variable that may affect its decision about time allocation. In Model 1, prior to terrorism intensity, education resulted in the lesser time allocated to leisure (–0.047), which means that the more educated a person, the less prepared he/she would be to allocate his/her time to leisure. This may be due to the higher opportunity cost for leisure, that more educated people have relatively higher earning profiles and hence higher opportunity cot for leisure. However, the trend reverses in the post-2009 scenario, when the sign turns positive but statistically insignificant. On the contrary, in the pre-2009 period, education had no significant effect on time allocation to business activities, whereas in the post-2009 period with increased terror intensity, higher education reduces the time allocation to business (–0.031). The one possible justification is that sensitivity to terrorism increases with education hence they are more sensitive to the risks involved in going out for economic activities.

HH Income (INC_i): The result presented in Table 3 shows that household income carries a positive and statistically insignificant effect on HH's time allocation to leisure and business activities. Though unexpected, the results still make sense in the wake of the issue under consideration. When an event involves risk of death, income seems misfit among the list of factors that impact the respective decisions pertaining to time allocation. In the pre-2009 period, there seem to be other factors (rather than income) that influence HH decision to allocation time. Similarly, in the post-2009 scenario, the risk to life is a stronger impetus than the prospects of income that affect decisions about time allocation.

HH Involvement in Community Decisions (COM_i): Household involvement in community decisions enters all four variables significantly, however, does not hold a uniform sign across models. For instance, for the time allocation to leisure in the pre and post-2009 period (Model 1 & 2), HHs time allocation to leisure increased due to involvement in community decisions as they felt safer outside. Therefore, involvement in community decisions has a positive and significant impact on time allocation to leisure in the pre-2009 period. On the contrary, in the post-2009 period, time allocation to leisure is negatively affected by involvement in community decisions, with a relatively greater coefficient (–0.28). This can be associated with the fact that people might not feel safe outside due to greater exposure to negative vibes prevailing in the community in the wake of terror hikes. In Models 3 and 4, whereas the dependent variable is time allocation to business activities, in both cases, the variable holds a negative sign that is statistically significant. The following reasons may explain why? As the terrorism hit the sample area (District Peshawar) with more intensity, the fear of attack triggers in individual minds due to greater

exposure to negative feelings from the peers and community, hence, individual chooses to spend more time at home, family and less to business activities, as explained by Enders & Sandler (2005). They argued that as the attack hit the locality, the fear triggers the trust deficit in individuals that diminishes the economic activities.

HH Location (LOC_i): Another very important determinant of time allocation to leisure and business activities is the location of the HH. Results indicate that people living in urban areas allocate more time to leisure in the pre-2009 period (0.397) compared to the post-2009 period when the coefficient turns insignificant. Hence, prior to terrorism, HHs used to enjoy their lives by allocating more time to leisure in city areas as compared to HHs located in small towns. Similarly, HHs located in city areas used to allocate more time to business activities as compared to people in town areas, in the pre-2009 period (0.196), which even further increased (0.329) in the post-2009 period argues that with an increase in terrorism people choose to work more to cover losses than to spend time on leisure activities.

On the contrary, HHs located in villages are used to spare less time to leisure both in the pre and post-2009 periods with a coefficient though higher in the post-2009 period (0.109). Whereas, in the pre-2009 era, HHs located in rural areas are used to spare more time to business (0.257) activities while the relationship reversed (–0.929) in the post-2009 period reflecting the extremely negative consequences of terrorism on the business environment in rural areas.

6. CONCLUSION AND POLICY IMPLICATIONS

There has been little understanding of the economic impacts of the psychological trauma of casualties on economic agent and their families. The phenomenon may not only result in higher spending on health, absenteeism from work, and reduction in labour productivity but can also diminish welfare and life satisfaction at the household level. In this connection, this study explores whether or not terrorism shapes the household's time allocation pattern. The basic hypothesis is "terrorism trigger fear in people's mind that affect their preferences about time allocation". In this context, the study empirically investigates the effects of terrorism on the household's time allocation decision in the pre and post-2009 periods to seek their time distribution between business activities and leisure time.

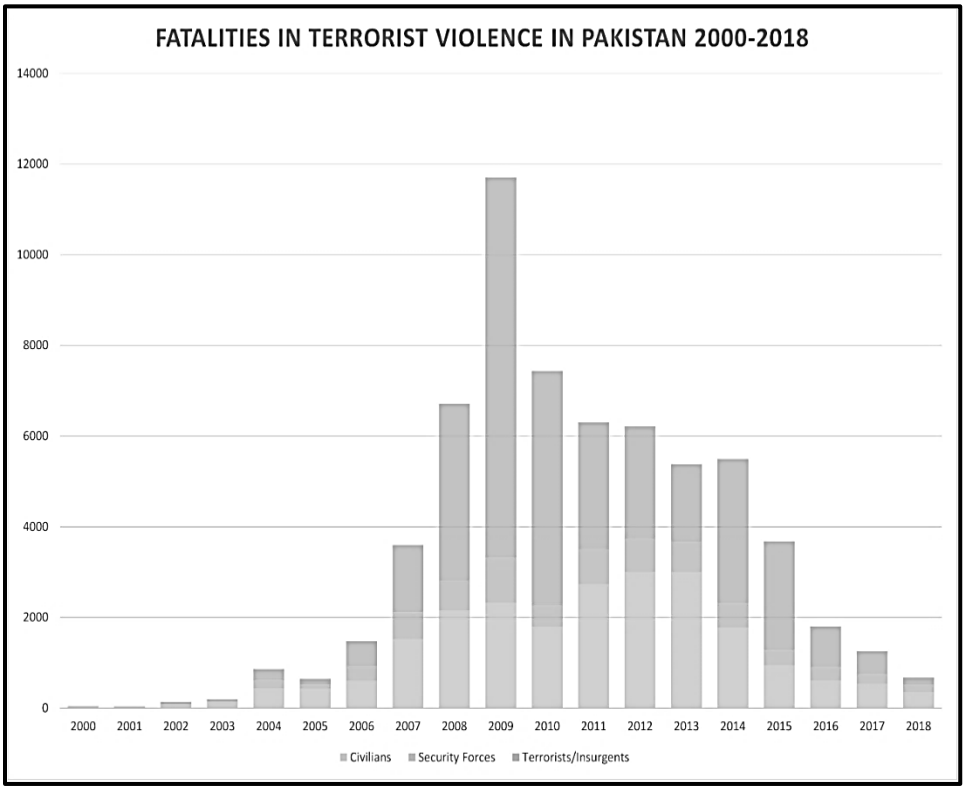
In general, the study's findings reveal that households' time allocation patterns have changed due to terrorism because people feel fear at workplace, consequently increasing leisure time while allocating less time to business activities. Touching the result thoroughly, as in model 4,[11] four out of five terrorism proxies are statistically significant and holds negative sign pointing toward the statement that individual prefers to stay at home and spend time on leisure activities rather than on business activities. In addition, the empirical evidence shows that proximity to 'terrorist attacks areas' of the sample district signifies its role in the decision-making of the people about time allocation. This indication moved towards our result that people living in areas closer to the terrorist attacks have experienced a significant change in time allocation patterns compared to those living far-off.

[11] Dependent variable is time allocated to business activities in post 2009 period.

We believe the findings of the study feed well into policy recommendations. The policymakers need to regularly monitor the situation and make every effort to keep society and people safe. Once the area is prone to terrorist attacks, it is the perception that hurts more than the actual happenings. As our analysis expose that even if the HHs have not been in contact with any terrorists' attack, still their time allocation gets affected due to 'hear-say'. Therefore, important policy measures should be put in place to inform the citizens of state's resolve and counter strategies to fight terrorism. This will give people hope and encouragement for a comeback. To conclude, the government's defense spending has important social implications attached to it, and a country's spending on defense should not just be taken as numeric figures only. Stronger defense improves the quality of life and yields tangible economic benefits.

Despite the hard work undertaken for this research, the following limitations need to be taken care of in the impending research on the subject. Firstly, this study was carried out in district Peshawar only. Conversely, the entire country is through a lot of disruption, as terrorist attacks resulted in deaths and devastation and disturbed the way of life in the whole country. Therefore, the sample area and size can be extended in future research. Secondly, the state of life is broader in scope, hence any future research can study some other important aspects like happiness, cultural activities and public's social preferences, etc. to capture the state of life at its full length.

APPENDIX-AI



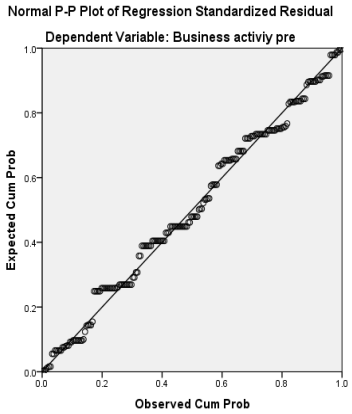
Source: Wikipedia <https://commons.wikimedia.org/w/index.php?curid=68554607>, (Accessed on June 2, 2020).

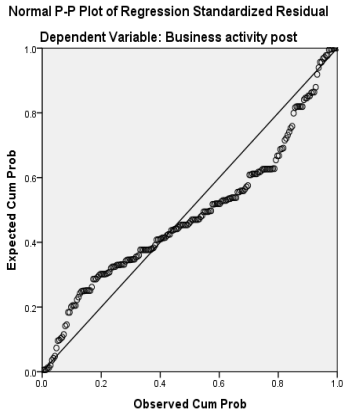
APPENDIX A2

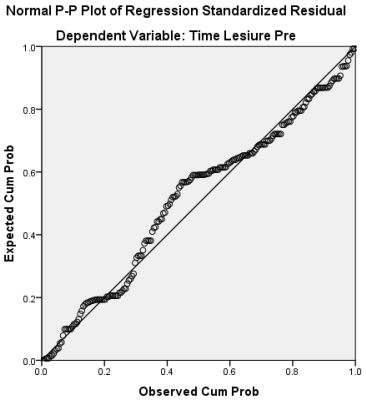
VIF Test Result

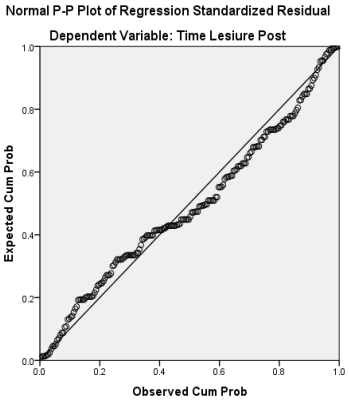
Variance Inflation Function			Variance Inflation Function-Uncentered		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
Number of Terrorists Incidents Seen	1.11	0.90253	Number of Terrorists Incidents heard	3.81	0.26259
Number of Blasts heard	1.15	0.86704	Number of Blasts heard	4.26	0.23491
HHs affected by terrorism	1.42	0.70596	HHs affected by terrorism	7.15	0.13987
Family is economically or physically affected by terrorism	1.21	0.82873	Family is economically or physically affected by terrorism	3.38	0.29587
Extent of terrorism in the locality	2.2	0.45357	Extent of terrorism in the locality	7.7	0.12983
HH size	1.25	0.80157	HH size	6.26	0.15977
Respondents Education	1.26	0.79275	Respondents Education	4.67	0.21414
HH Income	1.15	0.87063	HH Income	1.19	0.83934
HH involvement in Community decisions	1.17	0.85264	HH involvement in Community decisions	6.4	0.15629
HH location-city	2.18	0.45863	HH location-city	6.41	0.15594
HH location-village	1.72	0.58092	HH location-village	1.93	0.51702
Mean VIF	1.44		Mean VIF	5.76	

APPENDIX A3









APPENDIX A4

Table A2

Summary Statistics of Variables under Consideration

Variable	Obs.	Mean	Std. Dev.	Min	Max
Time Allocated to Leisure (Pre-2009)	200	3.09	0.27	2.54	3.732
Time Allocated to Leisure (Post-2009)	200	2.95	0.37	2.16	3.819
Time Allocated to Business (Pre-2009)	200	3.25	0.65	1.74	4.924
Time Allocated to Business (Post-2009)	200	2.87	0.62	1.30	4.577
Number of Terrorists Incidents Seen	200	2.19	1.41	0	5
Number of Blasts Heard	200	2.58	1.58	0	5
HHs Affected by Terrorism	200	2.48	1.24	0	4
Family is Economically or Physically affected by Terrorism	200	1.76	1.32	0	4
Extent of Terrorism in the Locality	200	2.29	1.45	0	4
HH Size	200	4.43	2.21	1	11
Respondents Education	200	3.41	2.07	0	8
HH Income	200	0.01	0.04	7.36e-10	0.5748
HH Involvement in Community Decisions	200	2.15	1.02	0	3
HH Location-City	200	0.66	0.47	0	1
HH Location-Village	200	0.11	0.31	0	1

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Commentary

The Nuisance of Own Money in Automobile Purchases

MOHAMMAD SHAAF NAJIB and USMAN QADIR

Own Money: In A Nutshell

Own Money: A premium charge for immediate ownership of an automobile being sold.
The supply side of passenger car manufacturing as we know it, is not functioning at full capacity. Artificial shortage is created - giving rise to the "own money" culture.
The demand side has gotten habitual of this.
Demand side is guilty of encouraging "own money" culture, but it is not the primary culprit.

INTRODUCTION TO OWN MONEY

The constant gap in demand and supply of vehicles in Pakistan gave birth to a phenomenon unique even today to the Pakistani automobile market known as the 'own money' for brand new vehicles. For immediate possession of an automobile that has been purchased, the buyer must pay a premium charge: own money. The question is, what is this own money, and why must one pay this to possess something one has already paid for?

In the early 2000s, when car sales in Pakistan rose sharply, aided by the banks' introduction of car financing services, the demand and supply gap widened. The number of buyers increased rapidly, while vehicle production capacities did not significantly increase to match this rise in demand, resulting in an increased waiting period for the delivery after booking the vehicle. An opportunity to earn commission was created for those in the middle of the supply chain, i.e., the 3S[1] dealerships.

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Authors' Note: This analysis has been motivated by discussions with Dr. Nadeem Ul Haque, Vice Chancellor, PIDE. We are also grateful to Mr. Nabeel Anwar for gathering data and invaluable contribution in understanding the culture of own money. The author is grateful to Dr Nadeem Ul Haque, Vice Chancellor, PIDE for ideas/ comments on the earlier draft of this brief.

[1]3S dealerships are car dealers associated with a certain automobile manufacturer providing Sales, Service and Spare Parts Management services to the costumers. They act as the middleman or as bridge between the car manufacturers and buyers for sales and after-sale services.

At the time of vehicle shortages and production delays, the car dealers started charging own money for quick delivery of brand- new vehicles. Own money is a premium charged over and above the quoted price of a vehicle for immediate delivery. For instance, the company ABC sets the market price of its vehicle X at PKR 2 million inclusive of all taxes, but the tentative delivery date is six months from the booking date. The buyer is forced to pay a considerable amount and wait for an extended period. This allowed the car dealers to develop the process of own money, where they offer the buyers a way out at the time of booking. As a result, the buyer is given the option to pay an 'm' amount of money, over and above the price quoted by the company, and get the car within a week, even the same day in some cases. By paying this own money, the buyer is then relieved of the waiting time for vehicle delivery and obtains ownership of the car immediately.

The question that arises is when the company is taking a much more extended period to produce and deliver vehicles, how can the dealers offer express delivery? Does that mean the companies are directly involved in encouraging the culture of own money on the sale of cars or indirectly seeking the benefits of this culture? This knowledge brief sheds light on the industry's current structure and highlights the slim margins between production and sales in virtually all sub-sectors of the industry. The own mechanism is discussed, followed by the implications for consumers and a possible way to reign in the nuisance of own money.

FOSTERING THE OWN CULTURE

The automobile industry of Pakistan was set up with the assistance of foreign firms by forming joint venture agreements to facilitating the transfer of technology and know-how for manufacturing automotive vehicles of all types. Income levels in the country have influenced the growth of the industry sectors; the motorcycle and small automobiles have become the workhorses of the low and lower-middle-income groups of the economy, while high powered luxury sedans are the preferred choice for the higher-income bracket in the economy. In the motorcycle industry, the established Original Equipment Manufacturer (OEMs) are facing stiff competition from the new incumbents from China, but recent trends indicate they are managing to hold their own, no doubt capitalising on a brand name, quality, and after-sale service while the Chinese brands are focusing on undercutting the price (Qadir, 2016).

The domestic automobile industry in Pakistan is comprised of several OEM firms that are manufacturing a variety of products in the industry, ranging from two and three-wheelers to passenger cars, commercial vehicles, and even buses, trucks, and tractors. The distribution of these manufacturers is skewed in favour of two and three-wheelers (motorcycles and autorickshaws), and there is a high degree of concentration in the remaining segments of the industry.

The own money culture is not hidden from anyone, and while the regulators (i.e., Auto Industry Development Committee on the supply side, and Competition Commission of Pakistan on the demand or market side) and companies might not be actively involved in this, but they have not taken any steps to curb the practice. Instead, their inactions have ended up aiding the own culture.

Table 1

Distribution of OEMs Registered with PAMA

Passenger Cars	5
Trucks	3
Buses	3
Jeeps	4
Pick-ups	5
Farm Tractors	3
Two and Three Wheelers	10

Source: PAMA Website.

When a company opens bookings for a new vehicle, the 3S dealers themselves book several vehicles. Not only does this create artificial demand at the time of booking, but it also creates hypes about the vehicle in the market. As a result, more people are pushed to book their vehicle as soon as possible due to rising bookings. This creates a fear among potential buyers that waiting a while before booking could result in a much longer waiting period; thus better to book immediately. This overbooking causes severe issues for the companies who are unable to meet the demand, leaving the field open for 3S dealers to exploit buyers. As a result, when the vehicles booked by the 3S dealers are delivered to them, they start offering the car to buyers with an immediate delivery under the condition they pay some premium over and above the car's actual price. This premium, as mentioned above, is known as the own money.[2]

Time Cost of Money and Pakistan's Own Culture

We work under the assumption that the buyer has *two options:*

A. To pay a large sum of money to book their vehicle and wait for a long period of time for the car delivery. For the time that the car has been booked but not yet delivered, the money can be referred to as a dead investment as there is no return or utility being gained by the consumer.

B. To pay a premium, referred in local automobile market as own money, and get the vehicle immediately.

Analysing the opportunity costs attached to the above situations, many buyers tend to prefer option B, as for them the social cost of waiting a long period of time for the vehicle delivery with dead capital paid to the company is greater than the total cost of getting the vehicle immediately by paying a premium or own money.

Summing, the deep rootedness of **own culture** in Pakistan's automobile sector can be explained through basic economics concepts. Artificial shortage is created by intentional overbookings and under manufacturing, thus nurturing supply-demand distortions and then through 3S dealerships primarily, and elsewhere as well, customers are made to choose between options A and B as described above based on their individual opportunity and time costs of money.

[2]This discussion is based on information collected from interviews with various stakeholders in the industry, including those from several dealerships.

While regulators and companies are rightly criticised for harbouring the own money culture in Pakistan, and the 3S dealers held the most responsible for being at helm of the affairs in this, a lot of responsibility lies upon the buyers as w ell who are willing to pay the premium amount thus giving the dealers the message that not only they willing to pay extra for an immediate delivery. In economic theory, this can be described as the "*Time Cost of Money*." Situational Analysis of this is explained in the Table 2.

Table 2

Own Money, Final Price, Production and Sale Comparison (July 2021)

(PKR)

Manufacturer	Vehicle Model	Own-Money Over Price	Price Ex-Factory	Ex-Dealership	Final*	Ratio: Own Money to Final Price (%)	Automobile Production	Sales	Gap (Production - Sales)
MG	ZS	165,000	4,099,000	4,149,000	4,239,768	3.89			
	HS	465,000	5,749,000	5,799,000	5,922,768	7.85			
Hyundai	Tucson	863,000	4,979,000	5,098,500	5,211,845	16.56	3,821	3,748	73
Kia	Sportage	396,000	5,270,000	5,370,000	5,488,775	7.21			
Toyota	Yaris	70,000	2,669,000	2,753,000	2,815,848	2.49	29,127	28,295	832
	Corolla Altis	370,000	3,249,000	3,333,000	3,412,035	10.84	18,552	18,355	197
	Corolla Grande	400,000	3,869,000	3,978,000	4,069,435	9.83			
Changan	Alsvin	250,000	2,519,000	2,569,000	2,628,168	9.51			
Honda	Civic	300,000	3,864,000	3,952,500	4,043,425	7.42	25,081	25,276	-195
Suzuki	Alto VXL	110,000	1,521,000	1,528,500	1,564,710	7.03	35,994	37,720	-1,726
	WagonR VXL	100,000	1,610,000	1,625,000	1,662,100	6.02	12,280	12,659	-379
	Cultus VXL	120,000	1,830,000	1,845,000	1,884,300	6.37	18,714	17,510	1,204

Source: PAMA Website.

Interviews with various dealerships.

Pak Wheels (2021), Get Instant on Road Price of New Cars webpage.

Note: * Final price includes: Federal Capital Charges (Token Tax, Income Tax, Registration Fee, Professional Tax, Number Plate Charges) + Ex-Dealership Price.

The own money culture has become so common and successful in Pakistan's automobile market that only the 3S dealerships are not profiteering from this mechanism. Instead, many private dealers have developed their entire business model on the own money concept. These private dealers now do not deal in secondhand cars but rather deal in brand new vehicles only (a snapshot of own money, the final price of the vehicle, and supply-side trends are given in Table 2 to highlight these distortions). They book new cars from multiple companies and then sell them to consumers who are willing to pay extra for buying the car immediately instead of waiting for months. These dealers' edge over 3S dealerships is that 3S dealers can deal in only one company's vehicles whereas the private dealers have no such restriction.

As own money at any given time is impacted by the market forces of demand and supply, there is a fluctuation in the own- money demanded on every car. So, if the demand and supply gap for a certain vehicle is lower, with a minimal waiting period, then the own money demanded will either be relatively low or none. On the other hand, as the demand-supply gap widens and the waiting period increases, the own-money rate also increases. Consequently, the private dealers, due to diversification, can cater to such risks. In contrast, for the 3S dealers, the risk levels are higher as they might not be able to earn the profits as they planned by twisting the consumer's hands if the automobile company is adequately managing its supply.

A look at own money, prices, and automobile production and sales data reveal key insights into the working of the automobile market. For one, the ratio of own money to final price of the automobile does not vary according to price, but the perceived popularity in the market. MG is offering luxury vehicles aimed at the upper segmen t of the market, so the own money being charged is higher. Similarly, Toyota Yaris is an entry-level Sedan, so it commands lower own money as compared to the company's Corolla variants. The *Altis* and *Grande* models are highly popular due to their brand recognition and relatively more rugged build, with the model being the go-to option for many rent-a-car services. Hyundai Tucson commands the highest ratio of own money to price, at 16.56.

CONCLUSION

Pakistan appears to have a unique automotive industry, with variety at the higher end of the spectrum in terms of different models being offered, and many variants being offered by a dominant player at the lower end of the spectrum. The culture of charging own money has been credited to production shortfalls that result in demand exceeding supply. On the flip side, consumers are willing to pay whatever premium they are charged to take ownership of a product they have paid for in advance. In the US, dealers charge premiums for their services, but consumers are free to shop around and choose the premium they are willing to pay. The manufacturer identifies a minimum price to the dealers there, below which they cannot sell. The premium above that is negotiable between the dealer and consumer so allowing them to reach a mutually beneficial price and not letting one twist the arm of the other party.

Moreover, given that the production of automobiles in Pakistan is being done on-demand, rather than mass manufacturing, just in time or even lean production, the justification for charging own money does not make sense. This feature of the Pakistan automotive industry bears further analysis, but the current culture of own money in the industry results from the actions of all stakeholders involved. The regulators must fulfil their duty to protect the rights of consumers by crippling the unregulated power at the hands of auto manufacturers. Instead, regulations must focus on creating a market structure facilitating all market players and not tilting to one side only.

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Commentary

Don't Fall in Love with Parity: Understanding Exchange Rate Depreciation

ABDUL JALIL

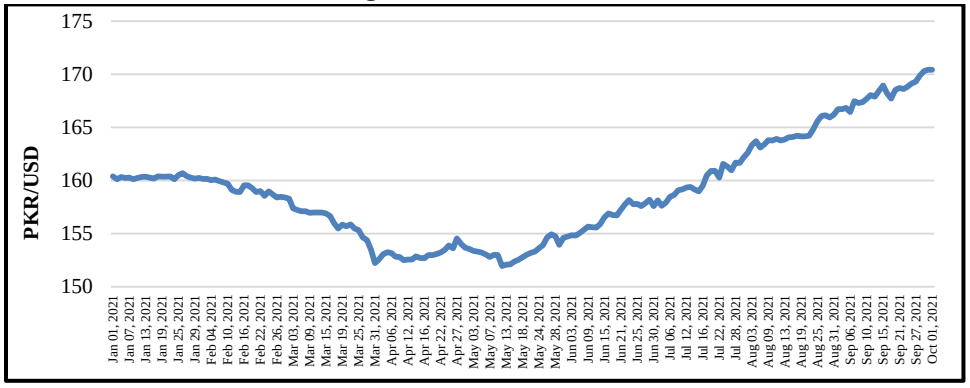
Key Takeaways from Global Research

- Exchange rate is like temperature in a human body: It merely reflects underlying weaknesses. Like the human body artificially holding the temperature down for long periods without addressing the causes is likely to lead to grievous consequences.
- There is no such thing as an active devaluation policy for boosting exports.
- Holding the exchange rate at an artificially appreciated rate is only possible through reserve loss. These losses cannot be incurred over the long run as reserves are finite and market participants know that reserves can be attacked to their advantage.
- Bolstering the exchange rate through exchange and import controls serves only to disrupt supply chains and eventually weaken the domestic economy. At best it is a short-run painful solution.

The Pakistani rupee has depreciated, against the US dollar, around 10 percent, since May 2021 (see Figure 1). This is a natural response of the exchange rate parity to swelling trade deficit, mounting inflation, and negative real interest rates. Considering the macroeconomic fundamentals of the Pakistani economy, it is expected that the rupee will remain under pressure and will continue on the fall. This situation raises several questions. What should be the response of the State Bank of Pakistan (SBP)? Should SBP intervene in the forex market or not save the parity? If yes, then how much? If not, then why? What should be the course of action of the government and the SBP in the long run?

This policy viewpoint will answer these questions and provide straightforward guidelines for the SBP and the government.

Fig. 1. PKR/USD in 2021



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Author's Note: I am grateful to Dr Nadeem Ul Haque, Vice Chancellor, PIDE for ideas/comments on the earlier draft of this brief.

SHOULD SBP CONTINUOUSLY SAVE THE EXCHANGE RATE PARITY THROUGH FOREIGN EXCHANGE INTERVENTION?

The answer is NO.

It is being argued that the exchange rate is continuously depreciating despite having a handsome amount of foreign exchange reserves. So, this is against the fundamentals of economics that the foreign exchange reserves are increasing and, on the other hand, the rupee is depreciating. So, SBP should manage the pressure on the exchange rate through the intervention in the foreign exchange market (see Box 1).

Box 1. Exchange Rate Pressure: Managed or not Managed

When there is a mismatch between the demand of the foreign currency (dollars in our case), and the supply of the foreign currency than the home currency (Pak rupee in our case) remain under pressure to depreciate or appreciate. In this case, the central bank, SBP in our case, may intervene in the foreign exchange market through the selling or buying of the foreign currency to manage the pressure. The difference between the actual nominal exchange rate and the equilibrium exchange rate is called the unmanaged portion of the pressure. If the actual exchange rate is equal to the equilibrium exchange rate, then SBP is not managing the exchange rate. If the actual exchange rate is overvalued when the demand of the dollar is higher than the supply of the dollar, then the pressure is fully managed by the SBP (see Jalil, 2021 and Rao, 2019 for the details and calculations of exchange market pressures and management).

We argue that the SBP should not intervene in the forex market. It is very clear that the amount of foreign exchange reserve is not in the safe zone. As per the SBP data, Pakistan's liquid foreign exchange reserves are around 26.1 billion USD (19.2 billion USD SBP reserve and 6.8 billion USD commercial bank reserve). It is also important to mention that we availed several debt reliefs and additional finances during COVID. If we net off all these finances, roughly, the foreign exchange reserves level will be around 20 billion USD.

On the other hand, the import bill is around 6 billion USD per month and growing in the backdrop of post-COVID recovery and increasing international commodity prices. According to these numbers, the foreign exchange reserves provide only the coverage of 3.0 to 3.5 months imports coverage. So, the reserves are not in the safe zone. If SBP intervenes in the foreign exchange market by selling the dollars, then foreign exchange reserves' loss is very obvious. That's why, keeping in view the pressure on the external sector in the future and the level of foreign exchange reserve, it is not advisable, in any case, that SBP should intervene continuously.

If SBP intervenes continuously, the loss of foreign exchange reserves will lead to balance of payment (BOP) crises. The obvious outcome is to approach to International Monetary Fund (IMF) to manage the BOP crises. The heart of the IMF loan-led policy is 'stabilisation' and 'the market-based exchange rate.' Consequently, the SBP intervention in the forex market will lead to loss of reserve, BOP crises, depreciation of the currency, and compromise on the GDP growth.

THEN WHAT ARE THE OTHER OPTIONS?

The SBP has other options in this challenging situation that are not being utilised. We think that SBP should seriously think on these lines.

Publicly Announced Interventions in the Foreign Exchange Market

The important thing is that the SBP should intervene in the foreign exchange market to curb the extra volatility and the artificial demand in the foreign exchange market. The extra volatility and the artificial demand are creating uncertainty in the foreign exchange market. Indeed, this situation is prone to speculative attacks and untargeted bidding (see Box 2). First and foremost, the task of the SBP should tackle this situation to save the market from speculative attacks.

Box 2. Untargeted Bidding in the Foreign Exchange Market

The untargeted bidding phenomenon often happens in the forex market when the traders feel uncertainty about the speed of the movement of exchange rate parity. It means that when a foreign exchange dealer just takes the ask/bid rate from the other dealer without committing the deal. This, just asking the rate, generates expectations about excess demand and excess supply in the market. Ultimately this creates the artificial demand and supply of the foreign currency in the forex market. It is also important to mention that the untargeted bidding can generate a very irrational number of order flow, based on the number of buyers and sellers, while the amount of buying and selling do not indicate the same trend.

One of the most important tools is the publicly ***announced intervention***. The SBP should adequately communicate about the size and the sign of the foreign exchange intervention. When an artificial buyer will have information that the SBP will intervene to save the parity, this will discourage his/her intention of buying or dollarisation. So, the publicly announced intervention may curb the unnecessary artificial demand of the dollars and the speculative attacks.

Recently, Patel and Cavllino (2019) surveyed several central banks and concluded that the publicly announced intervention significantly strengthens the signalling effect of the market. This is not new evidence or advice. Sarno and Taylor (2001) is a valuable read in this regard.

Importantly, this is growing practice among the central banks that they intervene publicly and remain transparent in the forex market. However, this phenomenon is more common in Latin American economies than in Asian economies (see Patel and Cavllino, 2019). Patel and Cavllino (2019) also argue that transparency and publicly announced intervention have advantages. It sets a signal from the central bank that what is going to happen in the future. Similarly, it enhances the credibility of the central bank. A credible commitment regarding the intervention or no intervention reinforces the signalling effect.

Should Focus on the Market Intelligence

However, there is no question that market intelligence is key to success. The knowledge about the intensity and the persistence of the exchange rate pressure may help determine the level of the foreign exchange intervention for anchoring the volatility of the exchange rate. If the pressure is persistent and due to structural issues, then it is better not to intervene. Otherwise, the forex traders will trade in the opposite direction of the central bank, and the central bank may deplete reserves without much impact on the volatility and the parity. Both announced interventions and secret interventions don't work in this case.

Proper Communication to Curb any Conspiracy Theory

The SBP should get accurate information about the inflows and outflows of the foreign exchange and then correctly communicate to the stakeholders to curb any conspiracy theory. For example, recently, there has been a rumour that the dollar is being transacted on Afghanistan's borders. The volume of these transactions is not precisely known. It may be possible that the actual volume is very low. But the rumours of 'huge transactions' are creating uncertainty and artificial demand. Unfortunately, the government is also hiding herself and the structural issues behind these rumours. This is more dangerous than the actual situation. Therefore, SBP and the government should adequately investigate the number and volume of the transactions. Then it should be properly communicated to the relevant stakeholders. This is also true in all other cases where the artificial demand and supply of dollars may create uncertainties. This act of SBP and the government will reinforce the credibility of the central bank. Indeed, the action of any credible central bank matter a lot to reduce speculative attacks.

Communication about the Equilibrium Exchange Rate

Jalil (2021) clearly shows that the undervalued/undervalued exchange rate has a positive/negative impact on economic activities. Therefore, SBP should continuously monitor the equilibrium value of the exchange rate and then properly communicate to the stakeholder. This will further signal to the stakeholder about the direction and the extent of the movement of the exchange rate and the intervention of the SBP into the foreign exchange market. This may also enhance the credibility of the SBP and may curb the extra artificial pressure on the home currency.

Very Calculated Tightening of Monetary Policy

The current monetary policy statement (MPS) of the SBP increases the policy rate to indicate that the SBP has changed its stance in the backdrop of rising inflation due to the increased demand. This is further linked with the revival of economic growth and the recovery from COVID-related recession. Partially, it is true that the prices have been increased due to the rise in demand. But there is another version that the supply chain is disrupted due to the Covid. If this is the case, then the monetary policy's tightening will not help curb the cost-push inflation pressure. The rising interest rate will hit both sides, that is, slow down the revival of the growth and increase the cost-push inflation. Surely, the rising inflation will hit the poor of the society and competitiveness as well. So, the SBP should track the actual reasons and size of the demand and supply-side pressures on inflation and act accordingly in the context of tightening the monetary policy.

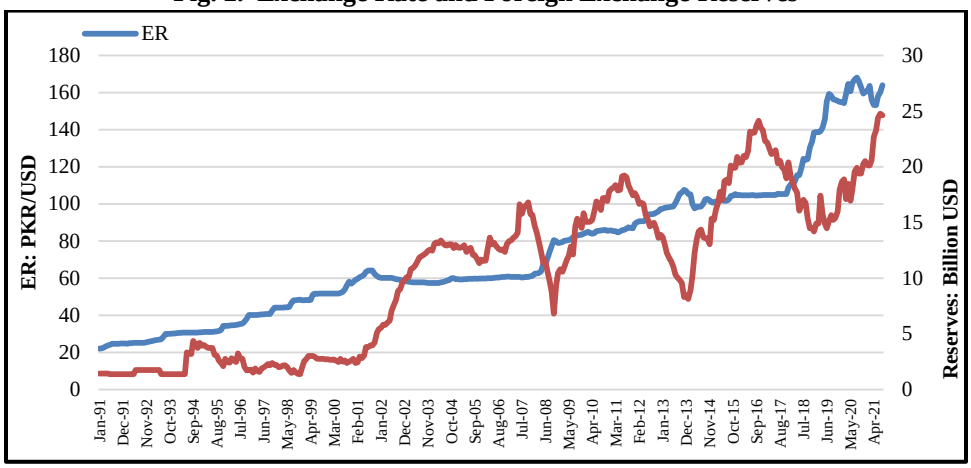
LONG RUN STRATEGY

Don't Fall in Love with Parity

It is highly recommended that the exchange rate parity should move with the market forces. Historically, whenever the SBP intervened in the forex market to stabilise the exchange rate against the market forces then after some period the loss of foreign exchange reserves was the obvious outcome (see Figure 2) and the BOP

crises.[1] This led to the IMF programme. Consequently, we had to over-adjust the rupee to follow the IMF programme. This led to both depreciation and the loss of foreign exchange reserves. Therefore, the SBP should not repeat the old mistake. If SBP and government claim that this is a new regime and the 'parity can move in both ways', then the SBP and government should not panic. They should be bold enough to wait for the natural movement of the exchange rate. They should let the rupee on the market forces with anchoring the artificial pressure and artificial uncertainties.

Fig. 2. Exchange Rate and Foreign Exchange Reserves



Clear-cut Structural Reforms to Ease the Pressure on the External Sector

If a country has chronic issues in the BOP, then the home currency cannot be stabilised for a more extended period. Therefore, Pakistan should concentrate on the long-term strategy to recover the BOP issues. Merely, depreciation will not correct the current account deficit (CAD) or trade deficit issues. It may partially, keeping rigidities given imports, reduce the imports. But the exports cannot be flourished with the depreciation only. Because we have several limitations with the exports on the front of narrow base, regulations, governance and international diplomacy. It is very obvious that the regulations have to be improved, simplified and streamlined. Without improving the external sector, the issue in the currency would not be resolved.

Accumulate Foreign Exchange Reserves

As mentioned earlier, the foreign exchange reserves of Pakistan are not in a safe zone according to reserves adequacy ratios. Therefore, the SBP should accumulate foreign exchange reserves. On the one hand, aforesaid should intervene in the foreign exchange market by selling the dollars to save or reverse the parity. On the other hand, the SBP should purchase the dollars from the forex market whenever possible. Last year, there was an

[1]We may get some benefits on the fiscal side by artificially stabilised exchange rates. However, we may not continue this policy for a longer period given the level of foreign exchange reserve. Once we let the parity on the market forces and allow rupee depreciation then we shall have, as usual, problems on all sides, that is, exchange rate, foreign exchange reserves, inflation and fiscal side.

excellent chance to buy the dollars from the market. However, the SBP let the PKR appreciate from 168 per USD to 151 per USD by announcing that the *parity will move both sides*. The SBP could purchase a heavy amount of dollars through purchasing and could maintain the rupee undervalue.[2] This would not be a unique case. The SBP purchased a heavy amount of dollars from the market in the early 2000s (see Hussain and Jalil, 2006).

Don't Put Exchange Controls

The SBP should not strengthen the local currency through foreign exchange control and import controls. Indeed, this act will serve only to disrupt supply chains and eventually weaken the domestic economy. At best, it is a painful short-run solution. It is well documented in the literature that foreign exchange restrictions spawn the parallel currency markets and the parallel exchange rate.[3] The premium between the official rate and the kerb rate reflects the sign of devaluation/depreciation. Therefore, ultimately, the currency has to be depreciated along with a high cost. We have witnessed the kerb exchange market and the dual exchange rate in Pakistan during the 1980s and 1990s.

CONCLUDING AND WAY FORWARD

This note discussed several options for the SBP and the government in the backdrop of currency depreciation and uncertainty in the forex market. We suggest that SBP should:

- Public information about the size and direction of the foreign exchange interventions in the foreign exchange market.
- Properly communicate with the stakeholders about the transactions of the dollars.
- Educate the stakeholders about the market value of the exchange rate.
- Move towards the tightening of monetary policy in a very calculated way.

We believe that these steps will curb artificial volatility and artificial demand in the short run. Secondly, the intervention in the forex market on a long-term basis is not advisable in any case. The cost is huge as we have experienced in the past. Third, the structural reforms are indispensable for the correction of the chronic issue in the BOP. We want to clear that we are not against the intervention in the forex market to curb the extra uncertainty in the forex market, but there must be a tolerance level. More clearly, this note is to inform the fear of nominal exchange rate fluctuations and especially of future depreciation. We believe that the debate on this issue will lead to a better monetary and exchange rate policy.

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Policy

Remove Service Charge on IBFTs to Encourage Digital Transactions

MOHAMMAD SHAAF NAJIB

The State Bank of Pakistan (SBP) announced on June 16, 2021, that it has now allowed banks to charge a transaction fee of 0.1 percent of the transaction or PKR 200, whichever is lower on Inter-Bank Funds Transfers (IBFTs). SBP has made compulsory free-of-cost IBFTs of up to PKR 25,000 per month per account. For accounts exceeding the limit, the banks will charge the transaction fee as mentioned above.

Inter-Bank Funds Transfers

Inter-bank funds transfer is the term used to define transactions where funds are instantly transferred from an account of a bank to an account of another bank. In this case, funds are deducted from one bank's reserve, the one with the sender's account, and are added to the reserve of the other bank, the one with the receiver's account.

Moreover, there are intra-bank funds transfers as well where funds are transferred from one account to another, but both the sender's and receiver's accounts are in the same bank. This way, the bank's reserves are neither depleted nor expanded and the only change is which account in the bank holds those funds. Such transfers are exempted from the digital transaction service fee that the SBP has allowed banks to charge.

Following the onset of the COVID-19 pandemic, on March 19, 2020, the Government of Pakistan and SBP decided to make all IBFTs free of charge. The idea behind this decision was to limit consumer visits to banks and thus restrict the COVID-19 threat. Before that, the banks were allowed to charge a transaction fee on IBFTs as per SBP's defined schedule of charges.

The practice did continue for a little over a year until after the third wave, the state bank, as mentioned above, assumed an improved COVID-19 position for reviewing the policy and thus reimposed the charges on digital funds transfer. Since then, Pakistan has entered the fourth pandemic wave as a much deadly delta variant and other new variants grow rapidly in Pakistan. Consequently, the basis of this review and policy change can be contested on the pandemic spread grounds, but for now, this policy viewpoint discusses the decision from an economic and financial perspective.

The policy viewpoint will establish an evidence-based impact of change in transaction fees by looking at transaction data, the volume of IBFTs, and other

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relevant data points. The initial hypothesis is that transaction fee on IBFTs discourage the public from adopting digital transactions and instead pushes them to return to cash-based dealings.

IS THE SERVICE CHARGE A CONSUMER PROTECTION POLICY?

The SBP clarified that this should be considered a service charge collected by the banks rather than a government tax. As the SBP explains, the reason behind allowing banks to collect this charge is to help the banks cover their costs for digital funds transfer services. This, as per the SBP, will aid in ensuring a sustainable supply of digital services by fintech and banks without discouraging digital transactions in the economy.

What are Consumer Protection Policies?

Consumer protection rules, regulations and laws are meant to safeguard the rights of buyers of goods and services from any kind of exploitive, deceptive, or fraudulent practices by the sellers of these goods and services.

Various state institutions, agencies and statues are employed by the government to enforce these consumer protection policies and keep the power of exploitation shifting towards the seller and thus ensuring in maintaining fair transactions in the market.

On the one hand, considering the scenario painted by the SBP, we can see this not as a charge imposed on consumers but as a consumer protection policy by setting a maximum limit of charge applicable while allowing banks to decide individually whether they wish to charge the fee or not.

It is essential to note that the transaction fee on IBFTs forms a very small and/or negligible portion of non-interest earnings of the bigger banks, but without collecting this service charge the smaller banks are expected to suffer severely. Subsequently, the main target of SBP's policy is to cater to the issues these banks might face.

This, though, could result in a possible consumer shift towards those offering free IBFTs, and the smaller banks will continue to suffer, one way or the other, indicating the solution lies elsewhere.

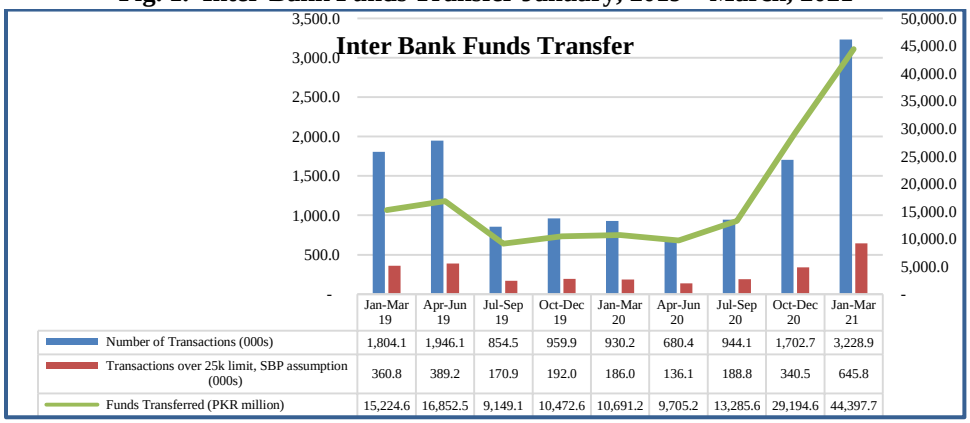
DOES SERVICE CHARGES DISCOURAGE IBFT?

Figure 1 represents the total number of IBFT transactions every quarter over two years from January-March 2019 to January-March 2021. Figure 1 also shows the number of transactions that would have been charged the service fee had this rule been applicable throughout the mentioned period under the 80-20 ratio as defined by the SBP. The graph also displays the total funds transferred in these transactions during the time.

According to the SBP, around 80 percent of monthly IBFT do not cross the PKR 25,000 limit, therefore, the charge will be applicable on only 20 percent of the transactions. Using this information, we work under the assumption that of the total IBFT transactions in a month, 80 percent of those did not cross the PKR 25,000 limit while the remaining 20 percent are the ones over and above this limit. As we assume this ratio on monthly transactions, the same will hold true for quarterly transactions. We then use data from '*State Bank of Pakistan's Branchless Banking Statistics'* to assess the IBFTs and the impact of service charges on them.

As shown in Figure 1, the IBFT has been on the rise in Pakistan, especially in the post-pandemic period. Even if only 20 percent of transactions cross the PKR 25,000 limit, around 200,000 to 300,000 transactions cross the PKR 25,000 limit every quarter. This means, on average, 100,000 IBFT transactions every month are over and above the PKR 25,000 limit. It is equally important to note that the IBFT became free of charge at the end of the January-March 2020 quarter, while the April–June 2020 quarter was marred by the first wave peak of the COVID-19 pandemic. Since then, as some normalcy was restored and economic activity resumed, the IBFT has shown an unparalleled rise in three quarters in terms of the number of transactions and funds transferred.

Fig. 1. Inter-Bank Funds Transfer January, 2019 – March, 2021



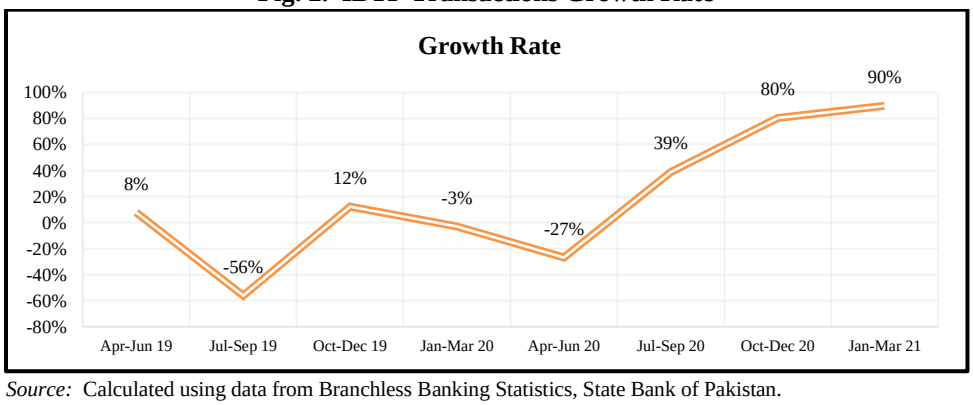
	Jan-Mar 19	Apr-Jun 19	Jul-Sep 19	Oct-Dec 19	Jan-Mar 20	Apr-Jun 20	Jul-Sep 20	Oct-Dec 20	Jan-Mar 21
Number of Transactions (000s)	1,804.1	1,946.1	854.5	959.9	930.2	680.4	944.1	1,702.7	3,228.9
Transactions over 25k limit, SBP assumption (000s)	360.8	389.2	170.9	192.0	186.0	136.1	188.8	340.5	645.8
Funds Transferred (PKR million)	15,224.6	16,852.5	9,149.1	10,472.6	10,691.2	9,705.2	13,285.6	29,194.6	44,397.7

Source: Branchless Banking Statistics, State Bank of Pakistan.

In October–December 2020, IBFT transactions were slightly lower but at almost the same level as during the two quarters January–March 2019 and April–June 2019. The funds transferred in October–December 2020, a quarter with no service charges, were almost twice as much as the two quarters in 2019. This shows that not only were the number of transactions on a constant rise during the period no service charges were being collected, but the funds being transferred were much higher as well.

Figure 2 represents the growth rate of Inter-Bank Funds Transfer transactions over this period.

Fig. 2. IBTF Transactions Growth Rate



Source: Calculated using data from Branchless Banking Statistics, State Bank of Pakistan.

The positive impact of free-of-charge IBFTs is quite evident in Figure 1 and Figure 2. The significant rise in IBFTs following the removal of charges in March 2020 means more transactions were happening through banking channels instead of cash dealings, resulting in a more documented economy and transaction history, which has been the aim of all recent fiscal policies in the country. With the imposition of transaction charges on IBFTs again, this could be reversed as people would be tempted to revert to dealing in cash.

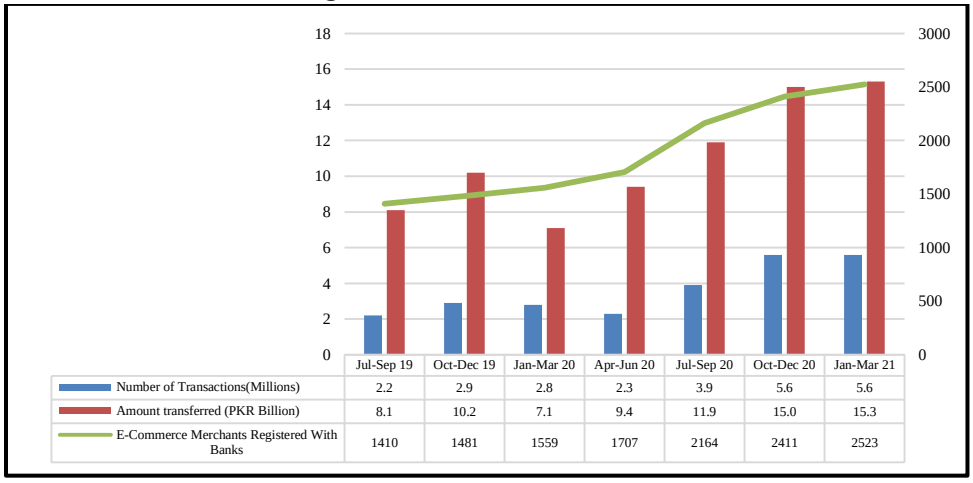
IMPACT OF POLICY CHANGE ON SPECIFIC SECTORS

Above, we have talked about the impact of allowing banks to collect service charges on IBFT on banks, consumers, and the transactions in the economy. This policy will undoubtedly have a direct effect on various economic agents in multiple sectors and industries. In this policy viewpoint, we touch upon a few of those.

While the COVID-19 pandemic proved to be a health problem, it also caused a nuisance in various social and economic sectors. Realising the need of the changing times, numerous people globally adjusted to new ways of doing business and other activities. Adopting the new normal and favourable policies during the COVID-19 peak to facilitate the public brought many changes in Pakistan's landscape.

The rise in E-Commerce Merchants Registered with Banks is proof that online business dealings are now on the rise in Pakistan, and facilitating policies will continue to grow. Figure 3 below shows how significantly E-Commerce businesses and transactions have increased ever since the pandemic began and the SBP removed the transaction fee on IBFTs.

Fig. 3. E-Commerce in Pakistan



	Jul-Sep 19	Oct-Dec 19	Jan-Mar 20	Apr-Jun 20	Jul-Sep 20	Oct-Dec 20	Jan-Mar 21
Number of Transactions(Millions)	2.2	2.9	2.8	2.3	3.9	5.6	5.6
Amount transferred (PKR Billion)	8.1	10.2	7.1	9.4	11.9	15.0	15.3
E-Commerce Merchants Registered With Banks	1410	1481	1559	1707	2164	2411	2523

Source: Payment Systems Review, State Bank of Pakistan.

Reimposing the transaction fee will prove detrimental to the growth of E-Commerce businesses and their transactions. The increased cost due to transaction fees will either increase the cost of business for E-Commerce merchants or discourage customers regarding the adoption of digital purchasing methods.

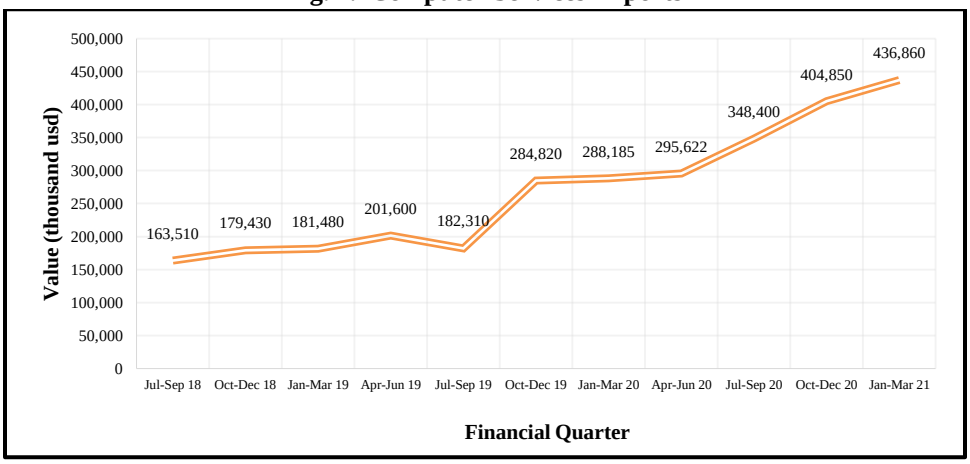
This will hurt the E-Commerce merchants in their dealings with their suppliers as well. If the burden remains untransferable to the suppliers, then the cost of business for E-Commerce merchants will increase. However if they manage to transfer the expense to their suppliers, then they (suppliers) will naturally prefer doing business with those dealing in cash rather than with E-Commerce merchants.

The transaction fee thus will automatically add distortions in the supply chain, hampering the rise of E-Commerce businesses in Pakistan.

Graduate unemployment is on the rise in Pakistan, and the COVID-19 pandemic made matters worse for the employment aspirant youth in the country. This, though, did present them with an opportunity to look elsewhere. The rise in earnings through freelancing and IT services during the recent past, especially in the post-COVID period, is something that the government has regularly talked big about as the IT exports have now crossed the $200 billion per month mark.

Figure 4 shows the quarterly trend of Computer Services Exports by Pakistan. While the exports were steadily increasing, following the onset of the COVID-19 pandemic, there was a sharp increase in exports. The majority of the financial dealings of freelance and IT services cannot escape the banking channels, which means they will suffer highly due to the transaction fee imposition. Freelancing has been a source of support and income for many skilled professionals who could not secure a decent job while also a source of second income for those pressed by their socio-economic conditions. The distortions by the imposition of the transaction fee will put a barrier in the growth of freelancing activities and the IT services sector of the country, as all stakeholders will be adversely affected.

Fig. 4. Computer Services Exports



Source: Exports of Goods and Services, State Bank of Pakistan.

Moreover, local remittances will be affected severely as well as transferring from a bank account in a commercial bank to mobile wallet accounts also falls under the IBFTs. In most rural areas, commercial bank branches are not as accessible as in cities; therefore, many people use mobile wallet services such as ‘easypaisa, upaisa, jazz cash’ etc. for remittance purposes. Households in rural areas are supported by any family member

employed in major urban centres, where salaries are often deposited in commercial banks. Consequently, the compulsion to pay a transaction fee will adversely affect the low-income and lower-middle-class families.

WHAT IS THE WAY FORWARD?

As established through evidence-backed analysis of the impact of IBFTs, it is recommended that the transaction fee be immediately waived once again. This will encourage people to adopt digital banking channels and formalise more transactions as it did during the past year. The PIDE Reform Agenda[1] highlights and emphasises the need for easing up regulations to facilitate boosting the size markets, economic activity, and transactions in the economy. This policy recommendation follows the same principles, as also represented by data that removal of transaction fee on IBFT will have a significant impact on increasing IBFT thus documenting and formalising transactions in the economy.

However, if the SBP considers it essential to help banks cover the operational costs, which, as mentioned above, could be necessary for smaller banks, alternative measures to help the banks must be adopted.

- One way is to reduce the corporate tax rate for the banks by a slight amount which will not make a significant difference in overall tax collection but will help banks cover their costs of providing free-of-cost digital funds transfer facilities. The banking sector forms the largest taxpayer unit among the corporate taxpayers, and extending some relief from the fiscal side to help increase financial inclusion in the economy will be a good deal. The overall gains from free-of-cost digital transfers will be higher than the reduction in revenue due to a slight decrease in the corporate tax rate.
- The second alternative could be to reduce the capital gain tax on investment in government securities for the banks. The rate currently lies at 10 percent, and a slight reduction could help cover the banks' costs without hampering the tax revenues if the government is unwilling to alter the corporate tax rates, which form a much higher revenue stream.
- Besides, the State Bank of Pakistan and the government can reduce either tax rates above conditional to providing free-of-cost digital funds transfer. In other words, the SBP may allow them to charge a service charge on digital funds transfer as per the current guidelines. However, if they decide to provide free-of-cost services, they shall be incentivised by a reduced tax rate on either corporate tax or the capital gains tax on investment in government securities.
- This way, the government and SBP will have protected consumers by putting a maximum limit on service charges and encourage the banks to reduce their tax liability by providing free-of-cost services. In such a way, the banks will have the choice while consumers will be fully aware of government, SBP and banks to facilitate them, thus, being able to make an informed choice regarding which bank services they must opt for.

[1]https://pide.pk/research/the-pide-reform-agenda-for-accelerated-and-sustained-growth/

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Policy

Policy Insights to Maritime Economy in Pakistan

AFRASIYAB GUL and VICE ADMIRAL[(R)] KHAWAR ALI SHAH

The term "Blue Economy" originated in 2012 from the Rio+20 Conference of the United Nations on Sustainable Development and Growth.[1] Given the vastness of oceanic resources, the blue economy has been touted as the panacea for all economic woes of less developed coastal countries. It basically refers to leveraging the coastal and marine resources for economic benefits, emphasising sustainable economic growth and environmental conservation.

United Nations 2030 Agenda for Sustainable development directly linked sustainable economic growth and Blue Economy via SDG 14. World Bank defines Blue Economy as: "Sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem." Due to its international obligations for SDGs, Pakistan has integrated SDGs into its domestic development agenda, which implies that Pakistan is cognizant of the blue potential.

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[1]In Rio+20, Member States decided to launch a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals. Hosted by Brazil in Rio de Janeiro from 13 to 22 June 2012.

INTRODUCTION

A Blue Economy that comprises marine or oceanic resources holds vast and untapped potential to drive economic growth in Pakistan. Investment in coastal and various categories of marine resources can help meet the food, transport, and energy needs of Pakistan. This is important in the context of slow economic growth, financial instability, volatility of investment, and ever-rising unemployment that Pakistan has experienced in recent years. It is time that Pakistan looks to coastal and marine resources to diversify its economy beyond traditional land-based investment avenues.

Pakistan has about 990 km long coastline, an Exclusive Economic Zone of 240 000 sq. km, and an additional continental shelf area of about 50,000 sq. km, making Pakistan an important coastal state. The exclusive geostrategic position of Pakistan lends its ports a unique significance concerning maritime trade. Furthermore, the construction of Gwadar as a transit and transhipment port under CPEC has further augmented Pakistan's maritime potential as a key player in Indian Ocean Region.

Blue Economy of Pakistan offers a wide range of maritime sectors peculiar to the geostrategic and economic realities of the country. It includes conventional maritime industries, namely fisheries, coastal tourism, maritime transport, etc., and newly emerging areas of aquaculture and marine biotechnology, deep sea-bed mining, resource extraction, oceanic renewable energy, and maritime tourism. The construction and operationalisation of Gwadar Port have enhanced the scope of maritime transport in Pakistan. Noteworthy, maritime transport industries that offer great opportunities for investment in Pakistan are Port Development and Coastal Urbanisation, tourism, Shipbuilding, Ship-breaking/recycling, and Transhipment companies.

Pakistan is a lower-middle-income country,[2] with the economy growing at less than a 3 percent growth rate, whereas, Pakistan Institute of Development Economics suggests for Pakistan a potential of sustainable 8 percent growth annually. Being the 5th most populous economy globally with a population growth rate of nearly 2 percent, Pakistan might face precarious food security challenges in the future. The inadequacy of tax revenues and the balance of payment situation add to the economic woes of Pakistan. The extreme vulnerability to climate change needs new forms of decision making, such as investing more into blue economy because Pakistan might face food security problems related to the limited land and water resources (Rahman and Salman 2013). In a post-COVID-19 world, diversifying the economy beyond land-based avenues of investment remains difficult due to lack of capital but paradoxically remains a significant option to spur economic growth in Pakistan. Thus, Pakistan's ocean and oceanic resources hold great potential to be leveraged, keeping up with the international practices of inclusive growth and community development.

Currently, the government is giving attention to the shipping sector up to some extent, after decades of neglect. After announcing the year 2020 to be the year of Blue Economy, the government did the right thing by amending the Merchant Marine Policy, 2001. The amended policy provides a range of incentives to private investors like

[2]According to World Bank Classification, low-income economies are defined as those with a GNI per capita of $1,045 or less in 2020; lower middle-income economies are those with a GNI per capita between $1,046 and $4,095; upper middle-income economies are those with a GNI per capita between $4,096 and $12,695; high-income economies are those with a GNI per capita of $12,696 or more.

reduction in gross tonnage tax, first berthing right to flag carriers, acceptance of freight charges in Pakistani rupees along with US dollars, Long Term Finance Facility, and other fiscal incentives. The provision of these incentives is highly laudable and will increase the size of the sector. Ministry of Maritime Affairs has sought a phased policy to transform and leverage the sector's real potential. However, several measures are yet to be taken to improve the performance of the sector. Another significant factor is the competitiveness and capacity of the government bureaucracy to implement the policies. The lack of investment in training and infrastructure with lengthy processes makes the whole system slow and unattractive for investment despite these right policies.

INSIGHTS OF GOVERNANCE ISSUES

The Ministry of Maritime Affairs is Pakistan's primary state institution overseeing all maritime sectors. Pakistan National Shipping Corporation and the Merchant Marine Departments, as well as all three of Pakistan's port agencies, namely Karachi Port Trust (KPT), Port Qasim Authority (PQA), and Gwadar Port Authority (GPA), are all under its umbrella. All three ports are not budgeted, meaning they earn and spend their budget on all concerned operations but require government approval through the Ministry of Maritime Affairs. The other stakeholders include Freight Forwarders, All Pakistan Shipping Association (APSA), Customs, Federal Board Revenue, and the banking sector. PNSC (Pakistan National Shipping Corporation) Regulations 1984, Marchant Marine Policy 2001, and other department regulations culminate to make the national shipping policy.

Pakistan Merchant Marine Policy 2001 (MMP) was amended in 2019 and will continue up to 2030. According to amendments, no federal tax (Custom duty, income tax, and sales tax) shall be levied on Pakistan resident ship owning companies during the exemption period. All Pakistan flag vessels shall be given priority berthing at all Pakistani ports. PNSC is directed to continue to pay tax of US$ 1.00 per Gross Register Tonnage (GRT) on its shipping income annually. The new companies that accept Pakistani rupees instead of dollars for freight charges shall be incentivised for the first five years of shipping and pay a tax of US$ 0.75 per Gross Registered Tonnage (GRT).

As per United Nations Liner Code 1974, a country can lift 40 percent of its cargo in its own ships, which can even be raised to 60 percent without getting into the realm of unfair trading practices. Pakistan lifts only 10-11 percent of its international trade, thereby forgoing a substantial source of FE earnings. One of the changed clauses in the amended Maritime policy gives the first right of refusal to PNSC for hydrocarbons cargoes imported on FOB basis; this amendment is however contrary to the policy's para 8, that gives cargo preference to Pakistani flag vessels over PNSC chartered vessels. Secondly, the MMP lacks the legal status that is enjoyed by an act or ordinance. Its provisions are subject to a decision made by the cabinet and Economic Coordination Committee (ECC) from time to time. Negligible amendments, extending MMP to 2030, and declaring the shipping industry as a strategic industry are not enough. Stakeholders consensus agree that previous policy did not yield fruitful results and extending it to further ten years may not work as well. Previously, incentives were withdrawn from time to time and reinstated, thus, rendering them inconsistent for long-term planning purposes (NIMA). The shipping sector is highly capital intensive and requires long-term planning

for financing. Besides this, Merchant Shipping Ordinance 2001 (MSO) also needs to be amended and revised to create synergy between the basic commitment in the policy and legal instrument for its implementation.

It is the need of the hour to frame a comprehensive Marine Policy that must include each and every sector of the blue economy to ensure optimal use of ocean resources, rather than sticking to few ordinances and regulations. This will require all stakeholders' input; the stakeholders having the responsibility of governance is of core importance to kick start blue economy development.

The need is to overcome the procedural inefficiencies as well as improvement in service delivery to leverage the actual potential. Pakistan has a high compliance cost as compared to other regional countries such as India and Korea. The high compliance cost is associated with documentary requirements for customs clearance. On average, Pakistan requires 400 hours while India and Korea require 270 and 196 hours, respectively (Table 1). Similarly, the time taken for the customs clearance process and documentary compliance in case of imports is 12 times longer than in UAE. The indirect cost associated with uncertainty and delays affects customer choices. On the other hand, poor track and trace consignments, custom clearance, inexpedient schedule, transport-related infrastructure are bottlenecks that keep the industry from meeting its actual potential. According to the Ministry of Maritime Affairs, Pakistan can raise its share in transhipment to 200,000 TEU's, which can be further increased by removing procedural inefficiencies.

Table 1

	Pakistan	India	Korea
Imports			
No. of Hours (TEU)	216	85	7
Days (TEU)	9	3.5	0.3
Cost (TEU)	400	366	342
Exports			
No. of Hours	113	64	14
Days (TEU)	5	3	0.6
Cost (TEU)	406	270	196

Source: PIDE Policy Viewpoint No.17:2020.

It is paradoxical to note that Pakistan has a small shipping sector despite having trade of over $70 billion. Ministry of Maritime affairs is well cognizant of the true potential and possesses the will to transform the sector into a profitable economy sector. It has sought a phased policy to transform and leverage the actual potential of the sector. The only need is to highlight the weaknesses in the prevalent policies and overcome mistakes being made in shipping practices. A large number of vessels owned by private Pakistani owners operate under the Flag of Convenience (FOC). There is a need to bring in all long-term imports under Freight on Board (FOB) basis, mandating it for Pakistani Flag vessels to lift it. Proper checks and balances should be enforced to avoid delays under this system. The Ethiopian model offers a lot to learn from it.

Pakistan adopted a protectionism policy while many countries like Turkey and Chile liberalised their economies and saw sustainable growth and their manufacturing sector developed. Consequently, local manufacturers neither developed nor upgraded their technology to cope with modern world markets. The tariff rate followed by Pakistan is much higher than other countries in the region, as depicted in Table 2. Sri Lanka and Malaysia have a meager effective tariff rate of 7.0 and 4.5, respectively, whereas Pakistan follows an average effective tariff rate of 11.2. The policy-makers should consider economic liberalisation policy to boost trade, and the involvement of maritime needs particular focus to execute it effectively.

Table 2

Regional Comparison of Effective Tariff Rate

Country	Average Effective Tariff Rate
Pakistan	11.2
Malaysia	4.5
China	5.2
Sri Lanka	7.0
India	7.5
Bangladesh	10.6

Source: World Tariff Profile by WTO.

Pakistan needs to allocate more funds for infrastructure development, up-gradation, and diversification of its fleet. However, the Maritime Affairs division budget was reduced to PKRs. 2.6 billion in 2021, which was PKRs. 3.6 billion in 2020. Reduction in the budget for maritime division may not directly impact the industry, but it hampered the infrastructure development efforts. More autonomy should be afforded to PNSC as well as other private entities in order to encourage investment and competition.

Pakistan has a large EEZ, and long coast, and this sector is vital for economic growth, employment generation, and food supply. There is a shortage of trained and skilled professionals domestically and internationally due to the ever-expanding shipping market**.** Pakistan can train and produce skilled professionals to meet the demand of domestic maritime activity and supply of human capital to the international market.

BOAT AND SHIPPING INDUSTRY IN PAKISTAN

The shipping industry holds paramount importance in any economy in today's globalised world as 80 percent of world trade is carried out through the sea. Over 90 percent of Pakistan's trade by volume is through the sea.

The shipping sector of Pakistan is governed by several organisations under both international law and a dedicated national shipping policy. The Ministry of Maritime affairs acts as the supreme authority to regulate most of the maritime sector of Pakistan. Pakistan National Shipping Corporation (PNSC) is the largest and the only Pakistani flag shipping company in Pakistan lifting only 10-11 percent of Pakistani cargo (Yousuf and Ali, 2020). Worldwide, 70,094 ships are registered, out of which the USA operates 3000 registered ships. As of 2021 in the Southern Asia region, (Table 3) depicts the fleet size of countries in the region. Pakistan possesses seven oil tankers, five bulk carriers, and a

Table 3

	India	Iran	Bangladesh	Sri-Lanka	Pakistan
Total Fleet	1801	893	468	90	57
Oil Tankers	136	84	144	11	7
Bulk Carriers	63	32	48	6	5
General Cargo	587	371	140	13	0
Container Ships	22	31	6	0	0
Other Types of Ships	993	375	130	60	45

Source: UNCTAD.

total fleet of 57 ships, which is the lowest number compared with other regional countries. India has a total fleet of 1801, Bangladesh 468, Sri Lanka 90, and Iran, despite long-standing international sanctions, maintains 893 ships. Not just that, Pakistan does not possess a single general cargo or containership. The regional countries comparison calls out the vulnerable position of Pakistan's fleet size. The concerned authority must look forward to acquiring oil tankers and bulk carrier ships in the first phase, as Pakistan depends on oil import.

According to PNSC 2018 import data, 916 import shipments were made, including 341 shipments of oil. Similarly, according to port's import data sources, 840 shipments were made that including 13 shipments of jet fuel. (NIMA).

The amount of trade through sea has been increasing every year but the share of PNSC is decreasing instead of going up (Table 4). In 2018, the total seaborne trade of Pakistan was 100.247 million tons, and PNSC was trading about 12.76 percent of it. According to official sources, PNSC imports only 26 percent of liquid and only 3 percent of dry bulk cargo of the country, while the rest is imported through foreign vessels. Similarly, in 2020 total seaborne trade of Pakistan was 94.321 million tons, where the PNSC share was 9.33 percent. This costs Pakistan a whopping 5 billion USD freight charges annually that is paid to foreign vessels. In 2020, PNSC earned a net profit of about PKRs. 2,414 million and paid PKRs. 332 million worth of taxes and PKRs. 231 million in dividends to the government, an increase of 10 percent compared to last year (Table 5). In some Flag of convenience countries, an overwhelming majority of the World's ships are registered due to easy processes, no taxes and no questions about the source of investments.

Table 4

(In Million Tons)

Years	Dry Cargo	Wet Cargo	Total Cargo	PNSC Share	PNSC Share %
2016	58.867	29.419	83.286	13.326	16
2017	42.653	32.863	89.852	14.304	15.919
2018	65.836	34.411	100.247	12.797	12.765
2019	80.253	30.44	110.693	10.383	9.38
2020	66.585	27.736	94.321	8.80	9.33

Source: PNSC Annual Report 2016-20.

Table 5

(PRs. In Million)

Years	Net Profit	Tax Paid	Dividends to GoP
2017	2,477	488	227
2018	1,641	437	229
2019	2,194	296	173
2020	2,414	332	231

Source: PNSC Annual Report 2020.

Despite giving incentives through federal tax exemption and lowering the tax to US$ 0.75 per Gross Registered Tonnage (GRT), the private sector is reluctant to get the benefit. The investors' confidence was shaken by ill-thought out of private shipping lines in the 70's and safe investment avenues available in Tax-free havens. On the other hand, the Merchant Marine Department (MMD) is behind time with unskilled staff that cannot handle the modern demands of the shipping sector and registration maintenance (NIMA). Whereas the leading flag of convenience countries provide services and can register and de-register ships in 24hrs.

The domestic boat industry of Pakistan, requires urgent government support before the traditional artisans and boat makers become extinct. Due to official apathy, traditional boat building is moving outside Pakistan. At one time, Pakistan was the largest builder of Dhows in the region. The informal sector involved in the boat-making industry is running side by side. According to a report, it employs about 3,500 skilled labourers. The workers are expert enough to build small or large boats without drawing and sketches, and most of the workers earn a daily wage of about $14.

It is time to take upon the cross-disciplinary approaches to deal with new world challenges and tradeoffs. Government intervention will be especially welcomed in introducing incentive schemes and facilitation services for the registration of boats and the development of boat engines that are efficient and durable in extreme weather conditions. Government intervention is also required in record-keeping and pricing of water transport services in Pakistan. State Bank of Pakistan has allowed a long-term finance facility (LTFF) under Merchant Marine Policy 2001 that will allow investors long-term borrowing at 3 percent to acquire floating vessels, tug boats, cargo vessels, and fishing boats. Currently, seafood export is US$ 450 million, but fishing stocks are

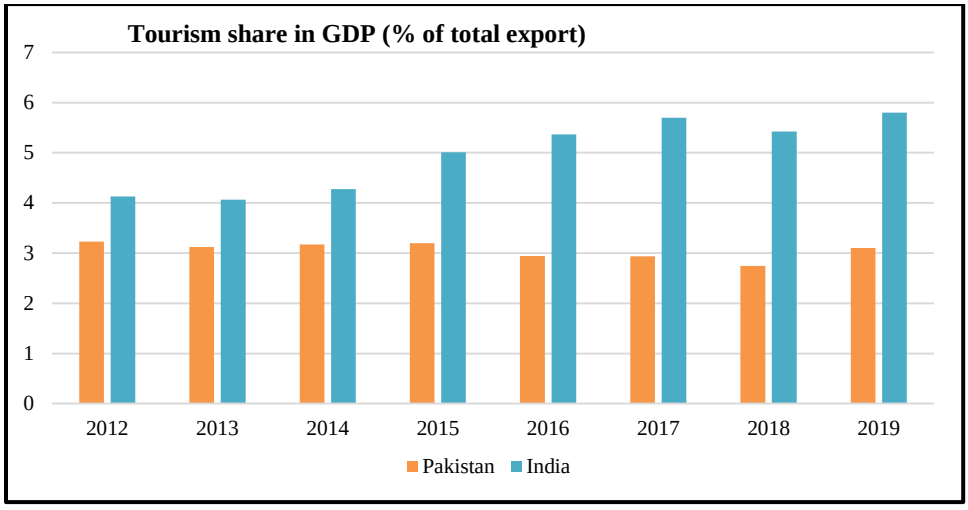
depleting fast, and fishing is becoming unsustainable. The country needs to invest heavily in Aquaculture to boost the fisheries sector and increase export seafood up to USD$ 2 billion annually while concurrently increasing the country's food security.

TOURISM—GOING BLUE

The tourism industry is one of the world's fastest-growing and is closely linked to the economic, social, and environmental wellbeing of many countries around the globe. The role of maritime tourism is well integrated into contemporary economies that the economic impact is relevant even to the less important countries in terms of tourism-related activities (Bunghez, 2016). The tourism economy represents 10.4 percent of the global GDP, which makes about 8.8 trillion dollars. About one out of every ten jobs is created by tourism-related industry. Tourism is one of the top five earning industries and a key source in generating foreign exchange in half of the developing nations. Small islands and developing countries have vast untapped potential regarding ocean-related tourism to create job opportunities and earn foreign exchange. Sustainable tourism takes account of the social, environmental, and future economic impacts while addressing the needs of visitors and host communities. The agenda for 2030 for Sustainable Development SDG target aims to implement policies to promote sustainable tourism to promote local product, culture and create job opportunities. Pakistan has immense Maritime tourism potential with a long coastline of 990 Kilometres which is blessed with diversified natural, religious, and cultural tourism resources. In 1989, Pakistan gave tourism an industry status. The federal government established a Beach Development Authority under Pakistan National Tourism Policy 1990 (NTP, 1990) to develop beaches and encourage water sports activities. The long-term policy was given under the Ministry of Culture, sports, youth affairs, and tourism to collaborate with provincial governments of Sindh and Balochistan provinces to promote water sport activities and tourism. However, maritime tourism is undeveloped due to political instability, lack of coordination among tourism authorities, poor governance, and security concerns (Ahmed and Mahmood, 2017). NTP 1990 is no more effective after the 18th amendment in the constitution as tourism is now a devolved subject.

Boating tourism, marine sports activities, beach development, and other aquatic environment are core sectors, and all other recreational activities come under marine-related tourism. When we compare the share of tourism in the GDP of Pakistan with the neighbouring country India, it shows that Pakistan is lagging in developing the tourism sector. For instance, consider an example of Kerala that has about 600km Arabian Sea shoreline and has been developed as a tourism hotspot. Over the years, tourism in Kerala has grown significantly to earn foreign exchange, revenue increase, and living standards of people associated with tourism activities. In 2019, a 17.19 percent increase in foreign exchange and 24.14 percent increase in revenue generated from tourism (Direct and indirect) was recorded in Kerala. The current government of Pakistan has paid attention to developing the tourism sector. However, government is more focused on land-based tourism and is neglecting the capacity of marine tourism. The availability of vast resources is a blessing and must be properly developed as it can significantly raise the standards of coastal communities used by human beings. Pakistan must develop a vast spectrum of marine tourism activities like harbour cruises, recreational fishing, maritime

museums, sailing yachting, beach activities, windsurfing, scuba diving, snorkelling, sea kayaking, and many more. Investors should be motivated with incentives like tax reliefs, high-profit expectations, ease of documentation process, and security guarantee. On the other hand, awareness and a friendly environment should be provided to local communities and visitors. The development of international tourism will pave the way to revenue generation and foreign exchange reserves.



Source: WDI.

CHALLENGES AND WAY FORWARD

The present government is revisiting its approach for the improvement in the marine sector of Pakistan. Primarily, the lives of people working in the marine sector need improvement and special support from the government. Studies have shown that the majority of problems faced by fishermen can be solved through minor interventions. Lack of education among these communities has kept them from modern technologies and systems.

Source: Kerala Tourism Statistics 2019.

Institutional constraints have restricted Pakistan's potential gains from the "Blue Economy". It is important to have the institutional capacity for dealing with Blue Economy. What seemed like a distant dream is, fortunately, converging towards reality due to the present government's efforts. In Pakistan, the local boat industry is still functioning without government support and is losing its competitiveness to other players. (Moazzam, 2012) added that most registered boats have dual registration for Pakistan and Iran, which eventually poses a security threat. In Karachi, small boats are used for tourism purposes, local transport purposes, and larger vessels are in the business of to carry cargo in the region.

ACTION POINTS—THE WAY FORWARD

The following action plan for policy-makers is based on the observation of internationally acknowledged practices. The study advocates to:

- Establish a network of researchers, industry stakeholders, government personnel, and media outlets to generate and disseminate awareness and knowledge regarding the scope and potential of blue resources. Information campaigns and mainstreaming and dissemination of the knowledge created by researchers for broader awareness and insights into the field will be beneficial.
- A complete survey and manpower audit of the Mercantile Marine Department (MMD) is required to identify the shortcomings, capacity, and needed up-gradation to fulfil its functions.
- Conduct a dedicated and full-fledged survey of Pakistan's maritime zones to ascertain the nature, type, and extent of resources to better understand Pakistan's blue potential.
- Strategise for a conducive environment for foreign and local investors to channel investments into the maritime sectors.
- Review procedural inefficiencies and introduce reforms for fostering investor confidence and improving prospects of business in the blue economy.
- Putting in place consistent long-term policies that are dynamic rather than static.
- Formulate an exclusive National Blue Growth Policy with clearly defined goals and realistically set targets to be achieved within a reasonable time. Greater coordination and consultations among academia, government, and other stakeholders are the key to achieving consensus in decision-making.
- Eliminate subsidies for bringing in competitiveness.
- Invest in R&D and forge partnerships with international research groups to keep pace with the current international practices.

CONCLUSION

Pakistan has a unique geostrategic location that offers opportunities and challenges as well. Geographical location, investment, and timely implemented policies are important in sea trade and ports development. For instance, the Middle Eastern countries incorporate about 3 percent of world GDP and handle about 20 percent of seaborne trade. Further, transhipment accounts for 53 percent. Pakistan can serve as a viable and most effective economic transit route to land-locked Central Asia and neighbouring countries.

China Pakistan Economic Corridor (CPEC) can spur economic activity in Pakistan and regional countries through roads and railway networks, whereas ports at the Arabian Sea will provide global connectivity. The Marine economy is one of the main pillars of economic structure, which needs a proper regulatory authority to monitor and evaluate it. It will play a critical role in the economic growth of Pakistan. This sector is facing numerous challenges like lack of institutional capacity, poor governance, and investment. The sector needs well-thought-out actions from the government including ease of business processes. The revenue from the sea routes transport system can be improved. The government has to play an important role to enhance ships fleet and increase the share of GDP. In addition, maritime tourism can generate $1-2 Billion annually through domestic/international tourism and employ coastal community people.

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Books

Huzaima Bukhari and Ikramul Haq. *Tax Reforms in Pakistan: Historic and Critical View*. Islamabad: Pakistan Institute of Development Economics, Islamabad. 2020. 299 pages.

In their book entitled *Tax Reforms in Pakistan: Historic & Critical View* authors Huzaima Bukhari and Ikramul Haq take up the important yet often under-researched topic of the taxation system in Pakistan. The book is a collection of various writings on the topic by the authors spanning over three decades and has been published online by the Pakistan Institute of Development Economics (PIDE).

The opening sections include a coherent overview of the issue by PIDE Vice-Chancellor Dr. Nadeem Ul Haque in the Foreword, along with the Preface in which the authors themselves provide a succinct summary of the dilemma at hand. The main body content of the book is further divided into three sections: *Issues, Past Legacy & Current Challenges, and Solutions.*

In the Preface, the authors begin by mentioning an instance that is representative of successive governments' general attitude towards the issue of taxation in Pakistan. In 2014, the government set up a Tax Reforms Committee (TRC) to "review and rationalise direct and indirect taxes, customs tariffs, the structure of FBR, evaluate the possibility of creation of border security force and ponder any other issue that it seems fit." Interestingly enough, the TRC was given just 120 days to complete its task. The finance minister and the management within the Federal Board of Revenue (FBR) were "naïve" enough to assume that a task as monumental as coming up with a well-researched reformative agenda for the tax system in the country could be completed in just 120 days. Naturally given the size of the work at hand, TRC took 500 days to submit its final report. This report has not yet been published by the government despite it being in circulation through alternate channels. Among the many important points the TRC's report makes, it also lists which according to the authors is one of the fundamental issues that afflicts Pakistan's tax system i.e. the system is regressive in that it "exhorts from the masses" while continuing to give out innumerable tax exemptions and concessions to the rich and mighty. Indicative of this regressive trend is the record level of tax expenditure (concessions) of about 1.5 trillion rupees handed out by the government in FY 2019-20. Another significant issue that the authors take up here is the dire need for an effective tax administration system. According to them, the failings of the current system under the FBR are highlighted by the fact that the bulk of all income tax revenue comes from withholding taxes.

In the first section titled *Issues,* the authors revisit the often misleading narrative that most people in Pakistan do not pay taxes. They feel that it is absolutely important to point out the simple yet often not understood difference between "taxpayers" and "return-

filers". The fact is that even in the government and within the tax administrative setup itself there are those who mix up the two concepts. While there are only about 3 million tax return filers in the country, this is not fully reflective of the number of people who pay taxes since many more people pay taxes at source in the shape of withholding taxes and sale taxes on the consumption of goods and services. In fact, since 1991-92, FBR has mainly relied on a combination of indirect sales taxes and withholding taxes to generate the bulk of its revenues. Authors mention that in the latest amended version of the Income Tax Ordinance (2001) there are about 65 withholding tax provisions.

The poor performance of FBR at collecting the revenues has meant that the government most of the time is in deficit; with this deficit hitting record figures of about 8.9 percent of the GDP in 2019. In response to pressure from governments that are perpetually in deficit, the FBR has resorted often at the behest of IMF and donors' consultants to increase the effective tax rates on the existing narrow base of taxpayers. The authors believe that this policy is misguided as it stifles the ease of doing business and incentivises tax evasion by those present within the existing narrow base. A better approach in their opinion is to reduce the effective tax rate and build a broader base. If the tax rate is suitably low, the base would be broadened as the businesses would have less incentive to evade taxes given the low compliance costs.

Furthermore, the authors point out how the revenue collection performance of the provinces is even worse than that of the center. The share of provinces in the total revenue collected by all federating units fell to 11 percent in 2019. For the authors, the fragmented tax system is partly to blame for the poor performance of the provinces and that the time is ripe for the FBR and all other provincial tax authorities to be abolished in favour of a consolidated National Tax Agency (NTA). A consolidated tax agency will bring simplification and clarity within the system which currently is overly complicated and cumbersome. For instance, there are about 70 different unique taxes administered by 37 different tax authorities.

Another important issue that the authors bring to attention is the huge untapped black/informal economy in Pakistan, which, according to them is worth around 50 trillion rupees. Effective measures to bring even a small fraction of this informal economy into the system can significantly add to increasing the formal tax-to-GDP ratio.

In the section titled *Past Legacy & Current Challenges*, the authors point out how, despite numerous reform efforts, the FBR has neither made any significant headway towards increasing the number of filers in the country at a sustained rate nor has it been able to increase the tax-to-GDP ratio in general. The performance of FBR at being an effective income tax collecting authority can be summed up by the fact that about 67 percent of all income tax revenue came from withholding taxes in FY 2018-19. According to the authors, in addition to FBR's lackluster performance as a revenue collecting authority, another important contributing factor to the narrow tax base in the country is the high effective tax rate which serves as an incentive for individuals and firms to evade taxes. Despite this, the authors state, on the behest of IMF and international donors, successive governments have continued to push for more and higher taxes on the narrow tax base of the country.

Despite their emphasis on income tax in the first part of this section, the authors are quick to point out that income tax revenue is only second to sales tax revenue in the

country with sales tax receipts contributing the most to total revenue collected by the FBR (FY 2018-19) The authors mention how despite tall claims being made, there is no reliable data that is regularly published on the active registered sales taxpayers in the country. Furthermore, the bulk of the sales tax collections is made from a handful of products.

The real issue the authors believe when it comes to successive governments being in deficit is the reckless spending by the state. Due to this wasteful expenditure, the government often finds itself in a deficit and then compulsively borrows from IMF and other sources. It is imperative that the size of the government be reduced and wasteful spending curbed for long-term macroeconomic stability.

In the last section titled *Solutions*, the authors begin by stressing the need to establish a National Tax Agency (NTA) to overcome the fragmentation in the current taxation regime. According to them, the current system is seriously fragmented across the provinces and the center. They suggest abolishing FBR and all other federal and provincial tax authorities and replacing them with the National Tax Agency (NTA). According to them the "mode and working of the NTA can be discussed in the Council of Common Interests (CCI)" and its "control can be placed under the National Economic Council (NEC)"

Furthermore, the authors believe that there is a fundamental level of mistrust between the taxpayers and the tax collecting agencies. While numerous reasons for this mistrust, primary reasons include the "highhandedness, maladministration, inefficiency, abusive behaviour and corrupt practices of FBR officials." Additionally, the mistrust also stems from the fact that continuous governments have failed to use taxpayers' money transparently leading to increasingly more and more taxpayers losing confidence and defying taxes. The authors suggest that a "Taxpayers Bill of Rights" should be introduced and adopted, one which "safeguards and strengthens the rights of taxpayers" and ultimately paves the way for a renewed level of trust between taxpayers and tax collectors. In addition to the Taxpayers Bill of Rights, the authors also suggest revamping the current tax appellate process through the formation of a National Tax Tribunal, one that is independent of the tax-collecting agencies and that of the Ministry of Law.

The last section also highlights the fact that Income Tax Laws in Pakistan historically have been drafted and promulgated through non-representative processes. The last two Income Tax Ordinances (1979 and 2001) were promulgated during military rule. The need is to introduce a new income tax law which is only adopted once it has been duly deliberated upon. The new income tax law according to the authors should be drafted as such that it ensures as much "uniformity of treatment" for all taxpayer categories as possible, should target reducing the overdependence on withholding taxes, minimise tax exemptions and encourage voluntary compliance through suitable nudges/incentives.

The authors also mention the need for revamping the sales tax regime in Pakistan. They suggest that the country should introduce a single Harmonised Sales Tax (HST) on all goods and services. The HST should be administered under the ambit of NTA where a balance between provinces and the center can be maintained. Furthermore, the introduction of HST should mean that the policy of taxing different goods at different rates should stop. The harmonised sales tax would ultimately, according to the authors,

simplify the system, increase compliance through a reduction in compliance costs, and reduce the dependence of authorities on a limited group of goods for revenue collection.

To conclude, Huzaima Bukhari's and Ikramul Haq's book is a great starting point for anyone looking to acquaint themselves with the issues that afflict the taxation system in Pakistan. The book is meticulous to the point that it can be used by policymakers, but also at the same time remains accessible to a wider non-technical audience. The authors' analysis although seemingly anecdotal in some parts of the book is generally backed by empirical numbers. The solutions that the authors suggest for the most part are actionable and the authors do an articulate job of manifesting this action-ability by delineating case studies and examples from other countries.

Having said that, despite the many things that the book gets right, it can perhaps be organised in a better manner. There is extensive overlap in information across sections and readers can get the feeling of some information being repeated too often. The repetitiveness perhaps is a byproduct of the fact that the book is a collection of writings spanning over three decades. Given the extremely revealing information presented in the book, the authors can perhaps work on writing a shorter yet thematically coherent book that presents all the information in an order that is conducive to more lucidity.

Raja Rafi Ullah

Pakistan Institute of Development Economics,
Islamabad.

RESEARCH FOR SOCIAL TRANSFORMATION AND ADVANCEMENT

2021 RASTA Competitive Grants Programme for Policy-oriented Research

The Pakistan Institute of Development Economics (PIDE) has launched a multi-year competitive grants programme for policy-oriented research in Pakistan titled **'*Research for Social Transformation and Advancement*'** (RASTA) under the Public Sector Development Programme (PSDP) of the Ministry of Planning, Development and Special Initiatives, the Government of Pakistan. RASTA's mission is to develop a research network of academia, think tanks, policymakers, practitioners and other stakeholders across Pakistan producing high-quality, evidence-based policy research to inform Pakistan's public policy process.

There will be six rounds of the Call for Research Proposals. The first call was in October, 2020, and the second one would be announced in the first quarter of 2021. All updates will be published on PIDE/RASTA website from time to time. In pre-submission engagements webinars and workshops are scheduled to guide potential applicants. For more details and guidelines related to RASTA programme, eligibility, application process and updates, please visit PIDE/RASTA website and follow us on Twitter.

Call for the third round coming soon.

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ARTICLE 5

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