

**Innovation & Technology Centre (ITC)**  
**Lahore School of Economics**



**ITC**  
**Innovation & Technology Centre**

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## 1. ITC Stakeholder Activities

1. Distinguished Lecture at the National Management College to Senior Civil Servants; May 16, 2022.
2. State Bank of Pakistan Distinguished Lecture on Trade and Productivity; Oct 13, 2022.
3. Distinguished Lecture at the National Management College to Senior Civil Servants; Oct. 31, 2022.
4. Distinguished Guest Lecture at Mahbub-ul-Haq Research Center at the Lahore University of Management Sciences, May 26, 2022.
5. Hosted Distinguished Lecture of Pakistan Ambassador to WTO at the Lahore School of Economics; Nov 17, 2022.
6. Presentation on trade, innovation, and productivity at Annual Conference of the Pakistan Institute of Development Economics; Nov 22, 2022.
7. Training Workshop on Trade for Senior Ministry of Commerce Officials at the Lahore School of Economics; December 8-9, 2022 (planned).
8. Presentation on Productivity and Trade Agreements at Lahore University of Management Sciences 'Pathways to Development Conference'; Dec 19, 2022.
9. Member of Supervisory Committee for Pakistan's 5<sup>th</sup> Trade Policy Review (attended meetings with Ministry of Commerce and WTO ambassador, provided written inputs); Jan – March 2022.
10. Presentation to the Pakistan Minister of Commerce; Jan 6, 2022.
11. Preparation of background note on wheat exports for Pakistan's Ambassador to the WTO; September 2022.
12. Preparatory Note for Ministry of Commerce on Proposed Preferential Trade Agreement between Pakistan and GCC; Jun – Oct 2022.
13. Special Invitation to Meeting on trade policy and industrial activity with Federal Secretary of Industries; Nov. 8, 2022.

## 2. Projects:

Following are some of the ongoing projects of the centre:

### I. Innovation in the Pakistani Textile Sector

#### **Abstract**

The project has been developed under the *International Growth Centre (IGC)*. Innovation and competitiveness are considered to be the backbone of private sector led economic growth and its sustainability. However, in Pakistan, very little is known about the nature and the extent of innovation as well as its determinants and obstacles. In the absence of such evidence, policies can be misdirected and ineffective. In this project, the researchers surveyed a sample of 500 textile firms in Punjab and Sindh. The survey measured both the technological (product and process) and the non-technological (organizational and marketing) aspects of innovation where an innovation is the introduction of a new or significantly improved product, process, organizational method, or marketing method by an enterprise. Through this survey, the researchers measure 'innovation' in at least four different ways: (1) Innovation rate (based on the response of enterprise if they had innovated during 2011-13, which is further be divided into four types of innovation; i.e. product, process, organizational and marketing), (2) Innovation input (given by the ratio of R&D expenditure to sales), (3) Innovation output (given by the ratio of new products sales to total sales), and (4) Innovation efficiency (given by the ratio of new product sales to R&D expenditure).

Through this study, the researchers answer the following research questions:

- ❑ How innovative is the textiles sector of Pakistan (measured in four different ways as described above)?
- ❑ What are the correlates (both in terms of promoting and hampering) of innovation? (such as firm type and size, market structure, product market i.e. local or international, government regulations and facilitations, sources and type of cooperation, management patterns, skill profile, ICT, access to finance and source of finances, information on technology and markets, and demand for innovations etc.).

**Researchers:** Waqar Wadho and Azam Chaudhry (Lahore School)

### II. Nudging SMEs in Pakistan to invest in renewable energy: the role of information provision.

#### **Abstract**

In this exploratory study, we intend to design and administer a survey across a sample of small-medium manufacturing enterprises in central Punjab to better understand the main structural, informational and behavioral barriers that prevent business owners from switching to greener energy sources. In particular, we will elicit respondents' personal preferences, beliefs and attitudes around greener energy sources, as well as their intended behavior or expected likelihood of adopting greener energy.

**Researchers:** Theresa Chaudhry, Azam Chaudhry, Phillip Garner, Nikita Grabher-Meyer and Nida Jamil

### **III. Fixed costs of innovation as barriers to upgrading in the surgical-goods sector in Sialkot**

#### **Abstract**

We propose to offer grants for innovations that increase exports and for innovations to produce new products (i.e. that have not previously been produced in Sialkot). The main goal is to evaluate the effectiveness of the grant program in promoting innovation among treated firms. We will also look for spillovers of innovations to other (untreated) firms through network links.

**Researchers:** Azam Chaudhry, Shamyla Chaudry, Amit Khandelwal (Yale University), Eric Verhoogen (Columbia University) and David Atkin (MIT)

### **IV. Developing an Optimal Industrial Strategy in the Context of the China Pakistan Economic Corridor (CPEC)**

**Researchers:** Azam Chaudhry, Theresa Chaudhry, Maryiam Haroon and Nida Jamil, Lahore School of Economics.

### **V. High costs of high-quality inputs as a barrier to upgrading in the football sector in Sialkot**

#### **Abstract**

We develop an experiment to offer subsidies for high-quality rexine to a random subset of firms and examine if this subsidy spurs upgrading. We look at two related but distinct dimensions of behavioural responses by firms. First, since high-quality inputs are likely to be complements in production, the subsidy may induce firms to purchase complementary high-quality inputs and produce higher-quality footballs, using their existing technologies and production processes. Second, the subsidy may potentially stimulate learning and spur technological improvements in the production process, if for instance innovation has a higher return in high-quality segments of the industry or if producing higher-quality balls leads firms to transact with more knowledgeable buyers. Accordingly, we intend to track complementary changes in other inputs, shifts in the composition of output toward higher-quality footballs, and other process innovations.

**Researchers:** Azam Chaudhry (Lahore School), Shamyla Chaudry (Lahore School), Amit Khandelwal (Yale University), Eric Verhoogen (Columbia University) and David Atkin (MIT)

### **VI. Relationship between firms' productivity and its export market participation**

#### **Abstract**

This study proposes to investigate the relationship between firms' productivity and its export market participation. Using the methodology developed by De Loecker et.al (2012) we use the Census of Manufacturing Industries (CMI) data from 2000-2011 to detect the direction of causality between productivity and exports i.e., does productivity enhance exports or does the export status of the firm increase productivity. The first part of the paper will be based on studying the self-selection hypothesis where more productive firms choose to become exporters for reasons like cost advantages or ease of overcoming barriers to foreign markets entry as opposed to less productive firms. The second part of the paper explores the learning by exporting hypothesis where firms which are already exporters enhance their productivity mainly by knowledge flows and international market competition which forces the firms to improve faster as compared to the domestic firms.

Analyzing the textile sector, this study aims to find which hypothesis provides a better explanation for the dynamics within the largest export sector for Pakistan.

**Researcher:** Nida Jamil (Lahore School)

## **VII. Heterogeneous Adoption of Knowledge Capital and its impact on the firm's Performance**

### **Abstract**

We will use detailed primary data already collected by the Lahore School from firms in the textile, light engineering and automotive sectors to explore two important aspects of innovation:

First, we explore the heterogeneity in the adoption of 'knowledge capital' (defined as the new set of knowledge acquired, produced and used in the value creation process) at firm level in textile, light engineering and automotive sectors in Punjab to estimate its impact on the firm level outcomes such as revenue, cost of production, quality of the final product and market price of the final product.

This heterogeneity in the adoption of knowledge capital is introduced in two distinct ways:

First, the uneven distribution of the sources of innovation acquired across firms in different sectors. The heterogeneous sources of innovation at firm level are introduced via five distinct ways i.e., technology (equipment), product, process, marketing and business model innovation. Amongst these five different types of innovation, we estimate how significantly each of these sources of innovation have affected firm level outcomes, in different sectors.

Second level of heterogeneity is introduced in terms of the variation in technology adoption across firms based upon its origin (local versus international technology), recent versus already established technology and how often a firm upgrades their respective technology to explore how it may affect the firm level outcomes in different sectors differently.

Next, we argue that organizational and market rigidities may play an important role to motivate (deter) the firm to innovate (or not to innovate). We determine the probability of the firms to engage in innovation (product, process, marketing and business) based upon these factors as well as explore whether different sources for funding the innovation at firm level may play a trivial role in the firm's probability to innovate across different sectors.

Last, we explore if any of these factors affect the firm level outcomes and the probability of innovation for the exporting and non-exporting firms any differently.

In addition to the analysis above, we explore one more important aspect of exporting firms in global market. We argue that global competition that the local exporting firms face, may affect their tendency to innovate in terms of its both intensity and direction. While intensity is measured on a scale from 0-5 as the aggregate of five heterogeneous sources of innovation at firm level i.e., technology (equipment), product, process, marketing and business model innovation.

**Researcher:** Rabia Arif (Lahore School)

### **3. Surveys and Reports:**

Following are the projects conducted by ITC in 2022:

#### **a) Business Confidence Survey 2022-2023:**

The Innovation and Technology Centre (ITC) of the Lahore School of Economics is conducting its eighth Business Confidence Survey on businesses across all four provinces in Pakistan with a special emphasis on exporting and importing firms in Pakistan. The survey started in November and is still ongoing.

**Authors:** Dr. Azam Chaudhry & Saman Khan

### **b) Business Confidence Report of Pakistan 2022 (Key Findings)**

The Innovation and Technology Centre (ITC) of the Lahore School of Economics conducted its seventh business confidence survey from firms all across Pakistan in the year 2022 to understand the perception of the Pakistani businesses about the performance of the Pakistan's Economy.

The data was collected from 228 firms from 3 sectors i.e. Manufacturing, Services and Retail operating across all 4 provinces of Pakistan from February, 2022 to May, 2022. The firms were also characterized in terms of exporters and importers in order to see the behavior of firms in each category.

This year's survey analysed at the most concerning global issues such environmental factors, percentage of female workforce in firms, change in output per worker, management structure of firm along with financial performance of firms, change in. Investments level, Bank borrowings and Employment Levels, important steps to boosts detartrating exports etc.

Although this years' survey proved to be better a year in terms of financial performance, exports and other factors as compared to the previous year but some important issues such environmental concerns and gender equality in workplace were badly ignored by firms operating in Pakistan.

**Authors:** Dr. Azam Chaudhry & Saman Khan

### **c) Business Confidence among Exporting and Importing Firms of Pakistan-2022**

The Innovation and Technology Centre (ITC) of the Lahore School conducted its seventh annual business confidence survey in from January 2022 to end of April, 2022. This years' survey had a separate detailed section for exporting and importing firms to explain the unprecedented trade deficit, so that policy makers could determine what factors have led to the fall in exports and what measures do we need to tackle the deterioration in Pakistan's trade balance. The survey was conducted selecting a variety of firms across three important sectors viz. the manufacturing sector, the services sector and the retail sector. The data was comprised of 227 firms from all four provinces of Pakistan, with 52 exporting and 111 importing firms. The survey was conducted from mid-January, 2022 till end of April, 2022.

Contrary to last years, this years' survey found that exports have increased in 2021 as compared to 2020 and a larger percentage of firms had positive expectations about further increase in the level of export sales in 2022. It was found that a majority of exporting companies were exporting a significant percentage of their output abroad and thus their export volume was increasing both in current Pakistani rupee and current US \$ terms. Thus, the exporting companies experienced an increase in the average price of the exported products both in current Pakistani rupee and current US \$ terms. Also, exporting companies were using imported raw material and machines to produce their exporting product thus improving the quality of the exported products.

When asked about the factors that could boost exports, a significant proportion of firms reported government subsidies, promoting exports of higher value-added goods, upgrading technology and uninterrupted supply of electricity and gas as the most important factors.

**Authors:** Dr. Azam Chaudhry & Saman Khan

Link to the Report: <http://itc.lahoreschool.edu.pk/>

### **d) Innovation in Automobiles-2022**

The Innovation and Technology Centre (ITC) of the Lahore School of Economics started conducting annual surveys to observe the growing trends in the field of innovation and technology upgradation in various sectors. The purpose of these surveys is to observe the extent, quality and impact of innovation activities on the performance and profitability of the innovating firms. The surveys also look at the barriers faced by the innovating firms.

Looking at the results of innovation, most of automobile firms revealed that their quality of output improved, they didn't have to retrain their employees to adopt new technology, their revenues increased, their

cost of production decreased, they didn't have face resistance from their employees while introducing innovations and lastly the prices of their product remained mostly unchanged as the result of innovation.

The two greatest barriers faced while trying to perform innovation were lack of financing and lack of innovation opportunities. It can be concluded that more incentives for innovations could be given by providing more sources of funding for the innovating firms in the form of aid from the government and with the assistance of financial institutions.

**Authors:** Dr. Azam Chaudhry & Saman Khan

**Link to the Report:** [https://itc.lahoreschool.edu.pk/downloads/06\\_innovation%20Report%202022%20V2.pdf](https://itc.lahoreschool.edu.pk/downloads/06_innovation%20Report%202022%20V2.pdf)

#### **e) Innovation in the Exporting and Importing & Non-Exporting in the Automobiles sector firms- 2022**

The Innovation and Technology Centre (ITC) of the Lahore School of Economics conducted a survey in 2018/2019 to observe the growing trends in innovation and technology upgradation in the exporting and non-exporting firms from the textile and readymade garment sectors in Lahore. The purpose of this survey was to observe the extent, quality and impact of innovation activities on the performance and profitability of the innovating exporting and non-exporting firms. The survey also looked at the barriers faced by the innovating exporting and non-exporting firms in this sector. The data consisted of 125 firms involved in manufacturing readymade garments and other textiles, including 87 exporting and 38 non-exporting firms, collected during the period of September 2018 to December 2018. In the surveyed exporting firms, 40% of those firms were selling 100% of their output abroad, with majority of them exporting to Europe followed by worldwide.

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**Authors:** Dr. Azam Chaudhry & Saman Khan

**Link to the Report:** [https://itc.lahoreschool.edu.pk/downloads/07\\_Innovation%20Report%202022%20V1.pdf](https://itc.lahoreschool.edu.pk/downloads/07_Innovation%20Report%202022%20V1.pdf)

#### **4. The Modelling Lab at the Innovation and Technology Centre (General Equilibrium Macroeconomic Model for the Pakistan Economy)**

##### **Intro to the Modelling Lab**

The Modelling Lab Team at the Lahore School's Innovation and Technology Centre has developed a General Equilibrium Macro (GEM) model for the Pakistan economy over the past two years, for policy simulations and teaching. The Lahore School now does quarterly updates for Pakistan and is also headed towards global macroeconomic modeling estimations, starting with the European Union.

##### **1. State of Pakistan Economy Report No. 02-2022:**

##### **GDP Growth**

The Lahore School of Economics macro model for the Pakistan economy projects that GDP growth over the fiscal year July 2022 – June 23, (FY2023), will be 0.82 percent. This projection for the annual growth rate of GDP for FY2023, has been weakened by two quarters of falling GDP growth.

Our projection of GDP growth is comparable to the IMF and World Bank's estimate of GDP growth of 2 percent for FY2023.

Our model's estimates show that the flood damage to lives, livelihoods and incomes, over just the first quarter (Q1) of the fiscal year, from July to September 2022, have taken a devastating toll.

### **Inflation for the Fiscal year 2023**

Inflation for FY 2023 is estimated by our model at 26.1%, as shown in Table 2. This is year on year, for FY 2023, compared to FY 2022.

Our estimate of inflation at 26.1% for FY 2023, is quite comparable to GOP's estimate of 27%.

Our model estimates inflation as being driven by four factors. An output gap. The budget deficit. Depreciation of the exchange rate. And global commodity prices.

For FY 2023, the overwhelming driver of inflation has been the huge depreciation of the exchange rate. By some 32% as observed over Q1 and Q2 of FY 2023. Contributing to near two thirds of the inflation rate. Note that after Q2, the exchange rate is assumed to have reached its equilibrium value, and therefore is not estimated to depreciate any further over Q3 and Q4.

### **GOP Emergency Economic Policy over FY 2023**

GOP faces a near flattened growth rate of 0.8% over FY 2023. Its forex reserves have dwindled to approximate \$3 billion, giving half a month's worth of imports.

With the extension of the IMF's EFF to calendar year 2023, covering virtually all of FY 2023, its fiscal stance is extremely limited by the terms of the agreement with the IMF.

That does leave it monetary policy to generate growth and support welfare. Monetary policy is primarily occupied with controlling inflation raging at 26% per annum. Largely using the interest rate peaking at 17% per annum.

However, we have shown here that two thirds of this inflation rate is being contributed to by the massive depreciation of the exchange rate.

Further, research at the Lahore School shows that depreciation of the exchange rate sets in place depreciatory expectations, leading to increase capital outflows, (Mahmood and Chaudry, Lahore Journal of Economics, 2020). Which of course Pakistan's weak Current and Capital Accounts can ill afford. Nor can a weak investment rate of 16% of GDP.

Therefore, on all these counts, GOP needs to arrest the depreciation of the exchange rate urgently.

## **State of the Pakistan Economy**

### **Quarter Two Based Estimates of Annual Growth in Pakistan**

#### **Fiscal Year 2023**

#### **GDP Growth for Fiscal Year 2023**

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Our estimate of inflation at 26.1% for FY 2023, is quite comparable to GOP's estimate of 27%.

**Authors:** Dr. Moazam Mahmood, Dr. Azam Chaudhry, Aimal Tanvir Malik & Seemab Sajid

## **2. State of Pakistan Economy Report No. 01-2022:**

### **GDP Growth**

The Lahore School of Economics macro model for the Pakistan economy estimates that GDP growth over the fiscal year July 2021 – June 22, (FY2022), has been 5.05 percent. The Covid 19 pandemic, intermittent lockdowns and openings, and hysteresis, have given way to growth.

Our estimate is comparable to GOP's estimate for FY2022, of 5.79 percent. While noting the IMF's estimate of 4 percent.

Our model also uniquely estimates a supply shock, positive or negative. Which then feeds into a demand shock. To give a final change in GDP for FY2022.

Both the unique estimation of the supply cum demand shock, accounts for the difference between GOP's estimate of GDP growth for FY2022 of 5.79 percent, and our estimate of 5.05%.

### **GOP's Economic Policy Stance over FY 2022**

With the Covid-19 pandemic and shutdowns of FY2021, GOP had two policy objectives. To generate growth. And to curb inflation raging at 12%-14%.

As inflation has continued to trend upwards over FY2022, from 8% to 14%, GOP has had to raise the interest rate. From 7% to 7.25% in a small rise of 25 basis points. Then a much higher 150 basis points rise to 8.75%. Tapering to a 100 basis points rise to 9.75%. With a final massive 250 basis points rise to 13.75%. Which has brought the real interest rate effectively to zero. Equaling the inflation rate. But raising the cost of investment. The second tradeoff is for the policy instrument of the exchange rate. The exchange rate has to be appreciated or kept constant to curb importing inflation. But the exchange rate needs to be depreciated to improve the current account balance. Raising exports, and lowering imports.

GOP's policy choice here has been more fraught. It has continued to free the exchange rate, allowing it to depreciate from Rs 157 to the USD in June 2021, to Rs 201 by June 2022.

This has had the punitive outcome of leaving inflation stubbornly high, and trending higher. Nor has inflation been countered sufficiently by the raising of the interest rate.

**Authors:** Dr. Moazam Mahmood, Dr. Azam Chaudhry, Aimal Tanvir Malik & Seemab Sajid

**Link to the Article:** <https://www.brecorder.com/news/amp/40183983>

## **5. Details of Publications**

Some of ITC's publications from the years 2020 to 2022 include:

### **i) Emigration's Heterogeneous Impact on Children's Wellbeing in Punjab, Pakistan**

Arif, R., Chaudhry, T.T & Chaudhry, A. (2023). "Emigration's Heterogeneous Impact on Children's Wellbeing in Punjab, Pakistan", *Child Indicators Research*.

## ii) Experimental Evidence on Group-based Attendance Bonuses in Team Production

### **Abstract**

We test the effectiveness of a group-based attendance bonus in a field experiment in a factory in Pakistan, where workers manufacture electric fans in stages using batch-production methods. We find that the group-based attendance bonus increased by more than a quarter the average number of days that the team's attendance target was met. This effect was larger for junior and mid-level workers as compared to senior workers. We find that the bonus incentivized better coordination among workers, especially in the latter part of the month, rather than through higher average attendance. Our experiment's results suggest that temporary incentive programmes may help workers in the transition period to new ways of organizing production and may prove to be a valuable tool for change management. Group-based bonuses offer an alternative to individual or tournament-based incentives based on one's own or relative performance, which may have deleterious effects on intrinsic motivation and pro-social behaviour.

Chaudhry, T., Tirmazee, Z., & Ayaz, U. (2022). "Experimental Evidence on Group-based Attendance Bonuses in Team Production". *Journal of South Asian Development*, 0(0). <https://doi.org/10.1177/09731741221129350>

## iii) Impact of prenatal exposure to Ramadan on disability in Pakistan among adults age 18–64

### **Abstract**

Temporary disruptions to eating and sleeping patterns due to exposure to Ramadan during pregnancy have been shown to increase the probability of disability and chronic health problems later in life. This study aims to analyze the intent-to-treat effect of prenatal exposure to Ramadan (the Islamic month of fasting) on individual disabilities for individuals age 18 to 64 across three provinces encompassing 94% of Pakistan's population.

Chaudhry, Theresa Thompson. (2022). "Impact of prenatal exposure to Ramadan on disability in Pakistan among adults age 18–64", *Journal: Dialogues in Health*; Publisher: Elsevier

## iv) Trading textiles along the new silk route: The impact on Pakistani firms of gaining market access to China

### **Abstract**

In this study, we analyze the impact of the lower Chinese tariffs on Pakistani textile manufacturers that resulted from the Pakistan-China Free Trade Agreement (FTA). As a result of lower Chinese tariffs, Pakistani textile manufacturers increased exports though the number of firms exporting to China changed marginally and only in the spinning sector did exports substantially rise. Using a variety of recently developed methodologies, our results indicate that the productivity of textile manufacturers rose 3-8 percent and product quality rose 1-2 percent. Firms reduced product offerings in response to tariff drops. In contrast to a number of previous studies where exporting was accompanied by investment or R&D, exporters to China increased material and labor inputs but not capital. Non-exporters' productivity and quality also rose, indicating the presence of spillovers. Testing this, we find that these spillovers occurred for non-exporters downstream from higher productivity exporters in close geographic proximity.

Chaudhry, A., Chaudhry, T.T., & Jamil, N. (2022). "Trading Textiles along the New Silk Route: the impact on Pakistani firms of gaining market access to China," *Journal of Development Economics*, Volume 158.

## iv) Innovation strategies and productivity growth in developing countries: Firm-level evidence from Pakistani manufacturers

### **Abstract**

We examine the determinants of product, process, and organizational innovations, and their impact on firm labor productivity using data from a unique innovation survey of firms in Pakistan. We find significant heterogeneity in the impact of different innovations on labor productivity: Organizational innovation has the

largest effect followed by process innovation. But unlike much of the literature, we found a negative impact of product innovation suggesting a disruption effect of new products. We find a strong impact of engaging in knowledge creation on product and process innovation. We also find that external knowledge networks and innovation cooperation play no significant role in firms' decision to engage in innovation and its intensity, however, vertical linkages with suppliers (clients) promote product (process) innovations. Foreign competition has a negative effect on product innovation and a positive effect on organizational innovation. Exposure to foreign markets both in term of exporting and quality standard certification leads to better innovation performance.

Chaudhry, A., & Wadho, W. (2022). "[Innovation strategies and productivity growth in developing countries: Firm-level evidence from Pakistani manufacturers](#)," *Journal of Asian Economics*, Volume 81.

#### **v) Home-Based Enterprises: Experimental Evidence on Female Preferences from Pakistan**

##### **Abstract**

Enterprises run by women in developing countries are largely home based and belong to small-business networks, which may explain these businesses' small size, low profitability, and short life. Using data from Pakistan, we confirm that the majority of female-owned microenterprises are home based and find that these home businesses are likely to close within 2 years. Our incentivized tasks elicit household preferences for business location and advice-taking from women and male decision makers. Both men and women are willing to sacrifice almost 60% of median profits for running businesses from home. Women avoid taking outside advice, even when it increases task earnings. Women's preferences are correlated with business experience but not with agency within the household, mobility, and household responsibilities.

Chaudhry, A., d'Adda, G., Said, F., & Mahmood, M. (forthcoming), "[Home-based Enterprises: Experimental Evidence on Female Preferences from Pakistan](#)," *Economic Development and Cultural Change*.

#### **vi. Impact of Remittances on Child Health Outcomes in Punjab, Pakistan**

##### **Abstract:**

Primary motive of temporary migration in developing countries like Pakistan is generally in response to the income constraint faced by the households. Therefore, to relax the resource constraint, migrants tend to remit back to their families in home countries. This study attempts to look at the impact of remittances on child health outcomes as measured by height-for-age Z-scores (HAZ) & weight-for-age Z-scores (WAZ) in Punjab, Pakistan using a cross-sectional data set from the Multiple Indicator Cluster Survey (MICS). We use an instrumental Variable Approach to correct for the endogenous decision to remit. Two Stage Least Square with an instrument that comprise of an interaction of number of banks in each district with the number of adult males in a household to create household level variation in the instrument has been used to estimate the causal relation between remittances and child's health outcomes. Our results suggest significant positive impact of remittances on both indicators of child health outcomes. Further this study confirms that gains for girls are greater relative to boys.

R Arif, M Aslam (2022), "[Impact of Remittances on Child Health Outcomes in Punjab, Pakistan](#)", *Journal of Development and Social Sciences*".

## vi. Determining the Extent of Gender Discrimination in Educational Attainment: A Case of Pakistan

### **Abstract**

Gender bias in developing countries may restrict educational opportunities for girls in comparison to boys. This paper attempts to measure the gender disparity in education amongst children from 5 years to 18 years of age across Pakistan. Using the Cross-sectional data from PSLM and applying Oaxaca decomposition with probit estimation we measure the gender gap through explained and unexplained variation on three aspects of education; first, the overall school enrollments across Pakistan, second the differences in the school enrollments based upon the type of school i.e. public vs. private schools for the three levels of education: primary, middle/secondary and higher secondary. Third, we determine whether gender discrimination exists in the accumulated schooling decision for the age group of 18 to 30 years. The results interestingly show that although a strong bias exists against females in overall enrollment rates, but as we explore further we see that males drop out of private schools more as compared to females and the accumulated level of schooling of the male adults is also lower than that of females. We find that much of these differences are not due to the endowment effects. Large negative deviation for males may be attributed to the unobservable pressure and society's norms regarding the role of males that affect them in an adverse manner.

R Arif, M Khalid, (2022). "[Determining the Extent of Gender Discrimination in Educational Attainment: A Case of Pakistan](#)" *Pakistan Social Sciences Review*.

## vii. Measuring Mother's Empowerment Through Culture of Son Preference in Pakistan

### **Abstract**

This paper highlights whether giving birth to a son plays a role in determining mother's empowerment in Pakistan and in particular, if the birth-order of the son has any additional impact in uplifting the mother's status within a household, using the Pakistan Demographic and Health Survey (PDHS) 2012-13. In Pakistan, the household's economic conditions make parents treat their sons and daughters differently and ultimately, giving preference to sons over daughters, in terms of education, health and nutrition, as the social and economic utility of a son, overpowers that of a daughter. In the presence of this culture of son preference, if women then give birth to a son or a number of sons, then it should help empower them. The results of the study show having a son significantly helps in empowering mothers in Pakistan. In contrast, the son's birth-order (both higher or lower) is not an important factor for improving mother's empowerment. Mother's empowerment is mainly driven by the number of sons, and age of the son, and these results are more pronounced in rural areas of Pakistan, and for mothers belonging to poor households

Arif & Tanvir. (2022). "[MEASURING MOTHER'S EMPOWERMENT THROUGH THE CULTURE OF SON'S PREFERENCE IN PAKISTAN](#)" *Journal of Research and Reviews in Social Sciences Pakistan*, Vol 5 (2), 2022 pp 1884-1917.

## viii. The Macro Determinants of the Drop in Pakistan's Long Run GDP Growth

### **Abstract**

This paper attempts to address the long-run determinants of trend GDP growth in Pakistan for years 1973 till 2017. The theoretical framework chosen has been the Keynesian general equilibrium framework of aggregate demand, decomposed into the macro aggregates of consumption, investment, government expenditures, exports and imports (Keynes, 1937). The analytical strategy we have used is to establish first whether there has been a discrete drop in GDP growth at any particular break date. Establishing a break date allows us to define two periods of GDP growth, a higher growth period, followed by a lower growth period. The determinants of GDP growth can then be established, by looking for correlated changes in their behavior between the two time periods. Our findings suggest that high GDP growth in the first phase, pre-1992, is explained by high investment growth. Paired with a Marginal Propensity to Consume in this phase which is low. Making this high GDP growth phase investment led. Low GDP growth in the second phase, post-1992, is now explained by low investment growth. Paired with a Marginal Propensity to Consume, in this phase which is higher. Making this phase consumption-led.

Moazam, Rabia & Mahmood, M. (2022), "The Macro Determinants of the Drop in Pakistan's Long Run GDP Growth", Pakistan Business Review, Volume 24, Issue 2.

## 6. Research Grants Awarded

- International Growth Centre (FCDO, UK) for Research on Promoting Investment in Solar Energy across SMEs in Pakistan, 2023.
- World Trade Organization (WTO) Chairs Programme, 2022.

## 7. Publications 2022:

- Arif, R., Chaudhry, T.T & Chaudhry, A. (2023). "Emigration's Heterogenous Impact on Children's Wellbeing in Punjab, Pakistan", *Child Indicators Research*.
- Chaudhry, T., Tirmazee, Z., & Ayaz, U. (2022). "Experimental Evidence on Group-based Attendance Bonuses in Team Production". *Journal of South Asian Development*, 0(0). <https://doi.org/10.1177/09731741221129350>
- Chaudhry, Theresa Thompson. (2022). "Impact of prenatal exposure to Ramadan on disability in Pakistan among adults age 18–64", *Journal: Dialogues in Health*; Publisher: Elsevier
- Chaudhry, A., Chaudhry, T.T., & Jamil, N. (2022). "Trading Textiles along the New Silk Route: the impact on Pakistani firms of gaining market access to China," *Journal of Development Economics*, Volume 158.
- Chaudhry, A., & Wadho, W. (2022). "Innovation strategies and productivity growth in developing countries: Firm-level evidence from Pakistani manufacturers," *Journal of Asian Economics*, Volume 81.
- Chaudhry, A., d'Adda, G., Said, F., & Mahmood, M. (forthcoming), "Home-based Enterprises: Experimental Evidence on Female Preferences from Pakistan," *Economic Development and Cultural Change*.
- R Arif, M Aslam (2022), "Impact of Remittances on Child Health Outcomes in Punjab, Pakistan", *Journal of Development and Social Sciences*".
- R Arif, M Khalid, (2022). "Determining the Extent of Gender Discrimination in Educational Attainment: A Case of Pakistan" *Pakistan Social Sciences Review*.
- Arif & Tanvir. (2022). "MEASURING MOTHER'S EMPOWERMENT THROUGH THE CULTURE OF SON'S PREFERENCE IN PAKISTAN" *Journal of Research and Reviews in Social Sciences Pakistan*, Vol 5 (2), 2022 pp 1884-1917.
- Moazam, Rabia & Mahmood, M. (2022), "The Macro Determinants of the Drop in Pakistan's Long Run GDP Growth", Pakistan Business Review, Volume 24, Issue 2.