

INNOVATION TECHNOLOGY CENTER

RESEARCH OUTPUT OF THE INNOVTION & TECHNOLOGY CENTRE

| CATEGORY | 2023 (Actual) | 2024 (On-going) |
|---|----------------------|------------------------|
| HEC W Category/Impact Factor Journal Articles | 6 | 8 |
| HEC X and Y Category Journal Articles | 2 | 1 |
| ABDC/ABS/ MLA Journal Articles | | |
| Books | | 1 |
| Book Chapters | | 1 |
| National Conference Papers | 4 | 3 |
| International Conference Papers | 1 | |
| Case Studies | | |
| Lahore School Working Papers / International Working Papers | 7 | 4 |
| Artistic productions (catalogued) | | |
| MS Research Projects Supervised | | |
| MPhil Theses supervised (Completed) | 2 | |
| MPhil Theses supervised (On-going) | | 3 |
| PhD Theses supervised (Completed) | | |
| PhD Theses supervised (On-going) | | |

RESEARCH PUBLICATIONS (ACTUAL & ON-GOING)**Actual 2023 (Author/s, Title of Publication, Journal, Year)**

1. Arif, R., & Chaudhry, A., Understanding how Complementarities in Innovation Affect Firm Performance: Evidence from Pakistan, Innovation and Technology Center (ITC) Working Paper 04-2023, Lahore School of Economics, 2023. **(ITC Working Paper)**
2. Arif, R., Chaudhry, A., and T. Chaudhry, “Empowered Mothers and Co-Resident Grandmothers: Two Fundamental Roles of Women Impacting Child Health Outcomes in Punjab, Pakistan, (with Rabia Arif and Azam Chaudhry), PLOS One, November 2023, <https://doi.org/10.1371/journal.pone.0285995>. **(W Category)**
3. Arif, R., Chaudhry, T. “Heterogeneous Effects of Emigration on Labor Market Activity and Investment Decisions in Punjab, Pakistan,” *Advances in Life Course Research*, Vol. 56 (June), 2023, <https://doi.org/10.1016/j.alcr.2023.100547> **(W Category)**
4. Arif, R., Chaudhry, T., and A. Chaudhry, “Emigration of Caregivers and its Impact on Child Wellbeing in Punjab, Pakistan,” *Child Indicators Research*, 2023, <https://doi.org/10.1007/s12187-023-10014-4> **(W Category)**
5. Chaudhry, A., Andaman, G., & Junaid, A., A Roadmap to Diversifying Pakistan’s Exports: Operationalizing the Product Space, Innovation and Technology Center (ITC) Working Paper 03-2023, Lahore School of Economics, 2023. **(ITC Working Paper)**
6. Chaudhry, A., Chaudhry T. T., Garner, P., & Grabher-Meyer, N., “Promoting Investment in Solar Energy Across SMEs in Pakistan,” Innovation and Technology Center (ITC) Report No. 03-2023, Lahore School of Economics, 2023. **(ITC Working Paper)**
7. Chaudhry, T. & R. Arif, “The Impact of Consanguineous Marriage on Children's Human Capital in Pakistan,” *Journal of South Asian Development*, November 2023, <https://doi.org/10.1177/09731741231200380>. **(W Category)**
8. Chaudhry, T., and H. Ahmed, “The Global Gig Economy: Pakistan’s Opportunity to Become a Leader in Service Exports?” ITC Working Paper No. 13-2023, Lahore School of Economics. **(ITC Working Paper)**
9. Jamil, N., Chaudhry, T. T., & Chaudhry, A., “Self-Selection versus Destination based Learning- by-Exporting: Firm Level Evidence from Pakistan,” Innovation and Technology Center (ITC) Working Paper 02-2023, Lahore School of Economics, 2023. **(ITC Working Paper)**
10. Jamil, N., Chaudhry, T., and A. Chaudhry, “Adjustments in markups after a Free Trade Agreement: An analysis of Pakistani firms gaining increased access to China,” (with Nida Jamil and Azam Chaudhry), *Journal of International Trade and Economic Development*, June 2023, <https://doi.org/10.1080/09638199.2023.2222419>. **(W Category)**
11. Arif, R., Chaudhry, T., & Chaudhry, A. (2023). “Emigration’s Heterogeneous Impact on Children’s Wellbeing in Punjab, Pakistan.” *Child Indicators Research*, 1-45 **(W Category)**
12. Arif, R., Jamil, N., & Chaudhry, A. (2023). Strategic Trade Policy for Pakistan’s Textile Sector in 2018: Enhancing High Value-Added Exports through Low-Priced Intermediate Input. *The Pakistan Development Review*, 145-166. **(HEC Y category)**

13. Tanvir, A., & *Arif, R. (2023). “Measuring Mother’s Empowerment through the Culture of Son’s Preference in Pakistan.” *Journal of Research & Reviews in Social Sciences Pakistan*. (HEC Y Category)
14. ITC Working paper No.01-2023: “Low Priced Intermediate input and Export Boost, Proposing A strategic trade Policy to Achieve High Value-Added Exports: A case of Pakistan’s Textile Sector”.(ITC Working Paper)
15. Moazam Mahmood, Dr. Azam Chaudhry, Aimal Tanvir, Seemab Sajid, Amna Noor Fatima/State of the Pakistan Economy (Fiscal Year-2023) /ITC-Lahore School of Economics/2023 (National Conference)
16. Moazam Mahmood, Dr. Azam Chaudhry, Seemab Sajid, Amna Noor Fatima/State of the Pakistan Economy (Fiscal Year-2024) /ITC-Lahore School of Economics/2023 (National Conference)
17. Moazam Mahmood/ Global employment growth in the long run/ Employment Prospects in Developing Countries: Implications of Technological and Demographic Trends (Columbia University)/2023 (Book Chapter)
18. Moazam Mahmood, Dr. Azam Chaudhry, Shamayla Chaudry/ Relationship between Budgets and the Current Account/ Management of Pakistan's Economy (Lahore School of Economics/2023 (National Conference)
19. Moazam Mahmood, Seemab Sajid/ The Need to Differentiate the Formal Labor Market from The Informal Labor Market in Pakistan/ Lahore School of Economics/2023 (ILR)
20. Azam Chaudhry, Gul Andaman, Aymen Junaid (2023). “A Roadmap to Diversifying Pakistan's Exports: Operationalizing the Product Space”. ITC Working Paper, 03-3023 (ITC Working Paper)
21. Azam Chaudhry, Gul Andaman, Aymen Junaid (2023). “Pakistan’s Unofficial Capital Outflows: Stemming the Tide”. (National Conference Paper)

Actual/On-going 2024 (Author/s, Title of Publication, Journal, Year)

1. Arif, R., & Chaudhry, A., Understanding how Complementarities in Innovation Affect Firm Performance: Evidence from Pakistan (Impact Factor – Planned)
2. Azam Chaudhry, Gul Andaman, Aymen Junaid (2024). Are Trade Related Policies Holding Pakistan’s Export Back? Insights from the Global Trade Alert Database. (Planned for Journal Publication)
3. Azam Chaudhry, Gul Andaman, Aymen Junaid (2024). Can Foreign Aid Trigger Unofficial Capital Outflows? Panel Data Analysis. (Planned for Journal Publication)
4. Azam Chaudhry, Gul Andaman, Aymen Junaid (2024). Exploring the Influence of Trade Policies on Pakistan's Economic Performance (Planned for National Conference to be hosted in LSE)
5. Azam Chaudhry, Gul Andaman, Aymen Junaid (2024). Pakistan’s Product Space: Exploring Potential for higher exports in Pakistan (Planned for National Conference to be hosted in LSE)
6. Chaudhry, T., “How Robust Are Intent-to-Treat Effects of Prenatal Ramadan Exposure on Child Outcomes?” under submission at W category journal.

7. Does Empowering Women increase their Participation in Labor Force: A case of Pakistan.
8. From Home to Economy: Analyzing the Heterogeneity in the Gendered Production for the Invisible Labor Force in Pakistan. (MPHIL Thesis Supervised)
9. Jamil, N., Chaudhry, T. T., & Chaudhry, A., Self-Selection versus Destination based Learning by-Exporting: Firm Level Evidence from Pakistan (Impact Factor – Planned)
10. Jamil, N., Chaudhry, T., Chaudhry, A., “Measuring Actual TFP Growth: Stripping away Omitted Price Bias and Demand Shocks,” under submission at W category journal.
11. Jamil, N., Chaudhry, T., Chaudhry, A., “Self-Selection versus Destination based Learning-by-Exporting: Firm Level Evidence from Pakistan,” under submission at W category journal.
12. Moazam Mahmood, Amna Noor Fatima/ Using Arrow Debreu's First and Second Welfare Theorem to Analyse Poverty Reduction in Pakistan/2024 (MPhil Thesis Supervised)
13. Moazam Mahmood, Azam Chaudry, Shamyla Chaudry/The Relationship Between Fiscal Policy and BOP Constraints: A Crisis is a Terrible Thing to Waste/2024 (National Conference)
14. Moazam Mahmood, Dr. Azam Chaudhry, Seemab Sajid, Amna Noor Fatima/State of the Pakistan Economy (Fiscal Year-2024) /ITC-Lahore School of Economics/2024 (ITC Working Paper)
15. Moazam Mahmood, Eeman Fatima/ Estimating GDP Growth and Income Inequality using the Proxy of Night Light Data in Pakistan/2024 (MPhil Thesis Supervised)
16. Moazam Mahmood, Seemab Sajid/ The Need to Differentiate the Formal Labor Market from The Informal Labor Market in Pakistan/ International Labour Review/2024 (MPhil Thesis Supervised)
17. Moazam Mahmood/ Global employment growth in the long run/ Employment Prospects in Developing Countries: Implications of Technological and Demographic Trends (Columbia University Press)/2024
18. Rabia Ikram, Moazam Mahmood/ Macroeconomic Determinants of Growth- A Case Study of Pakistan/2024 (Book)
19. Shenk, M., Naz, S., and T. Chaudhry, “Intensive Kinship, Development, and Demography: Why Pakistan Has the Highest Rates of Cousin Marriage in the World,” revise and resubmit at *Population and Development Review*. (W Category)

List of ITC Working Papers, 2023

| Sr. No. | Title of the Working Paper | Name of the ITC Fellow | Name of the Supervisor | Abstract |
|---------|---|--|------------------------|--|
| Jan-22 | <p>Measuring Adjustments in Markups in Response to the Free Trade Agreement: An Analysis of the Pakistani Firms Gaining Market</p> <p>Access to Chinese Markets</p> | <p>Nida Jamil</p> <p>Theresa Chaudhry</p> <p>Azam Chaudhry</p> | | <p>Increased market access through trade liberalization can affect the markups, prices, and marginal costs of exporters. Understanding these dynamics is critical for firms and policymakers, particularly as they formulate export strategies. We examine the impact of China lowering tariffs on Pakistani products under the Pakistan–China Free Trade Agreement (FTA), which gave Pakistani exporters greater market access. Using disaggregated output and price data for textile manufacturers in Punjab, Pakistan, we estimate product-level markups and marginal costs using the methodology of De Loecker, Goldberg, Khandelwal, and Pavcnik (2016) [“Prices, Markups, and Trade Reform.” <i>Econometrica</i> 84 (2): 445–510]. We then extend this to the firm level by using the methodology of De Loecker and Warzynski (2012) [“Markups and Firm-Level Export Status.” <i>American Economic Review</i>, 2437–2471]. We find that Pakistani firms exporting to China followed a dynamic pricing strategy by reducing prices to compete with global competitors in the Chinese market. We also find evidence of a decrease in marginal costs as a result of reductions in X-inefficiencies. But because Pakistan’s exports to China are relatively homogeneous, the extent of quality differentiation and markup margins was limited. Finally, we find evidence of pro-competitive effects.</p> |
| Feb-22 | <p>Multiplayer Strategic Evolutionary Game Model</p> <p>Analysis on Ban of Single-</p> | <p>Beenish Amir</p> | <p>Saba Firdousi</p> | <p>This paper has looked at the response of plastic manufacturers and retailers after the introduction of Pakistan environment protection Act of 2019. This paper conducts analysis of the behavior of government, manufacturers and retailers using evolutionary game theory model.</p> |

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| | <p>Use Plastic Bags Under</p> <p>Pakistan Environmental</p> <p>Protection Act 2019</p> | | | <p>This model was used to test for hypothesis related to various characteristics associated with the three players. Main variables selected for this purpose include probability of adoption of business process innovation, probability of monitoring, income manufacturers and retailer can expect from innovation and costs associated with non-compliance of regulations. Furthermore, we conducted simulation analysis to look at the stability of equilibrium strategies. Additionally, we conducted a small survey in Lahore and Islamabad on plastic bag manufacturers and retailers to find empirical support for our research. The results showed that environmental regulation can be helpful if incentive-based approach is used by the government. Subsidies and tax incentives should be given to manufacturers and retailers for adopting business process innovation and using environment friendly bags.</p> |
| <p>Mar-22</p> | <p>Is Fintech the New Path to Sustainable Resource Utilization and Economic</p> <p>Development?</p> | <p>Minahil Awais</p> | <p>Ayesha Afzal Saba Firdousi</p> | <p>Sustainability has become an important topic due to the environmental damage caused by economic activity. In this scenario, fintech can help achieve improved resource utilization and green economic development. Even though fintech and sustainability are amongst the main policy areas, they have rarely been assessed together. So the purpose of our research is to improve understanding of this relationship. This study uses panel data from 66 countries for the 2010-2021 period to develop a green growth (GG) index. Regression results show that availability of secure technology, Internet popularization, R&D expenditure, energy supply, industry value added, technological exports and GDP growth have positive effects on green growth. Conversely, unemployment and air pollution have negative effects. Overall, results show that there is a positive impact of fintech on resource use and green growth. Importantly, this research highlights the need for regulators and policy makers to promote application of fintech for</p> |

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| | | | | achieving greener economic growth. |
| Jan-23 | <p>Low priced Intermediate input and Export Boost, Proposing A Strategic Trade Policy to Achieve High Value-Added Exports: A Case of Pakistan's Textile Sector</p> | <p>Rabia Arif Nida Jamil Azam Chaudhry</p> | | <p>Despite having numerous ways proposed in literature to boost exports like devaluation of currency (Nicita, A. 2013; Krugman and Obstfeld, 2003; Feenstra and Taylor, 2008) such as giving direct loans to the entrepreneurs to open new businesses or re-investing in existing businesses (Bach 2013) and Banerjee and (Duflo 2004) there still is need to explore other ways by which export performance can be improved. Therefore, in this paper we propose a more direct remedy i.e., through a strategic reduction in tariff rates on a selective range of intermediate inputs in order to climb up the export value chain.</p> |
| Feb-23 | <p>Self-Selection versus Destination based Learning-by-Exporting: Firm Level Evidence from Pakistan</p> | <p>Nida Jamil, Theresa Chaudhry and Azam Chaudhry</p> | | <p>It is a well-documented fact that exporters outperform non-exporters. The exporting firms are more productive, larger in scale, more capital-intensive, and pay higher wages than non-exporting firms (De Loecker, 2007; Fernandes & Isgut, 2015; Wagner, 2016; Jamil et al., 2022). However, the direction of causality-productivity increases exports or exports enhance productivity- is still debatable within the trade-firm-productivity literature. The two hypotheses: self-selection versus learning-by-exporting are alternatives, but not mutually exclusive hypotheses on why exporters perform better than non-exporters.</p> |
| Working Paper No. 03-2023 | A Roadmap to Diversifying Pakistan's Exports: Operationalizing the Product Space | Gul Andaman Aymen Junaid | Azam Chaudhry | |
| Working Paper No. 04-2023 | Understanding how Complementarities in Innovation Affect Firm | Rabia Arif | Azam Chaudhry | |

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| | Performance: Evidence from Pakistan | | | |
| Working Paper No. 05- 2023 | Underdog Entrepreneurship: A Model to Predict the Success of Poor Entrepreneurs | Amber Sajjad | Amina Talat | |
| Working Paper No. 06- 2023 | Investigating Moral Vs Non-Moral Transgressions with Cancel Culture: A Non- Western Perspective | Nosheen Khan Niazi | Shamila Nabi Khan | |
| Working Paper No. 07- 2023 | Harnessing Household Economic Vulnerability: Evidence from a Developing Economy | Nida Naz | Syeda Rabab Mudakkar | |
| Working Paper No. 08- 2023 | An Innovation in Banking: Green Banking Practices and Stakeholders' Influence | Hammna Jillani Hesan Zahid | Muhammad Nawaz Chaudhry | |
| Working Paper No. 09- 2023 | Spatiotemporal Clustering, Hotspot Analysis and Fire Risk Assessment in the Northern Region of Khyber Pakhtunkhwa (KPK), Pakistan | Rida Naseer Salman Tariq | Muhammad Nawaz Chaudhary | |
| Working Paper No. 10- 2023 | Improving the Prediction of Firm Performance using Nonfinancial Disclosures: A Machine Learning Approach | Usman Bilal Sufi Khaled Hussainey | Arshad Hasan | |
| Working Paper No. 11- 2023 | Women Entrepreneurs Overcome Challenges while Setting up Business | Zoraq Mansoor | Aamir Khan | |

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| Working Paper No. 12-2023 | Monopoly Fostered by Regulation: The Case of Pakistan Stock Exchange | Ramsha Noor | Khalid Mirza | |
| Working Paper No. 13-2023 | The Global Gig Economy: Pakistan's Opportunity to Become a Leader in Service Exports? | Hamna Ahmed | Theresa Thompson Chaudhry | <p>Freelancers in Pakistan earned around \$400 million in both FY21 and FY22, accounting for about 15% of the \$2.6 Billion in ICT exports. Pakistan's IT exports have been rising in absolute terms as well as a share of service exports over the last several years, but it is still far behind countries like the Philippines and India. Further, it has a long way to go before it rivals the importance of remittances to Pakistan from abroad, which stood at \$31.2B in FY22.</p> <p>To learn more about the landscape of freelancing in Pakistan, we scraped the data on Pakistan-based freelancers from two popular sites. The majority of the 9,495 Pakistani freelancers advertising their services on Freelancer.com are based in Punjab and Sindh. The most commonly advertised skill is in programming, web and app development, followed by design, research/writing, photography, and marketing. Nearly three-quarters of the workers listed have earned money through the site. Firms charge the most per hour on average and have completed the largest number of jobs. Men charge around \$2.40 more per hour than women and have larger total earnings, even though they have completed fewer transactions. Women have the highest repeat hire rate as compared to both men and firms. Earnings and hourly rates are increasing (at a decreasing rate) in the experience of freelancers and percentage of jobs completed on time. Average ratings, however, have no statistically significant impact on either total earnings and rates per hour of freelancing work. In contrast, out of 85,314 freelancers advertising their services on the site Guru.com, only 1,100 (1.3 percent) had ever completed a transaction. Men make more per</p> |

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| | | | | transaction but earnings in the last year were roughly equal for men and women. |
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