

FOREWORD

The Centre for Research in Economics and Business (CREB) was established in 2007, as an independent research centre at the Lahore School of Economics, Pakistan. CREB aims to produce high quality research with meaningful policy impact, build capabilities of early career researchers and engage with academics, practitioners and policy makers on issues of importance for Pakistan's economic development. It strives to continuously improve the quality of its research by developing links with international researchers and encouraging publications in top ranked international journals. CREB organizes international conferences and publishes working papers and policy briefs to promote discussion on policy issues and disseminate research. It hosts visiting international scholars undertaking research on Pakistan, facilitates research by the Lahore School faculty, and coordinates the postgraduate program leading to the MPhil and PhD degrees at the Lahore School.

In the short period since its inception, CREB has built an excellent reputation for the quality of its research. Our faculty and researchers have received funding support from regional partners and international agencies such as British Academy UK, International Growth Centre (IGC), National Science Foundation, USA, Private Enterprise Development in Low-Income Countries (PEDL), Open Society Foundation (OSF) and South Asia Network of Economic Institutes (SANEI).

Our staff members are highly skilled in applied research and have been actively involved in projects that help build strong policies. They focus on three main fields of research: one, modeling political economy; two, exploring the social sector, with an emphasis on education, health, microfinance and community driven development; and three, investigating industrial innovation and agglomeration.

The aim of the CREB Research News is to provide a perspective regarding the scope and depth of research activities being carried out at CREB. We invite you to visit our website www.creb.org.pk and browse through our ongoing and completed research.

Naved Hamid
Director
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Editor's Note

This issue of the CREB Research Newsletter is the eighth in a series of newsletters from CREB. It provides information on current and completed research projects at CREB. It also has a record of conferences and workshops attended by CREB staff, Working Papers published by CREB, journal articles by members of the CREB team and MPhil Economics theses completed for the period April, 2017 to February, 2018.

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<http://creb.org.pk/>

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Research Projects

I. Ongoing Projects

1. Barriers to Upgrading in the Sialkot Football Sector

Azam Chaudhry and Shamyla Chaudry (Lahore School), David Atkin (MIT), Amit K. Khandelwal and Eric Verhoogen (Columbia University)

The project has been developed under the *International Growth Centre (IGC)* and the *Private Enterprise in Developing Countries (PEDL)* initiative. In this project, the researchers investigate the extent to which high costs of high-quality inputs are a barrier to upgrading in the football sector. One of the primary inputs into football production is an artificial leather called rexine. They propose an experiment to offer subsidies for high-quality rexine to a random subset of firms and examine if this subsidy spurs upgrading. They will 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.

2. Institutional Capacity as an Organizational Challenge: A Field Experiment in Pakistan

Hamna Ahmed (Lahore School), Kate Vyborny (Duke University), Simon Quinn (University of Oxford) and Asha Gul (University of New South Wales)

This project is a novel field experiment involving a large donor organization and over 800 recipient community organizations across Pakistan. The project involves two components: The first component aims to study whether community organizations can be incentivized to improve their performance through: (i) systematic self-assessment and reporting of defined Key Performance Indicators (KPIs), and (ii) A transparent non-financial rewards scheme based on these KPIs. *Pakistan Poverty Alleviation Fund (PPAF)* and *International Growth Centre (IGC)* have funded this component of the project. Initiated in 2014, four rounds of reporting and incentives for recipient organizations have been completed to date.

The second component of the project will explore (i) how each part of a large, complex organization (the donor) responds to new information on performance (of recipient community organizations) on KPIs; (ii) How the responses of both donor and recipients to new information and incentives relate to organizational characteristics of theoretical importance, including divergence of preferences between members of the organization; communication costs between parts of the organization; and decentralization of decision-making authority. This part will build on an existing

initial stage of the research carried out in component 1 of the project. *National Science Foundation (NSF)* is providing support that will allow the continuation and strengthening of Component 1 and expansion of the scope of the study to cover component 2. A first pilot of this component was carried out in February 2018. The full experiment will be carried out in summer while the endline survey for the study is scheduled for fall of this year.

Hamna Ahmed and Kate Vyborny presented some initial findings from this project at PPAF's second international research conference to deliberate converting Knowledge to Action, held in Islamabad in April 2017.

3. Microcredit and Microsaving for Microenterprises in Pakistan: Finding from framed field experiments in Pakistan

Marcel Fafchamps (Stanford), Simon Quinn (Oxford), Giovanna d'Adda (University of Milan) are working with Naved Hamid, Farah Said and Uzma Afzal (Lahore School)

They are designing a Randomized Control Trial in 4 districts of Punjab to compare the effectiveness of micro-savings and micro-loans as means for households to manage risk and liquidity. The study was being conducted in collaboration with the National Rural Support Programme (NRSP) funded by the *Department for International Development (DfID)* and *Economic and Social Research Council (ESRC)*. The study explores the role of commitment and reminders in product take-up and repayment.

This project builds on existing research and pilots funded by the *International Growth Centre (IGC)* with a sample of microfinance clients of NRSP. Results indicate that for microfinance clients, savings and credit products are often substitutes, satisfying the same underlying demand for a regular schedule of deposits and a lump-sum withdrawal (Published in *Economic Journal*: www.onlinelibrary.wiley.com/doi/10.1111/eoj.12512/abstract and working paper available here: http://ibread.org/bread/system/files/bread_wpapers/449.pdf)

Resisting temptation to spend: Microcredit and Microsaving for Microenterprise in Pakistan

4. Impact assessment of startup loans to female run micro-enterprises

Azam Chaudhry, Naved Hamid, Farah Said (Lahore School), Giovanna d’Adda (University of Milan) and Mahreen Mahmud, (CSAE, University of Oxford)

This study is a Randomized Control Trial to evaluate the socio-economic and welfare impacts of micro-loans to female micro-entrepreneurs. This study looks at whether access to finance leads to

What constraints female enterprise – Finance or family?

female setting up their business and attempts to measure household dynamics faced by borrowers that may act as a constraint on the decision to set up a business. This study was conducted in collaboration with Kashf and the fieldwork completed in October 2016. The project was funded by the *International Growth Centre (IGC)*.

There was a positive, but transitory, impact of the microfinance product on the likelihood of setting up a business but no improvement in household asset holdings or in women’s independence when making ordinary household decisions. To provide measures of social and household dynamics these borrowers operate in, this study also made use of lab-in-the-field experiments at the time of the first follow up survey in 2015, with 267 randomly selected RCT participants and male members of their households. Experimental results show that in pairs where women were entrepreneurs, men and women did not hide experiment money from each other. However, husbands of housewives chose to keep more for themselves when this allocation could be kept hidden from their partners. In literature, this is taken as evidence of ‘hiding’ of resources from the spouse. In addition, men and self-employed women exhibit entitlement over their earnings, whereas housewives do not. These results point towards possibly adversarial dynamics in households where the woman is not working.

5. Pressures from peers and spouses and self-control problems as constraints to microenterprise growth: Experimental evidence from Pakistan

Marcel Fafchamps (Stanford), Giovanna d'Adda (University of Milan) Farah Said and Uzma Afzal (Lahore School)

They are working on a research that assesses the role of self-control problems and peer pressures on take-up and use of a financial product by female micro-entrepreneurs in Pakistan by combining laboratory and field experiments. The project received *International Growth Centre (IGC)* funding in March 2015 and experimental sessions were carried out in Chakwal in April-May 2015. A second round of experiments was conducted in April 2017.

Results indicate that female involvement in household decision making is decreasing in the

importance of the decision, a. Authors find no evidence that women have pent up demand for agency. Instead, women are less willing to pay for agency

when facing an unknown man. This evidence suggests that women in the study population have internalized gender norms, and that these norms regulate

Indoctrination, fear and lack of agency: constraints on women outside the home

interactions between genders most strongly outside of the household.

6. Overcoming Constraints to Female Labor Force Entry

Hamna Ahmed, Farah Said and Zunia Saif Tirmazee (Lahore School)

The project has been funded by the *Private Enterprise Development in Low-Income Countries (PEDL)* Exploratory grant, 2017 This study is a randomised controlled trial to test the impact of two low-cost interventions to overcome psychological and information constraints to female labor force participation (FLFP). The research questions that this project aims to address are, (i) does motivating female students and (ii) does providing information about the job market, promote female labor force entry. The project focusses on female students, in their final year undergraduate degree, and enrolled in women only Public colleges in urban Lahore, the second largest metropolitan city in Pakistan, comprising of approximately 11 million people. While socioeconomic background, information on available jobs and job skills are significant determinants of entry into the labor market (Humphrey et al 2009; Jenson, 2012); studies have shown only modest impacts of job search assistance and skills training on employment and wages (McKenzie 2017). Further, skills training programmes in particular often suffer from low enrolment (Cheema et al., 2012, 2015) and high cost (Adhoho et al., 2014); suggesting it is time to think of new interventions that can complement traditional skills training programmes to promote employment. One

possibility for these results may be presence of psychological barriers and low motivation as binding constraints to FLFP which this project aims to address.

7. Barriers to Product Upgradation in the Sialkot Surgical Goods Sector

Azam Chaudhry and Shamyla Chaudry (Lahore School), David Atkin (MIT), Amit K. Khandelwal and Eric Verhoogen (Columbia University)

The project has been developed under the *International Growth Centre (IGC)* and the *Private Enterprise in Developing Countries (PEDL)* initiative. In this project, they investigate the extent to which fixed costs of innovation are a barrier to upgrading in the surgical-goods sector in Sialkot. If there are externalities in the process of innovation, there may be an important role for governments in subsidizing the costs of innovation. A leading policy idea is to provide matching grants, in which governments provide supplemental funding for projects chosen by individual firms. However, there has never been a rigorous randomized evaluation of such a program (Campos et al, 2012). They are conducting such an evaluation in the surgical-goods industry in Sialkot and plan to offer matching grants for innovations that increase exports.

8. Access to solar electricity in rural Sindh: Role of payment schedule and planning

Farah Said (Lahore School), Jacopo Bonan (Fondazione Eni Enrico Mattei), Giovanna d'Adda (University of Milan), Massimo Tavon, (Politecnico di Milano) and Mahreen Mahmud (University of Oxford)

This research is funded by the *International Growth Centre (IGC)*. Almost 70 million people in Pakistan (35% of the population) do not have access to electricity, as they live in areas, mostly rural, not reached by the grid. Over 75 million (38%), while on-grid, receive low quality energy and experience outages for more than 12 hours per day (IFC, 2015). In spite of the significant benefits of access to electricity, the long-run feasibility of grid expansion for the provision of quality electricity to remote areas is often a concern.

The study is a collaboration with a for-profit company supplying sustainable and efficient solar energy solutions (e.g. lights, fans, mobile chargers, TV) to small businesses in off-grid areas of rural Sindh, to evaluate one market solution to increase access to energy. The product is innovative, as it alleviates credit constraints to adoption and has strong enforcement features: customers access energy through a pay-as-you-go monthly payment scheme and are disconnected when the credit expires. The study will investigate key determinants of the sustainability of the business model and of product take-up, by looking at the trade-off between discipline and flexibility in repayment schedule. The experiment will be able to explore

behavioural underpinnings of two repayment schemes, by testing soft ways to increase the salience of repayment.

9. Behavioural insights for evidence-based policy making - impact of maternal depression intervention on individual preferences

Farah Said (Lahore School), Sonia Balhotra (University of Essex), Utteeyo DasGupta (Wagner College & Fordham University) and Joseph Vecci (University of Gothenburg)

This research is funded by the *University of Essex*. Depression is often associated with significant economic costs. For instance, depression is considered to reduce productivity by decreasing the motivation in performing everyday tasks or creating pessimistic views on returns on effort (de Quidt & Haushofer, 2016). However, economics literature does not provide us with any evidence quantify these effects. This research aims to use lab-in-the-field experiments to identify such behavioural effects of depression on economic decisions. Among preferences that we expect are modified by depression are risk-aversion, decisiveness, altruism, trust and effort.

Quantifying the effects of depression

10. Constraints to Female Entrepreneurship in Pakistan

Farah Said (Lahore School), Giovanna d'Adda (University of Milan), Mahreen Mahmud (University of Oxford) and Diego Ubfal (Bocconi)

This research is funded by the *International Growth Centre (IGC)* and will be conducted in collaboration with National Rural Support Programme (NRSP). Evidence on the impact of microfinance loans on business outcomes shows that the effects are moderately positive, but not transformational, especially for women (Banerjee, 2013; Banerjee, Karlan, & Zinman, 2015). This is confirmed even when access to finance is coupled with business training (Gine and Mansuri, 2016, Berge, Bjorvatn and Tungodden, 2014), suggesting that other factors, beyond credit and knowledge constraints, reduce women's ability to start or grow a business. Psychological and social factors, limiting female autonomous decision making and control over resources, have been cited as important obstacles to

Exploring the role of goals and aspirations

the impact of microfinance and business training programs (Jakiela and Ozer 2016, Field, Jayachandran and Pande, 2010, Field et al. 2015, De mel, Mckenzie and Woodruff 2014). Psychological factors include self-control problems, feeling incapable of resisting demands from peers and family members and low perceived self-efficacy. Social factors may include intra-household constraints on women's ability to

work outside the home or interact with non-household members and lack of bargaining power. The study involves a RCT in Punjab, Pakistan to test for these two explanations directly through two interventions, one targeting women's aspirations, and the other focusing on their ability to achieve objectives. This study will determine which of these psychological elements, combined with microcredit loans, can lead to enterprise creation and improve business outcomes.

11. Reducing non-payment for Electricity

Farah Said (Lahore School), Giovanna d'Adda (University of Milan), Mahreen Mahmud (University of Oxford) and Diego Ubfal (Bocconi)

This research is funded by the *International Growth Centre (IGC)*. The proposed research tests the effectiveness of behavioral interventions in fostering regular bill payment through a randomised field experiment (RCT) to be conducted in

Nudging
timely
payments

Karachi, Pakistan. The experimental design was defined in partnership with K-Electric (henceforth, KE), a private, vertically integrated electric-energy corporation serving around 23 million residential, industrial and commercial customers in Karachi. In spite of the company's efforts to reduce losses from non-payment of bills, recovery rates still range between 70 and 90%. Energy provision by KE follows a policy of selective loadshedding at the feeder level, with the number of hours of outages increasing in the level of losses. Under this

policy, the individual decision to pay in full and on time generates a positive externality, in terms of quality of energy provision, on clients living in the same neighbourhood. Our proposed interventions will make use of the tools commonly used in tax evasion and energy efficiency studies, i.e. communication to customers in the form of letters, to deliver information on the selective loadshedding policy and to make explicit the link between individual repayment decision and neighborhood level quality of energy provision. This will contribute to an exciting recent literature that combines laboratory and field experiments to study how real world outcomes can be explained by underlying preferences and norms.

12. Innovation in the Pakistani Textile Sector

Waqar Wadho and Azam Chaudhry (Lahore School)

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 answers 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).

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

Theresa Chaudhry and Azam Chaudhry (Lahore School) are developing the elements of an optimal industrial strategy for Pakistan. With industrial growth and exports stagnating in Pakistan, there is an urgent need to develop a coordinated industrial strategy. The researchers are working with Lahore School researchers and policy makers to develop an industrial strategy which has the following elements: (i) deciding on which sectors (and subsectors) to invest resources into, (ii) deciding the optimal location for planned industrial zones and special economic zones, (iii) determining the optimal location of industries in the context of CPEC, (iv) developing a coordinated trade strategy that helps promote higher value added exports and (v) determining the financing needs of the SMEs which make up most of the industrial clusters in Pakistan.

14. Business Confidence Surveys of the Business Community in Lahore

In March 2015, the Lahore Chamber of Commerce & Industry (LCCI) and the Lahore School of Economics signed a Memorandum of Understanding, which established a link between academia and the business community. As part of this collaboration, the Innovation and Technology Centre of the Lahore School (headed by Azam Chaudhry) and the LCCI has conducted three annual business confidence surveys (starting in 2015) to understand the perceptions of the business

community regarding the prevailing economic conditions and the level of innovation being done.

15. A Partial Lagrangian Approach to Solving Dynamic Models of Economic Growth

Azam Chaudhry and Rehana Naz (Lahore School) are developing a new approach termed as a discount free or partial Lagrangian method for construction of first integrals for dynamical systems of ordinary differential equations (ODEs). It is shown how one can utilize the Legendre transformation in a more general setting to provide the equivalence between a current value Hamiltonian and a partial or discount free Lagrangian when it exists. As a consequence, they develop a discount factor free Lagrangian framework to deduce reductions and closed-form solutions via first integrals for ODEs arising from economics by proving three important propositions. The approach is algorithmic and applies to many state variables of the Lagrangian. In order to show its effectiveness, they apply the method to models, one linear and two nonlinear, with one state variable. They obtain new exact solutions for the last model. The discount free Lagrangian naturally arises in economic growth theory and many other economic models when the control variables can be eliminated at the outset which is not always possible in optimal control theory applications of economics.

16. A Partial Hamiltonian Approach for Current Value Hamiltonian Systems

Azam Chaudhry and Rehana Naz (Lahore School) are developing a partial

Hamiltonian framework to obtain reductions and closed-form solutions via first integrals of current value Hamiltonian systems of ordinary differential equations (ODEs). The approach is algorithmic and applies to many state and costate variables of the current value Hamiltonian. However, they apply the method to models with one control, one state and one costate variable to illustrate its effectiveness. They explain their approach with the help of a simple illustrative example and then apply it to two widely used economic growth models: the Ramsey model with a constant relative risk aversion (CRRA) utility function and Cobb Douglas technology and a one-sector AK model of endogenous growth are considered. They show that their approach can be used to deduce results given in the literature and also to find new solutions.

17. Understanding Institutional Barriers to Technology Adoption in the Pakistani Manufacturing Sector

Matthew McCartney (University of Oxford), Theresa Chaudhry and Azam Chaudhry (Lahore School) plan to study the historical barriers to technology adoption in the Pakistani manufacturing sector with a special emphasis on institutional barriers like the conflict between workers and management, the impact of family run firms on organizational structures and the relationship between producers and suppliers in an uncertain business environment.

II. Completed Projects

1. Analysis of Technology in the Sialkot Soccer Ball industry

Azam Chaudhry and Shamyla Chaudry (Lahore School), David Atkin (MIT), Amit K. Khandelwal and Eric Verhoogan (Columbia University)

The project has been developed under the *International Growth Centre (IGC)* and the *Private Enterprise in Developing Countries (PEDL)* initiative. The Sialkot soccer ball cluster is made up of a large number of manufactures who export approximately 60 million hand-stitched soccer balls each year, accounting for about 70 percent of global production. But over the last few years, the amount of soccer balls produced in Sialkot has fallen. This project aims to better understand the technologies within the industry and determine the characteristics of the firms that are able to identify and implement new technologies.

The research team developed a cost saving technology in 2012 which it has given to a number of soccer ball manufacturers in Pakistan in order to determine the factors affecting technology adoption in firms and technology spillovers between firms. The research team has also looked at how misaligned incentives between firms and employees can affect technology adoption. The preliminary data analysis was presented at the IGC Growth Week in September 2012 and September 2013 in London. The researchers have presented this work in seminars and conferences at University of Berkley, Yale University,

Columbia University, Harvard University and University of Oxford. It has also been presented at the Government of Punjab in 2015. After these presentations the Secretary Finance and the Secretary Industries, Punjab Government used the project's findings to propose and initiate an Innovation Development Fund (IDF). Currently, the Punjab Government has initiated this fund and the Lahore School is represented on its executive board. The findings of this project have been published in Atkin, A., Chaudhry, A., Chaudry, S., Khandelwal, A. K and Verhoogan, E. "Organizational Barriers to Technology Adoption: Evidence from Soccer-Ball Producers in Pakistan". *Quarterly Journal of Economics* (2017); Atkin, A., Chaudhry, A., Chaudry, S., Khandelwal, A. K., Raza., T and Verhoogan, E. "On the Origins and Development of Pakistan's Soccer-Ball Cluster". *World Bank Economic Review* (2016); Atkin, A., Chaudhry, A., Chaudry, S., Khandelwal, A. K and Verhoogan, E. "Markup and Cost Dispersion across Firms: Direct Evidence from Producer Surveys in Pakistan". *American Economic Review, Papers and Proceedings* (2015).

2. Economic Geography and Misallocation in Pakistan's Manufacturing Hub

Theresa Chaudhry (Lahore School), with Muhammad Haseeb (University of Warwick) and Maryiam Haroon (Lahore School) looked at whether localization of industries can reduce economic distortions and dispersion in total factor productivity (TFP) among firms in Punjab using the Punjab Census of Manufacturing Industries (2005-06). This project was completed in 2016.

They considered two types of misallocation: i) dispersion in the distribution of output-based TFP (TFPQ), in particular, the survival of low productivity firms in the left tail; and ii) dispersion in revenue-based TFP (TFPR), indicative of allocative inefficiency. On one hand, we find that the distribution of TFPQ is less dispersed in more agglomerated areas (measured by the localization quotient, local productive concentration, and average firm size) and that average TFPQ is positively related to localization. On the other hand, we do not find evidence that agglomeration improves allocative efficiency measured as deviations in TFPR from the sector average, concluding rather that greater localization of small firms is associated with firms being more output and capital constrained. Findings of this project are published in Chaudhry, T., Haseeb, M. and Haroon, M. "Economic Geography and misallocation in Pakistan's manufacturing hub" *The Annals of Regional Science* (2017).

3. Understanding and Addressing Rural Poverty in Pakistan: Oxford University– Lahore School Collaboration

Marcel Fafchamps, Simon Quinn (University of Oxford), Kate Vyborny (Duke University), Naved Hamid, Azam Chaudhry, Theresa Chaudhry, Hamna Ahmed, Asha Gul, Uzma Afzal and Farah Said (Lahore School) and Muhammad Haseeb (University of Warwick)

With funding from the *British Academy* and the *Lahore School of Economics*, researchers at Oxford and CREB have completed the 3-year collaborative

program on the Economics of Rural Poverty in Punjab. The collaboration has led to several joint academic projects between the two institutions. The collaboration has now far exceeded the scope originally planned, leading to new joint projects that have continued beyond the end of the grant. This project was completed in 2014.

The collaborative work includes research on the following topics:

a. Patron-Client Relationships and Rural Development in Pakistan

How do social networks and local "patrons" affect household wellbeing and access to public services? Patron-client relationships, or vertical social relationships in which individual powerful "patrons" have multifaceted relationships with "clients", are said to be key features of both markets and politics in many developing country settings, including rural Pakistan. But how do these relationships work in practice and how do they affect the delivery of government goods and services?

These questions were explored by Azam Chaudhry (Lahore School), Muhammad Haseeb (Lahore School/University of Warwick) and Kate Vyborny (Duke University/Lahore School) initially with data collected from the Lahore School's Privatization in Education Initiative (PERI) survey and then with the new survey under this project. The researchers have developed several research papers analyzing these data, which examine questions including how local context affects the patron-client relationship, how political connections affect targeting of government programs, and whether

different types of program design make programs for the poor more robust to the influence of patronage. The researchers have presented this work in Lahore at the Lahore Economic Development Research Seminar Series (LEDRS) and at International Food Policy Research Institute (IFPRI), AIMS-Manila and Duke University as well as at seminars and conferences in Oxford, Ottawa and Paris and will submit papers for publication soon.

b. Learning about Flood Risk: Evidence from a Field Experiment in Pakistan

Farah Said, Uzma Afzal (Lahore School) and Ginger Turner (The Wharton School) investigated how individuals learn about flood risk through the experience and observation of flood events. The study tested the theory that individual risk perceptions and preferences could change with disaster experience, even when controlling for variation in initial asset constraints and losses. The aim was to improve on previous studies by matching game choices with survey data that included questions on expectations, asset, information sets, and timing by complementing surveys with experimental design.

A main contribution of this study was to improve the identification of individual loss measures, to test whether variation in flood damages at an individual level can explain differences in observed risk aversion changes. This research was particularly innovative in the Pakistan context, where there has been little work to date on behavioral economics. Findings on behavioral changes have been published in Turner, G., Said, F. and Afzal, U. "Microinsurance

Demand after a Rare Event: Evidence from a field experiment in Pakistan". *The Geneva Papers on Risk and Insurance – Issues and Practice* 39, 201 – 223, (2014); Turner, G., Said, F., Afzal, U., Campbell, K. "The Effect of Early Flood Warnings on Mitigation and Recovery during the 2010 Pakistan Floods". A. Singh and Z. Zommers (Eds.), *Preventing Disaster: Early Warning Systems for Climate Change*. London: Springer (2014); Said, F, Turner, G. and Afzal, U. "Attitudes Towards Risk in the Wake of a Rare Event: Evidence from Pakistan", *CREB Working Paper No. 02-14*, (2014) and Said, F; Turner, G. and Afzal, U. "Risk Taking and Risk Learning after a Rare Event: Evidence from a Field Experiment in Pakistan", *Journal of Economic Behavior & Organization* 118, 167 – 183, (2015).

c. Evaluating the Impact of Punjab's Girls Stipend Program

The government of Punjab, starting in 2004, offered a conditional cash transfer (CCT) of Rs 200 per month, to girls in class 6 to 8 with minimum 80 percent attendance, in order to increase the educational attainment of girls in districts with less than 40 percent literacy. The program was later was extended up to grade 10.

Using two rounds of data collected, a 2009 survey of urban and rural households in Punjab (supported by NSF and the Lahore School of Economics) and a 2013 survey of only rural households (supported by the *British Academy* and the *Lahore School of Economics*), Amar Shuja and Theresa Chaudhry (Lahore School) are analyzing the impacts of this CCT on enrollment and marriage outcomes by means of triple difference-in-differences approaches,

comparing eligible girls to their non-eligible elder sisters younger siblings in both stipend and non-stipend districts.

4. Caste, Social Exclusion and Education in Rural Punjab: World Bank and CREB joint Research Initiative

Tayyaba Tamim (Lahore School) and Rehan Jamil (World Bank)

This funded research was in collaboration with the *World Bank* and *Lahore School of Economics*. They used a multiple case study design and mixed methods approach to capture in-depth processes by which caste-based social exclusion shapes the educational opportunity for the marginalized castes in rural Punjab. Three villages were selected from the PERI 2011 data based on geographical spread (North, south and Centre of Punjab), caste and religious complexity and lowest school enrollment. Each village was taken as a case. Amartya Sen's capability approach to human development was used to evaluate educational opportunity in the space of capabilities and opportunities, in combination with forms of social exclusion identified by (Whitley, 2005), while Pierre Bourdieu's social critical theory provided the analytical toolkit. Data from 105 interviews with low and high caste parents of (10 -16 year old children) and school heads along with questionnaires, revealed that the caste-based social exclusion stemming from socioeconomic dimension refracted into active and passive forms of institutional exclusionary processes at macro and micro levels, across temporal, spatial and social planes on the one hand;

and unfavorable inclusion of the low castes in their own groups, on the other hand; forcing the poorest and most excluded castes to self-deselect themselves from accessing educational opportunity. This project was completed in 2013.

The results of the study were published as: CREB working paper "Caste, Social Exclusion, and Opportunities for Education in Rural Punjab", *CREB Working Paper No. 01-15*, (2015) and in an international journal Tamim, T. and Tariq, H. "The Intersection of caste, social exclusion and educational opportunity in rural Punjab", *International Journal of Educational Development*, 43, 51-62 (2015). Two other papers from the same study are in the pipe line: 'Factors affecting low - caste parents' choices for schooling their children: case study of a village in southern Punjab'; 'Caste, social capital and education in rural Punjab'.

5. Public Vs Private Schooling Choice at the Household Level

Masooma Habib, Hamna Ahmad and Sahar Amjad (Lahore School)

With a grant from *Open Society Institute (OSI) Privatization in Education Initiative (PERI)*, researchers undertook a study titled Determinants of School Choice – Evidence from Punjab, Pakistan. The study addressed the following overarching question: Why do parents choose low cost private schools when free public schools are available? The main emphasis of the study in answering this question was on the role of parents' perceptions in school choice while controlling for a range of child, household and school specific characteristics. The

study was based on a sample of 1024 rural households in 64 clusters spanning over 8 tehsils and 7 districts of the Punjab. This project was completed in 2012.

Findings of the study have been published in Ahmed, H., Amjad, S., Habib, M & Shah., S. A. "Determinants of School Choice: Evidence from Rural Punjab, Pakistan", *CREB Working Paper No. 01-13*, (2013) and Ahmed, H., Amjad, S., & Habib, M. "Private Schooling: Determinants and Implications for Social Justice in Rural Punjab, Pakistan". I. Macpherson, S. Robertson, & G. Walford (Eds.), *Education, Privatisation and Social Justice: Case studies from Africa, South Asia and South East Asia*, Oxford: Symposium Books Ltd (2014).

6. Financial Crisis and Migrant Remittances: Effects on Growth and Poverty in Selected South Asian Countries

Azam Chaudhry, Naved Hamid and Mahreen Mahmud (Lahore School)

With a grant from *South Asia Network for Economic Institutes (SANEI)*, researchers from the Lahore School of Economics empirically investigated the effects of the global financial crisis on remittance growth and national income in Bangladesh, Sri Lanka and Pakistan. This project was completed in 2011.

Findings of the study have been published in Mahmud, M., and Hamid, N. "Migrant Remittances to South Asia: Determinants and Effect on Growth". In M. K. Mujeri, and M. Wahiduddin (Eds.), *Adjusting to Global Economic Volatility. The Case of South Asia*. New Delhi: Academic Foundation (2014).

Other Research related activities at CREB

Working Papers

CREB publishes a Working Paper series, which is based on rigorous analytical and empirical research studies.

- **CREB Working Paper No. 02-17**
Homophily and Strategic Behavior in Social Interactions: Evidence from a Lab Experiment.
Zeenat Ansari and Farah Said
- **CREB Working Paper No. 01-18**
The Impact of Prenatal Exposure to Fasting on Child Health Outcomes
Azka Sarosh Mir and Theresa Chaudhry

Journal Articles

A. CREB Staff

1. **Two Sides of the Same Rupee? Comparing Demand for Microcredit and Microsaving in a Framed Field Experiment in Rural Pakistan.** Uzma Afzal, Giovanna d'Adda, Marcel Fafchamps, Simon Quinn and Farah Said *Economic Journal*, 2017. doi: 10.1111/eoj.12512
2. **Economic Geography and misallocation in Pakistan's manufacturing hub.** Theresa Chaudhry, Mohammad Haseeb and Maryiam Haroon, *The Annals of Regional Science*, Vol 59(1) 2017
3. **Exchange Rate Management and Economic Growth: A Brewing Crisis in Pakistan.** Naved Hamid and Azka Sarosh Mir, *Lahore Journal of Economics*, Special Edition, Vol 22, September 2017
4. **Free Trade: Does Myopic Policy Overlook Long-Term Gains?** Maryiam Haroon, *Lahore Journal of Economics*, Vol 22:2, Winter 2017
5. **Diversification on Small Farms: An Empirical Investigation of Panel Data for 2001-10.** Sadia Hussain and Farah Said, *Lahore Journal of Economics*, Special Edition, Vol 22, September 2017
6. **Mobile Banking: A Potential Catalyst for Financial Inclusion and Growth in Pakistan.** Syed Kumail Abbas Rizvi, Bushra Naqvi and Fatima Tanveer *Lahore Journal of Economics*, Special Edition, Vol 22, September 2017
7. **Government size and economic growth in an endogenous growth model with rent-seeking.** Waqar Wadho and Umair Ayaz, *Economics & Politics* 2017. doi.org/10.1111/ecpo.12105
8. **Innovation and Firm Performance in Developing Countries: The case of Pakistani Textiles and Apparel Manufacturers.** Waqar Wadho and Azam Chaudhry, *Research Policy*, (Forthcoming)

B. Other members of the CREB team

1. **Closed-form Solutions for the Lucas-Uzawa Growth Model with Logarithmic Utility Preferences via the Partial Hamiltonian Approach.** Azam Chaudhry and Rehana Naz, *Discrete and Continuous Dynamical Systems Series*, Vol 11(4) 2018
2. **Organizational Barriers to Technology Adoption: Evidence from Soccer-Ball Producers in Pakistan.** David Atkin, Azam Chaudhry, Shamyla Chaudhry, Amit Khandelwal, and Eric Verhoogen *Quarterly Journal of Economics*, Vol 132(3) 2017
3. **Comparison of Closed-Form Solutions for the Lucas-Uzawa Model via the Partial Hamiltonian Approach and the Classical Approach.** Rehana Naz and Azam Chaudhry, *Mathematical Modelling and Analysis*, 2017
4. **Economic Geography and misallocation in Pakistan's manufacturing hub.** Theresa Chaudhry, Mohammad Haseeb and Maryiam Haroon, *The Annals of Regional Science*, Vol 59(1) 2017
5. **Pakistan's Experience with the Pakistan-China FTA: Lessons for CPEC.** Theresa Chaudhry, Nida Jamil and Azam Chaudhry, *Lahore Journal of Economics*, Special Edition, Vol 22, September 2017

Research Conference and Seminars

International Conference on the Management of the Pakistan Economy

The Centre organizes the Lahore School's International Conference on Management of the Pakistan's Economy. The proceedings of the Conference are published in a special issue of the Lahore Journal of Economics. This year's conference is titled **"Accelerating Economic Growth in Pakistan: Key Macro and Sectoral Drivers"**. Previous conferences have focused on a range of themes covering topics in growth, trade, and development.

CREB Research Seminar

The center has started the CREB Research Seminar series in 2015. The CREB Research Seminar has been initiated to disseminate ongoing research by CREB staff and other researchers. The objective of the seminar is twofold. One, to make young researchers aware of the research being done by others and two, to encourage young researchers to question and critically discuss each other's research in a supportive environment. We have had 11 seminars since April 2017 and research presentations have been made by Dr. Mahreen Mahmud (CSAE, University of Oxford), Muhammad Haseeb (University of Warwick), Dr. Sajid Rasul (Bureau of Statistics, Punjab), Maryiam Haroon, Zunia Tirmazee and Farah Said (CREB), Fauzia Viqar (Punjab Commission on the Status of Women), Dr. Ali Hasanain (Lahore University of

Management Sciences), Dr. Rehana Naz (Lahore School of Economics), Dr. Hadia Majid (Lahore University of Management Sciences), Attique ur Rehman (Consortium for Development Policy Research CDP) and Hamid Masood (Punjab Health Initiative Management Company).

Punjab Economic Forum

Anum Bukhari, Research Associate and Zenab Naseem Office Manager, (CREB, Lahore School) represented CREB at the Punjab Economic Forum 2017: Institutions for Growth & Equity held from 3-4 April 2017 at the Faletti's Hotel in Lahore. CREB put up a stall to disseminate CREB Research and Events by displaying CREB publications such as CREB Research Newsletter, Working Papers, Research Project summaries, Conference Abstract Book and Conference proceedings. It was a good opportunity to highlight and showcase the research work done at CREB. The Forum was organized by the Punjab Economic Research Institute (PERI), P&D department Punjab in collaboration with the Urban Unit. The event was attended by policymakers, professionals, academicians, businessmen, international and national economists and the development practitioners.

Second International Conference on Microfinance Products and Processes: Lessons from the Field 2017

The Centre for Research in Economics & Business (CREB) and University of Oxford jointly hosted a conference on the Microfinance Products and Processes: Lessons from the Field on 13th April, 2017. The conference was part of the ESRC-DFID

project on 'Microcredit and microsavings for small enterprises in Pakistan'. The conference brought together speakers from microfinance institutions, donors, academics and practitioners from Pakistan and outside of Pakistan. The conference highlighted the current research on microfinance with the purpose to start a conversation on the roles research can play in the future to help the sector achieve its goals of poverty alleviation, financial inclusion and sustainable enterprise growth. The conference was attended by Dr. Rashid Bajwa (CEO, National Rural Support Programme), Kamran Azim (Chief Operating Officer, Kashf Foundation), Zubyr Soomro, (Chairman, PMIC), Akbar Zaidi (Member of Board, Pakistan Microfinance Network), Dr. Simon Quinn (Associate Professor and Deputy Director, Centre for the Study of African Economies, University of Oxford), Dr. Ali Cheema (CERP, IDEAS, IGC), Dr. Andreas Landmann (Paris School of Economics), Dr. Shawn Cole (Harvard Business School), Dr Karlijn Morsink (Oxford), Rachel Cassidy (Oxford) and Muhammad Meki (Oxford).

Pakistan Poverty Alleviation Fund (PPAF) Second International Conference 2017

Naved Hamid, Director (CREB, Lahore School) served as a Panelist in the PPAF Second International Conference on Research and Learning - From Knowledge to Action for the session on Graduation vs. Resilience- What matters most? It was held in Islamabad in April 2017.

Hamna Ahmed (CREB, Lahore School) and Kate Vyborny (Duke University) presented some initial findings from their project:

“Institutional Capacity as an Organizational Challenge: A Field Experiment in Pakistan” at the same Conference. Dr. Vyborny talked about the inclusive nature of the community organizations. Dr. Ahmed shed some light on the dynamics of decision making within community organizations in order to understand how decisions were made and to illuminate the effect of the background of the organization members. The findings showed that members tend to be more cautious in making decisions when they were in groups. The mechanism to arrive at a decision usually followed a voting process that went with the majority opinion. One of the surprising findings was that the personality of the TTO members did not play a significant role in the decision making process. These findings made a strong argument for the need to engage in community development and decentralization.

19th International Conference on Environmental, Biological, Ecological Sciences and Engineering

Zenab Naseem, Office Manager (CREB, Lahore School) presented her research paper titled "Climate Change and Dengue Transmission in Lahore, Pakistan" at the "ICEBESE 2017: 19th International Conference on Environmental, Biological, Ecological Sciences and Engineering" on July 27th and 28th, 2017. It was an exciting experience as the topic of her research was intriguing for the researchers who had come from other countries; she had a very productive question and answer session after her presentation. The paper is under review for publication in the "International Journal of Environmental, Chemical, Ecological, Geological and Geophysical Engineering".

78th Annual Conference of The Verein für Socialpolitik 2017

Shaheen Naseer, (CREB, Lahore School) presented her paper at 78th Annual conference of The Verein für Socialpolitik 2017: "Alternative Structures for Money and Banking" September 3 – 6, University of Vienna. At this conference, the core ideas underpinning the alternative architectures pertinent to money and banking were reviewed, and also their consistency, completeness, and prospects of adoption were assessed by leading and experienced representatives in the field: Michael Kumhof (Bank of England) and Albrecht Ritschl (London School of Economics). On this international stage, Shaheen presented the work entitled "Bureaucratic Identity and the Shape of the Public Policy: A Game Theoretical Analysis". In this paper, she developed a framework to understand the strategic interaction between the legislator and bureaucrats, building on the rational choice analysis of bureaucracies. The paper was very well received and Shaheen got intriguing comments on her work.

Regional Studies Association Winter Conference 2017

Maryiam Haroon a PhD candidate and (CREB, Lahore School) participated in "The Place Dimension of Cities and Regions: Governance, Industrial Development and Sustainability", Annual Winter Conference 2017 hosted by Regional Studies Association (RSA) held on 16th and 17th November in London, UK.

RSA works with international members to facilitate the highest standards of

theoretical development, empirical analysis and policy debate of issues of sub-national scale, incorporating different conceptions of space, topics which align well with Maryyam's current research interest. Maryyam presented her work titled "How close is close enough? Geographical Proximity: Externalities versus Competition" coauthored with Dr. Azam Chaudhry in the session focusing on Place, Firm Location and Performance. She also chaired one of the sessions focusing on place leadership, governance and regional development.

She benefited from engaging with vibrant mix of participants including policy makers, leading practitioners, student members and early career researchers.

Newspaper Articles, Summer Courses, etc.

Forced devaluation of rupee: a recipe for disaster

Naved Hamid and Azka Mir, Research Fellow, (CREB, Lahore School) piece on *Forced devaluation of rupee: a recipe for disaster* was published in the Dawn Newspaper on 30th October, 2017 and is available at <https://www.dawn.com/news/1367119/forced-devaluation-a-recipe-for-disaster>.

Summer School 2017 at University of St. Gallens

CREB/Lahore School of Economics PhD students; Farah Said, Maryyam Haroon and Zunia Saif Tirmazee visited the University of St. Gallens, Switzerland in summer 2017 to attend a two week Global School in Empirical Research Methods (GSERM) workshop. GSERM is a distinguished integrated program for PhD students, postdocs and practitioners from leading universities all over the world offering a course-based learning experience. Our research fellows got an opportunity to learn at a great place and to meet people from throughout Europe and elsewhere. They chose to enroll in Structural Equation Modeling I and II, Experimental Methods for Behavioral Science and Econometrics of Big Data from over 100 different courses (one course per week, 4 ECTS each). They found it to be a unique experience giving them a lot of new insights in their respective fields of research and an attractive opportunity to interact with their fellow students and professors.

MPhil Economics Theses

1. *Homophily and Strategic Behavior in Social Interactions: Evidence from a Lab Experiment*

Zeenat Ansari (Supervisor Farah Said)

Social networks play an important role in human interaction. It is possible for social differentiation and segregation to discourage links that are desirable from an efficiency point of view, or for social matches to encourage them. This study looks at how individual behavior and the diffusion of demographic information affects social interactions. Based on a controlled lab experiment, we assess three key determinants of social interaction: (i) homophily, (ii) preference for fairness and (iii) past behavior. Of the experiment's three treatment groups – an out-group and two variations of in-group pairings – we find that participants show less homophily toward an in-group match when they know their partner cannot influence their outcome. However, if there is chance of the behavior being reprimanded, the opposite is true. Finally, we present strong evidence in favor of reciprocity and coordination because participants are responsive to their partner's decision in prior interactions.

2. *Impact of Prenatal Exposure to Fasting on Child Health Outcomes*

Azka Sarosh Mir (Supervisor Theresa Thompson Chaudhry)

Early-life factors play an important role in fetal development, according to Barker's (1990) 'womb-with-a-view' hypothesis. This study examines how prenatal exposure to fasting in the month of Ramadan has an impact on child health outcomes in terms of height-for-age and weight-for-age z-scores. In the absence of actual reported fasting behaviors, we use the 'intent-to-treat' (ITT) approach, as applied in randomized control trials. While the ITT approach does not require or assume that all women pregnant during Ramadan necessarily fast, it is critical for Ramadan to remain exogenous to the timing of pregnancy. The ITT framework is used to compare the health outcomes of two groups of children under five in the Punjab – those whose period in utero coincided with the month of Ramadan (the treatment group) and those who were not exposed (the control group). In each case, the child's date of birth establishes whether the pregnancy overlapped with the month of Ramadan and this information is used to construct a set of gestational month-of-exposure variables. The data for this analysis is drawn from the Multiple Indicator Cluster Survey for 2008 and 2011. The study's results indicate that prenatal exposure to fasting during the first two trimesters has negative implications for children's height-for-age. In addition, children who were prenatally exposed to fasting in the

second and third trimesters were, on average, thinner than nonexposed children. We find no evidence of selection bias arising from the decision to selectively time a pregnancy to avoid Ramadan – a major concern of our study.

3. *The Impact of Early Childbearing on Child Health in Punjab*

Aeman Nadeem (Supervisor Uzma Afzal)

Early Childbearing is a major social and public health concern. Empirical studies have focused on both the consequences and causes of early childbearing. Much of the empirical work has focused on the impact of early childbearing on children's developmental and academic outcomes. However, there is limited research pertaining to the effect of early childbearing on child health outcomes in Pakistan. Using the newly available data, Multiple Index Cluster Survey for Punjab 2014; the paper aims to test if early childbearing affects child health outcomes, both in the short and long term. In addition to this, studies have established that the decision of early childbearing is influenced by a wide array of factors which include individual and household level characteristics as well as social and cultural norms. The paper also deals with the issue of omitted variable bias concerning early childbearing. As part of the estimation strategy, the paper employs ordinary least square, cluster fixed effects and household fixed effects. The empirical results shows that early childbearing exerts negative

impact on child health outcomes. However; controlling for unobserved characteristics at household and cluster level shrinks the size of the coefficient of early childbearing compared to a simple ordinary least square estimate; indicating the influence of important household and cluster unobserved factors on early childbearing decision. The results of the paper also confirms that the analysis is robust to changing the specifications of early childbearing as well as the data set used in the analysis.

4. *Corruption and Tax Evasions: The Role of Taxes and Wage Incentives*

Saadia Toor (Supervisor Waqar Wadho)

This paper builds a theoretical model to study the joint effect of optimal taxes and an optimal wage policy which is decided by a budget balancing government. Tax evasions are rampant in economies prevalent in corruption, namely bureaucratic corruption. Researchers and policy makers propose paying high wages to deter bureaucratic corruption. However, there is not much evidence of the implementation of this strategy in economies prevalent with high levels of corruption. In this paper, we argue that there exists an equilibrium where the government is better off paying wages below the market level and accepting corruption at high levels of cost of compliance. Deviating from existing literature, we integrate all major factors determining the incentives to be corrupt for both the tax payers and tax collectors to study the joint effect

of optimal taxes and an optimal wage policy. We study cases for both developing and developed economies and find for both types of economies, the government is better off eliminating corruption by paying high wages at low levels of cost of compliance and accepting corruption by paying wages below the market level at high levels of cost of compliance. Furthermore, we argue that there exists complementarity of tax reforms; paying high wages will only be an effective anti-corruption strategy when accompanied with low levels of cost of compliance.

5. *Political Connections, Allocation of Development Projects and Voting Pattern in the Faisalabad District*

Tahreem Zia (Supervisor Azam Chaudhry)

Development related funding is critical for the long-term growth of any country, but the allocation of funds between politicians and different areas can vary due to various factors and one important factor is the connections of politicians with those who approve or

allocate these funds. This thesis attempts to determine whether the strength of political connections impacts the allocation of development schemes across politicians in the Faisalabad district of Punjab. Some of the questions we answer are: Do politicians favor their own constituents with higher budget or more popular development projects? Does the allocation of development funds impact the decisions of voters in elections? Also, are there any differences in the popularity of projects, budget of projects and popularity of projects approved by the local government as compared to district and provincial government? Data on developmental schemes from the Faisalabad district has been used to answer these questions. The data is from 2010-2016 with a total of 6900 development schemes and covers the 8 towns, 11 national assembly constituencies and 22 provincial constituencies of the Faisalabad district. The results show that strength of connection, electoral strength and party affiliation significantly impact the allocation of development funds in Faisalabad.