SUSTAINABLE IMPACTS OF SOCIAL SAFETY NETS:
The Case of BISP in Pakistan

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Abstract

The study has assessed the welfare impacts of unconditional cash transfers of Benazir Income Support Programme (BISP) by using impact evaluation panel surveys, conducted in 2011 (baseline) and 2016 (follow-up round). The panel survey contains information from both the beneficiary and non-beneficiary households, selected through a proxy means test (PMT) formula. The research has measured the welfare impacts of unconditional cash assistance across and over the time where welfare has been defined by various socio-economic indicators, including per-adult equivalent monthly consumption, headcount poverty, multidimensional poverty index (MPI) and child deprivation index (CDI). The results indicate that BISP cash assistance has a positive impact on household consumption while conducting the cross-sectional analysis; however, benefiting households are until facing high rates of poverty as the majority of them have not been transited out of poverty. No sustained welfare impact has been found, as impacts of quarterly cash assistance on MPI and CDI are not significant in our cross-sectional analysis. The panel analysis shows that the recipient households' economic well-being has improved as measured through child deprivation indices.

Keywords: Welfare Impact, Multidimensional Poverty Index, Proxy Means Test, Poverty, Economic Wellbeing, Social Safety Nets.
JEL Classification: I132, I138, H53, P36.

I.   Introduction

Social protection aims to facilitate marginalised and vulnerable segments through public interventions and collective efforts to improve their standard of living and resilience against risks and vulnerabilities [Bari (2005)]. Social protection is categorised by six sorts of interventions: social safety nets (SSNs) or social assistance, social security, labour market initiatives, natural disaster management, basic fundamental facilities for the destitute, and adaptation instruments in the form of laws and policies opted to

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protect females from violence, children from early marriages, and people from exploitation like bonded labour and child labour.

Over time social protection programmes have gained attention by realising that economic growth alone is not sufficient for poverty alleviation—and that's why they have been placed as the third pillar of inclusive growth, besides sustained economic growth and social inclusion [ADB (2013)]. The aim is to protect poor and impoverished segments by managing uncertain risks, building their resilience and making societies more equitable. The success rate of SSNs in various countries depends on many factors, including targeting, coverage, enrollment of the beneficiaries and adequacy of the financial assistance [World Bank (2015)]. SSNs' welfare impacts in reducing poverty are debatable; still, they are gaining popularity as an effective mechanism for poverty reduction in the developing world.

The need for and the emergence of SSNs in Pakistan is connected to both the demand and supply-side factors, where on the demand side, the country has been facing various vulnerabilities including economic crises, political instability, natural disasters, high inflation and unemployment, growing population and high poverty rates (24.3 per cent for the 2015 year). On the supply side, the country lacks a systematic and comprehensive social protection framework to mitigate all forms of vulnerabilities. Although Zakat and Pakistan Bait-Ul-Mal emerged in the 80s and 90s, followed by micro-finance initiatives in the 2000s until the nature and targeting of social safety net programmes do not intend to eradicate poverty on a sustainable basis, as the majority of the interventions were designed for smoothing consumption.

After establishing the poverty reduction strategy paper (PRSP) in 2001, the Social Protection Policy (NSPP) was prepared in 2007, and this laid the foundation for the Benazir Income Support Programme (BISP) in 2008. The programme is recognized among the top programmes in the world in targeting and coverage [World Bank (2018)]. The programme has been providing cash assistance to 5.8 million families (ever-married women) with a quarterly stipend of Rs. 5000 (around the US $35). Besides, the programme aims to assist the children of low-income families in completing their primary-level education. So far, 3.5 million children are enrolled, and their mothers have been receiving an additional top-up of Rs. 750 per quarter for male children and Rs. 1000 per quarter for female children, with the condition that the child will attend school and meet a minimum attendance goal of 70 per cent.

Several studies have been carried out to estimate BISP cash transfer's welfare impacts, but these studies have lacked robust impact evaluation data, especially the longitudinal survey. Most of the studies are qualitative in nature and have been conducted on limited sampled observations [Shehzad (2011), Hassan and Bibi (2016), Malik, et al. (2013), Naqvi, et al. (2014)]. The studies by Nayab and Farooq (2014) and Zoneira, et al. (2018) have measured BISP's impact on poverty, but the analysis is cross-sectional in nature and lacked trend analysis. The technique of measuring the impact has also remained an issue in earlier studies, as none of the studies has used robust evaluation

techniques, i.e., Regression Discontinuity Design (RDD) and difference-in-difference (DiD) approach. The proposed research has attempted to develop various indices, i.e., the child deprivation index and the multidimensional poverty index, to measure the welfare impacts. These impact areas are developed by considering the potential theory of change in BISP, where the programme aims to improve consumption in the short run and poverty eradication in the long-run. Therefore, one can expect significant impacts on consumption, headcount poverty, the child deprivation index and the multidimensional poverty index.

The study is carried out by using both the cross-sectional and panel survey, where the baseline was conducted in 2011, followed by an impact evaluation survey in 2016. The study will contribute both to academia and from a policy point of view. On the academic side, it will update the impact evaluation literature by conducting a robust statistical panel analysis where none of the studies has earlier explored the impacts on the child deprivation index and the multidimensional poverty index. Regarding the policy perspective, the analysis will help to re-think the role of social safety nets in poverty eradication in Pakistan. The analysis will also help policymakers understand how social safety nets can be used in promoting sustainable development and achieving SDG indicators.

The rest of the paper is organized as follows. Section II summarizes the review of various studies pertinent to the welfare impacts of safety nets. Section III explains the social safety nets initiatives in Pakistan, including BISP. Section IV encompasses data description and the methodology employed. Section V comprises the results of the study, and the last Section VII pertains to conclusion and policy implications.

II. Review of the Literature

In developing countries like Pakistan, SSNs are broadly considered as protective mechanisms for helping the vulnerable and deprived and to enhance inclusive growth [Barrientos and Hulme (2008)]. Social safety nets are widely debated regarding their impacts on socio-economic indicators, ensuring livelihood, relieving deprivation, improving purchasing power and ensuring food security. Besides, safety nets have been used as a pragmatic mechanism for helping the poor to graduate out of poverty. There are plethora of studies available that exclusively deals with the welfare impacts of safety nets on different economic indicators. The present section has reviewed the theoretical and welfare impacts of social safety nets.

1. *Welfare Impacts of Safety Nets*

As detailed earlier, social protection and labour (SPL) interventions are comprised of social safety nets (SSN), social insurance and labour market programs. They may differ on objectives; however, the aim is to promote resilience, equity and opportunity.

SSN programmes are non-contributory interventions that target the poor and vulnerable through unconditional and conditional transfers. Social insurance interventions work through contributions to help individuals against various vulnerabilities, including aging, sickness, and natural disaster. Labour market programs can be contributory or non-contributory with the aim to protect individuals from unemployment and loss of income [World Bank (2018)].

With the passage of time, developing countries have been diverting more resources to SSN programmes, averaging 1.5 per cent of their GDP at present. The amount varies across regions; the percentage is 2.2 for Europe and Central Asia, 1.5 for Africa and Latin America, 1.1 for East Asia, one for the Middle East and East Asia and 0.9 per cent for South Asia. The donor-funded SSN programmes are mostly operational in fragile and conflicted countries with little financing from the government, i.e., Ethiopia, Somalia, and South Sudan. The type of programme also varies across regions. For example, South Asian countries heavily rely on unconditional cash transfers and very little is spent on conditional cash transfers (5 per cent) and fee waiver programmes (4 per cent). The Latin American countries allocate a 21 per cent share to CCT interventions, and only 0.13 per cent to UCT related programmes [Aspire Database (2017)]. The lowest coverage is given population, and the bottom quintile is in South Asia and the highest in Europe, reflecting that European countries are allocating more resources to SSNs. In low-income countries, 18 per cent of coverage comes from SSNs and 2 per cent each comes from social insurance and labour market interventions, thus totalling 22 per cent. Still, UCT is the most popular intervention in developing countries, including South Asian countries.

The welfare impacts, mostly captured through household surveys, vary across the countries. In the poorest quintile, they contributed to reducing headcount poverty by 8 per cent and the poverty gap by 16 per cent. The impacts are fewer in low-income countries compared to high-income countries [2 per cent reduction in poverty compared to 15 per cent]. The degree of impact depends on the coverage, targeting type and the transfer amount. Georgia and South Africa have the highest poverty reduction impacts with 42.6 per cent and 40 per cent, respectively; whereas Chad has only 0.1 per cent impact and many others have no impact. Empirical evidence suggests that cash transfers generate multiplier effects at the household level [Daidone, et al. (2016)], as well as spill-over effects in local communities [Thome, et al. (2016)]. Evaluating seven African countries shows positive impacts on crop production and household consumption [Daidone, et al. (2016)], and an increase in the value of consumption was found to total more than the transfer amount itself in Zambia. They also led to a change in the pattern of the crop for Ethiopia, Malawi, and Zimbabwe [Davis, et al. (2016)]. The meta-analysis of seven African countries shows that household consumption, on average, increased by $0.74 for each $1 in the transferred amount [Ralston, et al. (2017)]. Cash transfer programmes improve household resource diversification and thus, also allow benefiting households to manage the risks effectively [Barca, et al. (2015)]. They also improve

savings, as Ghana and Zambia found improvement in savings by 11 and 24 per cent, respectively [Daidone, et al. (2016)]. Though spill-over effects are difficult to measure, the study by Thome, et al. (2016) found that the impacts were diffused over a population greater than the beneficiary population.

Regarding national impacts, Zoneira, et al. (2018) estimated the welfare impact of BISP and Zakat on headcount poverty, MPI, child school enrollment and women's empowerment by using the Household Integrated Economic Survey's (HIES) 2013-14 data. The results indicated that the BISP cash assistance had a positive impact on reducing headcount poverty by 4 to 7 percentage points. Hassan and Bibi (2016) attempted to measure the role of BISP cash assistance in achieving food security by using primary data for Barikot, district Swat, Khyber Pakhtunkwa (KPK). Positive impacts were found on certain food items, i.e., wheat, sugar, milk and vegetable consumption.

Nayab and Farooq (2014) estimated the welfare impact of BISP's cash assistance by using the Pakistan Panel Household Survey, 2010 (PPHS). Found that the recipient group is at the most disadvantaged position as compared to those who had never attempted to apply for benefits and the group that had attempted to apply but had not received them. The study found positive impacts on each household's health and food expenditures, but no impact was found on women's empowerment, child schooling and poverty. The BISP impact evaluation was conducted by Oxford Policy Management (OPM) in three consecutive years: 2013, 2014 and 2016. The study found that cash assistance had positive impacts on poverty as measured through Food and Energy Intake (FEI) and women's empowerment as measured through women's mobility and control over cash. Iqbal, et al. (2020), explore that the impacts of the BISP on Women Empowerment. The studies finds significant impacts of BISP on women's mobility, voice in decision-making and voting behavior in the long run however there was negligible impact on spousal violence.

Naqvi, et al. (2014) estimated the BISP cash assistance's impact on poverty by using primary data in Mankera district, Bhakkar, Punjab. The results have shown that cash assistance has positive impacts on food consumption. Similarly, Malik, et al. (2013) found that BISP cash assistance has positive impacts on poverty reduction by using primary data for the Peshawar district. Shahzad (2011) explored the impacts of BISP cash assistance on women's empowerment by using primary data in four cities (Multan, Mianwal, Sanghar and Mirpurkhas) and found a positive impact on household food consumption. Gazdar and Mallah (2010) pointed out that beneficiaries of BISP were until poor due to a lack of political association with the opponents' parties.

III. Social Safety Net Initiatives in Pakistan

Pakistan falls among those few developing countries whose constitution delineates social security as the civil right of every citizen. As indicated in Article 38 of the constitution, it's the responsibility of the state to provide social security. Other basic needs

include housing, clothing, food, medical relief and education irrespective of the caste or race, creed and sex. Pakistan has remained prone to series of challenges, i.e. economic crises, political instability, natural calamities, i.e. floods, pests' attacks, earthquakes etc. To cope with socio-economic problems, various governments from time to time have initiated many programmes to protect the needy and poor populations. The history of social safety nets and social protection in Pakistan has explicitly emerged both from the private and public sector. Public sector schemes have been implemented in past decades but not remained persuasive part of social protection framework. Most of the schemes remained focused to reduce poverty in the past such as Rural Works Programme, Village Aid, People's Works Programmes, education and health related services programmes. Public sector schemes can be categorized into two main parts, including social safety nets initiatives and social security programmes– the first target impoverished and vulnerable poor communities. The programmes include PBM, Zakat, BISP, Food Support Programme and other safety nets run by federal and provincial governments respectively. The second category targets formal labour force employees and retirees through providing benefits pertinent to maternity, invalidity, sickness benefits, work related injuries, old age benefits etc. The schemes include Employees Old Age Benefits Schems (EOBI) and Workers Welfare Funds (WWF).

Historically, SSNs in Pakistan were only remained limited to private transfers and zakat system. The system of zakat was commenced in the 1980s under the Ordinance of Zakat and Usher while Pakistan Bait-ul-Mal (PBM) was established in 1991as a sovereign body. The amount of assistance provided to the poor under these systems was minimal and little along with limited coverage of poor, irregular mode of payments. However, zakat was being offered bi-annually while PBM payment was offered annually to the poor. The broad need for SSNs in Pakistan specifically emerged after the 2005 earthquake, high inflation in the late 2000s and floods in 2010. Subsequently, the government designed and opted the National Social Protection Strategy (NSPS) in 2007 to address and meet the basic needs of the poor and deprived. Now various formal sector and informal sector programmes are under implementation by the governments to cater to the needs of underprivileged segments. The detailed descriptions of all safety nets programmes do not come under the scope of this paper. However, functions of safety nets initiatives operating at present in the country are tabulated and placed in Table A-1 (Appendix A).

Whether these programmes have had incredible impacts on target beneficiaries or not is still debatable in the literature. Still, the country is in the transition to improve SSNs as currently the programmes have been facing operational, financial constraints and operational challenges of targeting, coverage and efficient service delivery [Bari, et al. (2005), World Bank (2007)]. Such initiatives need not only to improve accessibility to the impoverished but also help the poor to take them out of poverty along with to escalate their social security. Other challenges/issues include overlapping problems, duplications, lack of co-ordination between different organizations and fragmentations

as well which needs greater attention to be appropriately tackled for getting the greater impact of these programmes [Nayab and Farooq (2014)].

1. BISP's Performances and Achievements

Poverty in Pakistan is dynamic in nature as a large population is found around the poverty line and any micro and macro shock is likely to affect them [Arif and Shujaat (2014)]. Keeping in view poor economic growth along with high inflation, the Government of Pakistan has launched BISP as a flagship programme in July 2008 for smoothening consumption of poor and vulnerable households. Its long term impacts include the eradication of poverty and the promotion of women empowerment. Initially, the selection of beneficiaries was carried out through parliamentarians; however, BISP followed scientific based targeting mechanism in 2009 by selecting beneficiaries through the Proxy Means Test (PMT) formula. HIES 2008-09 was used to select socio-demographic and economic indicators that were easily verifiable and had optimal prediction on per capita household consumption. The PMT formula determined the welfare status of the household on a scale between 0-100. After the establishment of formula, a door-to-door survey was conducted in 2010-11 throughout the country by covering 27 million households with 87 per cent coverage of the total population. A threshold score of 16.17 was established to identify eligible beneficiaries. There could be multiple eligible families within the eligible household. Crucially, within each eligible family, a Receiver Woman was identified, defined as every ever-married woman having a valid Computerized National Identity Card (CNIC) who is then eligible to receive the cash benefit. Around 5.8 million beneficiaries have been receiving quarterly unconditional cash assistance until June 2019 [GoP (2018)]. BISP is also among the pioneer in World to disburse payment through biometric verification system (BVS) as all the beneficiaries have been receiving payment after live thumb/finger verification from Nation Database and Registration Authority NADRA. Despite the change in political regimes, the programme expanded over time with its budgetary allocation of PKR 34 billion in 2008/09 to PKR 180 billion in 2019-20.

IV. Data and Methodology

1. Data Description

To investigate the impact of BISP's unconditional cash assistance on selected welfare indicators, we have used BISP's Impact Evaluation Panel Survey conducted by Oxford Policy Management (OPM). The panel survey was designed to gauge BISP cash assistance's impacts on a variety of indicators, including per adult equivalent monthly consumption, headcount poverty, multidimensional poverty index (MPI), nutrition, livelihood, assets, saving, and women's empowerment. The evaluation survey

was typically designed to gauge impacts where a baseline was established in 2011 (right before intervention) by surveying both the beneficiary and non-beneficiary households. After two years of intervention, a series of follow-up rounds were conducted in 2013, 2014 and 2016 to gauge the impacts of the intervention. The study has used only the baseline and the 2016 round, as sufficient time passed after the intervention until 2016; thus, one can expect interventions to have socio-economic impacts.

The baseline survey was conducted from 8,675 households in all four provinces of Pakistan. Since impact evaluation requires robust treatment and control groups, BISP established treatment and control groups on the basis of narrowed PMT bandwidth; households having a PMT score between 11.17 and 16.17 were declared as beneficiaries and households having scores between 16.18 and 21.17 were declared as non-beneficiary households. Establishing a baseline helped in comparing the beneficiary (treated) and non-beneficiary (control) households across that time and overtime.

The 2016 follow-up round covered 9,159 households (Table 1). However, one can observe a high attrition rate between the rounds (2011 and 2016) that was due to data matching issues, as the baseline was conducted right before the poverty scorecard survey in some areas. Therefore, households that were found to be matched on PMT scores in both the baseline survey and poverty scorecard survey were considered valid and the rest were dropped.

2.   *Methodological Framework*

To accomplish the objectives of the proposed research on selected welfare indicators, we have conducted both bi-variate and multivariate analyses. The selected welfare indicators are per-adult equivalent monthly consumption, headcount poverty, multidimensional poverty index (MPI) and child derivation index (CDI). The reason for the selection of impact variables is the potential BISP's impact where 'Theory of Change'

TABLE 1

Sample Size of BISP's Panel Data

Province	Households Surveyed in 2011 (Baseline Survey)			Households Surveyed in 2016 (Evaluation Survey)			Panel Households (2011 and 2016)	
	Rural	Urban	Total	Rural	Urban	Total	Target	Control
Punjab	2389	773	3162	2287	999	3286	580	419
Sindh	1524	810	2334	1794	1213	3007	1001	233
Khyber Pakhtunkwa	1533	521	2054	1505	670	2175	651	269
Balochistan	829	296	1125	434	237	671	154	73
Total	6275	2400	8675	6020	3119	9139	2386	994

Source: Estimated from the BISP Impact Evaluation Survey 2011 and 2016.

suggests that BISP's cash transfer will help in consumption smoothening in short-run and assets building in long-run.

We have used both the various statistical techniques to gauge overtime and across the impacts, i.e. Regression Discontinuity Design (RDD) and difference-in-difference (DiD). However, one of the major drawbacks is to tackle selection biasness in evaluation as beneficiary (treated) households vary from non-beneficiary (control) households on socio-demographic characteristics. Propensity score matching (PSM) is a potential solution to avoid selection biasness, as it provides appropriate comparisons by constructing a treated and valid counterfactual group. However, the technique faces certain challenges, i.e. weak internal validity and absence of long-range comparisons [Caliendo and Kopeinig (2008)].

In multi-variate analysis, we have used the Regression Discontinuity Design (RDD) technique to gauge the cross-sectional impacts for the 2016 round where beneficiary households were compared to non-beneficiary households on selected welfare indicators. Similarly, we have applied the Difference in Difference (DiD) technique for panel households to measure the welfare impacts over time. As detailed in Table 1, we have data from 3380–panel households who were interviewed in both the 2011 and 2016 rounds. It is worth mentioning that all the beneficiary households cannot be compared with non-beneficiary households due to variations in socio-demographic and economic characteristics. Therefore, we have developed two comparable groups for comparison; beneficiary households having a PMT score from 11.17 to 16.17 were compared with non-beneficiary households having a PMT score from 16.18 to 21.17.

The bi-variate analysis has covered a comparison of socio-demographic and economic characteristics between beneficiary households and non-beneficiary households by developing two bandwidths of the poverty score, wherein households having scores above 11.17 and below 16.17 are declared as beneficiary households whilst households having scores above 16.17 but below 21.17 serve as the non-beneficiary group.

The measurement of selected welfare indicators as follows:

i) **Headcount poverty** is measured by following official methodology where both the food and non-food consumption expenditures are used. The method may be called as cost of basic (CBN) approach where the poverty line is set to fulfil basic food (2350 caloric intake) and non-food basic needs. Using 2013 official poverty line (Rs. 3030 per adult equivalent per month), we have used Rs. 2542 poverty line for 2011and Rs. 3240 for the year 2016. It is worth mentioning that the Planning Commission has updated the poverty line (Rs. 3030 per-adult equivalent per month) under the CBN approach in 2013-14. The same poverty line was deflated for 2011 and inflated for 2016 year by using the consumer price index (CPI).

ii) **The multidimensional poverty index** (MPI) is constructed by following the Oxford Poverty and Human Development Initiative (OPHI) methodology. The MPI index

is calculated by using three dimensions, including education, health and standard of living. Overall, 11 indicators are taken from 3 dimensions. Equal weights are assigned to each of the dimensions by following OPHI methodology. A household will be considered deprived and an MPI poor if s/he is deprived in 1/3 of the weighted indicators. Details on the definition of indicators are given in Table A-2 (Appendix A).

iii) **The child deprivation index** (CDI) is constructed using the following OPHI methodology. The same is also used by Iqbal and Nawaz (2017) for constructing the health index of Pakistan and by Wasswa (2015) for the child poverty index of Uganda. The index is developed at the household level by selecting more indicators related to children, and equal weights are assigned to five dimensions. A household is considered to be deprived and CDI poor if any household is deprived in 1/3 of the weighted indicators. Details on the definitions of the indicators are given in Table A-3 (Appendix A).

a.   Regression Discontinuity Design (RDD) Technique

As detailed above, we have employed the Regression Discontinuity Design (RDD) on the 2016 round to gauge impacts on selected welfare indicators. The technique aims to measure the impact of any intervention by comparing the beneficiary households with non-beneficiary households. The RDD is a quasi-experimental technique that is used in the evaluation for cross-sectional surveys. Here we have employed the RDD for evaluating the impact of BISP's cash assistance on selected welfare indicators by using various fixed bandwidth, i.e. +/-3 to +/-5, and optimal bandwidth. The reason behind using various bandwidths is to ensure internal validity. In other words, socio-demographic and economic characteristics of the beneficiary and non-beneficiary households must be the same, as one can then expect a concise comparison while reducing the bandwidth.

The RDD technique encompasses strong internal validity for those households located near or in close proximity to the threshold, which gives Local Average Treatment Effects (LATE) for households near the threshold but weak external validity for those farther from the cut-off—that's why we excluded benefiting households having scores below 11.17. Under certain assumptions of RDD, we have used observations close to the cut-off/threshold for assessing the impact of the programme on the outcome variable (OV) by taking the difference in the OV of the treatment and control group observations around the cut-off point, as illustrated below in Equation (1):

$$OV\,(1) - OV\,(0) = (OV_i | x_i, = 1, BISPscore_i) - E\,(OV_i | x_i, = 0, BISPscore_i) \quad (1)$$

The existing available literature has portrayed two types of RDD, namely sharp RD, wherein only eligible households can be selected for assistance. In contrast, non-eligible households will not be part of the programme and perfect compliance in selecting beneficiary and non-beneficiary households as possible. In Fuzzy RD, however,

some non-beneficiary group households may receive assistance based on some socio-economic characteristics like disability, and this approach does not require perfect compliance from the beneficiary and non-beneficiary households. We have used Fuzzy RD, as the BISP's assistance has also been given to some those households who are eligible but have a poverty score above 16.17. Furthermore, we have used a non-parametric approach that involves estimating differences in the intercepts, i.e. discontinuity in two local polynomial estimators from each side of the eligibility threshold. Formally, for positive bandwidth h Equation (2):

$$\min_{\beta} \sum_{i=1}^{n} \left(OV_i - \sum_{j=0}^{p} \beta \ (BISPscore_i - c_0)^j \right)^2 K\left(BISPscore_i - c_0 / h\right) \qquad (2)$$

Triangular Kernel weights have been assigned to the observations by using a Kernel Weight approach that we employed to assign higher weights to the observations close to the cut-off point than those observations farther from the threshold.

b)   <u>Difference in Differences (DiD) Technique</u>

The study has employed the difference-in-difference technique to gauge impacts for panel households where the same beneficiary and non-beneficiary households are compared over time (2011 and 2016). The DiD method compares changes in the outcome variables over time between the beneficiary group and non-beneficiary group to estimate the intervention's impact. It evaluates the impact of the program/intervention on the outcome variable 'Y'. Simple DiD results may be misleading, as they do not account time invariant characteristics and all households in both groups are similar. Moreover, the errors in households are more likely to be correlated pre- and post–treatment. By looking into this situation, the DiD with each household's fixed effect is more rigorous to use, which also clusters errors at the household level and avoids serial correlation. We have used the following model for estimating the DiD by using an impact evaluation panel survey of BISP for the 2011 and 2016 rounds as illustrated in Equation (3):

$$Outcome = \beta_0 + \beta_1 \ time + \beta_2 \ bisp\_assistance + \beta_3 \ (time*bisp\_assistance) + fe + \varepsilon \quad (3)$$

where the outcome is CPI, MPI, Headcount poverty and Peradult equivalent monthly consumption expenditures respectively, $\beta 0$ is the constant term, bisp_assistance is a dummy variable, '0' is the indicator for the non-beneficiary group, and '1' indicates the beneficiary group. Time is also a dummy variable with 0 if the time is 2011 and 1 if the time is 2016; time*bisp_assistance is the interaction term, the product of time and bisp_assistance; fe is each household's fixed effect and ε is error term. Here $\beta 3$ is the coefficient of the DiD. The negative value of $\beta 3$ shows the negative impact of the BISP cash assistance on welfare indicators. In contract any positive value of $\beta 3$ shows the positive impact of BISP cash assistance over time.

V. Results and Discussions

This section encompasses the findings of the study, where Section 1 has covers bi-variate analysis by making a comparison between the beneficiary and non-beneficiary households, whereas Section II explains multi-variate analysis, including the results estimated through the RDD and DiD approaches.

1. *Socio-Demographic and Economic Characteristics*

We have established two groups for comparison: beneficiary households having PMT scores between 11.17 and 16.17 and non-beneficiary households having scores between 16.18 and 21.17. Therefore, the impact evaluation analysis is carried out within a narrowed PMT bandwidth of +/-5 cut-off.

Table 2 displays the findings on socio-demographic characteristics of the beneficiary and non-beneficiary households where both the 2011 and 2016 rounds are used. Three results could be drawn from the analysis: first, beneficiary and non-beneficiary households are almost homogenous on various socio-demographic and economic char-

TABLE 2

Socio-Economic Characteristics by PMT Score within +/-5 Bandwidth

Characteristics	2011 Round		2016 Round	
	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17
Household size (average)	7.6	7.9	7.7	7.2
Age of head (Avg yrs.)	46.3	44.9	47.9	48.3
Female-headed households (%)	6.6	8.4	11.1	13.8
Male adults (No.)	1.8	1.9	2.1	2
Female adults (No.)	1.9	1.9	2.2	2.1
Presence of disabled persons (%)	32.8	31.5	22.7	22.2
High-dependency households (%)*	56.8	48.6	37.7	34.1
Education of HH head (avg yrs.)	2.1	2.4	2.4	2.9
Employment status of household head (%)	81.6	76.4	75.2	72.1
Max. education of household (avg yrs.)	6.7	6.3	7.3	7.9
Child stunting (%)	41.5	41.9	45.4	43.6
Child wasting (%)	21.1	19.5	18.1	18.1
Child underweight (%)	38.1	39.2	34	31.3
Child attendance age 5-12 years (%)	57	45	70.4	60.4
Child labour age 5-14 years (%)	16.7	14.1	13.4	10.7

Source: Estimated from the BISP Impact Evaluation Survey 2011 and 2016.

*The dependency ratio is the number of dependent members (below 15 or above 64) divided by the number of independents. Low dependency means the ratio is 0-0.05, medium dependency means 0.51-1 and high dependency means >1:

acteristics, except that the former has been receiving cash assistance. Second, both sorts of households have been facing a high number of vulnerabilities, i.e. larger household size, high dependency rates, lower levels of education and higher levels of malnutrition. Third, during the 2011 and 2016 period, only a few indicators have shown improvement in each household's well-being among both groups, i.e. improvement in child schooling, reduction in dependency and child labour, whereas there is still a high level of malnutrition.

A comparison among beneficiary and non-beneficiary households on dwelling and asset ownership is provided in Table 3, where both the 2011 and 2016 rounds are documented. The findings reveal that both the beneficiary and non-beneficiary households are at their most disadvantaged conditions in 2011 and 2016 due to their poor living conditions, i.e. less access to toilet facilities, challenges in access to safe drinking water, high crowding rates, and low-quality housing (katcha). In addition, the majority of them lack reproductive assets, i.e. land and livestock. Profiling both sorts of households (beneficiary and non-beneficiary) illustrates that both groups have exhibited, on average, similar characteristics across time. The socio-demographic and economic characteristics of panel households from 2011-2016 are placed in Table A4 (Appendix A).

In bi-variate analysis, we have also gauged the performance of cash assistance on selected welfare indicators by comparing both the cross-sectional and panel-surveyed beneficiary and non-beneficiary households. The consumption expenditures show that during the 2011 to 2016 period, the average real per-adult equivalent monthly expenditures improved, as shown by both the cross-sectional and panel analysis. The improvement is almost uniform on food and non-food consumption, as well as among both the beneficiary and non-beneficiary households. The estimates of headcount

TABLE 3

Asset Characteristics of Households by PMT Score within +/-5 Bandwidth

Characteristics	2011 Round		2016 Round	
	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17
Owning house (%)	77.9	80.7	81.8	84.1
Small animals (%)	41.7	40.3	32.6	29.7
Large animals (%)	31.8	30.2	28.9	27.2
Owning agricultural land (%)	12.4	13.9	12.2	12.5
Floor katcha (%)	72.9	65.3	59	53.1
Access to toilet facilities (%)	60.2	66.9	83.1	86.3
Access to safe drinking water (%)	76.8	79.7	82.5	84.1
Persons per room (Average)	5.1	5.5	4.9	4.4
HH faced shocks during the last two years (%)	73.8	68.5	48.4	49.3

Source: Estimated from the BISP Impact Evaluation Survey 2011 and 2016 rounds.

TABLE 4

Monthly Real Consumption Expenditures and Headcount Poverty

Characteristics	Cross-sectional household		Panel household	
	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17
2011 Round				
Real per adult equivalent monthly consumption (in Rs.)	1864	1869	1845	1867
Real per adult equivalent monthly food consumption (in Rs.)	803	791	808	800
Real per adult equivalent monthly non-food consumption (in Rs.)	1061	1078	1037	1067
Headcount poverty (%) based on CBN Approach	92	92	92.3	91.2
2016 Round				
Real per adult equivalent monthly consumption (in Rs.)	2349	2481	2278	2311
Real per adult equivalent monthly food consumption (in Rs.)	1173	1206	1159	1154
Real per adult equivalent monthly non-food consumption (in Rs.)	1177	1274	1119	1157
Headcount poverty (%) based on CBN Approach	73.7	67.7	77.6	75.3

Source: Estimated from the BISP Impact Evaluation Survey 2011 and 2016 rounds.

poverty depicts a decreasing trend in both beneficiary and non-beneficiary households when subjected to a cross-sectional and panel data comparison, but both groups remained more vulnerable and impoverished—according to cross-sectional as well as panel data comparisons—in facing high poverty, as illustrated in Table 4.

For analyzing the welfare impacts on child deprivation index (CDI) and multidimensional poverty index (MPI), we have used 33 per cent thresholds in computing the MPI and CDI indices. In other words, "33" means that a household is deprived if it is deprived in 1/3 of the listed indicators. It is worth mentioning that raising the deprivation cut-off will automatically lower the deprivation rates as measured through MPI and CDI. The results in Table 5 reveal that there are lower rates in the child deprivation index among non-beneficiary households compared to beneficiary households, as reflected through both the cross-sectional and panel analyses. The rates significantly declined over time: among panel households, 35.3 per cent of the beneficiary households were deprived according to the CDI in 2011; the percentage declined to 23.4 per cent in 2016. The declining rates during the 2011 and 2016 periods are higher among beneficiary households than among non-beneficiary households.

TABLE 5

CDI and MPI (%) among Beneficiary and Non-Beneficiary Households

Welfare Indicators	Cross-sectional household		Panel household	
	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17	PMT Score 11.17 to 16.17	PMT Score 16.18 to 21.17
2011 Round				
Child Deprivation Index (CDI)	35.8	28.2	35.3	28.3
Multidimensional Poverty Index (MPI)	32.6	27	32.1	27.2
2016 Round				
Child Deprivation Index (CDI)	22	16.6	23.4	18.3
Multidimensional Poverty Index (MPI)	21.2	16.4	22.5	17.3

Source: Estimated from BISP Impact Evaluation Survey 2011 and 2016 rounds.

The trends in the multidimensional poverty index (MPI) are reported in Table 6. The trends are almost the same, where a higher percentage of beneficiary households are deprived compared to non-beneficiary households in both the 2011 and 2016 rounds. The panel analysis reveals that an almost similar percentage of households (around 10 per cent) among both groups (beneficiary and non-beneficiary) succeeded in moving out of deprivation as measured through the MPI.

2. *Multi-Variate Analysis*

This study has used the regression discontinuity design (RDD) to assess cross-sectional welfare impacts on beneficiary households' where the 2016 round is used for the analysis in which beneficiary households are compared with non-beneficiary households to gauge welfare impacts. It is worth mentioning that the 2011 round cannot be used, as it is comprised of baseline characteristics and households having no intervention. We have used the difference-in-difference (DiD) technique for panel analysis, where we analysed the data of 3380 households (both beneficiary and non-beneficiary) who were interviewed in both the 2011 and 2016 rounds. The technique helps to draw comparisons over time by comparing the same households.

a)   Welfare Impacts through RDD Analysis

The results of the RD estimate on headcount poverty and per-adult equivalent monthly expenditures for cross-sectional households are illustrated in Table 6. The RD estimates on headcount poverty show that all coefficients of headcount poverty are negative and insignificant at +/-5 PMT score bandwidth. It suggests that the programme does not show any impact on reducing poverty while comparing the benefi-

TABLE 6

RDD Impact on Headcount Poverty and Monthly Consumption

2016 cross-sectional Sample	Headcount poverty (CBN)	Per-Adult Equivalent Consumption (Rs.)	Per-Adult Equivalent Food Con- sumption (Rs.)	Per-Adult Equivalent Non-Food Con- sumption (Rs.)
+/- 5 PMT Score Bandwidth				
RD Estimates	-0.02	69	21.1	48
Standard Error	(0.02)	(55.2)	(28.5)	(35.8)
P-value	0.35	0.21	0.46	0.18
Sample size left of the cut-off	3683	3683	3683	3683
Sample size right of the cut-off	4173	4173	4173	4173
+/- 3 PMT Score Bandwidth				
RD Estimates	-0.05	129	43	86
Standard Error	(0.03)	(68.6)	(35.7)	(44.0)
P-value	0.11	0.06***	0.23	0.05**
Sample size left of the cut-off	2500	2500	2500	2500
Sample size right of the cut-off	2489	2489	2489	2489
Optimal Bandwidth				
RD Estimates	-0.04	135	42	90
Standard Error	(0.03)	(84.3)	(39.6)	(53.9)
P-value	0.38	0.10***	0.28	0.09***
Sample size left of the cut-off	3307	2344	2793	2306
Sample size right of the cut-off	1004	1184	1525	1111

Source: Estimated from the BISP Impact Evaluation Survey, 2016 round.
*shows significance at 1 per cent, **shows significance at 5 per cent, ***shows significance at 10 per cent. Fuzzy RD estimates are used and the p-value is associated with the robust local polynomial that is bias-corrected, whilst the estimates are based on the kernel triangular method.
Note: The BISP poverty score was normalized so that eligibility threshold = 0

ciary households with non-beneficiary households. The RD estimates on total per-adult equivalent monthly expenditures shows that the programme improved total per-adult equivalent monthly expenditures of the beneficiary households over those of the comparison group during 2016, by Rs. 69 at +/-5 bandwidth followed by Rs. 129 at +/-3 bandwidth and Rs. 135 at optimal bandwidth. The results indicate the significance impact at +/-3 bandwidth and optimal bandwidth.

The RD estimates on per-adult equivalent monthly food expenditures show that the majority of the coefficients are positive but have no impact for the 2016 round. However, the RD estimates pertinent to non-food expenditures indicate improvement in total per-adult equivalent non-food expenditures by Rs. 48 at +/-5 bandwidth, followed by Rs. 86 at +/- 3 bandwidth and Rs. 90 at optimal bandwidth show significant

at +/- 3 bandwidth and optimal bandwidth, respectively. The BISP cash assistance's positive impacts on non-food expenditures have led to a positive impact on total consumption expenditures. The visual evidence of the RD estimates pertinent to headcount poverty, and total per-adult equivalent monthly expenditures are illustrated in Appendix B (Figure B-1 to B-4).

b) <u>Welfare Impact through DiD Analysis</u>

We have estimated the welfare impact of BISP cash assistance by employing difference-in-difference (DID) and using two rounds of panel data, the baseline in 2011 and a follow-up in 2016. The results of the DiD model are reported in Table 8, which

TABLE 7

RDD Impact on MPI and CDI, 2016

2016 Cross-Sectional Sample	Multidimensional Poverty Index (MPI)	Child Deprivation Index (CDI)
+/- 5 PMT Score Bandwidth		
RD estimates	0.001	0.002
Standard Error	(0.01)	(0.01)
P-value	0.9	0.88
Sample size left of the cut-off	3683	3683
Sample size right of the cut-off	4173	4173
+/- 5 PMT Score Bandwidth		
RD estimates	-0.02	-0.005
Standard error	(0.01)	(0.01)
P-value	0.27	0.71
Sample size left of the cut-off	2500	2500
Sample size right of the cut-off	2489	2489
Optimal Bandwidth		
RD estimates	-0.03	-0.005
Standard error	(0.02)	(0.02)
P-value	0.19	0.77
Sample size left of the cut-off	1913	2158
Sample size right of the cut-off	1019	1772

Source: Estimated from the BISP Impact Evaluation Survey, 2016 round.
*shows significance at 1 per cent, **shows significance at 5 per cent, ***shows significance at 10 per cent. Fuzzy RD estimates are used and the p-value is associated with the robust local polynomial that is bias-corrected, whilst the estimates are based on the kernel triangular method.
Note: The BISP poverty score was normalized so that eligibility threshold = 0.

TABLE 8

DiD Impact on Selected Welfare Indicators with Normed Poverty Score

Welfare Indicators	Control		Treatment		Difference-in-difference Coef (SE)
	Baseline Mean (SE)	Difference Coef. (SE)	Baseline Mean (SE)	Difference Coef. (SE)	
Per-adult equivalent monthly consumption	1866.7	444.53*	1760	439.8*	-4.74
	(43.64)	(49.76)	(31.57)	(35.16)	(63.25)
Per-adult equivalent monthly food consumption	800	354.1*	791.3	94.1*	-8.4
	(10.80)	(16.70)	(13.20)	(6.90)	(10.90)
Per-adult equivalent monthly non-food consumption	1067	90.4**	969	-620.48*	3.6
	(40.80)	(43.80)	(30.10)	(31.60)	(56.60)
Headcount Poverty	0.87	-0.18*	0.90	-0.17*	0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
Child Deprivation Index (CDI)	0.28	-0.10*	0.41	-0.13	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Multidimensional Poverty Index (MPI)	0.27	-0.10*	0.37	-0.10*	0.0
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Source: Estimated from the BISP Impact Evaluation Survey, 2011-2016 rounds
*significance at 1 per cent, **significance at 5 per cent, ***significance at 10 per cent.
Note: The BISP poverty score was normalized so that eligibility threshold = 0.

shows that per-adult equivalent monthly expenditures remained insignificant over time and DiD observed no impact on per adult food and non-food expenditures. The impact on headcount poverty is also insignificant. There is a positive impact on the child deprivation index (CDI), as deprivation was reduced by 3.3 percentage points. The impact on MPI is insignificant. Using various cut-offs of CDI and MPI other than 1/3, i.e. 40 per cent and 50 per cent, the impact is significant at 40 per cent and 50 per cent (Table A-5 in Appendix A).

VI. Conclusion and Policy Implications

This paper has explored the welfare impact of BISP cash assistance by conducting both cross-sectional and panel analyses. The bi-variate analysis shows that beneficiary group and non-beneficiary households hold almost similar socio-demographic and economic characteristics. The findings reveal that BISP has a mild welfare impact, as cross-sectional analyses have shown positive impacts on non-food consumption, total consumption and poverty, whereas there is no impact on the child deprivation index and multidimensional poverty index. The panel analysis shows positive impacts on the child deprivation index.

The findings draw various policy implications; first, unconditional cash assistance alone may not be helpful in graduating people out of poverty on a sustainable basis. The BISP has to focus on conditional cash transfers that would help in asset creation and skill development i.e. Mexico, Brazil, Chile etc, have been doing. Second, the current cash assistance (Rs. 5000 quarterly) is not sufficient even in consumption smoothening. The amount must be increased up to the extent that may help in achieving optimal consumption uniformity. Third, the programme should focus on other chronic challenges, i.e. malnutrition, financial literacy; child schooling etc that may help in improving SDG goals. Fourth, the control group (non-beneficiary households) suggests that the programme overlooks various deserving households. Keeping in view the dynamic nature of poverty, the process of including and excluding deserving households must also be dynamic in nature. Lastly, after the 18th Amendment, social security and safety nets are now provincial subjects. Keeping in view, a social protection framework is required to clarify the roles and responsibilities of federal and provincial governments as well as to tap the private sector.

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APPENDIX A

TABLE A-1

Current Safety Net Programmes in Pakistan

Programme	Assistance	Target Beneficiaries	Coverage	Financed By	Executed By
BISP	Cash transfer as income support	Married women belong to poor families	National	Public Funds	Federal Government
Pakistan Bait-ul Mal	Cash support to poor families for daughter's wedding, education and food	Disables, poor below the poverty line, orphans, widows	National	Public Funds	Federal Government
Microfinance	Cash support as loan for establishing business	Impoverished entrepreneurs for setting up self-employment to take out of the poverty trap	National	Donors Funds	Federal Government
People's Work Programme	Provision of Cash transfer for work	Support to rural people in the form of provision of gas, electricity, water supply, farm to market roads	National	Public Funds	Federal Government
Zakat and Ushr	Cash provision	Need, deprived and impoverished Muslims	National	Zakat levy & private contributions	Govt. Ushr & Zakat Committees
Employees Old–Age Benefit (EOBI)	Cash	Employees belong to formal sector	National	Employer's contribution	Federal Government
Workers Welfare Fund (WWF)	Provision of health, housing and schools facilities	Employees belongs to formal sector	National	Employer's contribution	Federal Government
Labour Market Programme	Provision of wage subsidies credit facility	Unemployed workers	National	Public Funds	Federal & Provincial Govt.
People's Rozgar Scheme	Provision of financial support for selected business	Educated unemployed community	National	Commercial Banks	National bank of Pakistan
Utility Stores	Provision of subsidy on prices	Poor and deprived segments	National	Public Funds	Federal & Provincial Government
Subsidy on sugar, wheat and fertilizers	In-Kind transfer	Poor community	National	Public Funds	Federal Government
Prime Minister Youth Loan Programme	Provision of financing for some selected business	Youth Community	National	Public Funds	Federal Government

Source: Ministry of Finance, 2017.

TABLE A-2

Multidimensional Poverty Index (MPI), Dimensions, Indicators and Weights

Dimension	Indicator	Definition	Weight
Living Standard	Electricity	Household is deprived if it does not have electricity	1/18
	Toilet	Household is deprived if it lacks toilet facility	1/18
	Structure of house	Household is deprived if the floor of the house is katcha (mud, sand etc)	1/18
	Water	Household is deprived if water does not meet MDG standards and distance to reach water is more than 15 minutes	1/18
	Clean energy	Household is deprived if using cooking fuel–wood, charcoal, kerosene oil, coal etc	1/18
	Assets	Households do not have more than one items: bike, motorbike, refrigerator or radio and does not own a car	1/18
Health	Household nutrition	Household is deprived if have access to only two food items during the last 7 days (wheat, wheat flour and rice/rice floor)	1/9
	Child nutrition	Household is deprived if child age 0-59 months old is malnourished	1/9
	Child vaccinations	Household is deprived if any child aged 20-59 months is not vaccinated for DPT or measles	1/9
Education	Years of schooling	Household is deprived if no household member has completed 5 years of schooling	1/6
	Child School Attendance	Household is deprived if any school aged child is out of school in Grades 1 to 8	1/6

Source: Estimated from the BISP Impact Evaluation Survey, 2011 and 2016 rounds.

TABLE A-3

Child Deprivation Index (CDI), Dimensions, Indicators and Weights

Dimension	Indicator	Definition	Weight
Education deprivation	Child Enrollment (5-14 Years Old)	Household is deprived if any child of age 5-14 years does not go to school	1/5
Labour deprivation	Child labour (5-14 Years Old)	Household is deprived if(a) any child in the age group 5-11 years old did one hour of economic activity or 28 hours of domestic work during the last week (b) any child of 12-14 years old did 14 hours of economic activity or 42 hours of domestic and economic activities combined are deprived. UNICEF	1/5
Health deprivation	Consult Doctors during sickness	Deprived if the household did not consult doctor for a child who is suffering from diarrhea and distance to the clinic is more than 30 minutes	1/15
	Child Immunization for BCG, DPT, Polio, Measles, Hepatitis Months Old)	Deprived if any child between age group 0-59 months old is not fully vaccinated	1/15
	Child Stunting	Deprived if any child is stunted/malnourished as per WHO standards	1/15
Food deprivation	Access to quality food	The child is deprived if household do not have access to one of the quality food items like fruits, meat, beef, poultry, fish, milk	1/10
	Access to sufficient food	Deprived if household do not have access to sufficient food during the last 12 months	1/10
Housing deprivation	Child crowding	Deprived if household's occupied two or less than two rooms	1/15
	Water	Deprived if the drinking water does not meet the MDGs criteria and distance to reach for water is more than 15 minutes	1/15
	Toilet	Deprived if household lack toilet facility at home	1/15

Source: Estimated from the BISP Impact Evaluation Survey, 2011 and 2016 rounds.

TABLE A-4

Socio-Demographic and Economic Characteristics of Panel Households
by Poverty Score within +/-5 Bandwidth

Characteristics	2011 Round		2016 Round	
	11.17 to 16.17	>16.17 to <21.17	11.17 to 16.17	>16.17 to <21.17
Household size (average)	7.9	7.6	7.9	7.4
Age of head	45.0	46.3	48.1	49.0
Female headed households (%)	6.2	8.1	8.3	9.7
Male adults (No.)	1.8	1.9	2.2	2.1
Female adults (No.)	1.8	1.9	2.2	2.2
Presence of disabled (%)	31.8	33.2	22.9	20.4
High dependency Households (%)	56.1	48.5	34.5	30.4
Education of HH Head (avg yrs.)	2.9	3.2	2.8	3.1
Employment status of households head (%)	80.8	75.2	74.8	72.6
Maximum Education of Households (avg yrs.)	6.3	6.7	7.1	7.7
Child stunting (%)	40.6	41.5	46.8	46.2
Child wasting (%)	20.2	17.8	16.0	19.0
Child underweight (%)	36.5	37.8	32.9	34.9
Child attendance of age 5-12 years (%)	53.8	43.4	58.8	68.9
Child labour of age 5-14 Years (%)	16.3	14.2	15.2	11.6
Dwelling and Asset Characteristics of Panel Households by Poverty Score				
Owning house (%)	79.0	82.6	83.3	86.5
Small animals (%)	42.7	41.1	36.1	34.9
Large animals (%)	31.3	33.0	33.0	33.2
Own agricultural land (%)	12.9	15.3	13.0	12.9
Floor kacha (%)	72.9	67.4	64.3	61.5
Access to toilet facility (%)	60.7	65.7	80.9	83.7
Access to safe drinking water (%)	79.7	76.6	81.4	84.7
Persons per room (Average)	5.5	5.1	5.0	4.9
HH faced shocks during last two years (%)	74.2	68.4	49.6	51.2
N	1210	994	1210	994

Source: Estimated from the BISP Impact Evaluation Panel Survey 2011-2016.

TABLE A-5

DiD Impact on MPI and CDI with Normed Poverty Score

Welfare Indicators	Control		Treatment		Difference-in-difference Coef (SE)
	Baseline Mean (SE)	Difference Coef (SE)	Baseline Mean (SE)	Difference Coef (SE)	
Child Deprivation Index (CDI) at Various Cut-offs (%)					
40	0.23	-0.09*	0.37	-0.14*	-0.05*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50	0.15	-0.06*	0.29	-0.14*	-0.07*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Multidimensional Poverty Index (MPI) at Various Cut-offs (%)					
40	0.18	-0.07*	0.3	-0.09*	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50	0.14	-0.05*	0.25	-0.08*	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Source: Estimated from the BISP Impact Evaluation Survey, 2011 and 2016 rounds.
Note: The BISP poverty score was normalized so that eligibility threshold = 0.
* shows significance at 1 per cent, ** shows significance at 5%, *** shows significance at 10%.

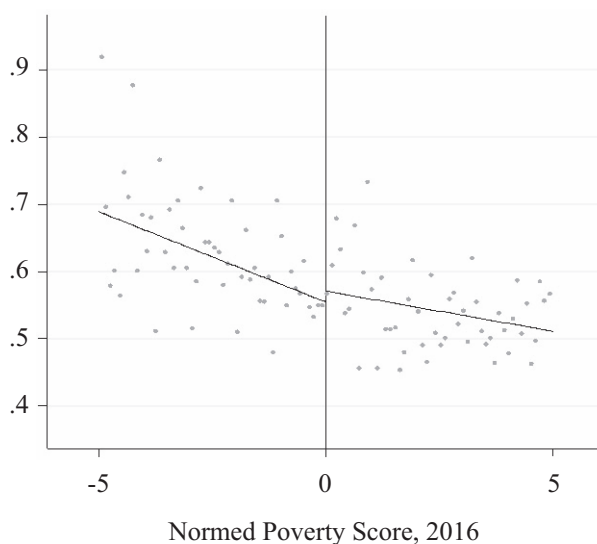## APPENDIX B
Visual Evidence of RDD Test on Welfare Indicators

Normed Poverty Score, 2016

FIGURE B-1

Headcount Poverty
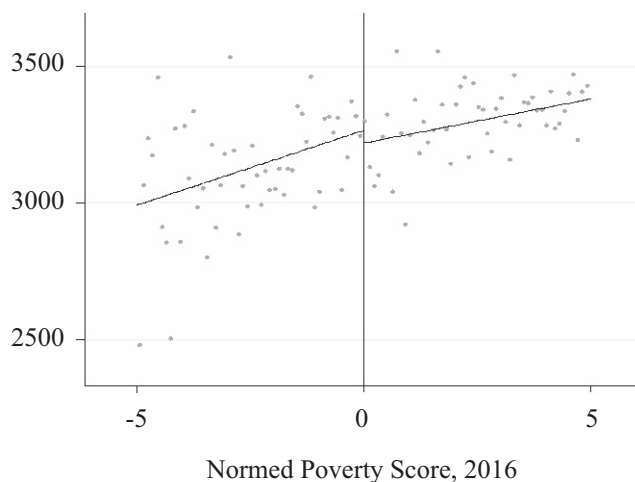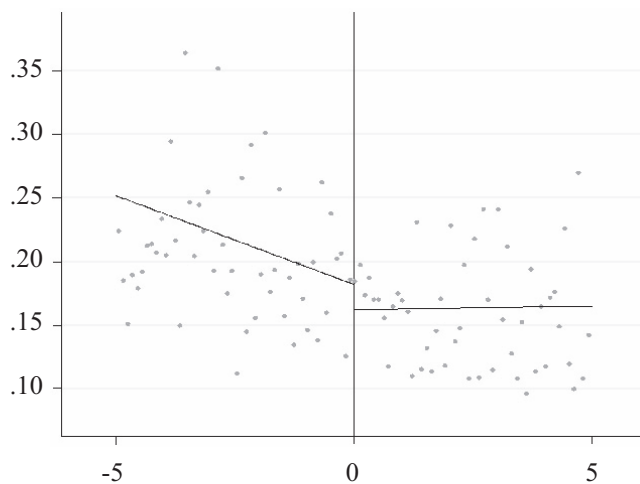

Normed Poverty Score, 2016

FIGURE B-2

Per Adult Equivalent Total Consumption Expenditures

Source: Estimated from the BISP Impact Evaluation Survey 2016 by authors. Graphs depicts scatter plot of average per adult equivalent monthly consumption expenditures and headcount poverty of each estimation sample with normed poverty score limited to +/-5 bandwidth in 2016 round. A linear regression line with the triangular kernel is fit on either side of eligibility cut-off.

Normed Poverty Score, 2016

FIGURE B-3

Multidimensional Poverty Index
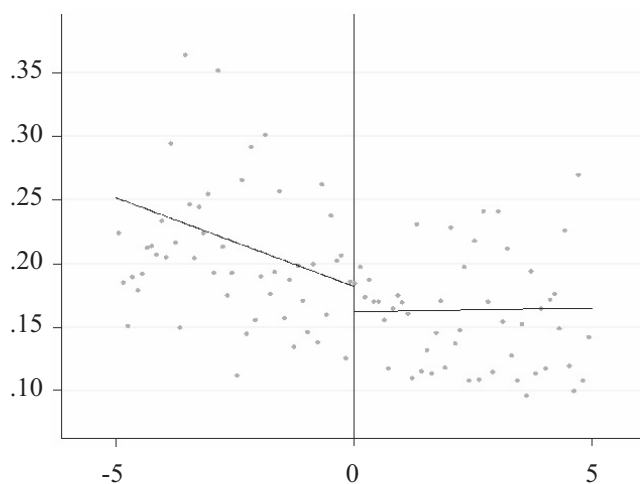
Normed Poverty Score, 2016

FIGURE B-4

Child Deprivation Index

Source: Estimated from the BISP Impact Evaluation Survey 2016 by authors. Graphs depicts scatter plot of MPI and CDI in each estimation sample with normed poverty score limited to +/-5 bandwidth in 2016 round. A linear regression line with triangular kernel is fit on either side of eligibility cut-off.